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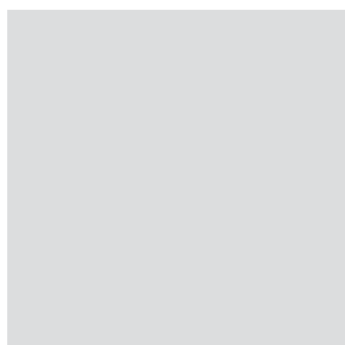
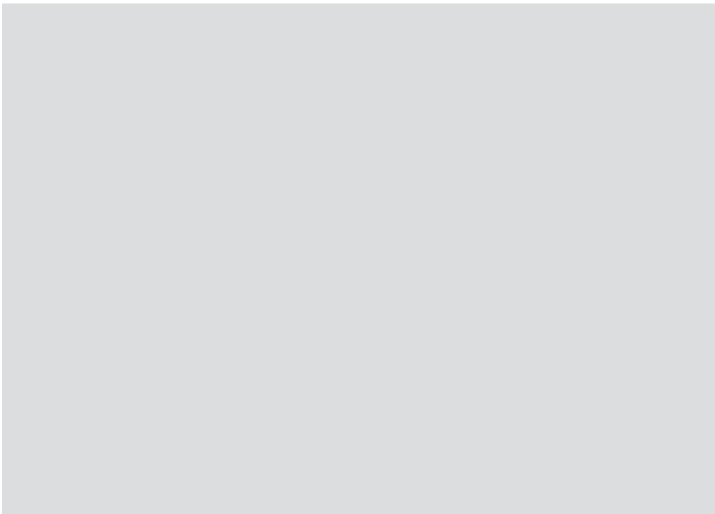
# Lesson Planning Guide for Students with Fragile X Syndrome

*A Practical Approach for the Classroom*



*Produced by*

**The National  
Fragile X Foundation  
Education Project**



The National **Fragile X** Foundation

*Mission Statement of the National Fragile X Foundation*

*The National Fragile X Foundation unites the fragile X community to Enrich lives through educational and emotional support, Promote public and professional awareness, and Advance research toward improved treatments and a cure for fragile X syndrome.*

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This guide owes a profound debt of gratitude to  
Dr. Marcia Braden, whose original work,  
*Curriculum Guide for Individuals With Fragile X Syndrome*,  
is incorporated extensively throughout these pages.



## Dedications



*Brett Dobslaw*

This project is dedicated with great respect and gratitude to Dr. Vicki Sudhalter, our advocate, teacher and friend.

Our lives have been enriched with much joy, laughter and love from our son Brett, his cousin Joe, and many others with fragile X syndrome. We want to thank them.

We are also immensely grateful to the many people who have helped in the preparation of this lesson planning guide—from the inspiration that sparked it, to the ideas that gave it life, to the hard work that gave it shape.

We look forward to this “work in progress” constantly evolving, with more lesson plans, strategies and innovative ideas continuing to be added as we learn more about fragile X syndrome.

### *The Dobslaw Family*

Randy and Diane, sons Blake & Brett  
Woodstown, New Jersey



*Sam Jacob & Ben Harrigan*

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The National Fragile X Foundation has been pleased to add additional support to the generous contributions of Randy & Diane Dobslaw in the production of this work. Completion of the Lesson Planning Guide has been a priority of the NFXF, and we greatly appreciate the hundreds of volunteer hours contributed by the Education Project Team. This guide will be of great benefit to educators, parents, and to children with fragile X syndrome, including my own sons Sam and Ben. I join my wife, Stephanie Jacob, in fondly dedicating this guide to all teachers who accept the challenge of teaching children with special needs.

### *John Harrigan*

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## Perspectives from Parents

*W*e believe that for education to have a real chance to be successful, a working partnership must be established between educators and parents. If all parties are willing to admit that they don't have all the answers, they should also be willing to admit that they can learn from each other.

Much like success in any interpersonal relationship, successful communication between school and home is built on a foundation of mutual respect and trust. Parents should acknowledge the teacher's expertise, dedication and value. At the same time, parents should be prepared to demonstrate what they know, that teachers don't. As parents of twins with fragile X syndrome, we have insight into our children's unique learning styles and the characteristics of their underlying condition. We also know that our children can learn, can effectively relate with others, and can fit in... if supported and given the chance. We know this because we have already successfully included them into our family and our community.



*Allison & Joshua Cohen*

As parents, what keeps us up at night are the unknowns in our children's future. As adults, will they fit in? Will they find jobs? Will they marry and have kids of their own? Will they have friends? Will they become productive and welcomed members of a community?

The hope and the dream and the ideal of true inclusion is that by making kids who are different real members of diverse school communities, when they reach adulthood each of the questions above will be answered in the affirmative. To witness this, to see teachers, administrators, and fellow students enriched by and acknowledging the value in our children, is what lets us begin to really believe that there truly is a place for them.

*Jeffrey and Arlene Cohen*

Parents of Allison and Joshua



*Sam Israel*

*A*n important milestone was my son's graduation from high school in 1994 with a regular diploma. He was the first special education student at that school to be honored as such. In the past, special education students received certificates of attendance. Well, students with special needs study at least as hard as other students. Diplomas are given to students whether they take algebra or basic math, whether they go on to college or not. Students with special needs do not just attend school. They learn a variety of subjects and become responsible citizens. It is the transcript that indicates what courses are studied. He marched in the commencement with his red cap and gown and received his diploma from a member of the school board. Following that came the all-night grad party!

*Margaret Israel*

Mother of Sam



*Jessie Ybarra*

*J*essie's best teacher was willing to try new things. He introduced drumming as a way to help calm and focus his students. It worked! Jessie, now 17, has flourished at school when he has had individual attention and regular sensory integration breaks. We're proud that recently several people have noted his improved decoding skills (from individual instruction on compound words and syllables). Others have mentioned his improved ability to plan and execute, learned surprisingly from his inclusion art class! Jessie is always learning, and he has taught us so much about being patient, kind, and empathetic. We couldn't be prouder!

*Carolyn Ybarra*

Mother of Jessie



*Caleb Head*

**C**aleb, my 7-year-old son, has flourished in his current school setting. One of his strengths is spelling. His teacher has been able to capitalize on that strength and help Caleb realize his potential. He is able to do his work on a dry erase board which is highly motivating to him. He also takes spelling tests on the same board. Caleb is lucky enough to have a group of staff members who know his strengths and use them to help him shine!

*Kristen Head*

Mother of Caleb



*David Inz*

**D**avid has been in school since he was 18 months old. He is now 18 *years* old. He was in inclusion classes for eight years and special ed classes for the rest. In both types, the most productive years were those in which the teachers embraced the notion that David learned best and was most comfortable when specific strategies and interventions were employed. Often this meant using educational techniques that were new to the teacher, such as the Edmark Reading Program, and making sure his sensory integration needs were met, such as having him sit in an “educube” during floor circle time in kindergarten. These teachers also facilitated social interaction by planning projects with peers, and they fostered self-esteem by assigning him jobs such as carrying a backpack for a student who had physical disabilities.

*Anita Inz*

Mother of David





# Lesson Planning Guide for Students With Fragile X Syndrome

*A Practical Approach for the Classroom*

## Introduction

We are all at one time beginners with fragile X syndrome (FXS). Whether your initial exposure comes through study, a friend, a relative, your own child, or a new and unique student who shows up at your classroom door the first day of school, you must begin somewhere in seeking to understand the challenges posed by children with FXS.

This workbook is intended to be just such a beginning for classroom teachers who may have little or no exposure to FXS. Indeed, even teachers with prior knowledge and experience of FXS should find benefit in these pages, as may parents who seek additional support in how to work with their children and in how to support, in turn, the teacher's classroom efforts.

No one knows better than teachers the high cost of failure to reach a student in a meaningful, learning-appropriate way. Our goal is to help make the teaching and learning environment from preschool through high school more effective, more efficient, and more rewarding for teachers and the student(s) with FXS who come under their care. We look to accomplish that goal by providing a wealth of practical information that includes background on FXS, descriptions of behavior and learning styles, discussion of educational and community resources, and sample lesson plans for children with FXS at a variety of developmental levels.

*What this guide provides*

Readers should find here a living document, open to amendment and adaptation. Its binder format makes it suitable for inclusion of many additional materials as they become available.

*Web-based updates*

It is also supplemented by web-based updates, available at [www.FragileX.org](http://www.FragileX.org). Whether you have 10 minutes before school to quickly grasp the contours of a lesson plan, or several hours to explore in depth the dynamics of learning by students with FXS, this binder should serve as a handy, easily digestible resource you can return to whenever you sense a need. It does not pretend to be the last word on FXS, but is instead intended to convey, in a spirit of pragmatism and genuine care, how you can make the most of your experience teaching these uniquely characteristic children.

*Fully supported inclusion is the best approach to educating most children with fragile X syndrome. They can perform to their own unique potential when both they and their classroom teachers receive the support they need.*



# What Is Fragile X Syndrome?

## A brief overview

Fragile X syndrome (FXS) is a genetic condition, present from birth, that is the most common known cause of inherited mental impairment. It is caused by a gene “premutation” that can be passed on over many generations without its carriers exhibiting any symptoms of the syndrome. When the full mutation does finally appear, it can cause a variety of intellectual, behavioral and physical differences, ranging from subtle learning problems to severe developmental disabilities. FXS affects both males and females, though males tend to exhibit more severe symptoms. It affects people of all races and ethnic groups worldwide.

*Its impact on learning*

FXS is a complex disorder that affects how children interact with others both within and outside the classroom. It can also dramatically impact how they learn. Providing them with opportunities that will allow positive interaction and successful learning can be a challenge, though rarely an insurmountable one. Although the disorder itself is complex, many of the strategies used to counter it in the classroom are based on proven teaching modalities that may apply to other children with special needs you see in the classroom—and often enough to all students. That said, students with FXS also have a number of needs that may require novel interventions by teachers. One goal of this workbook is to give teachers enough background and confidence to make ready use of those interventions.

*One couple reported 17 different diagnostic labels had been attached to their son during a years-long quest for diagnosis. The last one was fragile X syndrome.*

Despite their unique characteristics and needs, it is important to remember that children with fragile X syndrome share much in common with their classmates. By learning to identify and differentiate their needs, teachers can maximize these children’s learning, their sense of accomplishment, and their overall integration into the school environment.



# Essential Characteristics of FXS

The clinical characteristics of FXS can be observed in the major developmental areas encompassing physical, behavioral, and cognitive function. Although children with FXS tend to share certain commonalities we will discuss below, all characteristics are not necessarily present in any one person with FXS.

Approximately 1 in 4,000 males and 1 in 6,000 females in the general population have mental retardation due to FXS. Approximately 1 in 2,000 people have milder problems associated with the syndrome (which can often go undiagnosed).

## Physical

Males with fragile X syndrome often have a long face, high palate, large and/or prominent ears, and enlarged testicles. Loose connective tissue often leads to double-jointed fingers, flat feet, and vision problems. Heart murmurs (mitral valve prolapse) are not uncommon. Note that some of the facial characteristics do not appear until puberty or beyond, and do not necessarily appear in all males.

*Females may be different*

Females may also exhibit some of the physical characteristics observed in adult males, but are more likely to look similar to the general population.


Seizures occur in about 20 percent of people with FXS.

## Behavioral

Behavior in children with fragile X syndrome ranges from socially engaging and friendly to autistic-like and occasionally, aggressive. (It is estimated that approximately one-third of males with FXS have aggression problems, which most often show up as they approach adolescence.) Both genders are often shy or socially anxious, although more girls than boys learn to compensate for this by becoming outgoing and even gregarious. Difficulties with language may hinder social interaction. Autistic-like behaviors, seen in boys more than girls, may include hand-flapping or hand biting, fascination with moving objects and video displays, perseverative speech patterns, and decreased or absent eye contact.

*Lacking auditory filtering skills, students with FXS may experience noise as painful and aversive rather than mildly irritating. This can have profound negative implications not only for social development, but also for language acquisition.*

Children with FXS can become easily overwhelmed by sensory stimuli such as crowds, noises, or light touch.



*"It must be difficult for my son when he so intensely sees, hears and feels everything around him. We all get overloaded at times—sometimes everything is overwhelming. Just think, that's how it is for a child with fragile X syndrome—24 hours a day."*



Transitions from one task or location to another may also be difficult. Research shows that active management of the sensory integration needs of children with FXS improves these problems in many cases. When problems persist, medication may also be helpful, though this should be thoroughly evaluated by a physician with knowledge of FXS.

## Cognitive

*Wide range of development*

People with FXS represent a broad spectrum of intellectual development, so as in all matters, generalities must always give way to the specific person in front of us. Nevertheless, while some people with FXS demonstrate normal intelligence, we know that most exhibit deficits in cognitive development, ranging from mild to severe. While females can demonstrate the same deficits, they tend not to be affected as widely or severely as males.

Both genders tend to show weakness in auditory processing and what are called “executive functioning” skills such as planning, attending, sustaining effort, generating problem solving strategies, using feedback, and self-monitoring. (More specific gender-based information on strengths and weaknesses is provided in the next section.)

*Standardized tests often do not account for the tangential manner in which many children with fragile X form their associations to learning material. What may appear nonsensical and incorrect to the examiner could make perfect sense in the framework the student is using.*



# Developmental Characteristics

## Early development

One of the ironies of fragile X syndrome is that it is often slow to reveal itself, so it may go undetected in the early years. (This is more true of girls than boys.) Children without severe symptoms may thus not receive remedial assistance that could later help them adapt more readily to the school environment.

Girls with fragile X often show no academic difficulties as preschoolers. However, some girls and many boys will show delays in such early developmental milestones as walking and toileting. Fine motor development also tends to lag. Clinical experience suggests that the most common developmental delay for both genders is in speech and language acquisition.

*Imagine:*

*One mother reported  
that her son went  
through his entire early  
childhood without  
once taking a nap.*

*Common behaviors*

Even at an early age, both boys and girls may seem inflexible or perseverative in their approach to tasks. For example, they may insist on completing an activity in a particular way and become overly frustrated if interrupted. They also frequently exhibit hyper-sensitivity to noise, touch, and other normal stimuli of daily life.

Children with fragile X are more prone to ear infections and sleep irregularities than the general population. They may also become “stuck” in developmental behaviors that their peers move through with dispatch, such as sucking, biting and chewing on objects to satisfy oral stimulation needs.

## Cognition in boys with FXS

Cognitive strengths among males with fragile X syndrome may include:

- Verbal labeling and single word vocabulary.
- Simultaneous learning (the ability to process multiple pieces of information into an intuitive, gestalt-like whole, rather than putting individual parts together to form the whole).
- Receptive (listening) vocabulary, which is often higher than expressive (speaking) vocabulary. Vocabulary for subjects of interest may also be higher than would be expected based upon such indicators as test or IQ scores.

*Male cognitive strengths*



*Students with FXS benefit greatly when teachers set clear expectations and firm boundaries. But as in so many areas, this difference is not fundamental, but a matter of degree. All children need structure; children with FXS simply need more of it.*

- Visual matching and visual perceptual tasks with familiar information (e.g., puzzles with a known picture, as opposed to abstract block designs).
- Visual cueing using symbols or icons can prompt verbal responses. Whole images, such as pictures, logos, or words, can often be readily recognized.
- Memory for situations and for favorite TV shows, videos, and songs, is a strength in many boys.
- Mimicry, a skill which is often highly developed in boys and men with FXS. Success with memory tasks seems to be strongly influenced by the meaningfulness and complexity of the information presented (another point on which children with FXS have much in common with classmates at large).
- Adaptive functioning for life skills such as self-care, household management, cooking, and cooperative group work.

Cognitive weaknesses among males with FXS may include:

- Higher level thinking and reasoning skills.
- Complex problem solving, cause and effect questions, and abstract learning tasks.
- Visual-motor and visual construction tasks with novel items (such as bead sequencing and block designs).
- Sequential tasks. These are difficult because males with FXS tend to perceive the whole or “gestalt” rather than individual parts.
- Quantitative skills including arithmetic abilities, because of visual-spatial problems, sequencing, and poor concepts of quantity and number.
- Socialization and communication, especially in novel settings.

*Male cognitive weaknesses*



## Cognition in girls with FXS

Girls and women with FXS may have similar patterns of strength and weakness as do males, but their overall levels of performance are usually higher.

Cognitive strengths among females may include:

- Vocabulary and comprehension.
- Short-term visual memory.

*Female cognitive strengths*





- Reading and spelling (owing to strong visual memory skills).
- Writing. (Imaginative internal landscapes often follow from shyness and social withdrawal.)
- Spelling.

Cognitive weaknesses among females with FXS may include:

*Female cognitive weaknesses*

- Abstract thinking.
- Understanding spatial relationships for abstract information, especially with a motor requirement.
- Quantitative processing and generalization of number concepts.
- Conversational processing (inability to understand the give and take of conversation).
- Topic maintenance (a run-on narrative style with frequent tangents).
- Short-term auditory memory.
- Maintaining attention.
- Impulsive behavior.
- Non-verbal learning (reading non-verbal cues, visual spatial comprehension).

For more information on genetics, behavior, and therapy related to FXS, visit the website of the National Fragile X Foundation at [www.FragileX.org](http://www.FragileX.org).

*Children with FXS seem to compensate for auditory processing deficits by developing strong visual memory skills. So they find it enormously helpful when a visual component is included in presentations.*





# Putting Learning Styles to Work

All effective teachers take into account the varying skills and aptitudes of individual students, utilizing their strengths to build up weaknesses. By understanding commonalities of learning among students with FXS, teachers can then note and plan for the unique information processing styles that may be seen in any given individual.

## Understanding performance disparities

Students with FXS tend to function at a higher level than is demonstrated through typical cognitive testing. It is often assumed that cognitive ability determines achievement, but children with FXS outperform predictions that are based only on cognitive test scores. An example of this occurs with testing for reading comprehension. Though students may understand what they read, it might be difficult for them to answer direct questions about the content. Reading comprehension can be weak if concepts are abstract. (*See the literacy section, beginning on pg. 33 for more information.*) However, when asked to perform a task that shows an understanding of the same content, students with FXS are more likely to demonstrate understanding. Achievement tests are thus more useful than cognitive tests for judging a student's abilities. In addition, the social and performance anxiety of many students with FXS, along with the novel format of cognitive test designs, may lead to wide disparities in cognitive performance between the home and school settings.

## Managing inflexibility


*Take note of task avoidance*

Many children with FXS can be inflexible in their thinking, and, like children with autism, may become over-selective about the stimuli they attend to. They may be compulsive about using a certain type of pencil or paper. They may want to sit in a certain seat or may require that others also sit in certain seats. This is driven by their need to preserve familiarity and sameness, and goes along with their general aversion to novel tasks. Research tells us that students with FXS perform better on repetitive, familiar tasks. This does not mean that you should never introduce novel tasks, but that you note the ways in which he or she may be avoiding such tasks, e.g., diverting attention, acting out, becoming confused, or perseverating. Desensitization can then proceed, with the teacher encouraging indirect participation while supporting the outcome. The goal is to make each subsequent exposure to the task less anxiety-provoking.

*Sometimes teachers have to be like good attorneys, taking the indirect approach to securing the "evidence" that the student with fragile X really does know the answer to the question.*

## Promoting executive function

Developing the ability to diagnose a situation, formulate a plan and then carry it out can be a formidable challenge for children with FXS. These "executive function" abilities require a flexibility, nimbleness and confidence often missing in these students. Helpful strategies for



*"I know now that one of the greatest gifts my father gave to me by living the life that he did is the ability to compensate and adapt, and in the case of my own children, the dedication to look beyond a 'diagnosis' and know that no goal is out of reach in life."*



coping with executive function deficits include anything that helps students organize their approach to a task, including visual coding (by colors, numbers or symbols), step-by-step instructions, and encouraging them to ask for assistance from classmates or adults in the classroom. (The shyness and resultant social isolation experienced by many students with FXS makes achievement of this latter goal particularly difficult—and beneficial—to achieve.)

### Working around direct questioning deficits

It is not uncommon for children with FXS to become stymied by a direct question such as, “What was your favorite part of the story?” Such questions in isolation may force a response without the benefit of the contextual information students with FXS rely on to process their responses. The same question asked using a “fill-in” or “closure” technique such as: “When the boy jumped off the swing he...” tends to elicit the desired answer. Among very young children, asking a question that requires verbal expression—“What color is the ball?”—might elicit a blank stare, but when presented as: “Please hand me the green ball,” the child will choose the correct one. This is an example of a non-verbal response to a direct question.


### Allowing (and capitalizing on) the need for closure

Experience has demonstrated that children with FXS have a stronger need for completion or closure than do their classroom peers. It is not uncommon to observe a child desperate to finish a puzzle or fill in a blank before leaving a task. This need for completion can become a compulsion that may interfere with daily functioning or transitions—but it is also a trait that can be utilized to enhance learning.

*It is as if people with FXS see the world in one look and then face the challenge of examining it piece by piece, trying to correctly identify each part.*

The “closure” or “fill-in” approach can also yield results for social and behavioral functioning. For example, if a student is disturbed about an experience at school and is unable to verbalize the sequence of the event, a teacher or parent may use a fill-in technique to glean information. Instead of asking “Who hit you?” or “Where did this happen?” you may say something like, “Today on the playground you got...” or “When you were hit, Susie said...” The student’s need for closure often compels him or her to try to fill in the blanks. As you piece the incident together, you can gradually add more specifics to the story line and understand from your student’s perspective what happened.

*Communication tip*



*"There is nothing as frustrating as watching your child struggle to perform tasks that come quite naturally to other children their age. It isn't always easy to remind yourself that this is YOUR child and it's O.K. that he is 8 years old and cannot put together a simple puzzle or play first base on the team."*



## Learning from the whole backwards

Rather than learning one concrete and sequential step at a time, children with FXS tend to learn best by taking in a whole and then working backwards to its constituent parts. For example, when learning to read, most children learn letters, then sounds, words, phrases, and so forth. Math is also usually learned sequentially, with one numerical operation building upon another. By contrast, the simultaneous processing generally preferred by students with FXS uses intuition to organize and recall information. Such children learn facts or concepts by taking in multiple stimuli because that offers them more information—more building blocks—for forming an image or ideas or for solving a program.

A cogent example: Children with FXS are more likely to correctly identify a missing part from a whole image than they are to identify a whole image from individual parts. As you can surmise, this requires adjustments in normal teaching protocols.

## Tapping the familiar

*Put it in context*

Again, good teachers quickly learn to plug in learning materials that apply as directly as possible to the specific interests of their students. Students with FXS are in even greater need of such “associative learning” techniques because their attention deficits and hyperactivity make it more difficult for them to retain information without a clear context in their lives. For example, a student may well learn the ABC song before she is able to distinguish the different letters. Lacking the context of the song, the letters themselves are not ‘meaningful’ enough for the student to retain.

Some teachers have reported success using an “interest inventory” that is completed by parents, teachers, or caretakers. This can provide educators with a variety of meaningful “touch points” or sources from which to create teaching materials. For example, one student interested in television weather maps used the maps to learn geographical locations, states, and capitals, all of which would have been difficult to achieve when approached directly.

## Upwards from learning plateaus

All parents and teachers are aware of “plateau” phases during which children seem to be consolidating previous gains and “resting” without moving further ahead. These phases are usually followed by new leaps forward in a complex process one learns to marvel at without fully understanding. Students with FXS demonstrate this phenomenon more dramatically than others. If such students have pronounced intellectual deficits, teachers may fear the



plateau phase is permanent, or that any further progress may be much more difficult and incremental. That fear is almost always unfounded.

Students with FXS are capable of continuing to learn throughout their school lives, though their patterns may not fit the normal developmental sequence. They are just as much—and probably more—in need of encouragement, exhortation, persistence and patience as their peers in negotiating the many challenges of their learning years.

*Most children need the “rest” of a plateau phase where they can consolidate their developmental gains before pushing forward again. Children with FXS sometimes need a longer “rest,” but that shouldn’t lead anyone to think their development has peaked.*



# Problems, Interventions, and Strategies for Teachers

Teachers will of course want to make use of any and all resources available to help integrate the student with fragile X syndrome into the classroom setting. Occupational therapists can provide valuable assistance in suggesting classroom adaptations for the student with FXS. Resource teachers, psychologists and parents can also contribute substantially to this effort.

Following is a brief review of common educational issues, interventions, and strategies for teachers to integrate students with FXS into their classrooms

## *Problem*

With their susceptibility to sensory overload, students with fragile X may engage in patterns of withdrawal, acting out, and anxiety.

## *Interventions*

*Avoiding the “acting out”*

Have a “sensory diet” built into the daily schedule, designed in consultation with an occupational therapist. For example, every 1 1/2 hours, have the student do an activity that is known to be calming, such as brushing, wearing weighted clothing, performing physical tasks, jumping on a trampoline, etc.


## *Problem*

Distractibility. The student has difficulty attending to tasks and following directions from the teacher or classroom aide.

*Something as simple as where to seat students with fragile X syndrome can have far-reaching implications for their success in the classroom. Optimizing the learning environment in these subtle ways can make life better for everyone.*

## *Interventions*

Provide strategic seating location. Students with FXS may feel easily “crowded” and hypervigilant about people being behind them and “in their space.” Try seating such students as near to the front and side as possible, so the feeling of crowdedness is minimized. Avoid the middle of any seating layout. Consider use of a private study location (such as a study carrel) and a place for the student to work one-on-one with an assistant, with a fellow student, or in a small group with the assistant.



*"The special education professionals in each building provide the glue that holds his program together every year. They filter my vision for David into a workable scheme for the classroom teachers, and serve as liaison (and sometimes buffer and other times mediator) between home and the classroom."*





### ***Problem***

Off-task behaviors. Student attends to other, perhaps appropriate task, but not the one currently assigned.

### ***Interventions***

Try to redirect. Offer him a break in an alternative seating area or provide him with high-interest work. The work area should serve a positive and proactive purpose, and should never be presented as a punitive or negative consequence. Give him a preferred task to do as a substitute. Consider makeup work due later. Give student ample time for processing when asked to make decisions. Provide alternative methods of responding (visual symbols, hand signals, etc.).

### ***Problem***

Transitions. The student is easily frustrated and has difficulty making changes in routine or moving from one task or activity to another.

### ***Interventions***

Provide picture schedules to help student prepare for and visualize transitions. Prompt upcoming transitions using a visual count-down system or timer to signal the transition time. “Practice” changes in routine to give student ideas for appropriate reactions. Give student a “safe” place outside the classroom that is available upon request. The student can go to this location when frustrated or over-stimulated. Help the student learn how and when he or she needs a break away from the classroom.

*Creating a “safe” place*

*Students with FXS are much more likely than their peers to need the periodic physical release of a stretch, a walk, or a quick tour of the playground before gathering themselves up again. Teachers quickly learn to read the relevant clues that signal the student’s waning self-control.*

### ***Problem***

Obsessive behavior and perfectionism. Student stays too long at a writing task in a quest to see a “perfect” result.

### ***Interventions***

Increase use of word processing at the computer. This decreases perfectionism by eliminating handwriting (which the student thinks must be flawless), and helps with endurance during lengthy assignments. When possible and appropriate, however, allow student to finish tasks before moving on.



*Education for students with FXS is “physical” in the truest sense—they almost always learn better when counting is based on how many times they can jump over a line, and syllables are banged out on a drum.*

*Using visuals to give direction*

### ***Problem***

Anxiety and fear of failure.

### ***Interventions***

Avoid timed tests whenever possible. Consider replacement of written tests with oral tests as appropriate. Minimize assignment length and frequency. Limit homework—perhaps give it as an option (accompanied by plentiful encouragement) so the student with FXS can make the decision and feel more included.

### ***Problem***

Student resists standard “time-out” disciplinary measures.

### ***Interventions***

Isolation can be extremely anxiety-provoking for students with FXS. Discipline can be far more effectively achieved with a “sit-out” intervention that removes the student from the immediate activity but keeps him or her within range of classmates.

### ***Problem***

Difficulty with abstract concepts.

### ***Interventions***

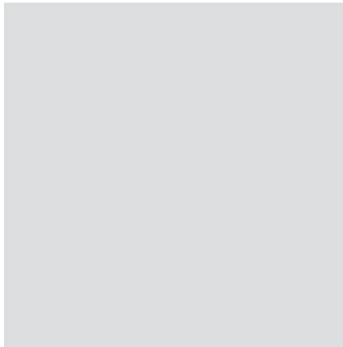
Provide concrete alternatives whenever possible. Use concepts in a realistic context. Examples: Measure or build to illustrate math concepts. Place a large numberline on the floor that can be jumped over. Have student jump, run or leap to understand differences in number value. Bang the rhythm of a word on the table to help convey syllables. Measure a space to help visualize the size of an object.

### ***Problem***

Delayed verbal processing; difficulty following oral directions and lessons.

### ***Interventions***

Capitalize on visual strengths of students with FXS by using manipulatives, visual material, videos, models, and computer programs. Pause during verbal presentations to allow processing time. Let the student observe before trying tasks. Use indirect strategies to query.



***Problem***

Difficulty maintaining friendships and resolving conflict with peers.

***Interventions***

Explore possibility of providing or accessing social skills training, including special classes or community resources. Capitalize on student’s observational strengths by looking to peers who are modeling desired behavior and solutions. Consult student’s psychologist for assistance.

***Problem***

Lack of motivation to learn.

***Interventions***

Intersperse learned and familiar tasks with new ones. Desensitize reaction to change by frequently changing the cue throughout the presentation. Increase initiation and risk taking by reinforcing student’s attempts and approximations of desired response. (Student thus feels less driven to perform perfectly.) Alternate periods requiring mental concentration with structured physical activity.

*Increase risk taking*



*Falling short of a perfectionist standard can cause the student with FXS to refrain from any effort at all that would expose his or her shortcomings.*



# Key Educational Strategies for Children With Fragile X

## *A Summary Checklist*

- ✓ To the degree possible, provide a calm, quiet classroom environment, with breaks in a “safe” refuge away from distractions.
- ✓ Seat student as near to front and side as possible to reduce distractive stimuli.
- ✓ Use small-group or one-to-one instruction when teaching novel tasks.
- ✓ Explore use of calming strategies in concert with an occupational therapist trained in sensory integration.
- ✓ Give ample time for processing and alternative methods of responding.
- ✓ Simplify visually presented materials to eliminate a cluttered or excessively stimulating format.
- ✓ Use technological adaptations, such as the computer, for writing assignments.
- ✓ Provide a visual schedule to prompt transitions.
- ✓ Use manipulatives, visual material, videos, and models.
- ✓ Provide social skills lessons and have typical peers model appropriate behaviors.
- ✓ Provide completion or closure for activities and lessons.
- ✓ Capitalize on strengths in modeling, memory, simultaneous learning and associative learning.
- ✓ Use indirect questioning rather than direct, e.g., fill in the blank/cloze technique.
- ✓ Utilize “cloze” techniques (fill-in blanks) to help facilitate executive function skills.
- ✓ Use backward chaining—ask the student to finish up a task after you begin it.
- ✓ Provide visual cues—such as color coding, numbering, and arrows—to help organize tasks.
- ✓ Use reinforcement such as “high fives” rather than hugs or pats on the back (close physical contact tends to over-stimulate children with FXS).



# Key Developmental Challenges

## *The Elementary Years*

### Attending behaviors

Even if the child with fragile X syndrome has experienced successful early intervention programs, a basic plank of subsequent success in elementary school is consistent focus on attending behaviors. Relative mastery of these behaviors achieves two key goals: the obvious and universal one of allowing for learning to take place, and greater acceptance by peers. These peers will thus not experience the classroom environment being dominated by the reprimand and redirection necessary when particular students have difficulty attending to required tasks.

### Language

*Speech/language therapy crucial*

Given that children with even minimal impairment from FXS will likely still exhibit speech and language deficits, it is critical that this area receive maximum emphasis in the elementary school years. Teachers should always consult a speech/language therapist for assistance. Speech/language goals should also be an integral component of an IEP.

### Problem solving

Research tells us that children with FXS experience more than the usual degree of difficulty with novel tasks. This can lead to anxiety and, in some cases, near obsessive avoidance of the unfamiliar. Teachers achieve the most success with such students by using measured introduction of new material, closely observing the student's response, then sustaining clear expectations while encouraging the student's effort and supporting the outcome.

*Effective behavior management of students with FXS allows learning to take place and greater likelihood of acceptance by peers.*

### Academics

*Balance the learning modalities*

The elementary years already bring with them the question of how much pre-vocational orientation to include for the student with FXS. Parents and educators must explore the appropriate balance between functional and traditional academics, always bearing in mind such students' general preference for hands-on, experiential learning with an emphasis on content area instruction.



## Fine motor

If evaluation reveals that fine motor deficits exceed 1-2 years' chronological age for the student with FXS, teachers should access the services of an occupational therapist familiar with motor planning deficits. Mastery of dressing and hygiene skills is particularly critical for social acceptance.

## Social relations

Elementary teachers can capitalize on their students' general acceptance of individual differences to help integrate students with FXS into as much of the instructional program as possible. General acceptance at this developmental level may pave the way for the student with FXS to experience spontaneous interaction with typically developing peers. Exposure to social activities such as scouts, music and sports provide invaluable exposure to socially appropriate behavior by peers.

*Involvement in mainstream academic and social activities in the elementary years provides valuable role modeling and self-esteem benefits for the student with FXS.*



# Key Development Challenges

## *The Middle School Years*

### Language

With elementary school having put the basic building blocks in place, middle school teachers can focus on helping students with FXS achieve greater clarity and precision in oral communication. Social anxiety often affects communication in students with FXS, so teachers who can identify and reduce stressors help sharpen oral skills. Encouraging the student to express himself independently (without fill-in assistance from peers or the teacher) helps foster confidence and appropriate risk-taking.

### Problem solving

*Positively reinforce self-initiative*

Students with FXS may find the greater self-reliance required in middle school to be highly challenging, because their frequent shyness can find them hesitant both to face the anxiety of finding their own way and to ask for necessary assistance. Teachers can help shape such students' movement toward independence by encouraging them to ask for help as appropriate, while also positively reinforcing efforts toward self-initiative.

### Academics


*Note students' special interests*

The issue of functionality emerges more strongly in the middle school years for students with FXS. All academic instruction should reflect a practical, functional base, equipping students with tools they can call upon in their interactions with the larger world. These functional modalities range from consumer math skills to following written instructions for tests. Questions regarding inclusion in regular classroom settings should take into account the invaluable social skill set gained there, as well as each student's unique—and often highly motivated—interest in a particular subject area such as science, history, and social studies. As always, students do better when assignments are modified to account for learning style and cognitive deficits. Transitional planning (as described on the next page) also begins to play a role as mandated by the IDEA at age 14.

*Unfortunately, having FXS spares the adolescent not at all in navigating the profound transitional issues inherent to their age group.*

### Social/sexual

Students with FXS are hardly immune to the much-chronicled hormonal awakening of the adolescent years. Complicating the matter is their generally greater tendency toward obsessive behavior, which can understandably be heightened when normal sexual curiosity asserts itself at this delicate age. As with other students, open discussion of sex education topics helps destigmatize normal sexual feelings. Students with FXS also respond well to rules and clear delineations of what is expected in “mature” behavior, so inappropriate actions can often be curtailed with appeals such as, “That is what younger students would do, but now that you’re 14, it’s no longer acceptable.”



*"I was shocked and dismayed but also relieved to know why my son had learning disabilities. It relieved a guilt that maybe I had contributed to his problem by being exposed to something during pregnancy."*





# Key Developmental Challenges

## *High School and Beyond*

### Transition planning

The themes of social function and vocational planning that begin to achieve prominence in the middle school years reach their apex in high school, where the curricular focus shifts even more to practical concerns of employability, social adaptability, and ultimately, the capacity of the student with FXS to achieve self-satisfaction and happiness in life. This emphasis on transition issues is formalized through a mandated Transition Plan by age 16. Community access, living options, leisure skills and vocational placements form the basic foundation for educational planning and skill development.

### Language

Building effective communication skills never ceases to be a concern for educators of students with FXS, but speech and language development shares increasing emphasis in the high school years with vocational concerns, training and placement. At this age, IEPs to meet a student's speech/language needs may be written to include a full range of school-based services, along with any ancillary or consultative services parents may find desirable. The specific method of service delivery tends to be less critical at this age, as long as the IEP addresses the student's general needs. The most critical of these is to continue skill building for the community beyond the school walls. Examples of these skills include using language to explain feelings, retelling stories or jokes, citing events, taking phone messages, setting appointments, noting directions, and using language to access community resources.

*Continue skill building*



### Problem solving

The natural protectiveness of parents and teachers toward special needs children meets its most severe test in the high school years, when adolescents with FXS must be encouraged to begin relying on their own still-developing skill set to find solutions to everyday problems. Allowing them to apply their own logic to problem solving is critical to the student's intellectual and emotional development—however unformed that logic may be.

*Allow student to problem solve*



*Vocational readiness becomes a major concern in the high school years, and key adults can help the process along with a judicious mix of support and allowing the student to find his own solutions to problems.*



## Academics

As in other areas, the academic focus shifts in high school, from acquisition of skills to learning how to apply them in the larger world. The world of work provides rich instructional opportunities that build directly on the skill set acquired through the academic years. Central to the community-based instructional emphasis are lessons on self-help, recreation, exercise, medication management, accessing mass transit, and other resources of daily living.

*Employment in high school is the ideal training and confidence-building ground for students with FXS as they prepare to confront the wider world of work, bus schedules, medication management and independent social relations.*

## Vocational training

*Rotate job placements*

Job experiences are invaluable for developing virtually every skill in the repertoire of students with FXS, including emotional maturity and the confidence that accompanies it. Whenever possible, school programs should provide a rotation of job placements so interest and competence levels can be assessed. Work Experience Studies (WES) can provide academic credit while the student gets to practice appropriate work behaviors.

## Social/sexual

Developing appropriate social/sexual behaviors is critical in the high school years, because young people with FXS must experience a degree of peer acceptance in order to build their self-confidence and credibility for work. Dating, school dances and extra-curricular activities become the laboratories where these students face many of the most challenging issues. Although that is likely just as true for all students in the highly sensitive area of sexuality, there is no under-estimating the more complex challenges faced by students with FXS, since they often lack the emotional maturity and confidence that can steel them to the frustrations, questions and rejection typical of this age. Nevertheless, with guidance and patience, it is possible to train students with FXS in how to respond to issues of privacy, exploitation, voyeurism, and sexual expression.

*Note:* A variety of resources exists to help parents and educators guide adolescent children through issues of emerging sexuality. See pg. 189 in the reference section, or contact the National Fragile X Foundation for additional resources.



## Guidelines for Developing Lesson Plans and Curriculum

Almost all students with fragile X syndrome will require some level of adaptive curriculum. These adaptations may range from minor and periodic to substantial and ongoing. The more quickly teachers can discern a student's adaptive curricular needs, the more effective and satisfying the instructional program will be for all parties. Reviewing the tables on the next page may help teachers discern whether and to what degree curricular adaptation should be employed.



# Decision Tree for Curricular Adaptations

Can the student with FXS understand and interact with curriculum used in regular education placement?

## No



If functioning level is minimally delayed, but understanding of content is unaffected, curriculum is adapted based on functioning level; for example, the student may be required to learn and demonstrate competency in core concepts only.



If the functioning level is moderately delayed, curricular adaptations require more varied opportunities to access the general curriculum, in which the same content is still taught but with progressively less volume and complexity of content.



If the functioning level is significantly delayed and curricular adaptations cannot be provided due to significantly impaired cognitive functioning and academic skills, a parallel curriculum may be required. Although this curriculum may be different from the one presented in the regular education placement, every effort should be made to focus on the same content topic to afford students the opportunity to learn with and benefit from their peers to the maximum extent.

## Yes



No adaptations are necessary. May require time adjustments or other accommodations such as skill streaming existing curricula to include only those skills that are important to maintaining competency in the classroom/course.



## Model for Adaptation of Curriculum and Classroom Accommodations

1. The case manager (special educator) solicits study units from the regular education teachers at least a week ahead of actual presentation.
2. The case manager adapts the curriculum to accommodate the student's functioning level and processing style, to incorporating his strengths into the presentation.
3. The case manager trains the teaching assistant to facilitate the adaptations in the regular education classroom.
4. The teaching assistant pre-teaches skills whenever possible and appropriate in the included environment.
5. The teaching assistant's role is multi-faceted and includes:
  - Teaching an alternative activity in or out of the regular education classroom based on student's ability to access the curriculum.
  - Providing cues and instructional support in the regular education classroom.
  - Teaching in a small group (2-3 students) utilizing indirect instruction and side dialogue. This can be done in the SPED or regular education classroom, depending on need.
  - Teaching social skills in a small group and "in vivo" experiences.
6. Weekly team meetings to make curriculum adjustments and to develop accommodations. The team includes a case manager, regular education teacher when appropriate, and teaching assistant.



# Adapting the Classroom Environment

## *A Brief Case Study*

Susan, a student with fragile X syndrome, had a difficult ninth grade year. She was at a critical point in both her skill acquisition and emotional maturity. Her academic challenges and emotional status were clearly correlated. It was vital to address her school failures while carefully considering the appropriateness of her current school placement. Simply repeating her ninth grade experience would not remediate her learning deficits. Additionally, she was not learning compensatory strategies to improve her performance. She was in need of alternative teaching methods to help her succeed. The following accommodations and curricular adaptations were suggested.

*Note special considerations*

- Because Susan could be easily distracted, she required a low-distraction environment. This entailed preferential seating away from distraction with access to a private study area (study carrel) and a place to work independently or in a small group. Seating near the teacher allowed the teacher to summon Susan's attention without obviously singling her out.
- Susan's poor impulse control suggested various behavioral strategies for her teachers. Expectations were established, with consequences she understood. Consequences were role-played. Frequent breaks were scheduled to include physical activity. Systematic procedures were established to help her better control her immediate emotional reaction to stimuli, e.g., stop, count back from 10 to 0, count by 2s to 50, recite months of the year, etc.

*Plan ways to redirect behavior*

- Because Susan could easily slip into off-task behavior, her adaptive plan included redirection by her teachers; regular breaks during which she enjoyed a choice of activities; the use of a timer to remind her of time constraints; a choice of tasks for which she could arrange the sequence of attack within an established schedule; and suggestions to pursue an alternate task when she was having difficulty with a primary task. The instructor would then loop back to the original task offering a higher strength reinforcer.



## A Snapshot of Success



“My name is Tammy and I am 19 years old. I have fragile X syndrome and graduated from high school last May. I am currently working at a grocery store in Colorado. When I graduated I got two senior awards. One was for citizenship. The other was the Academic Letter Award.”



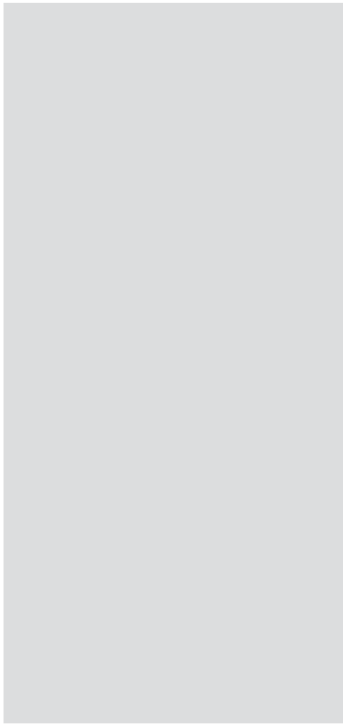
ENRICHING LIVES THROUGH EDUCATIONAL SUPPORT



## A Collection of Lesson Plans for Students With Fragile X Syndrome

The remainder of this binder will provide lesson plan examples across the curriculum for students with fragile X syndrome. Each curricular area's plans are preceded by general discussion of the challenges faced by students and their teachers in these subject areas, along with a listing of support services and programs to assist the teaching process when appropriate.

We are indebted to the many teachers and other professionals who have contributed lessons to our collection here, and we wish to reiterate that additional lessons will be warmly welcomed as we steadily build this comprehensive resource for teachers, parents, and others entrusted with the education of students with FXS. Lessons should, to the extent possible, follow the basic format of those outlined here. Please send all submissions via email to: [NATLFX@FragileX.org](mailto:NATLFX@FragileX.org).



The National **Fragile X** Foundation





# Literacy

## Reading

Students with fragile X syndrome have weak sequential learning skills, making phonetic reading programs difficult for them to follow in most cases. However, they have strong simultaneous learning skills. That is, they grasp “wholes” more easily than they do the parts that comprise them. “Whole word” or “sight word” methods are thus most effective as they begin learning to read.

The Logo Reading System<sup>®</sup>, developed by Marcia Braden, Ph.D, is an example of how this can be done. The system uses fast food logos to teach reading. The readily recognized logos are gradually faded to reveal sight words that form the foundation of further word identification.

An example of a widely used whole word program is the Edmark<sup>®</sup> Reading Program. Other programs that use a sight approach to reading are listed in the reference section.

The Dolch Program, with its lists of frequently used words, is also useful for students with FXS.

Some programs use visual cues to teach letter sounds or words. These may be rebus pictures, or pictures drawn inside the letters. An example is the “Picture Me” Reading Program. Homemade pictures used with letters and words can also be effective.

Other reading programs which have utility for students with FXS include SlingerLand<sup>®</sup>; Letterland<sup>®</sup>; and other “multi-modal” or “multi-sensory” reading programs. These programs incorporate letters and words with music, imagery, movement, and mnemonics. Using as many sensory modalities as possible helps the student with FXS learn and retain information.

Although phonics-based instruction is not advisable as the primary approach for students with FXS (because their simultaneous learning tendency and auditory processing difficulties make sound blending extremely difficult), it can be helpful to incorporate learning a beginning sound even if emphasizing whole words.

*For students with FXS, their difficulty with sequencing and their tendency to see “wholes” much more readily than parts dictates a “whole word” approach as the main avenue to reading.*

*Dyslexia methods may help*

For reading beyond the second grade level, methodologies in use for dyslexia may yet prove to be helpful for students with FXS, because those methods also address sequential learning



weaknesses. These methods would have to be adapted for the child with FXS, however. Methods using missing letters (“cloze” technique), word families (-ay -ing -ate), and configurations of structure and pattern matching have been quite successful.

Common adaptations for reading include use of books on tape, computer reading programs such as “Living Books,” “LeapPad” by LeapFrog, a story or “talking book” recorded by the student with FXS and paired with pictures or photos, and other technology that provides audio input for reading.

## Writing

Students with FXS have been successfully taught handwriting using the program “Handwriting Without Tears.” HWT was designed by an occupational therapist, and makes use of simplified lined paper and simplified letter shapes in the cursive alphabet. The printed alphabet program uses wooden shapes to form letters, and a multi-sensory technique for drawing letters on a slate. For printing, the simpler capital letters are taught first. For cursive, letters are taught in a sequential order according to similarity and complexity of shape. This program is inexpensive and has been adopted by some states for the standard elementary classroom.

*Imagery and letter shapes*

There are other programs that provide imagery for the writing paper and letter shapes, which is one key to the effectiveness of HWT. For example, there is paper that uses a blue top line, a green middle line, and a brown bottom line. Letter shapes are then described in reference to the “sky” line, the “grass” line and the “dirt” line.

Motor planning deficits (making the hand produce a symbol) are common in those with FXS. Most children with FXS want to write, and they become frustrated when they fall short. For more impaired children, it can be helpful to have a self-inked name stamp made so that the child can at least stamp his or her own name at the top of a paper and trace it. In this way, the child can independently compensate for motor deficits while feeling included.

For the more advanced student who is learning to compose sentences and paragraphs, there is useful technology available. While students with FXS may be able to verbalize a sentence, the process of writing may take overly long due to sequencing and spelling problems, with the sentence perhaps becoming altered in the process. “Word prediction” software and “talking” word processors (such as “Co:Writer” and “Write:OutLoud”) are useful in helping the student write more quickly, thus retaining more of the sentence as intended.



For writing/composition worksheets, the use of “sentence starters” is suggested. The student with FXS’s need for closure will help motivate him or her to “fill in the blank” when given a starting sentence or a story image. Similarly, “idea” software such as “Inspiration” or “Kidspiration” can be used to organize and compose ideas for writing.

In some cases a required adaptation may be to have students verbally recite sentences, paragraphs, or stories, with the teacher or aide writing them down for the student. This can be reinforced by having the student then type his or her own words (as written by the teacher) into the computer.



# Compound Word Attack

## *Topic*

Word attack skills using compound words

## *Level*

This was used with a 15-year-old boy with FXS who tested at a first- to second-grade reading level. Lesson requires sight word reading ability and basic understanding of phonics.

## *Duration*

15-60 minutes per session

## *Objective*

Student will learn word attack skills. Student will learn to break down compound words into smaller parts, to read parts of words separately, and to combine them to form a complete word.

## *Motivation*

High interest reading matter

## *Materials*

- Student's choice of reading material
- Notebook or composition book to be used as workbook (see sample attached worksheets)
- Pencil

## *Background*

Students with FXS have strengths in simultaneous learning and deficits in sequential learning. "Whole word" reading methods are often used initially. (The Edmark reading program is often used with success.) Phonics are taught later.

Older students may be able to sound out letters and parts of words, but have difficulty deciphering longer or unfamiliar words. They may also switch sounds, e.g., reading "was" as "saw." This problem, which manifests similarly to dyslexia, makes it more difficult to read longer or unfamiliar words, because the "sounding out" is not done in the correct left to right sequence.

Understanding that compound words are formed by combining two shorter words may help these students decipher longer or unfamiliar words, by training them to break down words into component parts. Using a variety of books and words over a long period of time allows students to get the repetition needed to learn this skill, without the work becoming boring.



These students may not test at a level that allows them to read these longer words independently. However, because students with FXS have scattered skills, it is sometimes helpful to jump ahead from their tested level for particular exercises.

*Tip:* Use lined writing paper or composition books from the “Handwriting Without Tears” program (see bibliography at end of lesson).

### ***Preparation***

Have student choose high interest reading material. This can be done a week or two in advance. Teacher can offer choices that contain compound words. Picture books are appropriate for this exercise, because they often have less text on each page (and thus fewer distractions for the child with fragile X).

Teacher chooses compound words from the reading material, or words that relate to the reading material. Teacher prepares a workbook page for student (see examples on pg. 40).

The workbook page has compound words written in parts and wholes, with a blank space underneath for copying. There should be only a few examples, so the student is not distracted by too much text.

### ***Activity***

#### **FIRST SESSION**

Direct Instruction:

Teacher reads the book to the student. Teacher explains workbook page to student, defining compound words as words that consist of two words. Provide examples, using words from the book read, or short words such as “into,” “beside.”

Guided Practice:

Teacher shows student the workbook sheet, which has 3-4 compound words in divided form and in whole form with a space underneath for writing (see sample below). Teacher reads the words, e.g., “in, side, inside.” Student repeats after teacher. Teacher copies first set of words to demonstrate the skill, and has student copy the next set of words under supervision.

Independent Practice:

Student fills in workbook sheet, copying compound words in divided form and in whole form. e.g., “in side, inside.”



## SECOND SESSION

### Direct Instruction:

Teacher reads the book to the student, having student read one or two words, sentences or pages (depending on reading level; to ensure success, choose words, sentences or pages at student's reading level).

### Guided Practice:

Teacher helps student read worksheet words as in session one. Words on second worksheet should be from reading material, if possible.

### Independent Practice:

Student independently (with prompting as needed) copies compound words in divided form and in whole form, as in session one.

## THIRD SESSION

### Direct Instruction:

The worksheet page for this session should have only the compound word (not in divided form). Draw a line between the two words in the compound word, read the word, then copy the whole word.

### *Extensions*

This progression can be used over a semester or more, using different books and words. Do the same sequence of reading and related workbook sheets, but this time using common word endings such as -ly, -ing, -ful, -ed, -ment, -ness, etc.

These exercises can be combined with handwriting practice.

### *Bibliography*

The following two books have images of the front covers of many picture books, so student can choose by looking at the pictures. (*Tip:* Have the child choose two or three, to ensure that you will find at least one of the choices at your local library.) These references also provide thematic curriculum ideas based on storybooks.

Raines, Shirley C., and Robert J. Canady. 1992. *Story Stretchers for the Primary Grades*. Gryphon House: Beltsville, MD.

Raines, Shirley C., 1994. *450 More Story Stretchers for the Primary Grades*. Gryphon House: Beltsville, MD.



The following book contains a useful handwriting method developed by an OT. The publisher also sells inexpensive paper and composition books that provide simple writing lines, and more space between lines, helpful for students with fine motor skills difficulties.

*Handwriting Without Tears*

Jan Z. Olsen, OTR                    1-301-263-2700  
 8001 MacArthur Blvd.            1-301-263-2707 fax  
 Cabin John, MD 20818            www.hwtears.com

***Assessment***

Student will correctly sound out an unfamiliar compound word.

*Note:* Parents of children with FXS sometimes say that their children talk in “code.” This appears to be a result of using or thinking in analogies. They may appear to be able to read a word correctly, but verbalize a synonym or related word instead of the word written. They verbalize the meaning rather than the sounds of the particular word. Perhaps this relative strength in analogous thinking can be capitalized upon. It is something to watch for when trying to test for reading ability.

***Adaptations for Fragile X Syndrome***

Students with fragile X syndrome demonstrate scattered skills. They sometimes demonstrate, through behavior and responses, much more advanced understanding than is indicated by testing. They sometimes have long “plateaus” during which their skill level (such as in reading) seems to remain the same, followed by sudden “jumps.” It is possible they are absorbing information and skills over time, without demonstrating them incrementally. Because of this, it may be useful to present more advanced information to students than their testing would otherwise indicate.

***Related IEP Goals***

Student will use word attack skills when presented with an unfamiliar word, breaking the word into component parts, sounding out each part separately, then combining the sounds.

***For Parents Only***

This lesson can be done as supplemental homework. Motivate your child during homework by having his or her favorite stuffed animal comment on his writing! (Of course, this may be more distracting than helpful for some children.) While reading to children, parents can demonstrate dividing compound words into component parts and sounding out each part. Cover part of the word with an index card to help your child isolate parts of the word.

***Source***

Original lesson.

Contact:  
 Carolyn Ybarra  
[ybarra@stanfordalumni.org](mailto:ybarra@stanfordalumni.org)

Name \_\_\_\_\_

## Compound Words Worksheet 1

Read the words.

Copy the words.

in

to

into

---

---

out

side

outside

---

---

some

one

someone

---

---

in

side

inside

---

---



Name \_\_\_\_\_

## Compound Words Worksheet 2

Read the words.

Copy the words.

cat

fish

catfish

---

---

sea

horse

seahorse

---

---

star

fish

starfish

---

---

sun

set

sunset

---

---

Name \_\_\_\_\_

## Compound Words Worksheet 3

Read the words.

Draw a line between the two words that form the compound word.

Copy the words.

starfish

---

---

sunset

---

---

outside

---

---

someone

---

---



# Beginning Computer Literacy

## *Topic*

Technology, reading, math

## *Level*

This lesson has been used in a computer lab and elementary school special education classroom, at the first- to second-grade level.

## *Duration*

One hour in classroom, and one hour in computer lab, plus additional time to practice for generalization, and for individual assessment.

## *Objective*

At the end of these lessons the children will demonstrate beginning computer literacy by naming the major components of a computer system, pointing to and using several specific keys on a keyboard, and progressing at their own pace through a readiness/first/second grade level math activity on a computer with assistance only as necessary.

The students will:

- Learn and demonstrate understanding of key vocabulary words commonly used when operating a computer.
- Become familiar with location and function of specific keys on a keyboard.
- Use a math computer program to practice math skills from individual student's I.E.P.s
- Name, point to and/or describe the main functions, and/or proper use of: a computer, monitor, keyboard, disk, disk drive, and printer.
- Point to and use the space bar, return key, letters of their own name, arrow keys, shift keys, and numerals 1-9 on a desk template and a computer keyboard.
- Boot up a math program, select and successfully complete a math activity on that program with assistance only when necessary.

## *Motivation*

Motivation will occur in the morning in the special education classroom. The children will have a whole group lesson on computer terminology using magnetic vocabulary cards to be included on the computer "word wall," and life-size paper desk templates of a computer keyboard. They will then work in pairs at the classroom computers and with desk templates to name parts of the system and various keys. Even if the students are not skilled at using computers, or have some fine motor problems, they will likely find the computers inherently motivating. Computer time tends to be one of the desired classroom rewards.



### *Materials*

For Activity:

- Computers
- Magnetized vocabulary cards containing the following vocabulary: computer, monitor, keyboard, disk, disk drive, printer, space bar, return key, letter keys, arrow keys, shift keys, and numeral keys 1-9
- Life size paper templates of a computer keyboard (identical to the computers in the lab)
- Large poster showing a computer
- Metal board
- Blank web worksheet (appended)
- Appropriate computer programs

For Assessment:

- List of all of the vocabulary listed above
- Laminated desk template on which the children can use markers to color in requested keys
- Blank web or preprogrammed worksheet to check vocabulary knowledge and meanings

### *Background*

The teacher needs a basic knowledge of computers and associated vocabulary, and should be able to select developmentally appropriate programs to meet needs of individual students. Assistive technology specialists can be called upon to help locate needed software. Knowledge of American Sign Language alphabet (finger spelling) is useful, but not required.

### *Preparation*

The teacher writes the target vocabulary words on magnetized vocabulary cards (either sentence strips cut to size with magnetic strips on the back, or for older children, use magnetic business cards). Place them on the metal board covered by a piece of tag board. The poster of the computer is also taped on the board. A blank web similar to the one enclosed is drawn on the chalkboard beside the metal board.

### *Activity*

Direct Instruction:

- With the whole class seated on the rug facing the boards, the teacher explains lesson objectives.



- Children are asked what they already know about computers. Their responses are recorded on the board web.
- Teacher asks who can name the parts of the computer shown on the poster and again records their responses.
- Teacher then asks students to help her write a brief summary story telling what the students already know based on the web words. Teacher takes dictation of sentences on the board as the children respond.

#### Guided Practice:

- The teacher lifts the poster board up and quickly reads the magnetic words, with the children echo reading each word after her. Then the class and teacher choral read the entire list and the cover is dropped back down. This gives the students an overview of what is coming and is particularly helpful for children with FXS.
- After that, the teacher chooses one word at a time and asks the children to raise their hand if they know where to place the word on the computer poster. If no one can read the word, the teacher says it and asks if anyone knows where to place it, or if necessary, places it herself.
- When all vocabulary words have been placed, they are again choral read and the children return to their seats.

#### Independent Practice:

- The children who are capable of doing so copy the web and board story into their copybooks and the other children receive assistance in “catching their thoughts” on the web and then transforming them into a five-sentence dictated story, telling what they remember from the lesson. The children are also asked to draw a computer.
- The children are then asked to find and highlight the target keys and the letters of their own name on their desk template. This will be taken with them to the computer lab later in the day.

#### Guided Practice:

- Following this lesson, all children go to the computer lab and are seated in pairs with one more (A) and one less (B) computer literate child in each pair.
- Teacher then reviews the previous lesson in a new setting to enhance generalization. The magnetic word cards are placed on the poster, and each child finger spells the word, then points to the correct part of the computer.
- The cards are removed and replaced one at a time, and only student A finger spells and points to the correct part, then the activity is repeated for student B.



- Student A is then asked to use the model template to find the target keys and the letters of his/her own name, and to type the name and numbers on the computer. The activity is repeated for student B.

Independent Practice:

- Now the children are separated and each child is at an individual computer.
- The cards are removed and replaced one at a time. Only student A finger spells and points to the correct part. Then the activity is repeated for student B.
- Finally, the children are given step-by-step directions for booting up a math program and typing in their own name. Those who are able proceed independently. The other students receive assistance as necessary in order to successfully complete one game on the selected math program.

### *Extensions*

The follow-up daily computer lessons will reinforce and extend appropriate technology vocabulary, teach proper care of the computer and disks, allow for practice using the shift key, allow then to change the size and font of the letters in their own name, practice the selected math program, and introduce importing graphics using the software Storybook Weaver.

### *Assessment*

Teacher observation and performance-based assessment of student responses/behaviors during the sessions; accurate completion of web/story, or extension work sheets/word lists will determine each student's entry level for follow-up lessons.

### *Adaptations for Fragile X Syndrome*

1. The initial presentation of information should be holistic, and give an overview of the entire coming lesson combining visual with auditory information.
2. The use of webs as a visual organizer seems to circumvent some of the sequential processing problems common to children with FXS.
3. For organization into a story, the various words on a web can be categorized by color coding, or by underlining in different colors words that may go together.
4. The gross motor movement involved in placing magnetic cards on a picture elicits active participation in learning. Gross motor ability is a strength of children with FXS.
5. Drawing uses the same strokes as handwriting, helps overcome fine motor deficits, is fun, and enhances memory.



6. Finger spelling is an “iconistic” and kinesthetic form of learning, which has shown great promise in helping children with FXS overcome difficulty in learning phonics and acquiring letter/sound correspondence.
7. Pair learning, or any form of cooperative learning (e.g., Think-Pair-Share), seems to enhance social skills, take advantage of the strength in imitating that many children with FXS have, improve both expressive and receptive language skills, and aid in the acquisition, retention, and generalization of diverse academic skills.

### ***Bibliography***

Websites:

[www.masterstechhome.com/The\\_Library/ASL\\_Dictionary\\_Project/ASL\\_Tables/Alphabet.html](http://www.masterstechhome.com/The_Library/ASL_Dictionary_Project/ASL_Tables/Alphabet.html)

<http://where.com/scott.net/asl/abc.html>

### ***Source***

Original lesson.

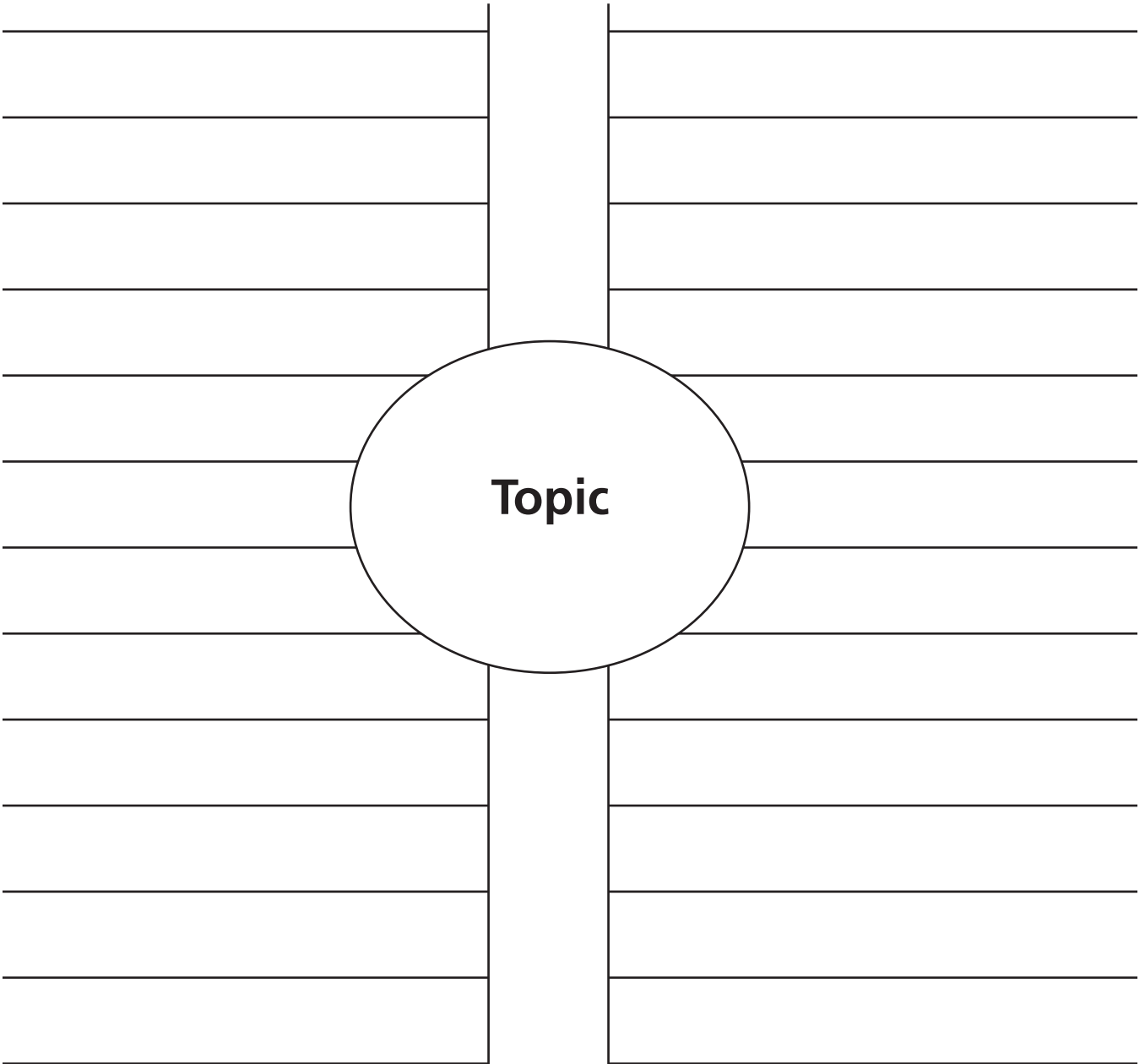
*Contact Information:*

*Dr. Laura “Chips” Merkle*

*chips@erols.com*

Name \_\_\_\_\_

# Idea Web







# Talking Tug of War

## *Topic*

Expressive language (any area, including vocabulary, categories, opposites, ABCs, questions/answers)

## *Level*

Elementary school

## *Duration*

5 minutes or less per session (flexible, short interactions are best)

## *Objective*

Improve ease in verbal language use with peers, including turn-taking.

## *Motivation*

Physical, game-like setting, provides sensory input, gives feeling of control, and is fun!

## *Materials*

- Picture cards or posters (if desired)
- Thick shoestring or soft rope

## *Background*

This activity provides sensory input that helps calm a child with fragile X syndrome. At the same time, it encourages conversational turn-taking and interaction with peers in a fun, safe, and predictable setting. It helps to have visuals available for all participants as cues.

## *Preparation*

- Display picture cues, create a safe area (seat children near each other).
- Explain the “rules” of the game (e.g., don’t pull too hard, both participants on chair at all times, no loud voices).
- Review topic of the game with the students (which category of words or alphabet, etc.).

## *Activity*

1. Two students sit facing one another, each holding one end of the rope.
2. One person states a word/phrase/question pertinent to the topic and pulls the rope as he speaks.
3. “Opponent” responds with a related word/opposite/response to the question as he pulls the rope. Examples:
  - Alphabet: First player says “A,” second player says “B,” first person says “C,” etc. through the alphabet.
  - Opposites: First person says “cold,” second person responds “hot,” first player says “big,” second player responds “small.”



- The game continues, pulling, tugging, and speaking. Each child must be pulling with enough tension to get sensory input without pulling the other child off the chair.

### *Extensions*

The rules of the game can be adjusted according to the profiles of each player. If the child engages in an inappropriate tone of voice, becomes silly, etc., the game is stopped and a point given or deducted. (It helps if there is a scorekeeper.)

Activity can be used this as a sensory release of tension, to activate the child, and to help with word retrieval and social interaction.

For older children with better language, abstract concepts can be introduced, and listening to the speaker becomes the focus (correct the sentence spoken; finish the sentence).

### *Adaptations for Fragile X Syndrome*

The sustaining of eye contact may be difficult. The objective of the game must be clear to the instructor, and rules made clear to students.

### *Related IEP Goals*

- To understand that speech is a form of interpersonal communication.
- To increase auditory attention.
- To understand the concept of turn-taking.
- To use appropriate volume of voice.
- To expand expressive vocabulary.
- To use intelligible verbal communication to express thought and needs.

### *Therapy Connections*

Speech therapist may assist in planning and setting goals. Sensory integration aspect is relevant to occupational therapy.

### *Standards Addressed*

Standards 3.1—All students will speak for a variety of real purposes and audiences.

Standard 3.2—All students will listen actively in a variety of situations to information from a variety of sources.

### *Source*

Original lesson.

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# Punctuation Bid

## ***Topic***

Writing skills: using correct end punctuation

## ***Level***

Elementary through middle school

## ***Duration***

Two 50-minute sessions

## ***Objective***

Students will be able to differentiate among the four different types of sentences (declarative, interrogative, imperative, and exclamatory), and use correct end punctuation.

## ***Motivation***

Game-like context, hands-on and tactile

## ***Materials***

- Colored discs (poker chips or tokens)
- Magnetic punctuation pieces (period, exclamation point, question mark)
- Construction paper, 24" length
- Access to laminator (optional)
- One "wipe off" marker
- Several copies of the activity sheet
- Reinforcers such as a favorite activity

## ***Background***

The main objective of this lesson is to get students to become better writers by learning how to use end punctuation correctly. *Formal instruction on the specific names of the types of sentences (declarative, imperative, etc.) does not need to be emphasized.* This may cause extra confusion. Rather, *simpler language* should be used in conjunction with common everyday examples to describe what types of sentences require particular punctuation. (Example: The following is a question that requires a question mark at the end of the sentence: 'May I use the bathroom?')")

## ***Preparation***

The following items will need to be made by the instructor:

- *Activity sheets*—Handouts that should contain 10-15 sentences without end punctuation.
- *Laminated 4" x 24" sentence cards*—Using large construction paper, cut out ten to fifteen 4" x 24" cards (make sure to use the same color for all cards). The number of cards should equal the number of sentences in the activity sheets. Each sentence from



the activity sheet will be written on one card using a dark marker. Make sure the sentences are numbered on the cards in the same way as they are on the activity sheet. If possible, have each card laminated.

### *Activity*

#### Session One

1. Write four example sentences on the blackboard, without end punctuation, each representing a different kind of sentence. One by one, read each sentence, clearly emphasizing the change in voice intonation as you go from one sentence to the next. For example, when reading an exclamatory sentence, raise the sound and excitement level in your voice. Exaggerated facial expression may help as well. Once all have been read slowly, explain how and why each sentence requires different end punctuation. Use the magnetic punctuation pieces to place at the end of each sentence.
2. Once the above step is completed, erase the four sentences. Write eight or 10 new sentences (introduce each sentence one at a time). Have students come up to the blackboard one at a time and use the magnet pieces to correctly punctuate sentences. Repeat several times using different sentences if needed. You may also want to remove the magnetic pieces and have students practice writing the punctuation marks on the board.

#### Session Two

3. After students are able to correctly punctuate using the magnet pieces, divide the class into pairs. One student will be designated to write and the other will be designated to raise her/his hand and read the pair's response.
4. Distribute four colored discs (or tokens/chips) and one activity sheet to each group.
5. Randomly hold up one sentence card for all groups to see (read the sentence while showing card). Pairs will locate the same sentence on the activity sheet and together decide which punctuation should be written at the end of the sentence. Responses must be written only when a sentence card is introduced. Once written, the pair will bid one colored disc for each round, placing it on the top left corner of the desk. Check responses. If correct, give the pair one disc. If incorrect, the group loses one disc.  
*Note:* If students have difficulties with having discs taken away, the rules may be modified so that all pairs are given the opportunity only to earn.
6. After all pairs have responded, the sentence card is taped onto the board. One student is asked to read the sentence aloud and to write the correct end punctuation onto the card using a "wipe off" marker. (If not laminated, write punctuation mark at the end of the sentence on the chalkboard.)



7. Steps 5 & 6 are repeated until all sentence cards have been used. The pair with the most discs wins. Reinforcers should be distributed immediately after the game has ended. If the entire class was cooperative and showed good sportsmanship, you may want to reinforce all students. You might give extra reinforcement to the winning group.

#### *Extensions*

As students get better, you may want them to develop their own sentences and have other students plug in the correct end punctuation. Depending on the level and needs of the students, other punctuation uses (i.e., commas, hyphens, etc.) can be introduced and practiced through this same method.

#### *Adaptations for Fragile X Syndrome*

Handwriting may be an issue with students who have FXS. Although not much writing is required for this activity, some students may feel more comfortable with a more tactile approach, using the magnetic punctuation pieces at their desks instead of writing their responses. On the other hand, because the writing requirement is minimal, having them write may be useful practice.

Simplify this lesson as needed. For example, use only declarative and interrogative sentences at first (statements and questions).

#### *Source*

Original lesson.

*Contact Information:*

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## Suggestions for Using Edmark As a Teaching Tool

These ideas come from Jeanette E. Moore, a tutor in Ridgefield, Connecticut. They were used for a 10-year-old boy using the Level 2 materials from Edmark, and following the Edmark Teacher's Guide.

### *Motivation and Reward System*

If the student is particularly anxious, it may benefit to have him/her do relaxation exercises prior to starting the lesson. An occupational therapist can provide you with a variety of exercises (for example, relaxation exercises, which use breathing and deep pressure, to alleviate anxiety and hypersensitivity, and prepare the student for the lesson).

The teacher should introduce the activity with a big smile, very enthusiastically. Give specific instructions as to what you expect of the student. Mention the motivating reward choices to ensure interest. The Edmark lesson is to be followed by a small reward (holding a favorite item, few pieces of popcorn/snack, a three-minute game, listening to one song on tape or CD, etc.). Additional reward intervals (maybe every 10 words) may have to be built into the lesson.

### *Example*

"George, we are on lesson 31. You are such a hard worker! I know you will be able to do this and earn your reward. What would you like to earn? It's your choice: snack or Discman?"

### *Segmentation*

Everything is to be done in groups, or segments, of five or ten. (You can alternate segments with relaxation exercises, lunch breaks, or other classroom activities.) The reason for this is that the entire lesson cannot be successfully completed unless the student shows he or she is completely on task, ready and focused. Dividing the lesson into segments causes less stress. The likelihood of success varies, depending upon student anxiety level and overall daily temperament.

### *Repetition*

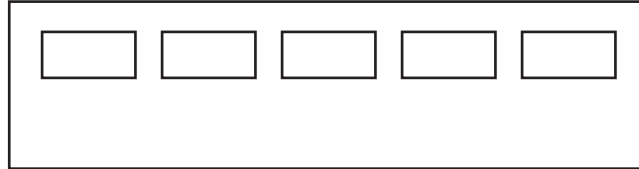
Since students with FXS learn well through repetition, lessons can be repeated two or three times, either on the same or different days.

### *Instructional Tool*

Sometimes the student may need to visually see how many items are to be read (five or ten at a time). Simply draw a rectangle on a sheet of paper and draw five small squares inside. As the student reads the word or sentence, make an "X" or check mark in the box. This shows the student how many he/she has completed and how many he/she has left to read. Other variations on this concept work as well.



## Example:



### *Preparation*

Lessons (including pre-tests) in the Word Recognition Book are to be administered to the student five or 10 frames at a time. They need to be pre-divided. Lessons that are in the Edmark Story Book are usually 1-2 pages long, and each sentence is to be written out separately on index cards. This allows the student to read words in the context of a sentence and the story. (For further simplification, write out one word per index card and have the student read word by word and put sentences together.)

As the student becomes able to handle more material at once, place numerous sentences on one card. Have the student read two, then three, then four sentences at a time per index card, until a full paragraph can be read, then a full passage.

Certain lessons have supplementary worksheets that may need modification (hand-on-hand writing, do five at a time, etc.). Certain lessons are story cards, which demonstrate the sequencing of events, while the student reads a few short sentences in isolation on small cards. The student places these cards beneath each described event. (Note that sequencing is a problem area for students with FXS, so you will need to use additional techniques to help teach it. In addition, it is important not to hold the student back merely due to sequencing deficits.)

### *How to Record Data*

Items missed must be recorded in the Edmark Student Record Book so there is a focus on specific frames for the lesson, especially if it must be repeated. Record date, what words/sentences were missed, and the anxiety level at the time of the lesson. Indicate whether or not the lesson has to be repeated.

### *Further Expansion and Reinforcement*

Use 4 x 6 index cards to create “quiz” cards, where children may be informally tested to assure word retention.



## Suggestions for Using the FOKES Sentence Builder

These suggestions come from Dawn Geannette, a teacher in Maplewood, New Jersey. They were used together with the FOKES Sentence Builder and instructor's manual (SRA/McGraw Hill 1-888-772-4543; or DLM catalogue), for teaching receptive and expressive language (specifically parts of speech).

### *Color-coded visual motivation*

The program materials consist of black and white pictures that are filed in separate color-coded boxes. (For example, all the nouns are in the yellow box, verbs in a red box.) Extending the use of color-coding to other materials helps the student learn the parts of speech by aiding in generalization of skills. One youngster with autism was stumped on a question, but he was so keyed into the colors that when prompted with 'It's a red word,' he came up with an appropriate verb.

### *Extensions of the FOKES concepts*

Color-coding of the parts of speech can be extended beyond the FOKES pictures:

- Using picture books or readers, have children make up their own sentences. Have the students write these out using color-coded markers to replicate the parts of speech learned from the exercises in FOKES.
- Using picture books or readers, present the children with FOKES cards that are represented in the books. They can use the cards as visual prompts to help themselves organize their thoughts and words as they tell you about or read the book to you.
- Use color-coded markers on a white board and throughout the day to help reinforce the parts of speech.
- Use "Wh..." questions (who, what, where, when, why) to elicit responses using the appropriate parts of speech—then color-code the responses.
- Replace a FOKES card with a colored block, symbolizing the missing part of speech. Ask the child to come up with an appropriate word.





# Presidents' Day Flag Facts

## *Topic*

Language arts, social studies (see math variation in math section)

## *Level*

K-2nd grade

## *Duration*

45 minutes

## *Objective*

Student will learn basic facts about the United States flag and its history. Student will learn flag-related vocabulary words, and will write short sentences.

## *Motivation*

Presidents' Day or other patriotic holiday. Use of manipulatives.

## *Preparation*

Students are told they will be studying the first flag of the USA. (Lesson could apply to student while in mainstream class.) Mainstream teacher presents story. Special education teacher, resource teacher, or aide supports the mainstream teacher and gives direct instruction to the student with FXS.

The special education teacher could modify handouts and worksheets used by the mainstream students. The attached handout (Flag Facts) was adapted for a student at his instructional level (pre-primer for reading). The school librarian may be able to help with background information and reading/audio-tapes for the student.

The following vocabulary words should be added to the student's augmentative communication device (e.g., "Dynamite") or made up as a vocabulary list. These were added as a pop up to the student's Social Studies Center page (on the Dynamite).

Depending on the student's communication skills, other options include listing words on a whiteboard or separate sheet of paper, with or without picture icons. More complex words can be chosen for students reading at a higher level.

- Flag
- Red
- White
- Blue
- Stars
- Stripes
- United States



### *Adaptations for Fragile X Syndrome*

Seat student in section of room with minimal visual or auditory distractions. Two mature students could be chosen to sit with student with FXS, creating a “Peer Sandwich.”

If student uses an augmentative communication device, it should be arranged so there are few visual distracters on each page or pop up.

Modified worksheets presented here were developed with an attempt to have few exercises per page, and “minimal fussiness.”

### *Therapy Connections*

The speech and language professional suggested my student would not benefit from the amount of “teacher talk” the rest of the second grade class endured. He would “shut down” and begin to become hyper-aroused. Therefore, the use of an audiotape whenever available became a useful option.

### *Materials*

- “Dynamite” (or other augmentative communication device, as needed)
- Flag history background for teacher; book and/or tape for student. Possible student book resource: *The Flag We Love* by Pam Muñoz Ryan, Charlesbridge Pubs.: Watertown, MA, 1996.  
Flag History Information—  
Smithsonian website: <http://www.si.edu/resource/faq/nmah/flag.htm>  
*Flags of the World website*: <http://www.crwflags.com/fotw/flags/us-1777.html#some>
- Pencil
- Attached copy masters: “COPS” Editing Strategy and Flag Facts handout.

### *“COPS” Editing Strategy*

This is a strategy that could be taught prior to the lesson. Students with FXS may be able to use the strategy in its most basic form to edit their work. The strategy may help organize them, given their executive function difficulties. (See attached copy master.)

### *Activity*

Direct Instruction:

As the mainstream teacher is giving a “teacher talk” about the first flag, the special education teacher (or aide) will sit with the student and two friends (who serve as a “peer sandwich” as described earlier). The special education teacher will teach the lesson to these three students at a slower pace, using simpler language and fewer facts. The students will not receive the lengthy reading packet the rest of the class has. Rather, they will receive direct instruction using basic facts and vocabulary needed in order to write a simple para-



graph. (See the previous vocabulary.) The student with FXS will use the Dynamite to give voice to the vocabulary words as well as recognize them in print.

#### Guided Practice:

The mainstream teacher asks the class to write three good paragraphs of about 5-7 sentences each about the first flag. The special education teacher instructs the two “peer sandwich” students to write a simple paragraph about the first flag (or whatever is appropriate to their level). The student with FXS will be asked to write two sentences about the first flag. He or she will have the words that are printed in his Dynamite for reference. The teacher will guide him in the writing of the first sentence. The student will be reminded of the writing strategy “COPS.” He will be given the COPS strategy sheet to refer to. (The words that would count in spelling are ones that are copied from the Dynamite.)

#### Independent Practice:

The student will be asked to write a second sentence. Students with FXS often have difficulty reporting what they know. Because of this, the exercise can be modified. For example, the teacher could provide “sentence starters,” such as “Flags have...” Or the teacher could provide partial sentences with blanks to be filled in, e.g., “The first flag had \_\_\_ stars.”

Students with FXS may also be able to verbalize a sentence, but then forget what they were going to say. The teacher might thus ask students to verbalize a sentence, which the teacher then writes down. The student is then asked to copy that sentence. A computer word processing program might be used where comprehension is the main learning goal, rather than handwriting and spelling.

#### *Assessment*

The sentences will be assessed holistically. The special education teacher will be looking for a capital letter to start, punctuation at the end, and at least five words for the sentence. Formation of letters need only be legible. Spelling counts only when using a word in the Dynamite.

#### *Extensions*

Art: Draw a picture of the first flag using crayons or markers. (This may be pleasurable for students with FXS, fostering practice in social skills and group activity.)

#### *Therapy Connections*

Student with FXS may not benefit from typical verbal instruction. Use of an audiotape whenever available may be effective.

#### *Source*

Original lesson.

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Name \_\_\_\_\_

## Flag Facts

Read the facts in the box.

### Our First Flag Facts

There are 13 stripes.

There are 6 white stripes.

There are 13 stars.

There are 7 red stripes.

Count the stripes in the flag picture.

Count the stars in the flag picture.



*Betsy Ross Flag, 1777. Source: Mark Sensen, FOTW Flags Of The World website at <http://flagspot.net/flags/>*

Name \_\_\_\_\_

## Editing Strategy

When you think you are done writing ... call the COPS!!

- C** Capitalization
- O** Overall appearance (neatness counts!)
- P** Punctuation
- S** Spelling





## Mathematics



Math is an area of particular difficulty for both males and females with FXS. The reason lies in their difficulty processing both sequential learning elements and abstract concepts. Early math concepts develop from an understanding of values that are intrinsically sequential. One number builds on the next and so on. Later, those concepts form the basis for operations and calculations. These activities require a complex sequential processing ability, which is extremely difficult for the student with fragile X to develop.

After concrete and sequential application (counting, ordering, and grouping), math concepts move into abstractions, also a problem area for students with FXS.

For addition and subtraction, some students with FXS have used “TouchMath” with success. “Finger Math” has also generated successful outcomes. Others have not found these helpful, and it is not yet clear what factors come into play in these differences.

*Initial use of a template*

For writing numbers, it is helpful to use a template and then gradually reduce its size. As this is mastered, remove the template and use dotted lines.

Using manipulative counters for addition and subtraction, concepts of more and fewer, etc. seem to be effective for teaching number concepts and calculation skills. “Intellimathics” is a useful computer program. Its visual “manipulatives” help students envision what they are doing in concrete terms.

The use of a MathBoard, (Braden-Lang) allows the student to place numbers into a mathematical equation while computing an answer on a calculator. This board eliminates the need to write or use computer skills. The initial step teaches equivalence matching and can teach money value, 1:1 correspondence and time.

Using a numberline is also effective for teaching addition and subtraction. It is important to transition from using counters and numberlines to doing problems “mentally,” as well as making calculations for practical “applied” settings. Note that making such a transition is often a difficult undertaking for the child with FXS.

*Both the sequencing requirements of basic arithmetic and the conceptual/spatial abstractions of higher math pose serious challenges for students with FXS. Fortunately, teachers can fill their tool bags with a number of effective math programs to help students along.*



Money math and telling time are particularly difficult for some children with FXS. The “dollar-up” strategy is often used for ensuring that one pays with the proper amount in bills. A “time-timer” may be an effective tool to help with time concepts—it marks time in a visual manner as it passes (see reference section). The “Judy Clock” or other clocks that have markers for the minute hand (5, 10, 15, 20...) can also be helpful aids.

Many boys with FXS have difficulty learning multiplication or division, fractions, or any math of a higher level. There are at least two approaches to teaching these topics. One is to use the calculator to teach, in a rote way, how to calculate multiplication and division problems. In some children, “over-learning” in a rote manner leads to eventual understanding of the concepts, or at least to an ability to correctly apply the rote techniques. The use of counting by 2, 3, 4, 5, etc. can help complement calculator skills if the student is able.

The second method is to teach these concepts within the practical context in which they might be used. Examples would be using multiplication to figure the area of a room, or division to calculate how many pieces of pie to cut. For fractions, cooking or experimental science are both good practical (and motivating) settings in which to apply math concepts.

*Uneven learning curves*

With mathematics, as with other subjects, it is important to NOT assume a student will “never” be able to learn a particular concept, topic or skill. Particularly because students with FXS tend to have unpredictable plateaus and jumps in learning, teaching new topics and concepts should never be abandoned.



# Presidents' Day Math

## *Topic*

Math

## *Level*

K-2nd grade (1-digit addition)

## *Duration*

30 minutes

## *Objective*

Student will practice adding two one-digit numbers, using manipulatives, to find correct answers.

## *Motivation*

Presidents' Day or other patriotic holiday. Use of manipulatives.

## *Materials*

- Pencil
- Stars from the PECs star packet (or 13 paper or plastic stars)
- Cut construction red stripes
- Cut construction paper white stripes
- Attached copy master: *Flag Math* worksheet

## *Background*

Develop a flag math worksheet at level appropriate to student, or use the attached "Flag Math" worksheet. The worksheet was developed to look identical to the mainstream class sheet, but it is modified.

## *Adaptations for Fragile X Syndrome*

Seat student in section of room with minimal visual or auditory distractions. Two mature students could be chosen to sit with student with FXS, creating a "Peer Sandwich."

If student uses an augmentative communication device, it should be arranged so there are few visual distracters on each page or pop up.

## *Activity*

Direct Instruction:

While the mainstream class is handed the flag math sheet as part of their work packet, the aide or special education teacher will work with the student with FXS. The student will first practice using paper strip and star manipulatives. He will practice a number of math facts.





(A simpler version would use only stripes of one color, and modify the worksheet accordingly. A higher level version would make use of the numbers 6, 7, and 13 from the “Flag Facts” handout used in the language arts lesson. The Flag Math worksheet would have totals that equal those actually in the flag—i.e., 6 white stripes, 7 red stripes, and 13 stars.)

**Guided Practice:**

The special education teacher will give the student the paper stripes and stars. She will read the First Flag Facts in the box to the student. She will guide student through the first problem and through the second problem if necessary.

*Optional:* The teacher can test student’s ability to manage unexpected situations by embedding a “problem,” e.g., two missing red stripes, in the lesson. This “sabotage” provides student with practice in asking for help in frustrating situations.

**Independent Practice:**

Student will be asked to finish the remaining two problems independently. The teacher will take note of the following:

- Does the student accurately add?
- Does the student use the stripes and stars as manipulatives?

***Assessment***

The student will be assessed anecdotally if he is able to use the manipulatives as a strategy. *Optional:* How did he deal with the “sabotage of materials?”

***Extensions***

Draw a picture of the first flag using crayons or markers. (This may be pleasurable for students with FXS, fostering practice in social skills and group activity.)

***Therapy Connections***

Student with FXS may not benefit from typical verbal instruction. Use of an audiotape whenever available may be effective.

***Source***

Original lesson.

*Contact Information:*

*Donna Baumgartner*

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Name \_\_\_\_\_

## Flag Math

Use your stars or stripes to solve the problems.

Add the number of stars.

$$2 + 3 = \square$$

Add the number of red stripes.

$$4 + 3 = \square$$

Add the number of white stripes.

$$2 + 4 = \square$$

Add the number of stars.

$$3 + 3 = \square$$



# Calculator Math

## *Topic*

Learning to use a calculator for one-digit addition and subtraction problems.

## *Level*

Beginning addition and subtraction. May be adapted to a higher level as well.

## *Duration*

10-20 minutes per session.

## *Objective*

Student will learn to use a calculator to obtain answers to simple math problems.

## *Motivation*

The lesson is to be followed by a small reward. (Holding a favorite item, few pieces of popcorn/snack, 3-minute game, one song on Discman, etc. Note that the calculator itself may be motivating: the tiny beeping sound that my student's calculator makes seems to motivate him to press the next button required in the math problem sequence.)

## *Materials*

- Large calculator with large buttons (preferably buttons that make sound, i.e., “beep”)
- 3-5 (yellow) index cards
- Pencil (if student is writing the answer down)

## *Background*

It is useful for students to learn to use a calculator for both basic and more complex mathematics problems. Physically “creating” the numbers and symbols by pressing buttons may help reinforce learning of the calculation problem, because of the tactile nature of calculators and the visual nature of the numbers thus produced. (This can be part of a multi-modal learning program, along with use of manipulatives and other multi-sensory methods.)

Higher level students may require calculators to perform more difficult math problems. Students may use calculators throughout their lives to help with the math deficits prevalent in fragile X syndrome. (However, note that use of calculators should be combined with other methods to help with a true understanding of what is being calculated.)



### *Preparation*

Clearly write simple addition or subtraction problems on the index cards. Begin with single-digit addition, or whatever level is appropriate to the child.

Be sure to write math problems using an equals sign, both in horizontally and vertically written math problems. This prompts student to press the equals sign on the calculator.

### *Activity*

#### LESSON ONE

Direct Instruction (with prompts):

*Teacher* Introduce the activity with a smile. Give specific instructions as to what you expect of the student. Mention the reward choices to ensure initial interest in lesson. Place the calculator in front of the student.

*Student* Plays with the calculator, explores the buttons, listens to the beeping sound.

*Teacher* Ask the child to get ready and place the first math card in front of him/her. Touch the child's finger on the first number and bring the finger to the calculator. Repeat for each number and symbol afterward.

*Student* States the answer and/or writes it on the card.

*Teacher* Continue through the next 2-4 problems in an identical manner.

*Student* Accepts a reward for completion of the activity.

#### LESSON TWO

Guided practice (Independently/No Prompts):

Repeat first two steps above, then...

*Teacher* Ask child to get ready and place the first math card in front of him/her. Ask child to solve the problem using the calculator. You may have to guide the child's finger to the problem (initial prompt). Encourage independence once the child seems to understand the sequence of the problem and how to obtain an answer.

*Student* Completes problems one at a time, and receives praise after each problem is successfully completed.

*Teacher* Reward the student accordingly (applause is nice, too!).

Independent Practice :

Once the child is comfortable using the calculator, this activity could be performed independently as a learning center activity, or the calculator could be used to complete math worksheets individually.



### *Extensions*

This lesson can be repeated daily in conjunction with a regular math program (i.e., Touch Math, etc.).

Calculators can also be used for multiplication and division problems for higher functioning students.

A teacher may use a cash register to clearly relate simple mathematical problem solving in daily life (i.e., going to check-out lines in stores, shopping). It can also illustrate the relationship between money and numeric value.

### *Adaptations for Fragile X Syndrome*

A talking calculator with a volume control or headset jack could be used for independent practice. Another alternative is a “whole equations” calculator, on which you can see the entire equation as you proceed.

An occupational therapist or assistive technology specialist can recommend and help you find specific equipment. A good resource regarding assistive technology is the Alliance for Technology Access: <http://www.ataccess.org>. This site includes a searchable vendor list for equipment.

Note that the ability to successfully complete a mathematics problem using a calculator does not necessarily mean that the student understands the problem content, or the context in which such calculations are appropriate and useful. Thus, it is important to teach basic calculations using other methods as well, such as with manipulatives, TouchMath, etc. In addition, it is important to place calculation skills in realistic life settings, so that students understand when these skills are needed and useful.

### *Related IEP Goals*

A sub-goal (“ability to perform simple addition problems with manipulatives and on a calculator”) in the math category of the child’s IEP can be added to provide diversity and integration of practical ways to problem solve.

### *Therapy Connections*

An occupational therapist or adaptive physical education teacher may be able to help integrate this activity with others that make use of fine motor skills.

### *Source*

Original lesson.

*Contact Information:*

*Jeanette E. Moore*

*JEMoore203@hotmail.com*



# Book Fun 1-10

## *Topic*

Mathematics: numbers 1-10

## *Level*

Adaptable for all levels

## *Duration*

15-30 minutes

## *Objective*

Students will create a book that reinforces their understanding of numbers 1 through 10.

## *Motivation*

High interest topics, personal interests, stickers, choice of rewards, producing your own book.

## *Materials*

Vary according to level. Choose from:

- Large construction paper
- Crayons, pencils, markers, stickers (a wide variety of stickers)
- Magazines
- Stamping markers (ten different markers)
- Sports cards
- Three-hole punch
- Access to laminator
- Other items of interest

## *Background*

Teacher should understand the performance level of student in order to modify presentation as appropriate. Teacher should also have an idea of the student's interest areas, and include high interest topics in lesson. (Ask parents for ideas.) For use in inclusion setting, this activity is appropriate during addition and subtraction lessons.

*Tip:* It is important to stay within the sequence of the realm of numbers you are trying to reinforce (1-6, or 1-10, etc.). Do not skip numbers; rather, count in sequence.

## *Preparation*

Have available 10 sheets of construction paper for each student. (Use a smaller or larger number if focusing on a different set of numbers.) 3-hole punch each page in advance for the students. Have an example of all 10 pages taped up across the board in front of the class.



### *Mildly Affected*

Provide students with materials.

### *Moderately Affected*

Provide students with dotted line numerals to trace on the bottom right hand corner of each page. (Pages will be numbered 1-10.)

### *Severely Affected*

Provide students with pages already numbered on the bottom right hand corner. After books are finished, laminate each page for future use.

### *Activity*

#### BOOK CREATION

Direct Instruction:

Teacher stands at front of class, pointing to each page number in turn, stating the numbers. Have the class repeat the numeral out loud in unison. Go through the numerals one by one, allowing students time to write or point to each one.

#### *Mild & Moderate*

Have students write numerals after saying their names. (For larger amounts of numbers, you may use more than one session.)

#### *Severe*

Point to numerals on their pages, as the teacher points to them on the board.

Guided Practice:

Teacher says, "Let's go back to page one. You will put one picture (sticker) on this page. Turn to page two. On this page you will paste two pictures (stickers)." Describe what students will do on each page.

Independent Practice:

Have students work independently to draw or place the correct number of items on each page. Use different items for each page. That is, use stickers of dogs on page 2, stickers of cats on page 3, and so on.

#### *Mild*

Draw pictures of items on pages. Or, use any of the ideas below.

#### *Moderate*

Cut out and paste magazine picture, sports cards, or other high interest items. Or, use any of the ideas below.



### *Severe*

Use stickers or stamping markers and place correct number of items on each page.

### *Activity*

#### BOOK USE

Number Identification:

Tell students, “Turn to page 4. What’s on your page 4?” Students will identify correct page number, identify object on page.

Severely affected students will need more repetition. Ask them “Go find X (the name of something on one of their pages).” Student turns to that picture, and identifies the page by number.

*Addition* Have students turn to page 2, ask them to turn 3 pages. “What page are you on now? What is 2+3?”

*Subtraction* “Go to page 10. Turn back 3 pages, what page are you on? 10 minus 3 is 7.”

*Skip count* “Find page 2, skip a page, What is the next page number?”

*Count backwards* “Start at page 10, turn the pages back as you count.”

### *Extensions*

You may wish to have students write the word name for each number as well as the numeral on the pages.

### *Assessment*

Look for comprehension of directions. Look for understanding of numbers and their value.

### *Adaptations for Fragile X Syndrome*

Kids with FXS typically have trouble with math because it is sequential. This lesson approaches such difficulty through a “back door” that helps desensitize students to the math phobia issue.

### *Related IEP Goals*

Students will identify numbers 1-10. Students will correctly sequence numbers 1-10. Students will correctly label numbers 1-10. Students will correctly write numbers 1-10.

### *Assessment*

Ability to identify, label, sequence and write numbers.

### *Source*

Modified from “Big Book Fun 1-10.” [http://www.eduplace.com/rdg/gen\\_act/fun/book.html](http://www.eduplace.com/rdg/gen_act/fun/book.html)  
Houghton Mifflin Company, 1997.

Contact Information:

National Fragile X  
Foundation





# Buy and Pay

## *Topic*

Money math: budgeting

## *Level*

Can be adapted for all levels, but particularly important for teens and adults

## *Duration*

Varied

## *Objective*

Student will understand concept of using a specific amount of money to make a purchase.

## *Motivation*

Purposeful, and promotes independence

## *Materials*

- Blank “Buy and Pay” form
- Pencil
- Calculator

## *Background*

Students with fragile X syndrome may not easily understand the value of items, nor is money math easy for them. Often, due to difficulties in counting mixed change (in the somewhat stressful situation of the checkout counter), they are taught the “dollar up” or rounding up strategy to ensure they hand the proper bills to a salesperson to pay for items. This lesson gives students functional practice in budgeting items to be purchased, to help convey the concept of using a specific amount of money to make a purchase.

## *Preparation*

Student should preferably have practiced the “dollar up” strategy and be able to use a calculator. It is helpful if the student understands the concept of “greater than” and “less than.”

This lesson involves a field trip to a store to make a purchase.

## *Activity*

1. Student is given a “Buy and Pay” form. This form can have more or fewer lines depending on student’s needs and abilities.
2. Student determines items he or she wishes to buy.
3. Student fills in blanks on “buy” list (teacher writes items if student needs assistance).



4. Locate items in the store, and write item prices as they are selected, in the second column of the form. (Teacher may record prices as necessary.)
5. Student enters item price into calculator as the item is placed in cart, and presses plus (+) BEFORE selecting next item. (Because sequencing is difficult for students with fragile X, pick a particular action to relate to entering the plus sign, e.g., key in the plus sign as you locate or touch the item on the shelf).
6. After the last item on the buy list has been selected and entered into the calculator, the student will see the word PAY on the form.
7. The word PAY is the prompt for the student to check the total on the calculator. (Teach student to relate PAY with the equals sign.)
8. The student writes the total cost of items in cart on the blank line next to the word PAY (teacher may need to assist).
9. Student will compare (using rounding up method) total cost of items to amount of money brought.
10. If total amount of purchase exceeds the amount brought, student must be assisted in making choices about which items should be returned.

### *Extensions*

You can use a grocery store flier in conjunction with making the shopping list. Have the student, using the flier, write the prices listed in the flier and calculate the total prior to shopping.

Buy the same items at two stores and compare the totals, to teach comparison shopping.

### *Assessment*

Proficiency is achieved when student can independently make decisions about purchases within a budget.

### *Adaptations for FXS*

- For higher functioning students and/or doing non-grocery shopping, add tax calculation information.
- For lower functioning students, practice buying items and calculating the total. Once success is achieved, add the budgeting section.
- Due to fine motor skill deficits, student may need to be prompted to write, or the teacher may need to write, the items/prices.
- Use a clipboard with a built-in calculator to hold the “Buy & Pay” form.



- Use a talking calculator (preferably with a volume control!).
- Simplify the “Buy & Pay” form if the student has difficulty following it.
- Student may need prompting to enter only the numbers on the calculator corresponding with the price of the item(s). (For example, do not enter the sku#, weight, or discount amount which may also be on the shelf or item.)
- As the items are selected, the teacher will need to prompt the student to press the PLUS symbol on the calculator.

After the total price has been determined, the teacher may need to prompt the student to round up the amount in order to facilitate an easier comparison between the total and the amount budgeted.

#### ***Related IEP Goals***

1. Student will be able to create a list of items to be purchased.
2. Student will locate and select items on a list.
3. Student will enter item price on a calculator, and add prices of remaining items as selected.
4. Student will round a dollar up from a given total.
5. Student will be able to compare two dollar amounts to determine which is greater.

*For Parents Only:* This activity can be reinforced in the community.

#### ***Source***

Original lesson from the lesson planning group of the National Fragile X Foundation.

Name \_\_\_\_\_

# Buy and Pay Worksheet

## Buy

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### Budget

I have \$ \_\_\_\_\_

— \$ \_\_\_\_\_

= \$ \_\_\_\_\_

If negative —, put something back!

## Calculate

\$ \_\_\_\_\_

+ \$ \_\_\_\_\_

+ \$ \_\_\_\_\_

+ \$ \_\_\_\_\_

Pay = \$ \_\_\_\_\_

Dollar up 

\$ \_\_\_\_\_ .00

← copy



# Let's Go Shopping

## *Topic*

Math: coin identification and use, coin combinations

## *Level*

Basic math; child should be able to count and recognize numerals

## *Duration*

About 15 minutes per session

## *Objective*

To learn to count out a correct coin amount using single and mixed coins

## *Motivation*

Immediate reward of receiving “purchased” item; game format

## *Materials*

- Number chart (indicate nickel/dime and other groupings of 5)
- Pictures of (or real) desired objects, labeled with cost (see attached example; post-it notes are great for labeling)
- Real coins
- Coin container (tub, bowl, coin purse or money tray)

## *Background*

Using actual coins, items or pictures of high-interest items, and a realistic setting (shopping) helps students learn coin use in a practical way. This activity is fun for the student.

Each item is identified as 1, 5, 10 or 25 cents combinations. Use direct teaching by naming the monetary units. The child is motivated to find it, name it, and exchange it for the desired item.

## *Preparation*

Teacher needs to know the interests of the child in order to choose high interest items to purchase. The teacher also must consider the child’s ability in order to present a lesson at the corresponding level of complexity.

Have coins, pictures or items, and charts available.

## *Activity*

1. Define roles of teacher as cashier and student as purchaser.
2. Present student with selection of items available for purchase.
3. Student indicates desired item to buy.



4. Cost is stated by teacher or student (depending on ability).
5. Student selects appropriate coin or counts out correct amount.
6. Student gives money to cashier in exchange for item.

#### *Extension*

Using a highlighted number chart, the child can visually see that once he has counted five pennies and placed them on the chart, the fifth is special, since the coins can now be exchanged for a nickel, and so on. Using an exchange chart, the child can see what combinations of coins he can exchange. Teacher can use this chart to challenge the student and select an amount using only a specified number of coins (e.g., “Give me 25 cents using three coins”).

#### *Adaptations for Fragile X Syndrome*

The game format and visual charts help reduce stress and anxiety.

#### *Related IEP Goals*

- Recognize monetary units by name
- Associate written monetary symbols (\$) and (¢) with value
- Demonstrate a command of coin equivalencies
- Identify and count pennies/nickels/dimes/quarters

#### *Standards Addressed*

Standard 4.1—All students will develop the ability to pose and solve mathematical problems in mathematics, other disciplines and everyday situations.

Standard 4.6—All students will develop number sense and the ability to represent numbers in a variety of forms and use numbers in diverse situations.

#### *Source*

Original lesson.

*Contact Information:*

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# Big and Small

## *Topic*

Pre-math concepts of “bigger” and “smaller”

## *Level*

Moderately and severely affected students; pre-school and early elementary school

## *Duration*

15-60 minutes

## *Objective*

Student will understand concepts of bigger and smaller.

## *Motivation*

Experiential, tactile format

## *Materials*

- Two sizes of blocks, one large and one smaller
- Two sizes of dolls, balls, or other high-interest objects

## *Background*

Students with fragile X have great difficulty conceptualizing abstract math concepts. This lesson helps make these concepts more concrete.

*Tip:* Use positive reinforcement for teaching.

## *Preparation*

Have materials readily available.

## *Activity*

Discriminating bigger and smaller sizes.

1. Teacher puts out two blocks of contrasting size and asks student “Show me the big one.” Follow with “Show me the small one.”
2. When mastered, give student a bunch of small and big blocks mixed together (the same sized blocks as in #1); ask student to sort blocks by making one pile of big blocks, and one pile of small blocks.
3. Try various methods of sorting into different containers:
  - Student can fill one bag with big blocks and another with small blocks.
  - Have two containers marked “big” and “small” with pictures of life sized blocks.
4. To help generalization to two dimensions, match pictures of blocks to the actual object. Then repeat exercise using only pictures.



5. Repeat above exercises #1-3 using other objects such as balls or dolls in two sizes.
6. Provide student with a group of mixed objects, e.g., small and large blocks, balls, and dolls. Ask for the “large ball” or the “small doll” from a mixed group of small and large objects of various sorts.
7. Repeat exercise #4 using pictures of several different items. To help generalization to two dimensions, match pictures of objects to the actual object. Then repeat exercise using only pictures.

#### *Extensions*

Generalize to other objects using only pictures. For example, show the child photos of a large house and a small house, and ask for identification of the big one and the small one.

#### *Assessment*

Teacher will keep data on correct answers until 100 percent accuracy has been achieved over two trials.

#### *Adaptations for FXS*

Note that individuals with fragile X may occasionally use the opposite word than intended when expressing concepts. For example, they may say the word “hot” when they know they mean “cold.” For this lesson, find ways to assess competence by having student demonstrate knowledge using receptive ability non-verbally, for instance, ask student to “Hand me the larger block.”

#### *Related IEP Goals*

- Student will be able to differentiate bigger blocks from smaller blocks.
- Student will be able to differentiate “big” from “small” using only pictures of items (rather than actual objects).
- Student will be able to discriminate concepts of “bigger” and “smaller” using various stimuli.

#### *Source*

Original lesson from the lesson planning group of the National Fragile X Foundation.





# Place Value

## *Topic*

Mathematics: place value (ones, tens).

## *Level*

For students who already can add and/or subtract single digit numbers, to introduce them to an understanding of place value. This is meant to be helpful to prepare for learning to add and subtract two-digit numbers.

## *Duration*

30-60 minutes

## *Objective*

Student will understand place value to tens.

## *Motivation*

Experiential, tactile format.

## *Materials*

- “Base Ten Blocks” (optional, see bibliography for resource information)
- Plastic bags (zip-lock type)
- Jelly beans
- Sticks of gum
- Goldfish crackers
- Beads and beading string
- Play money or real money: one dollar bills, ten dollar bills
- Sharpie or permanent marking pen

## *Background*

Students with fragile X have great difficulty conceptualizing abstract math concepts. This lesson helps make these concepts more concrete.

## *Preparation*

Fill plastic bags with ten each of jelly beans, sticks of gum, and/or goldfish crackers. Keep available single jelly beans, sticks of gum, and crackers as well. String ten beads on a string, and keep single beads available.

The “Base Ten Blocks” consist of blocks that represent “ones,” “tens,” “hundreds,” and “thousands.” The “ones” are single blocks, the “tens” are rods of ten blocks, the “hundreds” are squares of one hundred blocks, and the “thousands” are cubes of one thousand blocks.



This exercise does not focus on the “hundreds” or “thousands” places, but the same principle could be applied to use of those blocks as well.

See bibliography for source information for one type of “Base Ten Block.” There may be others available.

### *Activity*

#### DISCRIMINATING PLACE VALUE: ONES, TENS, HUNDREDS.

##### 1. Bags of ten

- Teacher counts out ten jelly beans. These are placed in a group, and then put in a plastic bag. Mark “10” on the bag with a Sharpie pen.
- Have students make their own “10’s” bag of objects, using jelly beans, sticks of gum, goldfish crackers, etc.
- Show students how to add the bags of “10’s.” First add two bags of 10 by counting each item in the bag. Then add them on paper by writing the numerals in an equation.
- Explain to students that the sum is the same whether you count each item in the bags, or add the numerals in an equation. (For some students you may want to use a calculator as well.)

##### 2. Strings of ten

- Teacher counts out ten beads. These are strung in a row.
- Have students make their own strings of ten beads.
- Add two or three strings of ten beads, first counting each bead, and then using written equations and/or calculators.

##### 3. Tens rods

- Teacher counts out ten of the single blocks. These are placed in a row. Teacher then places a rod (i.e., block of ten) next to the ten single blocks. Teacher explains that the rod represents ten blocks, or the “tens” place in a two-digit numeral.
- When mastered, give student a bunch of single blocks and rods of tens; ask student to sort blocks by making one pile of single “ones” blocks, and one pile of “tens” rods.
- Have students sort the “ones” blocks into groups of ten, and replace them with “tens” rods.

##### 4. Ten-dollar bills

- Repeat exercises using \$1 bills and \$10 bills. (Demonstrate that a \$10 bill represents a stack or bag of ten \$1 bills.)
- Have students match dollar values with corresponding Base Ten blocks: \$1 bill with one-unit block; \$10 bill with ten-unit square.



### *Extensions*

Fill a gallon-sized plastic bag with 100 jelly beans and/or goldfish crackers, and teach the concept of “hundreds” place using the same types of exercises. Use the square block of one hundred from the Base Ten Block set. Use a play \$100 bill, and compare to one hundred \$1 bills and ten \$10 bills.

To help generalization to two dimensions, match pictures of blocks to the actual object. Then repeat exercise using only pictures. Rubber stamps or paper pads with pictures of the blocks are available.

When this ability has been mastered, provide opportunities to generalize to real life events such as making a purchase (which bill is more than the total on the register, etc.).

### *Assessment*

Teacher will keep data on correct answers until 100 percent accuracy has been achieved over two trials.

### *Related IEP Goals*

1. Student will be able to identify blocks and baggies/objects representing “ones” and “tens.”
2. Student will be able to discriminate concepts of “ones” and “tens” using various stimuli.
3. Student will be able to match dollar values to corresponding blocks with matching units.

### *Bibliography*

Base Ten Blocks, books, and materials can be purchased from:  
EAI Education; 1-800-770-8010; [www.EAIeducation.com](http://www.EAIeducation.com).

### *Source*

Original lesson from the lesson planning group of the National Fragile X Foundation.



# River Frog, River Fish

## *Topic*

Counting objects

## *Level*

Basic counting (used with a 4th grade student doing arithmetic at 1st or 2nd grade level)

## *Duration*

5-10 minutes

## *Objective*

Student will learn/practice counting to 20.

## *Motivation*

Game setting and high interest topic

## *Materials*

- Construction paper (green, blue, & yellow or light green)
- Scissors
- Glue
- Plastic bag

## *Background*

This lesson was developed in conjunction with a 4th grade river study, but could be used for any student learning basic counting.

## *Preparation*

A river game board and pieces can be made of three pieces of construction paper. Use the colors green, for a lush background, blue for the river, and yellow or light green for the fish and/or frogs. Cut two wavy lines down the blue paper for the river. Glue it onto the green paper. Fashion several frogs and fish from the yellow paper and place into a plastic bag. (Make up to 20 frogs and fish, depending on student's counting ability.) Attach to the back of the game board.

## *Activity*

Discriminating place value: ones, tens, hundreds.

### LESSON ONE

*Teacher* Introduce the activity with a smile. Let the student know that you will be playing a "counting game." Describing the activity as a game and encouraging participation allows learning through play.



*Student* Ask student to independently retrieve the game board and pieces (in a plastic bag) from a particular area of the learning space. For example, my student's game board is located in a desk in the teacher's lounge. He is asked to retrieve and display it on his desk independently.

*Teacher* Ask student to count a specific number of items that you have placed in the river. Have the student point with the index finger and count aloud, slowly.

*Student* Gives the correct (or incorrect) number of items.

*Teacher* Either congratulates or says, "Try again." If the latter, encourages a second attempt.

*Teacher & Student* Repeat until there have been three consecutive counting sessions.

*Student* Praise student upon completion of activity and instruct him/her to return the game board to its regular storage space.

## LESSON TWO

Repeat first two steps of Lesson One.

*Teacher* Ask student to independently select a specified number of fish and/or frogs from the plastic bag: "Get five fish out from the bag." Have the student place the correct number of fish and/or frogs into the river.

*Student* Counts out the correct (or incorrect) number of items.

*Teacher* Either congratulates or says, "Try again." If the latter, encourage a second attempt.

*Teacher & Student* Repeat until there have been three consecutive counting sessions.

*Teacher* Praise student upon completion of activity and instruct him/her to return the game board to its regular storage space.

### ***Extensions***

Use plastic frogs, fish, or other items for counting. Change the item types every three or four days. This helps the student respond to a variety of items and textures.

Use together with numerals to teach 1:1 correspondence. For example, hand the student a card with the numeral "5," and ask the student to place that number of frogs or fish in the river.

### ***Assessment***

Record "Item Type," "Number of Items Counted," and whether or not the student had to be prompted. Note any patterns of mistakes. The goal is to have the student count out items independently and place them one by one into the river on the game board.

### ***Source***

Original lesson.

*Contact Information:*

*Jeanette E. Moore*

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# Counting Games

## *Topic*

Math

## *Level*

Beginning math, numerals 1-4. For students who may be able to count and read numerals, but do not yet grasp number concepts.

## *Duration*

5-20 minutes

## *Objective*

Help children develop their understanding of the number system. Practice counting. Learn concepts represented by numerals.

## *Motivation*

Appealing because the students use manipulatives, and the math concepts are presented in fun games and activities.

## *Materials*

- Unifixo® cubes or Lego® pieces
- Checkers, beans, or dried macaroni
- Post-it® notes
- Paper plates, blank paper, number cards or index card stock to make number cards
- Eight paper or plastic bowls

## *Background*

Many children with fragile X syndrome learn to read numbers and to count out loud, but still struggle to connect numerals with the concepts they represent. These fun and simple activities help them develop understanding of the number system. Encourage children to play many times to practice.

## *Preparation*

Several of these activities use Lego pieces or Unifix cubes. Unifix cubes are plastic cubes that fit together to form long sticks. They are easier to manipulate than Lego pieces (for students with fine motor skills difficulties, common to FXS). Some of the games use Post-it notes, which are helpful because they stay in place and children like working with them. Material preparation is simple, as described below for each activity.



### *Activity*

#### MAKE A FACE

Draw smiling mouths on paper plates. Ask the child to count out checkers, beans, or Unifix cubes to give each face one nose and two eyes.

#### MAKE A PERSON

Draw people on a sheet of paper. Ask the child to count out checkers to give each person one nose, two eyes, and three buttons.

#### FILL THE BOWLS

Collect four plastic bowls or small containers and some dried macaroni. Label each of four index cards with a numeral from one to four. Ask the child to put a card in each bowl and then count the appropriate number of pieces of macaroni into each.

#### MACARONI CONCENTRATION

Help the child hide one piece of macaroni under each of two bowls. Do the same for two, three, and four pieces. Players take turns turning over two bowls at a time and counting the macaroni pieces underneath. A player who finds the same number under each has made a match and keeps those bowls. Continue until all the bowls have been won.

Vary the game by substituting cards with the numerals one through four under four of the bowls, and play to match the numeral with the number of pieces of macaroni. Another variation is to place cards with one to four dots under four of the bowls.

#### LINE THEM UP

Label each of four Post-it notes with a numeral from one to four. Place them on a table in random order and ask the child to line them up in “counting order.” When the child can easily put those four in order, add zero and five, then six, seven, and so forth.

#### BUILD A STAIRCASE (for two or more players)

For this game, you need a box of Unifix cubes or Lego pieces, and, for each player, a set of four numeral cards (labeled one through four) and four numbered Post-it notes (also labeled one through four). The “staircase” is formed by completing four stacks of cubes and lining them up in numerical order, the lowest “step” having one cube and the highest having four cubes.

Before starting to play, ask the child to line up each player’s Post-it notes in numerical order. Then shuffle all of the numeral cards together, and place them facedown in a pile.

Each player in turn draws a card, takes that many cubes, and connects them to form a “step.” He then places the step next to his Post-it showing that number and places the card in the discard pile. If the draw pile is used up, shuffle the discard pile, turn it facedown, and continue to play. A player who draws a number he has already drawn misses that turn, but



you may want to have the child build the step for the number anyway so he can discover that he already has that number.

The player who completes his staircase first is the winner. Vary this game by using a die instead of the cards and building the staircases with six steps.

### *Extensions*

For students who can read the word names for numbers, you can replace the numeral cards (1-4) with the cards showing the word names (one, two, three, four).

### *Bibliography*

Baratta-Lorton, Mary, 1994. *Mathematics Their Way*. Pearson Learning.

Richardson, Kathy, 1984. *Developing Number Concepts Using Unifix Cubes*. Addison-Wesley Pub. Co. Out of print, see the following references instead.

Richardson, Kathy, 1998. *Developing Number Concepts: Addition & Subtraction*. Dale Seymour Pub.

Richardson, Kathy, 1998. *Developing Number Concepts: Counting, Comparing, and Patterns*. Pearson Learning.

The Center for Innovation in Education lists vendors who sell Unifix Cubes, at <http://www.center.edu/>. Cubes are sold in sets of 100 or 1,000, in different colors.

### *Source*

Several of these activities had been adapted from *Mathematics Their Way* by Mary Baratta-Lorton, and *Developing Number Concepts Using Unifix Cubes*, by Kathy Richardson.

*Contact Information:*

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# Dance Along the Numberline

## *Topic*

Number recognition, skip counting, addition, subtraction

## *Level*

Primary students with various developmental disabilities, ages 6-10 years old, including a child with fragile X syndrome

## *Duration*

One-hour introductory lesson, then incorporated into daily math activities and used as an individualized learning center

## *Objective*

Depending on students' ages and levels of mathematical ability, the giant numberline may be used to meet various objectives, including the following.

Upon completion of this lesson the students will:

- Step on and name numerals from 0 to 10/20/100 in consecutive and then random order.
- Step on and name numerals using skip counting by 2/5/10.
- Step on the initial number in a given addition number sentence, and proceed the correct number of spaces to the right in order arrive at, and orally name, the answer.
- Step on the initial number in a given subtraction number sentence, and proceed the correct number of spaces to the left in order to arrive at, and orally name, the answer.

## *Motivation*

The use of activities involving gross motor skills tends to be intrinsically motivating to primary age students because it seems like a game format.

## *Materials*

- Wide tipped black permanent marker
- Rectangular, flannel-backed, plastic coated, solid pastel tablecloth
- Post-it® notes
- Wide clear packaging tape
- Yardstick

## *Background*

General familiarity with the many uses of smaller numberlines is helpful for the teacher to have prior to using the giant numberline.

## *Preparation*

Get the permanent black marker and the large tablecloth. Fold the tablecloth lengthwise in half, then again in quarters. Mark and cut along lines to get four long, thin pieces.



Tape the pieces together on the back and front with packaging tape to form a long, thin and continuous strip. Outline the front of the strip with magic marker for high contrast visibility, and use a yardstick to measure equidistant spaces for number placement. (I initially used numbers 0-10, then increased to 0-20, and later from 0-100.)

Mark selected numbers in correct places with bold dark numerals, then tape the numberline to the floor with packing tape. Depending on which skills are being taught, the teacher will also need a set of numeral cards, and/or large flash cards with addition or subtraction problems for the students to use when “dancing along” the numberline.

### *Activity*

#### Direct Instruction

- The teacher will seat the students in pairs and use the “Think/Pair/Share” strategy to discuss various reasons and ways to use a numberline. The responses will be recorded on the board on an idea web (example attached) and demonstrated on desk numberlines.

#### Guided Practice

- The teacher will then introduce the giant numberline and will call one student up at a time to demonstrate how to do the mathematical tasks listed on the class web by “dancing along the numberline.”
- The class will then be divided into smaller skill groups (e.g., number recognition and naming, skip counting, and addition) with one group working on the giant numberline while the other two groups either complete standard numberline worksheets, or work at individualized stations.

#### Independent Practice

- The giant numberline will remain taped to the classroom floor to be used as an independent workstation along with appropriate flash cards, which are self-correcting on the back.

### *Extensions*

Once the students have become proficient at using the numberline for skip counting, it may also be used to teach and reinforce multiplication facts.

### *Assessment*

Teacher observation of numberline performance, oral questioning, and error analysis of related worksheets can be used to determine mastery and/or needs, which may then become the basis of future lessons to meet individual or group needs.



### *Standards Addressed*

Mathematics: name numerals; skip count by 2, 5, 10; add/subtract.

### *Word Definitions*

#### THINK/PAIR/SHARE

A cooperative learning strategy developed by Dr. Frank Lyman. This strategy is published by Kagan (2003, approximately \$3) on a very useful four-sided laminated card which explains the strategy and its many variations. The teacher asks a question, or makes a request for a response, places students into pairs (or “pair squared” if you choose to have four students in a group), requires them to “think” silently during wait time, quietly whisper their responses to each other during “pair” time, and to raise their hand to be called on during “share” time. Hand gestures or a classroom prompt chart are used to signal the transitions between stages.

This method work particularly well with children who have fragile X syndrome because it is quiet, clearly defines transitions, requires cooperation and listening/attending (which tends to improve social skills), provides automatic “wait time” to help organize thoughts, and gives practice opportunities for using oral language in a non-threatening manner and setting.

A web is a visual organizer used to gather, organize, and record written responses. There are a variety of web types that can be used, depending on your goal (e.g., Venn diagram). See the attached “Idea Web” for an example.

### *Source*

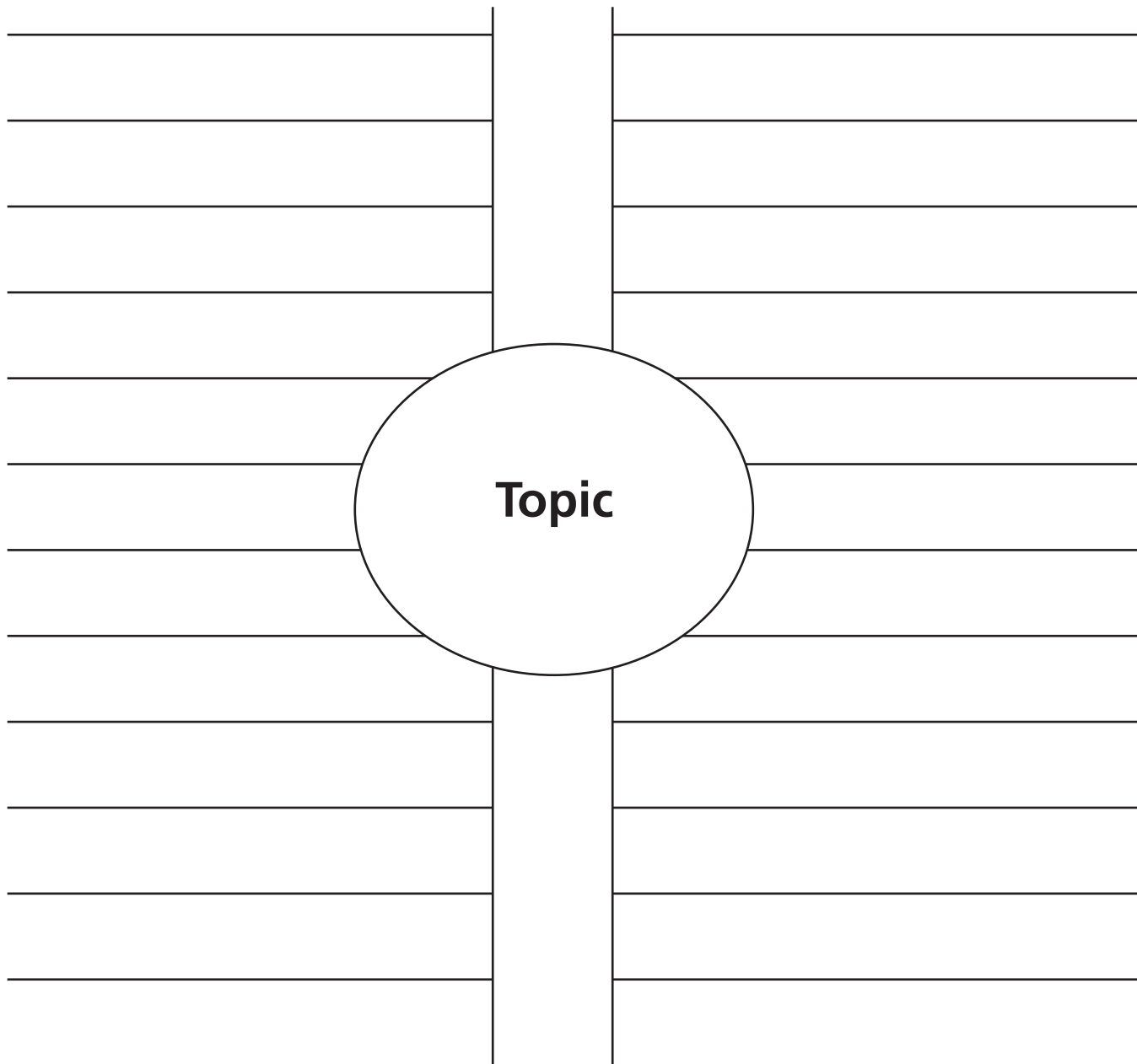
Original lesson.

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Name \_\_\_\_\_

## Idea Web





## “More” and “Fewer” Games

### *Topic*

Math

### *Level*

Beginning math, numerals 1-4. For student who may be able to count and read numbers, but do not yet grasp number concepts.

### *Duration*

5-20 minutes

### *Objective*

Help children develop understanding of the number system. Learn concepts represented by numerals. Learn concepts of “more” and “fewer.”

### *Motivation*

Appealing because the students use manipulatives, and the math concepts are presented in fun games and activities.

### *Materials*

- Unifix® cubes or Lego® pieces
- Half-cup measuring cup
- Bag or box to hold cubes
- Number cards or index card stock to make number cards

### *Background*

Many children with fragile X syndrome learn to read numbers and to count out loud, but still struggle to connect numerals with the concepts they represent. These fun and simple activities help children develop their understanding of the number system. Encourage children to play many times to practice.

In comparing numbers of objects—such as the cubes in the following games—the correct terms are “more” and “fewer.” But since “less” is commonly (if incorrectly) used, children may have a better understanding of “more” and “less.” Once a child becomes comfortable with the concept expressed this way, you may want to use “fewer” and “less” interchangeably.

### *Preparation*

Several of these activities use Lego pieces or Unifix cubes. Unifix cubes are plastic cubes that fit together to form long sticks. They are easier to manipulate than Lego pieces (for students with fine motor skills difficulties, common to FXS).

Material preparation is simple, as described below for each activity.



### *Activity*

#### SCOOP OUT (for two or more players)

Put some Lego pieces or Unifix cubes in a bag or box. Each player in turn uses a half-cup measuring cup to scoop out some pieces and connects them to build a “tower.” Players compare their towers by standing them side by side to determine which tower has more cubes and which has fewer. The player with more is the “winner.”

Vary the game by deciding in advance that the player with fewer will be the winner.

#### STAIRCASE PICK A CARD (for two or more players)

Each player starts with a four-step “staircase” made of Unifix cubes or Lego pieces. The staircase consists of 4 towers of cubes. The first tower has one cube, the second has two cubes, the third has three cubes, and the fourth has four.

Make a set of numeral cards, labeled one through four, for each player. Shuffle the cards and place them face down in a stack. For each round, each player draws a card and takes the corresponding tower from his staircase. Players compare their towers by standing them side by side to determine which tower has more cubes and which has fewer. The player with more is the “winner” and keeps both cards.

Vary the game by adding in numeral cards for zero and numbers higher than four, or by deciding in advance that the player with fewer cubes will be the winner of each round. After a while, try asking the child to predict just by looking at the cards that are drawn which player will be the winner.

Children with fragile X are sometimes better able to show what they know when they are not called upon to process a concept and language simultaneously. Therefore, try asking the child to point to the numeral he thinks will turn out to be more. He may be more successful than when asked to say its name.

#### CIRCLE IT

Show the child a drawing of two people playing Pick a Card (see attached worksheet). Write a different number on each card in the illustration and ask the child to circle the player who will have more cubes. Since children with fragile X sometimes are best able to show what they know nonverbally, the child might be more successful at this task than at saying which player will have more.

Eventually, try simply writing two numerals on an index card and asking the child to circle the number that shows more.



### *Extensions*

For students who can read the word names for numbers, you can replace the numeral cards (1-4) with the cards showing the word names (one, two, three, four).

### *Bibliography*

Baratta-Lorton, Mary, 1994. *Mathematics Their Way*. Pearson Learning.

Richardson, Kathy, 1984. *Developing Number Concepts Using Unifix Cubes*. Addison-Wesley Pub. Co. Out of print, see the following references instead.

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### *Source*

Several of these activities had been adapted from *Mathematics Their Way* by Mary Baratta-Lorton, and *Developing Number Concepts Using Unifix Cubes*, by Kathy Richardson.

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Name \_\_\_\_\_

## Circle It

Circle the player who will have more cubes.







# Subtraction and Addition Using Cards With Velcro®

## *Topic*

Subtraction and addition of numbers 1-15

## *Level*

This was used with a 16-year-old boy with fragile X syndrome who does math at the first-grade level. Adaptations are described for mildly, moderately, and severely affected students.

## *Duration*

15-60 minutes

## *Objective*

Students will learn to add and subtract with the aid of visual cues and manipulatives in the form of objects attached to cards with Velcro.

## *Motivation*

Using high-interest manipulatives is an effective and fun way to learn.

## *Materials*

- Card stock or large index cards
- Adhesive-backed Velcro
- Laminator
- Marking pens
- Small high-interest objects (e.g., coins, plastic disks, pictures on laminated cardboard or sturdy paper)
- Small plastic basket

## *Background*

Students with fragile X syndrome typically have difficulty with math concepts. Use of manipulatives helps make abstract concepts concrete. However, this approach can result in error if students miscount; it also can be very time-consuming, which makes it less than ideal for students with a short attention span. The exercise described here uses a modified approach, which includes use of a physical motion to help reinforce understanding.

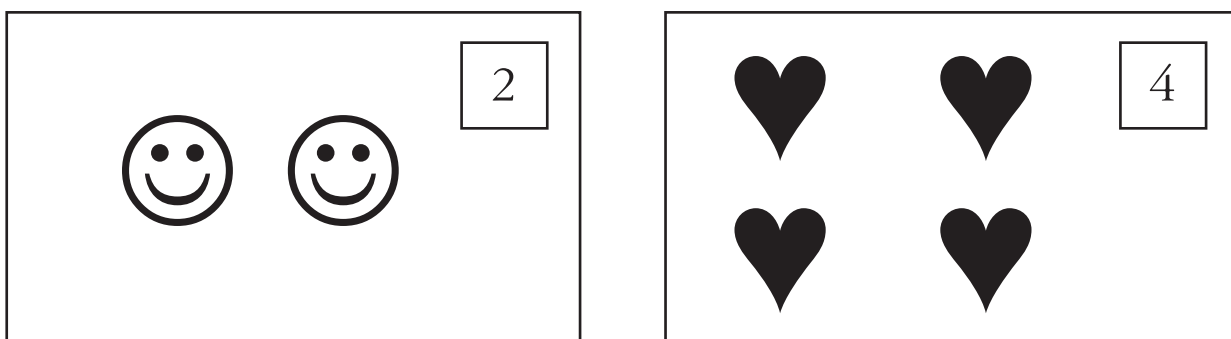
This lesson assumes the student can discriminate between “larger” and “smaller” numbers.

## *Preparation*

Write one number from 1 to 15 in the right corner of each of 15 cards, then laminate the cards. Attach the corresponding number of Velcro pieces to each card (e.g., four pieces on the 4 card).



Attach the other side of the Velcro to the high-interest objects for each card (e.g., four coins for the 4 card). Attach the objects to the numbered cards. (*Tip:* Ideally, the Velcro pieces should be of the same size and shape as the objects.)



Place cards sequentially in the plastic basket with the numbers visible.

### *Activity*

#### SUBTRACTION

Direct Instruction:

This approach is equally effective for mildly, moderately and severely affected students.

Write a subtraction problem on the board or have it printed on a work sheet (e.g.,  $8-5=\_$ ). Demonstrate finding the card representing the larger numeral in the problem.

Say “eight” while holding up the 8 card. Remove one Velcro object at a time, counting until you have removed five, and set them aside. Say “Eight minus five equals....” Count the remaining objects on the card and say “three.” Restate the equation: “Eight minus five equals three.”

Guided Practice:

Have students practice. Prompt as needed (e.g., tell them to count how many are left).

Independent Practice:

#### *Mild*

Have students copy the problems from the board, solve them using the cards, and write the answers.

#### *Moderate*

Give students a work sheet with the subtraction problems, and have them solve the problems using the cards; then have them write the answers.



### *Severe*

Students can work one-to-one with a teacher or aide who will guide them in using the cards.

### ADDITION

Direct Instruction:

Write an addition problem on the board or paper (e.g.,  $5+3=_$ ).

### *Mild*

Demonstrate finding the card representing the larger number. Hold up the 5 card and say, “Hold the larger number in your head: five.” Find the 3 card and say, “Five in my head plus three.” Have students point to each object on the 3 card and count beyond five: “Six, seven, eight.” (In other words, use the 5 card to represent “holding in your head,” and then count beyond five with the 3 card.)

### *Moderate*

Show students how to find each card. Hold up both cards or place them on the table, and count the objects to get the total. Then say “Five plus three equals eight.”

### *Severe*

Help students find the appropriate two cards, and help them add by counting the objects on both cards.

Guided and Independent Practice:

### *Mild*

Students who can hold a number in their head can reduce their reliance on the cards. Have students copy addition problems and solve by remembering the larger number in each problem, finding the card for the second number, and counting on by using the objects on the second card.

### *Moderate and Severe*

Give students written addition problems, and while monitoring their work, have them use the basket of cards to solve the problems.

*Note:* For the addition problems, the Velcro is not necessary. You can use cards that are not laminated, with the corresponding number of symbols (e.g., four stamps or stickers on the 4 card), or playing cards.

### *Extensions*

These materials can be used at an activity center in an elementary classroom for mildly affected students.



For students who can benefit from a more abstract technique, Velcro can be used in combination with a numberline (e.g., Velcro can be attached to particular places on the numberline and students move objects with Velcro attached along the numberline to subtract or add).

### *Adaptations for Fragile X Syndrome*

Consider the pattern used to arrange the items on each card. Some students may respond to patterns (as on dice).

To help students differentiate between subtraction and addition, have separate, clearly distinguishable sets of cards for each (e.g., cards with Velcro for subtraction and ones with stickers for addition). It also can be helpful to have manipulatives for the plus and minus signs; have students choose the appropriate sign and keep it visible as they work, in order to remind them of the type of problems they are solving.

### *Parent Report*

“We keep the cards in one of those little plastic baskets used for organizing drawers. The numbers are large and bright enough so it is easy to flip through the cards and find the appropriate one.”

### *Source*

Original lesson based on ideas from Kelley Geddes, Lisa Wildenberger, and Anita Inz.

*Contact Information:*

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## Card Math

### *Topic*

Identifying numbers

### *Level*

Basic

### *Duration*

15-60 minutes

### *Objective*

Students will create a personal deck of cards numbered one to ten (or more) and use them to practice number identification.

### *Motivation*

Pride in creating own materials; personal expression; tactile input

### *Materials*

- Large, heavy-weight, blank index cards
- Markers
- Stickers or picture stamps for illustrating
- Laminating machine

### *Background*

It is helpful for this lesson if teacher is familiar with student's interests. This enables teacher to provide materials that are appealing (e.g., stickers of birds, trucks, or other interest areas). Send a note home, discuss with the parent, or conduct an "interest inventory" to identify interest areas.

Caution: some high interest areas can be foci of perseveration, and serve as distractions rather than aids to learning. An example: "Pokemon" cartoon characters, for which many boys with fragile X imitate the many different voices.

### *Preparation*

Have materials available.

For students unable to write numbers, stencil numbers for tracing or write numbers in advance on the cards. Teachers may want to make their own deck of cards to show to students before starting task, and model making one card. You may also want to do a fun counting activity in preparation for this lesson—such as having kids count together and clap or jump (get those wiggles out!) to the number (clap once for one, twice for two, etc.).



### *Activity*

1. Student is instructed to take one index card and write the numeral 1 on it. (Tracing, stencils, or pre-written numerals are used as needed for individual students.)
2. Student is directed to illustrate quantity indicated by numeral (by drawing, using stickers or stamping), e.g., one sticker or drawing for the number 1, two stickers for number 2, and so on.
3. If having difficulty, student can be prompted to look at the teacher's model.
4. Praise efforts as the lesson continues. Use pictures for language stimulation and to hold interest.
5. When done, cards are given to teacher for laminating.

Direct Instruction:

There are many uses for the cards:

#### *A.*

- Teacher directs student to place cards face up on desk.
- Teacher asks student to point to or pick up card by a specific number.
- Repeat as often as attention and interest allow or until proficiency is demonstrated.

#### *B.*

- Teacher directs student to show the card with “four turtles” (specific to pictures on student's cards).
- Teacher directs student to point to the numeral on the card and say it.

#### *C.*

- Pair students for a card game.
- Have one student ask for a card by number.
- The other student finds the card and places it on the desk as modeled by the teacher.

#### *D.* To introduce skip-counting:

- Teacher directs the student to put all cards out on the desk, 1 through 10.
- Teacher prompts the student to find the number 2 card and turn it over.
- Repeat with 4, 6, 8, and 10.

#### *E.* To reinforce skip counting:

- Ask student, “What's missing?” while pointing to where the number 2 card belongs. If the student responds correctly, replace the card. Repeat with the subsequent numbers (4, 6, 8, and 10). This exercise can be done with the entire series, removing one or more numbers at a time.



- Have student line up the cards in numerical order from 1 to 10 on their desk. Have student turn over cards 1, 3, 5, 7, and 9. Have student read the numbers on the remaining cards: 2, 4, 6, 8, 10.
- Have student line up the cards in numerical order from 1 to 10 on desk. Have student skip over card 1 to card 2 and say “2.” Have student skip over card 3 and say “4.” Repeat by having students skip over every other card (5, 7, and 9).

### *Extensions*

Practice with a standard deck of cards (pull out face cards and gradually reintroduce them as distracters).

Introduce simple card games such as Uno®, Go Fish, etc. This will also provide good practice with turn-taking, an important skill for students with fragile X.

### *Assessment*

Over 10 trials separated by at least two days, if student identifies numbers with 95 percent accuracy for two consecutive days, mastery has been achieved.

### *Adaptations for FXS*

This lesson focuses on high interest, tactile materials, social interaction.

Use of high interest items is very effective for students with fragile X, as it helps them focus and concentrate.

### *Related IEP Goals*

- Student will be able to identify numerals one through 10 expressively and receptively.
- Student will be able to identify values corresponding to numbers one through 10.
- Student will be introduced to the concept of skip counting by two's.

### *Therapy Connections*

Fine motor skills can be reinforced in occupational therapy.

Cards can be used in social skills groups (use illustrations for conversation and practice turn-taking).

### *Home Connections*

This activity can be easily employed at home.

### *Source*

Original lesson from the lesson planning group of the National Fragile X Foundation.



# Coin Connections

## *Topic*

Math

## *Level*

Beginning money math (coin identification and value)

## *Duration*

5-20 minutes

## *Objective*

Help children develop understanding of coin names and values

## *Motivation*

Appealing because students use real coins, and the math concepts are presented in fun games and activities. Stickers or snacks “bought” with correctly identified coins can provide further motivation.

## *Materials*

- Coins
- Two to four bowls or other containers for coins
- Paper cups
- Pen or marker
- Large cardboard box, scissors, tape, a small ball
- Coin cards or index card stock to make coin cards
- Stickers or snacks to “buy”

## *Background*

For most children, coin identification and values are easy to learn. But for children with fragile X syndrome, the concept that one coin has a different value than another is difficult to grasp. The fun and simple activities described below help children learn to identify coins and their values.

These activities can be used at school or at home, and they can be made increasingly challenging as a child becomes more confident and proficient. You can develop your own variations.

## *Preparation*

Material preparation is simple, as described for each activity.





### *Activity*

#### COIN SORTING

Put some pennies and nickels into a bowl. Have the child separate the two types of coins into separate lines, piles, or bowls.

To help the child associate the names or values with the coins, try labeling the sorted batches with cards on which you have printed “penny” and “nickel,” or “1¢” and “5¢.” Once the child has mastered pennies and nickels, add dimes and quarters.

#### HIDING COINS/CONCENTRATION

Starting with two pennies and two nickels, hide one coin under each of four paper cups. Have the child turn over cups two at a time to find the two coins that are the same. As the child becomes proficient at recognizing a match, add cups hiding dimes and quarters into the game.

To make the exercise more interesting, play concentration. Hide coins under eight paper cups. Take turns with the child overturning two cups and keeping coins that match. Later, try working with combinations of coins. For instance, put three pennies under each of two cups and put a nickel and two pennies under each of another two. Have the child play to match the same combinations of coins.

#### ROLL 'EM

In the bottom of one end of a large cardboard box, cut three round holes. Each hole should be big enough for a small ball to fall through. Label the holes on the inside, by taping a penny next to one, a nickel next to the second, and a dime next to the third.

Have the child place the ball at the opposite end and tilt the box until the ball rolls through one of the holes. Then give the child a bowl of coins and ask him to find one that matches the coin on the hole through which the ball rolled. Ask him to tell you the name of the coin; this will give him practice at identifying the various coins.

Have the child play several rounds so that she will have a chance to match different coins. At the end of the game, ask the child to identify each coin she has collected.

#### *Some variations on this game*

- Use quarters as well.
- Have the child tell you for which hole she is aiming. This will give her additional practice at using names of coins.
- When the child recognizes the coins labeling the holes, change the labels to read “penny,” “nickel,” and “dime,” or “1¢,” “5¢,” and “10¢.”
- Have the child use the coins he has won to “buy” stickers or healthy snacks from you. You can label these items with coins, their names, or their values.



- Label the holes with other values (such as “3¢” or “5¢”), and help the child count out the right combination of coins.

### COIN CARDS

Glue or tape a penny to one index card, a nickel to another, a dime to a third, and a quarter to a fourth. On a separate set of cards, print the words “penny,” “nickel,” “dime,” and “quarter” or the values “1¢,” “5¢,” “10¢,” and “25¢.”

Show the child how to match the cards with the penny and the nickel to the appropriate name or value card. When this is mastered, add in the dime and quarter cards. Then move on to other activities with the cards:

- Give the child the coin cards. Lay the name or value cards down in a random row and have the child place the appropriate coin card next to each.
- Give the child the name or value cards. Lay the coin cards down in a random row and have the child place the appropriate name or value card next to each.
- Lay out the name or value cards, give the child a bowl of coins, and have him pick one coin at a time out of the bowl and match it to the correct card.
- Pretend the cards are price tags on items in your classroom or house, and play at buying items with coins.
- Play concentration with the cards.

Once the child can confidently name the coins and match them with their values, make cards to teach the value of groups of coins. For example, make a card with two pennies and a card reading “2¢.” Add the new cards into the deck and play the same games. Gradually introduce new cards with new values, including combinations of different coins, and continue to use them to play the same game.

### FINDING COINS AND ADDING MONEY VALUE

Provide a bowl of coins, and prepare cards with directions such as “Find one nickel and two pennies.”

Have the child read the card, or read it with her. Then have her find the coins. When she has gathered the correct coins, ask her how much money she has. The task of looking for specific coins reminds the child that there are differences between them. When you ask how much money she has, she will focus on the value of each coin, rather than on the number of coins. Using the example above, she will recognize that she has seven cents, rather than focusing the sum of three coins. With practice, the child will recognize the value of combinations of coins.

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### *Source*

Original lesson.



## Science

Many students with developmental disabilities are not exposed to as much science as the typical child, due to the extra time they require to learn basic subject areas, and to attend their various assistive therapy sessions. However, experience has long shown the importance of exposing the child with FXS to a wide variety of academic subjects. In some cases these topics can help motivate a student to learn basic reading or math (for example, an interest in tornados can be used to encourage reading; dinosaur toys can be used as math manipulatives).

*Hands-on science activities can often be a gateway to sharpen basic reading, math, and social skills.*

Science topics and concepts that are fairly concrete hold the widest appeal for the child with FXS, although more abstract topics can and should also be introduced. Examples of appealing topics include dinosaurs, planets, rocks and minerals, birds, dogs, ocean mammals, plants, weather, oceans, volcanoes, and earthquakes. (Yes, this list greatly resembles the topics that all students have shown great interest in since time immemorial.)

*Emphasize hands-on*

Experimental, hands-on science classes may be appropriate settings for integrating students with FXS into the mainstream. The hands-on activity can be calming as well as highly motivating for these students.





# Dinosaur Manipulatives: Name Count, Sort, Compare

## *Topic*

Science, math

## *Level*

Elementary school. This lesson was used in a classroom of developmentally challenged children from 6-9 years old, including a child with FXS.

## *Duration*

2 hours (can be split into units as necessary)

## *Objectives*

Upon completion of this lesson the students will:

- Given a model of a dinosaur, name and finger spell the initial consonant of the animal's name.
- Give an accurate description of the major characteristics of an animal model, and then relate that model to a picture of the animal or a word card containing the animal's name.
- Classify a mixed group of animal models by name, type, or major characteristics.
- Sort, count, and/or graph subsets of animal models.

## *Motivation*

Dinosaurs tend to be of interest to this age group. Working hands-on with manipulatives is a motivator.

## *Materials*

- Dinosaur models
- Worksheets (at the end of this lesson)
- Thick paper to create word cards. Or, deck of word/picture cards for dinosaurs, etc.
- Picture books on dinosaurs
- Dinosaurs computer program (optional)

## *Background*

Teacher must understand and be able to convey the differences among various types of dinosaurs, and be able to ask students to identify them and sort them by these characteristics. For example: Which dinosaurs are carnivores? Herbivores? Which have horns and plates? Which are bipedal or quadrupedal? See bibliography for teacher references.



## DEFINITIONS

### Dinosaur:

One of a group of extinct land reptiles that lived during the Mesozoic era. Some dinosaurs were bigger than elephants. Some were smaller than cats. The last dinosaurs died out 65 million years ago.

### Reptile:

A cold-blooded animal that creeps or crawls. Reptiles have a backbone, lungs for breathing, dry, scaly skin, and clawed fingers or toes. Reptiles lay their eggs on dry land. Snakes, lizards, turtles, tortoises, geckos, alligators, and crocodiles are reptiles.

American Sign Language finger-spelling is used as an option in this exercise. See references below for ASL alphabet information.

### *Preparation*

- Obtain three identical sets of models or puppets of each dinosaur type.
- Prepare or purchase three identical sets of word and/or picture cards with the names of each animal model. (If the small group portion of this activity is to be done at different times for each group, only one set of models and word/picture cards is needed.)
- Optional posterboard or whiteboard graph to chart the dinosaurs if desired.
- Borrow picture books from the library on dinosaurs.

### *Activity*

#### Direct Instruction

- The teacher will initially conduct a whole group review of concepts previously taught concerning dinosaurs.

#### Guided Practice:

- Oral discussion, VAKT methods (finger spelling, skywriting, tracing, writing on rug and on each other's backs) and manipulatives (plastic models, puppets, stuffed animals) will be used to describe/sort/compare sets of animals.
- The students will then be divided into three groups for differentiated instruction. The groups will participate in guided practice at an appropriate developmental level with assistance from the teacher or assistant. Each group will have an identical set of manipulatives and word/picture cards.
- The first worksheet will be done with assistance.
  - a. Match each model to the corresponding word/picture card. Name each model, using finger spelling for the first letter of the name.



- b. Ask student to sort out all the dinosaurs. Choose one dinosaur and describe the characteristics of the model (feet, claws, horns, plates, tail, color (of model; explain that we don't know what color they really were), size, what it eats, etc.).
- c. Have student count the herbivores, and enter the total on the worksheet.
- d. Have student count the carnivores, and enter the total on the worksheet.
- e. Repeat if desired, using other dinosaur characteristics.

**Independent Practice:**

- The second worksheet will be completed independently.
  - a. With manipulative models and word/picture cards as a reference, match pictures to dinosaurs names. Indicate knowledge of dinosaur names by matching names with pictures.

***Extensions***

- Use software Dinosaurs and Kid Works 2 to write and illustrate dinosaur stories.
- Picture books on dinosaurs during story time and independent reading.
- Art activities related to the above.
- Addition and subtraction exercises using the animal manipulatives.
- Add discussion of reptiles and amphibians, using models of these animals as well.
- Use both mammal and dinosaur models and sort using those classifications.

***Assessment***

Oral questioning and teacher observation of practice with manipulative materials/ computer programs and error analysis of worksheets will be used to determine mastery and/or needs that will become the basis of future lessons.

***Standards Addressed***

Reading:

Identify initial consonant sounds in unknown words.

Language Arts:

Accurately describe objects.

Science:

Classify, compare, and contrast different animals.

Mathematics:

Sort and count subsets of concrete manipulatives.



### ***Word definitions***

#### **VAKT**

Visual, Auditory, Kinesthetic & Tactile. Multi-sensory or multi-modal. Based on the idea that if a child uses all the senses, he or she will learn better.

### ***Bibliography***

John McIlwain, 1994. *The Dorling Kindersley Children's Illustrated Dictionary*. Dorling Kindersley: London, New York.

David Norman & Angela Milner, 1989. *Eyewitness Books: Dinosaur*. Alfred A. Knopf: New York.

National Wildlife Federation, 1997. *Digging into Dinosaurs*. Ranger Rick's NatureScope series. Chelsea House Publishers: Philadelphia. See especially pg. 20 "All the Better to Eat With" regarding carnivores and herbivores.

San Diego Natural History Museum Reptile webpage:

<http://www.sdnhm.org/exhibits/reptiles/index.html>

Realistic animal clipart from Clipart.com: <http://www.freeclipartpictures.com/index.html>

Dinosaur clipart from Kids domain and Golden Books:

<http://www.kidsdomain.com/brain/dino/clip.html>

If you want to use the fingerspelling alphabet from American Sign Language, here are helpful web sites:

[http://www.masterstechhome.com/The\\_Library/ASL\\_Dictionary\\_Project/ASL\\_Tables/Alphabet.html](http://www.masterstechhome.com/The_Library/ASL_Dictionary_Project/ASL_Tables/Alphabet.html)

<http://where.com/scott.net/asl/abc.html>

### ***Source***

Original lesson.

#### *Contact Information:*

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*Merkle, Ed. D.*

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Name \_\_\_\_\_

## Dinosaurs

Read the facts in the box.

### Dinosaur Facts

Some dinosaurs eat meat.    Some dinosaurs eat plants.

Carnivores eat meat.        Herbivores eat plants.

Sort the dinosaurs into carnivores and herbivores.

Count the carnivores. Write the number below.

How many carnivores? \_\_\_\_\_



*Example of carnivore from  
www.goldenbooks.com*

Count the herbivores. Write the number below.

How many herbivores? \_\_\_\_\_



*Example of herbivore from  
www.goldenbooks.com*



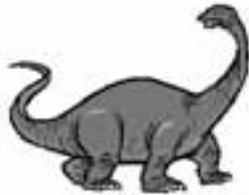
Name \_\_\_\_\_

## Dinosaur Matching

Draw a line from each dinosaur picture to its name.



Triceratops



Pterodactyl



Stegosaurus



Allosaurus



Apatosaurus



Ankylosaurus



# Water Cycle Sequencing

## *Topic*

Modified representation of the water cycle; a concept covered in a river study<sup>1</sup>

## *Level*

Elementary or middle school

## *Duration*

10-20 minutes

## *Objective*

Learn the stages of the water cycle on Earth

## *Motivation*

Hands-on activity

## *Materials*

- 8.5" x 11" laminated pictures depicting seven stages of the water cycle (see attached example)
- Photos of rivers, ocean, rainstorms, clouds (optional)

## *Background*

Using drawings helps convey an abstract science concept such as the water cycle. This can also be supplemented with photos.

This lesson is followed by a reward of the student's choice, such as a favorite activity.

## *Preparation*

Specific phrases can be displayed above the simple picture that depicts a particular stage of the water cycle.

*Note:* Use simple phrases rather than complex words such as precipitation, condensation, and evaporation. These terms can be introduced once the basic understanding of the water cycle is learned.

## *Activity*

*Teacher* Introduce the activity with enthusiasm. Give specific instructions on what you expect of the student. Mention motivating reward choices to ensure initial interest in lesson.

*Student* Shuffle through the seven sheets to get a visual idea of the order the water cycle follows. The student may peruse the sheets and ask questions accordingly. The student hands the sheets back when he or she is ready.

<sup>1</sup>Farmingville Elementary School, Ridgefield, Connecticut science curriculum focus.



*Teacher* Read phrase on top of first card twice.

*Student* Recite phrase back to teacher.

*Teacher & Student* Repeat Steps #3 and #4 until the seven sheets are complete.

*Teacher & Student* Have the student place the seven steps in sequential order.

*Teacher* Record success in data book.

*Repetition* This lesson is to be repeated until learned entirely. The student should be able to place the seven steps in order and read each step.

### *Extensions*

Simple sight words and basic weather vocabulary are ideal for building science vocabulary.

### *Adaptations for Fragile X Syndrome*

Sequencing is a weakness for students with fragile X syndrome. Use visuals to support the sequence. Especially for younger students, do not assume inability to place cards in sequence indicates a lack of understanding of the overall concept.

### *Source*

Original lesson.

*Contact Information:*

*Jeanette E. Moore*

*JEMoore203@hotmail.com*

Name \_\_\_\_\_

## Seven Stages of the Water Cycle



Ocean water *heats* up and rises into the air as vapor.



*Wind* carries the vapors high



Water vapor *cools* and forms clouds.



*Raindrops* form inside the clouds.



The water makes its way into *streams* and *rivers*.



Rivers then carry the water *back* into the ocean.



The *cycle* begins again.



# Weather Wise

## *Topic*

Weather concepts and vocabulary

## *Level*

Can be adapted to any level

## *Duration*

5–10 minutes per session

## *Objective*

Student will understand weather concepts and words used to express those concepts. Student will relate experience of temperature to the numbers used to express temperature.

## *Motivation*

Fun weatherman newscast activity. Use of interesting visual aids. Active discussion of the actual experience of the day's weather.

## *Materials*

- Weather book: *Weather Words*. by Gail Gibbons
- Small posterboard or 8.5" x 11" paper
- Large piece of posterboard or use a classroom display board
- Ziploc® bags
- Markers

## *Background*

This activity helps students expand their vocabulary while learning about the weather. They will also learn to relate the numbers used on the temperature scale with the actual weather.

## *Preparation*

Make "weather word sheets": posters or 8.5 x 11 pages with weather vocabulary words and supplemental information.

Make separate, smaller sets of "weather words," and sets of "weather pictures" (drawings that correspond with each weather word). Place the weather words in one Ziploc bag, and the weather pictures in the other.

Using a large piece of posterboard or a classroom display board, create a weather chart for the classroom, leaving blank spaces for the day's weather words and pictures.



### *Activity*

#### LESSON ONE—Weather Vocabulary Words

Direct Instruction:

*Teacher* Introduce the activity very enthusiastically. Give specific instructions on what you expect of the student. Tell student to take a look out the window and have him/her tell you what the weather looks like, i.e., sunny, rainy, snowy, etc.

*Student* Responds with a weather word.

*Teacher* Pull out weather word sheet. Discuss the weather word with the student. State what is on your weather word sheet twice.

*Student* Repeats back the weather word and corresponding information.

*Teacher* Ask the child what the temperature feels like, i.e., hot, mild, cool, cold.

*Student* Responds.

*Teacher* Discuss what the precise temperature may be, i.e., “in the 40’s.”

*Teacher & Student* Produce a small skit. Introduce yourself to the student as a news reporter passing the focus on to the weather portion of a newscast. The student is to introduce him/herself, “Good morning. Today’s forecast: \_\_\_\_\_, temperatures in the \_\_\_’s. Back to you, Miss Moore.”

*Student* Now ready for the weatherman role to be performed in front of the classroom with a peer.



### ***Group/Peer Activity***

#### LESSON TWO—Class Weatherman

*Student* Is called up by the classroom teacher. The student carries up two small Ziploc bags with weather words in one, corresponding pictures in the other. The student holds one bag in each hand as he/she leaves desk and goes to front of the classroom, where the chart is located.

*Teacher* Directs class (including weather reporter) to focus gaze on the window. Teacher asks the weatherman what kind of day it is outside.

*Student* Responds with a brief report, i.e., “sunny.”

*Teacher* Instructs peer partner to look in the Ziploc bags for the word.

*Student* Receives the word from the peer partner and sticks it on the chart on the wall.

*Teacher* Instructs the weatherman to find the corresponding picture, i.e., a sun with sunrays.

*Student* Hangs up the corresponding picture next to the weather word.

*Teacher* Thanks the student and peer partner.

*Student* Comes back to the seat and hands the two Ziploc bags back to teacher.

### ***Extensions***

Create a blank weather book with 30 pages. Have the student write the date each day, and fill in the weather word for the day, along with a picture. At the end student will have a complete record of the weather for that month.

Teach with thermometers (measurement) and other barometric devices to enhance the understanding of weather. Recording data and keeping a log can provide consistency and predictability—it can be a part of a child’s routine.

### ***Assessment***

This activity can culminate with a vocabulary test. Also, weekly words can be written on index cards and the teacher can “quiz” the student on a weekly basis to assess the student’s understanding of words and concepts.

### ***Adaptations for Fragile X Syndrome***

In an inclusion setting, the child with FXS can be the designated weather forecaster and present the daily forecast to the class, alone or with a peer. The dramatization and skit of the daily weather can be educational for the class and fun for the child doing the forecast.

### ***Related IEP Goals***

This activity ties in with weather units in the grade level curriculum. There are also science and math components to this lesson.



### *Practical Connections*

An additional focus of the weather lesson can be proper dress and attire for different seasons and types of weather.

### *Standards Addressed*

This lesson can address standards related to measurement of temperature, air pressure, understanding the water cycle, keeping a weather log, presenting to the class through drama, etc.

### *Bibliography*

*Weather Words and What they Mean.* 1992. Gail Gibbons. Holiday House.

Using the book *Weather Words*, by Gail Gibbons, you can find many words, phrases, and pictures for your students. Here is a list of weather words that can be found in her book: Sun, Sunny, High, Low, Fair, Rain, Rainy, Raining, Snow, Snowy, Snowing, Weather, Forecast, Change, Changes, Temperature, Mild, Chilly, Warm, Hot, Cool, Cold, Air Pressure, Force, Moisture, Water, Air, Evaporate, Wind, Motion, High Pressure, Low Pressure, Dry, Moist, Vapor, Ice, Crystals, Humid, Humidity, Cloud, Cloudy, Clouds, Cloud Types (Cirrus, Stratus, Cumulus), Sleet, Blizzard, Drizzle, Shower, Flood, Thunderstorm, Lightning, Gusty, Breezy, Gale, Hurricane, Tornado.

### *Source*

Original lesson.

*Contact Information:*

*Jeanette E. Moore*

*JEMoore203@hotmail.co*





# Greenhouse Visit and Planting

## *Topic*

Science, language, and speech

## *Level*

Used in middle school, community skills focus classroom

## *Duration*

3-4 hours, spread over 2-3 days

## *Objectives*

The student will identify the parts of a plant.

The student will understand what a plant needs to live.

The student will learn how to re-pot a plant.

The student will understand what happens at a greenhouse.

The student will formulate sentences and questions.

The student will follow multiple step directions.

## *Motivation*

Taking a trip into the community.

Giving a plant to a family member or friend.

Individual motivator at the end of the task. (Sticker, treat, etc.)

## *Materials*

- Library books on plants, plant growth, nurseries and greenhouses. For example: *Watch It Grow, Watch It Change*. by Joan Elma Rahn, 1978. New York: Atheneum.
- Plant pots
- Potting soil
- Plants
- Illinois Extension has an interactive kid's website in which students solve "mysteries" of plants and plant growth: <http://www.urbanext.uiuc.edu/gpe/index.html>.
- Saskatchewan Learning has a good website for plants and plant growth: <http://www.sasked.gov.sk.ca/docs/elemsci/gr1udesc.html>.

## *Background*

Plant Parts:

Students will learn to identify basic parts of plants: roots, stems, leaves. In addition, flowers, fruit, and seeds can be shown separately or as parts of the plant when possible. You



can prepare students by having them bring in samples of plants from around the school or home (ask permission before picking!). They can use magnifying glasses to look at leaves and flowers.

#### Plant Growth:

You can adjust the amount and level of information to your particular student. The basic information to be conveyed is that plants need soil, water, and sun to live and grow. More advanced students could learn about nutrients in the soil or about photosynthesis. These abstract concepts tend to be more difficult to convey to the student with FXS, so use hands-on demonstrations whenever possible.

#### Greenhouses:

In some communities greenhouse careers are suitable for adults with FXS. You might ask the greenhouse owner to demonstrate several tasks that are performed by employees at the greenhouse. Student can also be introduced to a variety of plant types while at the greenhouse.

#### Sentence Formulation:

Having students formulate their own sentences to make stories about upcoming activities helps them “control” any transition difficulties. This is also good practice for clear speech using complete sentences.

#### Following Directions:

Following directions with multiple steps can be difficult for some students with fragile X syndrome, because of sequencing problems. Note that keeping the steps in the correct order may be difficult, so provide clues or prompts when necessary. Also, students’ “path” to follow the direction may not be as fast or as direct as you had anticipated. Because of this, be sure to allow extra time. If you need to make corrections, first determine whether the student has his or own method for following the directions.

#### *Preparation*

Purchase pots and potting soil with students at a store. Have students look at or read aloud books about plants during visit to the library. Introduce or review vocabulary words that will be used, e.g., plant, greenhouse, water, dirt, pot, root, seed, leaf, flower, fruit, stem. Contact a greenhouse and arrange for a tour.



### *Activity*

#### COMMUNITY TRIP

##### Direct Instruction:

Demonstrate to the students the parts of a plant, using samples you or the students have brought in or gathered from home and school. Write the plant part words on the board or match with picture cards.

##### Guided Practice:

Create a story with the students to explain the environment they will encounter and the steps that will be carried out. Help them to write 3-5 sentences about the community trip experience, e.g., how they will get there, where they will go, what they will do there, what they will do upon return. (This could also be done with the planting portion of the lesson, by writing sentences about the steps in planting.)

As a group, students will go to a greenhouse for a tour. Show them or have a greenhouse employee show them different types of plants and different activities at the greenhouse. Adjust the number and type of things shown and described to your particular class level.

##### Independent Practice:

The student will comment or ask questions about the plants or tour. If the student does not independently verbalize, he will be prompted by the teacher through pictures or sentence strips to comment or ask questions about what is being discussed. The student will choose a flower or plant to purchase.

The student will pay for her flower or plant and will take it out of the store.

#### PLANTING IN THE CLASSROOM

##### Guided Practice:

The teacher will demonstrate to the students each individual step in transplanting the flower or plant into the pot. Steps could be: getting the plant, locating the pot, putting soil in the pot, taking the plant out of the container, putting the plant in the pot, adding more soil, watering the plant, or deciding whom to give the plant to. The steps can be as simple or complex as needed for the individual student.

After the step has been demonstrated, the student will verbally, or through pictures, give the direction that needs to be completed. The step will be written down on the board or sheet of paper.

The direction will be reread out loud.

The student will be directed to complete the step after the direction is read aloud.



The teacher will allow “wait or processing time,” but if the student does not complete the task in a reasonable amount of time, the teacher will provide an indirect prompt.

If needed, a direct verbal prompt may be given. If more assistance is needed, the step may need to be guided or done hand over hand.

For more independent students, the entire process could be taught once by demonstration, and the students allowed to do it independently.

This process continues step by step until the plant or flower is potted.

### *Extensions*

- Formulate a thank you to the greenhouse for the tour and express what you learned.
- Mail the thank you at the post office.
- Make future trips to the greenhouse for flowers.
- Take a trip to a botanical garden or nature center.
- Observe and chart changes in plants as they grow.
- Learn more about soil nutrients and composting from Illinois Extension website:  
<http://www.urbanext.uiuc.edu/gpe/tg/c2-background.html>. Illinois Extension also has an interactive kid’s site: <http://www.urbanext.uiuc.edu/gpe/index.html>.

### *Assessment*

Use data sheets to collect information on sentence formation and direction following. Show if the action is done independently, with indirect or direct prompts, or with physical assistance.

### *Adaptations for Fragile X Syndrome*

Students with fragile X syndrome often have difficulty formulating complete sentences, as well as asking and answering direct questions. Using “sentence starters” will help them practicing making more complete sentences. For example, say and write “I will go…” and let the student repeat and then complete the sentence (e.g., “I will go to the greenhouse.”). Once the student has worked on formulating whole sentences with some success, merely saying to the student, “Say the whole sentence” as a prompt can be helpful.

Having “fill in the blank” choices can also be helpful in creating the “stories” in this lesson. It is difficult for students with FXS to answer direction questions, but much easier for them to fill in blanks in a sentence you begin for them. Giving them two choices for answers can also be helpful.

Students with FXS sometimes have difficulty with transitions, and the written stories about the trip can help with the transition to the field trip. Carrying the story with them can also help. Students not speaking yet can also carry picture boards to illustrate the story of their trip.



### *Therapy Connections*

This activity was completed and carried out with a speech and language pathologist. I strongly recommend co-teaching and utilizing the knowledge of an SLP in your classroom as much as possible.

### *Standards Addressed*

Science:

Understands concepts about the earth.

Language:

Demonstrates competence in speaking and listening for a variety of purposes.

Math:

Money skills (could be addressed).

Social Studies:

Locating places in the community and environment (could be addressed).

### *Source*

Original lesson.

*Contact Information:*

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# The Three Purposes of a River

## *Topic*

Natural science (rivers); sequencing

## *Level*

This was used for a 4th grade student but could be used for any level learning basic natural science.

## *Duration*

20-30 minutes per session

## *Objectives*

Learn about the purposes of rivers; practice sequencing

## *Motivation*

Game-like context, colorful pictures, high-interest topic

## *Materials*

- 4" x 6" index cards
- Markers

## *Background*

This lesson was used in conjunction with a 4th grade river study.<sup>1</sup> It could be used to simplify a lesson about this topic for an inclusion student.

This basic lesson about the life of a river gives students an introduction to and an easy way to understand the role of rivers and water in supporting and sustaining life. The three purposes represented here are “life,” “travel,” and “industry.”

Students with fragile X syndrome have strengths in simultaneous processing and difficulties with sequential processing. Using picture cards as a visual aid to form a whole can help address this difficulty. Visual cues can stimulate word retrieval and recall skills. In addition, the river portrayed on the example cards below matches up at the edges to form a whole picture. This can help students to create the requested sequence.

## *Preparation*

Prepare a set of sequential River Cards (3 or 4 total, 4" x 6" index cards) with the three purposes of a river on them (one per card). These purposes can be displayed in the form of a few short sentences. (See example below.)

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<sup>1</sup>Farmingville Elementary School, Ridgefield, Connecticut science curriculum focus.



In addition to the sentences illustrated above, you may want to teach the student the meanings of the key words/concepts (Life, Travel, and Industry) which the sentences represent.

### *Activity*

This lesson is to be repeated several times in the course of the school year during science class.

*Teacher* Introduce the activity with appropriate enthusiasm. Let the student know that we are going to play a fun activity and learn about river life. Hand the student the river cards.

*Student* Shuffles through four river cards, observing and glancing at text and pictures.

*Teacher* Retrieve river cards and place the first on the desk in front of the student. Ask, “What can rivers do?” Perhaps the student already has background information that he or she can recall.

*Teacher* State a few things a river can do, such as, “A river has water that can flow through a marsh,” and, “A river can have plant and animal life,” and, “A river lets boats travel on its water.”

*Student* Stays attentive and may have feedback. Encourage the student to repeat back any phrases you stated to him/her in #4.

*Teacher* Place second river card next to the first. Read the card to the student twice. The second card depicts the concept of vegetation and river animals (Life). Also, you may want to ask, “What lives in a river?” depending on student’s sensitivity and anxiety level.

*Student* Repeats back the sentences. Points to picture and demonstrates a beginning understanding of the concepts.

*Teacher* Place third river card next to the second. Read the card to the student twice. The third card depicts the concept of transportation (Travel). Also, you may want to ask, “Who can travel in a river?” depending on student’s sensitivity and anxiety level.



*Student* Repeats back the sentences. Points to picture and demonstrates a beginning understanding of the concepts.

*Teacher* Place the final river card next to the third. Read the card to the student twice. The fourth card depicts the concept of the growth of civilization (Industry). Also, you may want to ask, “Where does the river end up?”

*Teacher* Review all cards in sequential order with the student.

*Teacher & Student* Fling the cards around the desktop. Slide them to and fro, mixing them up in a playful way. Ask the student to place them in order. Offer your assistance when necessary.

### ***Extensions***

Related activities can include field trips and lab studies. Visual cue cards can accompany virtually any science concept/lesson. Also, any sequencing goals can be accomplished through such a lesson.

### ***Assessment***

A student has mastered this lesson once he/she can sequence the set in order three consecutive times. The student must also be able to describe the details in each picture card, as well as read the phrases written.

### ***Adaptations for Fragile X Syndrome***

Using the cards in proper sequence with a local river in your town may promote further comprehension of the text, in conjunction with rote memorization of the phrase on each card. The cards can be customized to a favorite local pond or water source so they can further facilitate understanding.

### ***Bibliography***

Useful sources to understand concepts for this particular lesson include the following:

Bramwell, Martyn. *Rivers and Lakes* (Earth Science Library). Franklin Watts, Inc., March 1999.

Greenaway, Frank. *River Life*. Bt Bound, October 1999.

### ***Source***

Original lesson.

*Contact Information:*

*Jeanette E. Moore*

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## Social Studies



*Cover the basics*

Social studies often fall into the same overlooked basket that we noted with the lack of science instruction for students with fragile X syndrome. And just as with science, it is important to expose the child with FXS to social studies throughout the school year. No less than other students, they need context if they are to aspire to ideals of involvement, belonging and good citizenship in the wider community.

At a minimum, topics related to a student's personal, local, and national life should be presented as appropriate in the school setting. These might include local history; major figures and events in U.S. history; characteristics of local and national ethnic and cultural groups; map reading and geography; characteristics and relative locations of states and other countries, and the basics of U.S. government, including elections and voting. Many students will be capable of learning about the sociology, history, geography, and culture of other countries as well.

Using literature set in a variety of locations is one way to approach topics that are not part of a student's everyday life. Grounding more abstract social science in the more concrete representations found in literature will help the child with FXS reach a better understanding of topics discussed in class.

*The more concrete the representations, the better will the student with FXS understand the values and practices of good citizenship.*



# Identification of U.S. States

## *Topic*

Geography

## *Level*

Elementary to middle school

## *Duration*

15-20 minutes each session

## *Objectives*

Student will be able to receptively and expressively identify a state name and location in isolation and random format.

## *Motivation*

Familiar context, names, and pictures of family and friends

## *Materials*

- Large U.S. map (printed with state names), laminated and posted on poster board
- Photos or names of family members and friends (use text if student reads, photos if not) laminated on card stock with Velcro on back of photo or name plate
- Velcro for mounting on each state

## *Background*

Instructor needs to know the names and locations of U.S. states.

## *Preparation*

Laminate map and attach Velcro.

Survey names of friends and family that are familiar to the student. Ask parent to send in photographs or names to be mounted, and the name of the state where each person lives. Identify each state with friend, family member or places of interest. e.g., Grandma Sue—Washington State, Cousin Freddie—New York, Teacher Mrs. Brown—California. Include well-known places associated with a state as needed, e.g., Disney World—Florida.

Mount names (text) and/or photos on name cards. Attach the other side of the Velcro to name cards so they can be mounted on the map. Instructor can note state name (and person's name for photos) on the back of card, or refer to a list.



### *Activity*

Each activity below can be done separately or as a progression in one or more sessions, depending on the student's ability to concentrate, etc.

1. Ask student to identify or read each photo or nameplate.
2. Ask student to identify or read each photo/nameplate and associate it with a particular state. (Do not include duplications, i.e., only one name per state.)
3. Hold up the photo/nameplate and ask student to point to state associated with the picture.
4. Hold up a photo/nameplate and ask student the state name associated with it (them).
5. Ask student to attach, using Velcro, the picture or nameplate onto corresponding state.
6. Use cloze (intraverbal) technique to aid memory. This is Auntie Sara and she lives in \_\_\_\_\_(student says correct state name). This is Disney World and it's in \_\_\_\_\_ (Florida).
7. Fade out pictures/nameplates and ask student to name or point to states. Prompt can be a familiar person's name or picture.

### *Extensions*

Use as a large group activity for genealogy, U.S. geography or points of interest (see websites in bibliography for more ideas). Learn capital names, state birds, trees, flowers, industries, etc. For example, state birds or flowers can be used as the "nameplates" and associated with state names as well. Use wooden map puzzles instead of a laminated map, perhaps first attaching the family photos/nameplates to the state puzzle piece and then inserting the puzzle piece on the map.

### *Assessment*

Oral or performance testing of the task.

### *Adaptations for Fragile X Syndrome*

Often children with FXS lack memory for isolated facts. Associates provide glue to recall information.

### *Bibliography*

For information on "cloze" (intraverbal) technique, see ABLLS 1998, Partington & Sundberg. US Geological Survey (USGS) main site for education materials on life science, geography, and earth science: <http://www.usgs.gov/education/>.

USGS map lesson ideas:

<http://mac.usgs.gov/mac/isb/pubs/teachers-packets/mapadventures/mapadven.html>



Parent's ideas for teaching geography:

<http://www.ed.gov/pubs/parents/Geography/index.html>

Genealogy (family history) lesson ideas:

<http://www.kidlink.org/KIDPROJ/FamHistory/>

<http://www.ngsgenealogy.org/youthweb.htm>

*Source*

Original lesson.

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# Have Map Will Travel

## *Topic*

Basic map skills

## *Level*

All levels

## *Duration*

15-60 minutes

## *Objectives*

Student will understand map reading, including concepts of representation of locations and routes.

## *Motivation*

Gross motor movement; interest in destination; purposeful

## *Materials*

- Maps of classroom (desks, plants, library, study centers, blackboard, windows, door to hallway, etc.)
- Map of various routes to school destinations
- Map of school (have multiples as needed)
- Map of local community (have multiples as needed)
- Map of your state
- Photos of students' homes with house number and street name
- Photos of desired destinations in the community, with addresses, street names
- Dry erase markers, highlighters
- Access to laminator & photocopier with enlargement feature

## *Background*

Students with fragile X syndrome typically have much anxiety when confronted with novel locations, and have poor time and spatial concepts. Being able to use maps and predict distance may decrease anxiety and increase independence. Students may find this lesson anxiety provoking initially but with repetition will likely enjoy it.

Teacher should be able to obtain and draw various maps, or obtain assistance.

## *Preparation*

Have materials available as described—some maps may need to be enlarged and laminated. Contact parents to provide photos as described.



### *Activity*

#### CLASSROOM MAPPING

- List places frequently used by students in the classroom.
- Enlarge a map of the classroom to poster size, and put it up so everyone can see it. (For re-use, laminate map and use dry-erase markers.) Have identified on the map: windows, door, blackboard, teacher's desk, student desks, etc.
- Have students label or highlight windows, door, etc.
- Have each student highlight where his/her desk is on the map.
- Have student draw a route from their desk to various classroom locations.

#### SCHOOL MAPPING (group work)

- List locations frequently used by students in the school environment.
- If a map of the school building is available, enlarge it and modify as needed; or draw your own and post it in front of the classroom.
- Have students identify and label representations of locations listed on the map.
- Have students highlight routes from their classroom to selected familiar destinations.
- With map in hand, practice taking the class to destinations highlighted on a route, stopping at places along the way and practicing identifying where you are on the map.

#### COMMUNITY MAPPING (individual desk work)

- List locations of frequently visited places in community (corner stores, library, doctor's office, friend's house, park, etc.).
- Provide an enlargement of a community map for each student to have at his or her desk. (Focus on the area where the students live.)
- Student will look at a photo of his or her home and street and find it on the map.
- Repeat with other locations in the community.
- Have students draw routes from home to school and to other familiar locations.

### *Extensions*

This lesson can be expanded to include state and national locations.

Parents can assist children with a map of their room, home, and/or community and engage in the activity as described above.

For younger students, begin by mapping a set of items on the desktop.

At school, the teacher can escort the group on an outing, using a route mapped out to a walking distance destination selected by the class. Have students take turns at each corner deciding how to proceed by using the mapped route.



### *Assessment*

Proficiency is achieved when the student can independently follow a mapped route without assistance.

### *Adaptations for Fragile X Syndrome*

This lesson focuses on locations that are familiar and of high interest.

Some students may have difficulty knowing left from right, so routes should focus on using landmarks for making turns. We are defining landmarks here as very familiar, visually obvious identifiers.

While this lesson is likely to be very challenging due to spatial relation deficits, the rewards will be great. Practice and patient assistance will lead to competence.

### *Related IEP Goals*

- Student will be able to identify locations represented on a map.
- Student will follow a designated route on a map.

### *Therapy Connections*

If student is having travel training, share information regarding successful strategies, (e.g., landmarks that work as identifiers) with the person doing the travel training.

### *Bibliography*

There is a variety of classroom software for mapping. For example:

Where Are We? Mac/Win CD-ROM & Teacher's Guide. Tom Snyder Productions (Scholastic). 1-800-342-0236; [www.tomsnyder.com](http://www.tomsnyder.com). This software displays both a flat map image and a photographic location image together, to help convey the concept of map representations.

Neighborhood MapMachine 2.0. Mac/Win CD-ROM, Teacher's Guide. Tom Snyder Productions (see above). Contains 25 cross curricular activity files, sample maps, lesson plans, pre- and post-tests. This software allows you to create and customize community maps. Standards aligned.

U.S. Geological Survey (USGS) main site for education materials on life science, geography, and earth science. Includes mapping activities: <http://www.usgs.gov/education/>

### *Source*

Original lesson.

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# Dogs of the World

## *Topic*

Geography: learning countries

## *Level*

All levels

## *Duration*

1-2 hours; can be two or more sessions

## *Objectives*

Learn the names and locations of countries

## *Motivation*

Uses a high-interest topic to teach an abstract concept. Hands-on activity.

## *Materials*

- Large wall map of Europe or the world
- Dog breed books
- Blank postcards or card stock
- Markers
- Tape or tacks

## *Background*

Geography of foreign locations one has not visited can be very abstract. Abstract concepts are sometimes a weakness for children with fragile X syndrome.

Using a concrete, known, high interest topic such as dogs to introduce a more abstract concept can enhance students' learning.

## *Preparation*

Post the wall map in a visible location. If focusing on a particular continent or region (such as Europe, Asia, etc.), choose dog breeds from that area. Make a list of dog breed choices, and copy for students (see handout for an example).

## *Activity*

Hand out dog breed lists and/or dog breed books. Each small group or individual chooses a dog. (Use the index or table of contents to locate breeds on the list.) To find the dog's origin, look for the country name in the text, and write it on the postcard.

Draw a picture of the dog on the postcard. Alternatively, locate the breed on the Internet and cut out a photo, paste on the postcard.





For higher level students: write a sentence about the breed, e.g., “good with children,” “needs lots of exercise.”

Locate the country of origin on the wall map. Tack or tape the postcard to the country.

### *Extensions*

Have students look for countries of origin on clothing tags, backpacks, and other items. Write the words for these items on the postcards, and post on the map. Graph each country represented to determine which one produces the most clothing worn in the classroom.

Substitute endangered species for dogs.

For U.S. states: Provide students with a list of national basketball or football teams. Have them locate the team’s hometown on a U.S. map, and post the team name on a postcard (in team colors, or using the team logo).

Make charts of dog traits, listing the breeds on one side, and the traits across the top. Make an “X” on the traits each dog has. (For example: long-haired, short-haired, good with children, herding, retrieving...).

### *Bibliography*

Barron’s Encyclopedia of Dog Breeds. D. Caroline Coile, 1998. Barron’s Educational Series, Inc.: Hauppauge, NY.

### *Source*

Inspired by “It’s a Dog’s World” lesson, in Imogene Folrte & Marjorie Frank, Basic/Not Boring Social Studies, Grades 2-3: Inventive Exercises to Sharpen Skills and Raise Achievement, 1998, Incentive Publications, Inc.: Nashville, Tennessee.

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Name \_\_\_\_\_

## Dog Breeds of Europe

German Wirehaired Pointer  
Norwegian Elkhound  
Belgian Sheepdog  
Italian Greyhound  
Weimaraner  
Spinone Italiano  
Portuguese Water Dog  
Brussels Griffon  
Belgian Malinois  
Briard  
Doberman Pinscher  
Basset Hound  
Dachshund  
Greater Swiss Mountain Dog  
Rottweiler  
St. Bernard

## Dog Breeds of Great Britain

English Setter  
Golden Retriever  
Irish Setter  
English Cocker Spaniel  
English Springer Spaniel  
Irish Water Spaniel  
Welsh Springer Spaniel  
Beagle  
Greyhound  
Irish Wolfhound  
Airedale Terrier



## Communication/Living Skills

All students integrate huge amounts of basic living skill lessons as they proceed through their everyday school lives. Students with fragile X syndrome have no less of a need for those lessons, but they often learn them more slowly, with more significant hurdles in their way. Although the need for pure academic training is profound, students with FXS also require a more focused and prescriptive approach to basic life skills—particularly in the communications area—than do their fellow students. Specific behavioral strategies may look to achieve the following skill sets.

### Interactive/Conversation skills

- Use of sign language
- Use of pictures
- Use of communication technology
- Appropriate vocalizations
- Listening, responding, turn-taking
- Formulating and asking questions
- Initiating and continuing conversations
- Eye contact, overcoming shyness
- Social greetings, politeness
- Staying on topic
- Telling a story sequentially
- Sharing, helping others

*Focus on basics*

Teachers of students with fragile X perform an invaluable service when they never lose sight of the overarching importance of helping to encourage and shape these basic communication skills. So often taken as a given among school peers, these hard-won skills can ultimately be the key driver in ensuring the adaptability, success and lifelong happiness of students with FXS.



## Pocket Chart

### *Topic*

Schedule, days of the week, activity periods

### *Level*

Any level

### *Duration*

10-20 minutes per session

### *Objective*

Student will learn time concepts and sequence of activities.

### *Motivation*

Hands-on activity; student in control of choosing a preferred activity.

### *Materials*

- Card stock or felt pieces
- Construction paper
- Pictures of preferred items
- Markers

### *Background*

This activity helps students learn to plan and anticipate activities, and learn to relate hours and days of the week to scheduled activities. It helps demonstrate when “special” times are, such as occupational therapy, speech therapy, and recess.

The Pocket Chart allows the child to learn the time concept in general, and can help with sequential learning. It can be incorporated with the inclusion teacher’s schedule.

### *Preparation*

Prepare chart with shallow pockets into which to place the day, date, period start times, and name of the activity for that period. (Alternatively, you can use Velcro fasteners for each spot on the card if you are using a larger sized card, or magnetic pieces on a magnet board.)

Prepare construction paper cut-outs of the days of the week, months of the year, day numbers 1-31, the words “morning” and “afternoon,” all daily activities, clock time for the start of your school’s or classroom’s periods, and choice cards (pictures of preferred activities or items).

*Note:* Write the words and numbers toward the top of the cut-outs, so that they show when placed in the pockets.



## Chart Organization Example:

|           |           |                  |       |        |
|-----------|-----------|------------------|-------|--------|
| Morning   |           | What's the Plan? | 9:45  | O/T    |
| Today is: | Wednesday |                  | 10:00 | Art    |
| January   | 5         | 2005             | 10:45 | Snack  |
|           |           |                  | 11:00 | Choice |

### *Activity*

#### LESSON ONE

##### The Date

*Teacher* Tell the student that it is time to look at the daily schedule. In order, say, “We will do the day of the week, the date, and the plan.”

*Student* Shows he/she is attentive and ready (hands folded on desk).

*Teacher* Ask, “Is it the morning or the afternoon?”

*Student* Responds and places the “morning” card in the upper left-hand corner of the chart.

*Teacher* Ask, “What day is today?”

*Student* Responds, chooses the day Mon.-Fri., and places the day of the week next to “Today is.”

*Teacher* Ask, “What month is it?”

*Student* Responds, chooses the month Jan.-Dec., and places the month beneath “Today is.”

*Teacher* Ask, “What is today’s date?”

*Student* Responds, chooses the number 1:31, and places the date next to the month.

*Teacher* Ask, “What year is it?”

*Student* Responds, chooses between the two years of that school year, (e.g., 2004 or 2005), and places the year next to the date.

#### LESSON TWO

##### The Plan

1. Tell the student the order of the day’s activities (only two to five activities at a time).
2. Include the time of the activity and be sure to give “choice” or “reward” cards at the end of a lengthy schedule. The “choice” or “reward” should be a preferred activity. It follows a particularly difficult activity, or a small series (2-3) of short activities.



3. Review the schedule once constructed. Repeat several times for the student.
4. Have student repeat back the events in order.
5. Place the time next to each event.
6. Have student repeat back the times of the events in order.

#### *Extensions*

Clocks can be added to the schedule (digital and traditional). The student can be given an exercise to refer to a classroom clock or digital clock when consulting the schedule.

Use with an older student in organizing work tasks. Allow the student, if in high school, to have a graphic/electronic organizer, using alarms (small beeps) to remind the student of transition times. A younger child can simply have a watch, and the teacher can ask what time it is, then refer to the pocket plan for scheduled activities.

Use a chart that displays the entire week or month.

#### *Adaptations for Fragile X Syndrome*

Students with FXS have strengths in simultaneous processing, and difficulties with sequential processing. Many also have difficulty in making transitions. Having a chart list part of the day's schedule helps the student make transitions. The visual nature of the chart helps the student understand it as a whole (using the simultaneous processing strength), while also allowing him to better grasp the sequence of the day's activities.

#### *Source*

Original lesson.

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# Social Skills Training Model

## *A Sequential Approach to Building Social Skills Via Structured Classroom Interactions*

### *Level 1*

#### TURN-TAKING WITH AN ADULT

- Teacher/parent chooses a toy or activity of high interest.
- Adult verbally models “my turn” or if the individual is nonverbal, points to self and takes a turn.
- Adult gives the individual game piece, toy, etc., and says “your turn,” pointing to child and shaping the pointing to self.
- Student acknowledges.
- Student waits his turn and imitates the role model.
- Student points to himself, picks up toy or game piece and takes a turn.

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#### THIS PROCESS CONTINUES FOR AT LEAST FIVE EXCHANGES

*Variations:* Pegs, Lego building, drawing a person (hangman), drawing cards from a deck, passing objects back and forth, etc.

#### TURN-TAKING WITH ANOTHER CHILD

- Adult acts as facilitator and prompts whenever necessary.
- Students wait and take turns, pointing or verbalizing when it is their turn.

### *Level 2*

#### VERBAL EXCHANGE WITH AN ADULT WHILE DEVELOPING SPONTANEOUSLY INITIATED VERBAL INTERACTION

- Adult gives individual a compliment – “I like your shirt.”
- Student repeats – “I like your shirt.”
- Student responds with “thank you.”
- Adult responds with “thank you.”

As the interaction becomes spontaneous and the individual initiates the compliment without prompts from the facilitator, the adult begins the generalization step.

*Generalization Step:* This step can be facilitated by a visual cue such as pecs, photograph, icon, rebus symbol or sentence strip.

Trainer holds up visual cue to prompt a broader array of complimentary statements. For example, picture of a face to prompt facial features, or a sentence strip to cue, “I like your Lego space ship,” “I like your drawing,” etc.



### *Level 3*

#### VERBAL EXCHANGE USING FACTS OF PERSONAL INFORMATION ALREADY MASTERED IN ISOLATION

- Adult asks (from a list of personal information questions):  
 “Do you have a brother?”  
 “What is his name?”  
 “Do you have a pet?”  
 “Where do you live?”
- Student answers the question and asks the same question.

---

*Generalization Step:* Adult facilitates this interaction between two students and prompts whenever necessary.

### *Level 4*

#### TAKING TURNS TALKING TO AN ADULT

This level is facilitated by a traveling notebook provided by parents to teacher/therapist. The parent includes information related to an experience, event, book read, movie, trip taken, etc. This information forms the basis for discussion. It is later replaced by a chart that the child fills in and uses in place of a sentence strip.

- Adult says “Talk to me” and passes talking stick to the individual. If necessary, adult prompts discussion about an event discussed in notebook.
- Adult asks questions related to the information shared and begins to count the number of reciprocal exchanges dealing out cards.
- Student responds with information about a specific event, movie, or experience.
- Individual responds to the question and offers a reciprocal response. A card is given after each appropriate exchange.

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At end of discussion, cards are counted and tallied on personal interaction sheets.





## TAKING TURNS TALKING TO ANOTHER GROUP MEMBER

- Adult facilitates interaction between two individuals within a group milieu.
- Adult begins the discussion with “Talk to (other group member) about your trip to the zoo” (or any other event noted in the traveling notebook).
- Members pass the talking stick back and forth. The stick cues the turn and reinforces waiting a turn.
- Individual responds to other group member, but waits his turn.

### *Level 5*

## TAKING TURNS TALKING AND LISTENING

This level is to reinforce the importance of sharing talking time and listening. Questioning after listening is prompted verbally or with a visual icon or symbol. Formulating questions appropriate to the discussion is also reinforced. The use of cards and the talking stick can also be employed to signal the speaker.

- Adult holds up visual icon, current event from a newspaper, or presents an idea to be discussed.
- Group member responds with appropriate verbal expression.
- Group member formulates a question about the subject discussed.
- Group member passes talking stick to classmate of his choice and listens.
- Group member answers the questions and listens.

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*Variation:* Discussions can be based on newspaper events (can use weekly readers or kids sections of the newspaper), sports events (males with fragile X syndrome usually love sports), contrived scenarios about taking a trip to Disney World, a local amusement park, TV game show, etc.

### *Classroom Skills*

- Listening to the teacher
- Answering the teacher
- Following classroom rules
- Eye contact (this will require a lot of explanation)
- Using an appropriate voice
- Speaking clearly



- Initiation (this is a big issue due to executive functioning deficits—a number of strategies to assist initiation should be included)
- Making sense
- Telling a story sequentially
- Nontangential content—using scripts and props to help

### *Interactive Skills*

- Listening
  - Answering
  - Taking turns talking
  - Formulating and asking questions
  - Continuing a conversation (using a conversation ladder)
  - Using polite markers (thank you, excuse me)
  - Sharing
  - Helping others
-



## Buy A Snack

### *Topic*

Counting money, making purchases

### *Level*

Beginning ability to count mixed coins. Can be adapted for a variety of levels.

### *Duration*

5-10 minutes

### *Objective*

Learn to count and add mixed groups of coins in order to make a purchase.

### *Motivation*

Game setting, food reward

### *Materials*

- Life-like money (pennies, nickels, dimes, quarters, dollar bills)
- Price tags/stickers
- Snacks (pretzels, popcorn, veggies, etc.)
- Satchel for money

### *Background*

Counting out change and bills for everyday purchases is a life skill that often does not come easily to the child with fragile X syndrome. Practicing in a fun game-like setting helps motivate the student. This activity helps with both mathematics and life skills.

### *Preparation*

Prepare a variety of snack bags with price tags or price stickers. Prepare a satchel or purse of mixed coins (and/or bills, depending on what the student is working on that week).

### *Activity*

*Teacher* Introduce the activity with a game show theme, i.e., “O.K., Bill, it’s time to play, ‘Buy-A-Snack!’”—followed by claps and cheers.

*Student* Holds onto satchel with money in it. Prepares to purchase his/her snack.

*Teacher* Pulls out two or three items with price tags on them. The price should emphasize the lesson for the week, i.e., only nickels, mixed coins, coins and bills, totals less than 25 cents, etc.

*Student* Makes a choice as to which snack is wanted.

*Teacher* Tells the student the price of the snack and asks for the total price.



*Student* Generates the amount required. May need visual cues, i.e., cards with two nickels on them, for snacks that cost 10 cents.

*Teacher* Completes the transaction and thanks the student. Rewards him or her with the hard-earned snack!

### ***Extensions***

This can be done as a group or individual activity, and may be successfully used as an inclusion activity with a buddy group. Teacher can organize a peer interaction/exchange game and the children can go “shopping” (i.e., grocery) with a child who has FXS. The student can mimic his/her peers.

A classroom “store” could be set up for this activity. Store money could be given as tokens each day as part of a behavioral reward system, with purchases available at snack time, at the end of the day or end of the week.

### ***Assessment***

- Identify face value of coins and bills.
- Verbalize both numeric value and names (“nickel, dime”) of coins and bills.
- Successfully purchase specific types of items for specific amounts (role-play a cashier and customer scene).

### ***Adaptations for Fragile X Syndrome***

If possible, real coins and bills should be used for this activity. If play money is used, it should be as realistic as possible to help with later generalizing of skills.

### ***Related IEP Goals***

When given an amount of money in written form, student will successfully present the correct amount of mixed coins and bills.

Curriculum and grade level programs that involve math, especially with an inclusion student, may promote appropriate peer interaction, class participation, and a chance to share an answer (sense of confidence and accomplishment) with the group.

### ***Source***

Original lesson.

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# Cooking Word Games

## *Topic*

Learning to read, understand, and generalize use of words related to cooking and recipes

## *Level*

Any level

## *Duration*

A few minutes to an hour

## *Objective*

Student will learn to read and understand action words related to cooking and recipes. Student will learn names of measuring and cooking equipment.

## *Motivation*

High interest topic, real life application, game format

## *Materials*

### RECIPE CHARADES

- Flashcards with action words: pour, push, beat, dip, turn, stir, mix, whisk, etc. Include photos or drawings as needed.

### MEASUREMENT MATCH

- Large lotto card big enough to hold actual measuring equipment (approximately 12" x 16"). You can use a letter-sized file folder, opened up.
- Typed labels or markers.
- Measuring cups, measuring spoons.

### MEASUREMENT LOTTO

- Several differing individual lotto cards with 3-4 labels on each (e.g., 1/4 teaspoon, 1 cup, 1/4 cup).
- Set of cards with the name of one measuring cup or spoon on each.
- Multiple sets of measuring equipment.

## *Background*

Understanding action words and identifying measuring equipment are prerequisites to reading and following a recipe.

Note that the larger measuring cups and spoons with multiple markings are more difficult to learn and use. For example, with a glass 2-cup measuring cup, it is difficult to fill it exactly to the 1-cup mark. For children with fragile X syndrome, we suggest using the individual sets of cups and spoons instead.



### *Preparation*

Prepare flashcards, match board, and lotto cards. Lotto cards should have outlines of the measuring cups and spoons to help students match the actual items to the card labels. You may laminate the cards as needed.

### *Activity*

#### RECIPE CHARADES

- Take turns drawing the cards, acting them out, and guessing the action words the player drew.
- You could also do this using the appropriate kitchen utensils (a spoon, whisk, etc.).

#### MEASUREMENT MATCH

- Teach child how to find measurements on spoons and cups.
- Have child match markings on spoons and cups to labels on lotto cards.
- Have students place the spoons and cups in the appropriate space on the lotto card.
- The card can be used to hold measuring equipment while cooking.

#### MEASUREMENT MATCH

- Each student has a lotto card and a set of measuring spoons and cups. Teacher draws a card, says and shows the name of the measuring object (e.g., “1/4 teaspoon”). Students look on their lotto card to see if they have that object. If they don’t, they wait for the next turn. If they do, they find the matching object from their set of measuring equipment, and place it on their card. Teacher then draws the next card. Play ends when a student has a full card.

### *Extensions*

Progress to using flashcards and lotto cards to help with reading recipes and cooking.

Help student create a recipe file or recipe book, adding pages as new recipes are learned. Use measuring cups and spoons for teaching fractions.

### *Source*

Adapted from Oelwein, Patricia Logan, 1995. “Teaching Reading to Children with Down Syndrome: A Guide for Parents & Teachers.” Topics in Down Syndrome, Woodbine House.

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# Turn-Taking With Another Child

## *Topic*

Social skills

## *Level*

Pre-K through high school, depending on social skill level

## *Duration*

5-15 minutes, depending on age and ability to concentrate

## *Objective*

Student will learn to take turns through a play or social venue

## *Motivation*

High interest toy or activity

## *Materials*

- Favorite toy, game, educational activity

## *Background*

The instructor must be able to assess whether the student has the prerequisite skills to foster social reciprocity, waiting a turn or showing respect.

## *Preparation*

Provide student with a choice of high interest materials. This may require an interest inventory, observation of play choices, or a parent interview/survey.

## *Activity*

- Teacher chooses a toy or activity of high interest. (Individual indicates desired object, toy or activity.)
- Teacher verbally models and touches peer while saying, “Your turn,” or if the child is nonverbal, points to child and prompts a turn. (Child waits his turn and imitates the role model.)
- Teacher gives the individual game piece, toy, etc., and says, “Your turn,” pointing to him and shaping the pointing to self. (Individual points to himself, picks up toy, game piece and takes a turn.)
- Teacher continues to prompt each child to take a turn.
- Teacher fades physical prompt replacing with sign, giving game piece or toy to each child.
- Teacher waits for initiation by the child. If prompt is needed, deliver and fade as soon as possible so that reciprocity is natural.



### *Extensions*

Pegs, Lego building, drawing a person (hangman), drawing cards from a deck, passing objects back and forth, etc.

### *Adaptations for Fragile X Syndrome*

Children with FXS desire social contact. They benefit from side dialogue with another student, both because of their strengths in imitation and modeling, and because side dialogue is less direct or threatening.

### *Bibliography*

Braden, Marcia L., 2000 (Revised Edition). *Fragile: Handle with Care*. Spectra Publishing Co., Inc. Available from the National Fragile X Foundation:

<http://www.fragilex.org/html/resources2.htm>

### *Source*

Original lesson.

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# Turn-Taking With an Adult/Teacher

## *Topic*

Social skills

## *Level*

Pre-K through high school, depending on social skill level

## *Duration*

5-15 minutes, depending on age and ability to concentrate

## *Objective*

Student will learn to take turns through a play or social venue

## *Motivation*

High interest toy or activity

## *Materials*

- Favorite toy, game, educational activity

## *Background*

The instructor must be able to assess whether the student has the prerequisite skills to foster social reciprocity, waiting a turn or showing respect.

## *Preparation*

Provide student with a choice of high interest materials. This may require an interest inventory, observation of play choices, or a parent interview/survey.

## *Activity*

- Teacher chooses a toy or activity of high interest. (Individual indicates desired object, toy or activity.)
- Teacher sets up activity, board game, etc.
- Teacher verbally models “my turn” or if the individual is nonverbal, points to self and takes a turn. (Individual waits his turn and imitates the role model.)
- Teacher gives the individual game piece, toy, etc., to the child and says, “Your turn,” pointing to him and shaping the pointing to self. (Individual points to himself, picks up toy, game piece and takes a turn.)
- Teacher signals play and offers no other prompts. (Because you start 1:1, the adult’s proximity helps with grabbing, etc. Physically cueing by touching self-child-self helps.)



### *Extensions*

Pegs or other fine motor activity, Lego blocks, drawing a person (hangman), drawing cards from a deck, etc.

### *Adaptations for Fragile X Syndrome*

Children with FXS often display approach-avoidance social behaviors. Although they appear to be interested in a social situation, when confronted with being in the limelight they will avoid it.

### *Bibliography*

Braden, Marcia L., 2000 (revised edition). *Fragile: Handle with Care*. Spectra Publishing Co., Inc. Available from the National Fragile X Foundation:  
<http://www.fragilex.org/html/resources2.htm>

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## Talk With an Adult

### *Topic*

Social skills

### *Level*

Pre-K through high school, depending on social skill level

### *Duration*

5-20 minutes, depending on age and ability to concentrate

### *Objective*

Student will learn to take turns through a play or social venue

### *Motivation*

High interest toy or activity

### *Materials*

- Favorite toy, game, educational activity

### *Background*

The instructor must be able to assess whether the student has the prerequisite skills for turn taking with an adult and peer, waiting a turn or showing respect.

### *Preparation*

Provide student with a choice of high interest materials. This may require an interest inventory, observation of play choices, or a parent interview/survey.

### *Activity*

- Adult gives individual a compliment, “I like your shirt.” (Individual responds with “Thank you.”)
- Individual repeats, “I like your shirt.” (Adult responds with “Thank you.”)
- Replace shirt with other clothing item or toy, etc.

### *Extensions*

Visual cues such as pecs, photograph, icon, rebus symbol or sentence strip. Trainer holds up visual cue to prompt a broader array of complimentary statements, e.g., use a picture of a face to prompt facial features, in order to teach the appropriate facial features to use when paying compliments. Or, use a sentence strip to cue, “I like your Lego space ship,” “I like your drawing,” etc. (Sentence strips are a strip of paper with a complete sentence, single word, or phrase, depending on the language level of the child.)



### *Adaptations for Fragile X Syndrome*

Executive functioning deficits preclude initiation. Sentence strips offer solution to initiation deficits. Visual formats are salient for individuals with FXS.

### *Word Definitions*

Executive Functioning:

*Summing up intention, formulating a plan, and executing it.*

### *Bibliography*

Braden, Marcia L., 2000 (Revised Edition). *Fragile: Handle with Care*. Spectra Publishing Co., Inc. Available from the National Fragile X Foundation:  
<http://www.fragilex.org/html/resources2.htm>

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# What's Your Number?

## *Topic*

Identifying and using phone numbers

## *Level*

Any level

## *Duration*

15-60 minutes

## *Objective*

Student will be able to find phone numbers on functional materials and use them to make purposeful phone calls.

## *Motivation*

Highly purposeful activity, use of personal interest items

## *Materials*

- Blank index cards
- Business cards from the community
- Food take-out menus from the community
- Telephone
- Worksheets with copies of each student's business card (designed by students)

## *Background*

Students with fragile X syndrome generally have good memories. They can draw upon this strength in learning phone numbers. However, these students may have difficulty discriminating an important item, such as a phone number, from other distracting information in the text of a menu, business card, etc. This exercise helps them learn to search out and be able to use the phone number for a business.

## *Preparation*

Have materials available and knowledge of student's home phone number.

## *Activity*

Direct Instruction

- Teacher will ask student to verbalize home phone number, then write it on paper. If student doesn't know number, teacher will verbally prompt student to repeat number after her and practice saying it. If student needs assistance writing the number, teacher will provide a dotted-line sheet with the number and ask student to trace it. If student is unable to write number, teacher will provide a worksheet with student's home number on it, and distracters. Student will practice circling the number to visually identify it.



- Once students can identify their phone number, they will be instructed to design their own business card that will include name, street address, and home phone number. Students may also include a picture or sticker of a personal interest item on the card. (This part of the activity may be done by computer.)
- Students will practice discriminating the phone number from the address on the card by circling the number.
- Worksheets with copies of several cards will be distributed to students. Ask them to circle the phone numbers on the worksheet.
- Teacher will distribute copies of business cards from community merchants. Students should circle phone numbers on cards. Vary this lesson by having students verbalize numbers.
- Have students practice dialing their own phone number on a disconnected telephone.

### *Extensions*

- Have students bring in take-out menus from local merchants and repeat exercises to identify phone numbers and practice dialing.
- This could lead to role playing the placing of orders with restaurants.
- For real-life experience, practice asking merchants for hours of operation and/or address.
- Once skill is mastered, a reward could be to actually order a pizza or other item and have it delivered.
- Class could create a directory of local merchants with hours, location and other information.
- Students could use this exercise to practice number identification by simply pushing a button when orally prompted. This provides a tactile method of identifying numbers.
- Students could create a personal phone directory including photos, numbers and other pertinent information.

### *Adaptations for Fragile X Syndrome*

For students with poor motor coordination, phones with oversized numbers can be obtained. For dialing purposes, students may be more successful in looking at a phone number one digit at a time, rather than the entire number. If this is the case, write the phone number sequentially one number at a time on individual papers. Student will say the top number, dial it, then turn to the next number, say it, dial it, etc. This helps students to know when they have completed each number in the sequence. Students may need to rehearse what they will say during the call prior to dialing. They may benefit from teacher modeling.

### *Source*

Original lesson.

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# Sign Photographer

## *Topic*

Learning to read community signs

## *Level*

Could be used for life skills at any level, elementary to adult. This lesson is adapted for mildly affected, moderately affected, and severely affected students.

## *Duration*

1-2 hour field trip, one hour to create poster or book. Repetition time varies.

## *Objective*

Learn to find, read, and understand signs in the community

## *Motivation*

Field trip, taking photos, real-life experience, art materials

## *Materials*

- Digital camera (or regular camera, or disposable camera)
- Access to computer and printer (if using digital camera); or, funds to develop film
- Posterboard or paper
- Glue or tape
- Three-hole punch and rings to fasten the pages

## *Background*

This lesson uses real-life local signs to make learning relevant to students. Follow-up activity creating a personal book or classroom poster gets the student involved in learning.

## *Preparation*

Plan field trip and get permissions, obtain digital camera, regular camera and film, or disposable camera(s). After the field trip, teacher will print out one copy of signs for a poster, and/or multiple copies for individual student books.

## *Activity*

Direct Instruction:

Class takes a field trip within the community and takes turns with a camera, photographing signs in the neighborhood. This can include or be limited to school signs (Restroom, Exit, Office, etc.).

For example, community signs would be: “Stop” sign, “Danger,” “Construction,” “Crosswalk,” office or store signs, restaurant signs, “Railroad Crossing,” supermarket aisle signs, etc.



**Guided Practice:**

After returning from the field trip, reinforce knowledge of signs by recalling what signs were discovered. Explain what you should or should not do upon reading various signs. How do the signs help you find what you want? Which are warning signs?

*Mild*

Child could recall sign shapes and/or names. Draw signs and label them on the board or at the student's desk.

*Moderate*

Child could recall shapes, colors, or names of signs. If teacher has a previously prepared poster of signs, child could correctly identify signs as teacher points to them.

*Severe*

If teacher has a previously prepared poster of signs, teacher could point to and describe various signs seen on field trip. Have child repeat the sign names after the teacher.

**Independent Practice:**

In a subsequent session, teacher has already prepared large copies of sign photos from the field trip, and/or multiple copies for each student. For a classroom poster, each student chooses one photo and attaches it to the poster. Teacher describes each sign as it is attached, or asks the class to identify the sign. This poster can be used in later classroom activities.

For individual books, students adhere each photo to a separate page.

*Mild*

Write the name of each sign on the poster, and/or on each book page.

*Moderate*

Trace the name of each sign, pre-prepared by teacher, on each book page.

*Severe*

Teacher pre-prepares labels for each sign, and student adheres the labels under the signs.

**Extensions**

Use poster and books for identifying signs by name and image. Have class discuss functions of signs—what should you do when you see this sign? Where might you find this sign?

**Assessment**

Correctly identify community signs.





*Related IEP Goals*

- Student will correctly identify community signs.
- Student will match signs with labels.
- Student will correctly read community signs.

*For Parents Only*

Homework could be assigned for students to photograph signs in and around their homes.

*Source*

Original lesson.

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# Peer Trading Cards

## *Topic*

Social interaction; art

## *Level*

Can be adapted to various age groups

## *Duration*

Several hours total

## *Objective*

Peer interaction, social skills learning

## *Motivation*

This activity can be reinforced at regular intervals, e.g., every time a step is completed the child can earn his/her favorite reward. The lesson is written in step format to promote the sense of predictability and to indirectly promote sequential thinking.

## *Materials*

- Index cards, or oak tag
- Ruler
- Scissors (if using oak tag and not pre-cut cards)
- Glue
- A photo of each child (or Polaroid camera to take photos upon interview)

## *Background*

This activity allows children and young adults with social disorders and/or fragile X syndrome to learn about their classmates and peers. It also helps all students in an inclusion class share information about themselves.

The activity can be easily assigned to a variety of grade levels in the beginning of a school year. Every child can participate. The end product looks very attractive, and many kids think of them as “trading cards,” as if the children are baseball players! It is a wonderful inclusion lesson that can be designated to the socially inhibited child so they get to know and understand their peers, and appropriate likes and dislikes for their age group.

## *Preparation*

Before creating the cards, a paraprofessional or other adult must accompany the student in conducting personal interviews. It is fun for the child to pretend he or she is a newscaster, interviewing classmates. The child can ask three short questions and take down information (the adult can help where needed, i.e., recording peer info).



Examples of questions are as follows:

- What is your favorite cartoon?
- When is your birthday?
- Do you have a pet?
- What's your favorite sport?
- What is your favorite book?
- What is your favorite movie?

These interviews can be very brief or can be extended, depending upon the level of shyness and ability of the student interviewer. Two children a day for 1-2 weeks is usually adequate for the interviewing process to be completed. This concept can be dramatized for kids so they can role-play and have some fun peer interaction time.

The interviews also can be completely omitted. Alternatively, children can learn about their peers from questionnaires. The teacher can also provide information such as birthdays and after-school activities lists for the student to use in their peer card making process.

### *Activity*

Creation of the peer cards is in a linear step process. It can be simplified further and written in a checklist format for the student with fragile X.

1. Collect student information. Total number of students.
2. Take student pictures (or get photos ahead of time from teacher).
3. Cut 4" x 6" rectangles from the oak tag (OT can help in this step). Or use your index cards (pre-cut).
4. Think of a layout. Will the picture be on the top, the bottom, the left, the right, or in the middle? On the other side (the back)?
5. Arrange all photos first.
6. Lay the text down next. The student can type it up beforehand. (Insert "Type Information" as step 2, or do it gradually as you go along collecting during step 1.)
7. Apply glue.
8. Insert into a small box for safekeeping. Children can shuffle through them when wanting to know more about their friends. Teachers can use them as ways to gauge what are popular age-appropriate favorites of their students' inclusion peers.



### *Extensions*

This card making sequence can be applied to a variety of settings outside of school as well. If the child attends the YMCA or any groups, i.e., karate, taekwondo, it may be useful for the socially inhibited child to have a way to interview his/her peers, and compile information about each, like trading cards. It can be fun for the student, the teacher, and the whole class.

### *Related IEP Goals*

This activity can encourage verbalizing and appropriate conversation with peers. These may be speech goals on the IEP. Also, in this activity, a child can make/formulate several verbal interchanges with students by asking questions and commenting on the children's likes and dislikes.

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# The Assembly Line

## *Topic*

Social interaction; taking turns

## *Level*

Pre-school, K-1

## *Duration*

10-15 minutes

## *Objective*

This activity promotes social interaction in an inclusion setting for young children. It also gives the child practice in turn-taking.

## *Motivation*

Game-like setting, peer interaction. Short and predictable. If additional motivators are needed, perhaps a favorite game can follow this “game” or lesson.

## *Materials*

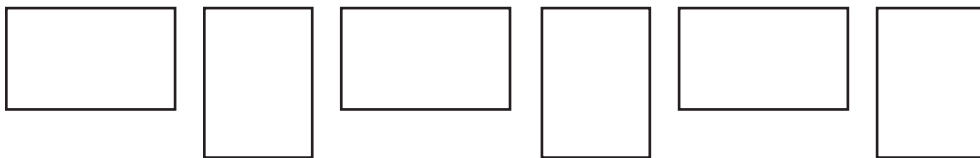
- Crayons or markers
- A large piece of construction paper
- Clipboard

## *Background*

This activity provides a simple, fun and untaxing way for a child with fragile X to be included in a group activity. It also reinforces turn-taking (each time the paper is passed).

## *Preparation*

Draw a large, simple picture on the board. The picture should consist of a few shapes.





### *Activity*

- The directions can be as simple as, “Each child is to draw one rectangle or one square when the paper is passed to you.” The end result would be a sheet of paper with X number of squares and/or rectangles.
- Assemble the group/class into a line, all children sitting next to one another.
- Child #1 starts the line and draws a square or rectangle on the paper, then passes it to his right to the next child. The process follows (and can get the kids a little competitive!), as each child draws the designated shape.
- Teacher prompts as needed: “Whose turn is it now to draw the shape?”

The end result can be simply tallied. The class can count the number of shapes on the page. They will be amazed at how in such a short amount of time, many hands can make many shapes. You can note that when there is an assembly, where everyone does his or her part, the job can be done very quickly.

### *Extensions*

Use this sequence to separate recyclables and/or types of garbage in science curriculum.

### *Related IEP Goals*

Student may be required to utilize knowledge and demonstrate abilities to draw specific shapes.

Student demonstrates appropriate behavior taking turns in a social setting.

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# Declining An Invitation

## *Topic*

Declining an invitation in person or on the phone

## *Level*

8th-12th grade

## *Duration*

Two 50-minute sessions

## *Objective*

The student will be able to appropriately decline an invitation given a scenario (e.g., being invited to a basketball game, concert, church, party, etc.).

## *Motivation*

Real-life scenario

## *Materials*

- Two real or pretend phones per student group of two (optional)
- Teacher-created scripts for students to read
- Poster paper or binder
- Markers

## *Background*

Students with fragile X syndrome can have difficulty displaying appropriate behavior in social situations and can thus benefit from modeling of such behavior.

## *Preparation*

The teacher should prepare a poster that displays each of the steps involved in the task. Each step should be represented by a picture and as few words as possible. An alternative to a poster is a binder that contains each of the pictorially-represented steps.

Teacher should also have two prepared scripts for students to read. The first script will be for the inviter—the person making the invitation. The other script will be for the invitee. See sample script.

Telephones can be used to simulate a phone conversation. Or, this exercise can be done as an in-person conversation.

## *Activity*

Session One

1. Introduce the lesson by presenting two brief humorous scenarios in which one person invites the other person to do something ridiculous (e.g., eat some garbage, paint your



teeth purple, etc.). The teacher and the assistant/ paraprofessional should present the two scenarios. At the end of each scenario the teacher will ask students whether or not they would accept the invitation (yes or no).

2. The teacher and the assistant/paraprofessional will role-play a scenario (declining an invitation) by using the scripts. Scripts should be placed on an overhead transparency so that the teacher and the assistant can finger-point as they read the script. Students will be asked to listen and track the words on the overhead or on a student copy at their desks.
3. Students will break up into pairs to partner read the two scripts. Teacher and assistant to help as needed.
4. Once students have read through the scripts, ask them to act out the scene in pairs. Each pair will take turns being the inviter and invitee. The teacher and the assistant/ paraprofessional will roam/float during this time, offering guidance and feedback during this portion of the lesson. The goal is familiarizing students with the language that is used in declining an invitation.
5. After students have acted out the scripts, bring them back as a whole class to discuss the various steps in the task. Lead students to identify the following steps in calling to make an appointment.
  - Listen to the entire invitation before responding.
  - Thank the person for the invitation (facial features demonstrate sincerity).
  - Decline the invitation (e.g., I can't make it...).
  - Provide a reason for declining the invitation.
  - Indicate interest in future invitations (optional).
  - Thank the person for the invitation again.

#### Session Two

6. Review the six steps that have been identified. Teach students by showing them the picture that represents each step and demonstrating each of the steps one by one. Lead students in discussion about how each picture tells the invitee what to do.
7. Break the class up into pairs again. Give the inviter the script. Encourage invitees to use the poster or a picture binder instead of the script. Either way, invitees will be asked to provide their own reasons for declining an invitation and to indicate if they wish to be invited in the future. (Provide exact scripted wording as needed for individual students.) Each pair will take turns being the inviter and invitee. The teacher and the assistant/ paraprofessional will roam/float during this time, offering guidance and feedback.
8. Invite pairs to perform in front of the class and assess their performance using the





provided rubric. Each student is assessed on the invitee portion of the role-play. If student pairs do not wish to perform in front of the class, the teacher or assistant can assess their performance during guided practice.

9. Close the lesson by having students do a sentence completion task in which you review each of the steps. For example, the teacher would say, “The first thing that you need to do if you want to decline an invitation is listen to the entire invitation before you \_\_\_\_\_.” In this way, students are prompted to provide a word such as “talk” or “speak.”

### *Extensions*

The teacher can extend this activity by having students practice saying “Thank you” while smiling. Students can also evaluate dialogues from sitcoms, in which a person declines an invitation, on a scale of 1 to 10.

Scripts can be adapted to student’s level.

### *Assessment*

Assess students using the following rubric.

| <i>Performance Indicator</i>   | <i>Observed</i> | <i>Not Observed</i> |
|--|-----------------|---------------------|
| 1. Listens to the entire invitation before responding.                           |                 |                     |
| 2. Thanks the person for the invitation (facial features demonstrate sincerity). |                 |                     |
| 3. Declines the invitation (e.g., I can’t make it...).                           |                 |                     |
| 4. Provides a reason for declining the invitation.                               |                 |                     |
| 5. Indicates interest in future invitations (optional).                          |                 |                     |
| 6. Thanks the person for the invitation again.                                   |                 |                     |

### *Adaptations for Fragile X Syndrome*

The complex process of declining an invitation is modeled in its entirety first before it is broken up into its different steps, to take advantage of students’ general ability to process information simultaneously. In this way, students with FXS see the whole process and its purpose before the act itself is broken up into different steps.

In addition, the process is taught using photographs or pictures to represent each step. This adaptation builds on the visual processing strengths of many students with FXS. Social skills instruction by its very nature takes advantage of these students’ desire to participate in meaningful and real-world activities.



The use of familiar partners during this activity may help reduce anxiety levels for students with FXS. In addition, short breaks can be planned during the lesson for students who experience sensory overload.

### ***Related IEP Goals***

- Demonstrate appropriate social conventions.
- Demonstrate appropriate decision-making skills.

### ***Suggested Pictures***

- Listens to the entire invitation before responding.  
*Picture of an ear with the word “Listen” underneath the picture.*
- Thanks the person for the invitation (facial features demonstrate sincerity).  
*Picture of a person smiling with the words “Thank you” underneath the picture.*
- Declines the invitation (e.g., I can’t make it...).  
*Picture of a written invitation inside a circle with a diagonal line across the circle.*
- Provides a reason for declining the invitation.  
*Picture of a person doing some work-related task, which represents the notion that the person is busy and cannot accept the invitation. An alternative picture is two people having dinner together, which represents the notion that the person already has plans.*
- Indicates interest in future invitations (optional).  
*Picture of a written invitation with the word “Future” followed by a question mark.*
- Thanks the person for the invitation again.  
*Picture of someone shaking another person’s hand or patting him or her on the back. Under the picture, the words “Thank you.”*

### ***Sample Script***

*Inviter* Hey {insert name}. I have some tickets to the Mets game this Saturday. It starts at 1:15 p.m. I think they’re playing the Atlanta Braves. Do you want to go?

*Invitee* Hey, thanks for the invitation. I would love to go the game, only I can’t go this coming Saturday. I already made a commitment to my mother and told her that I would baby-sit my younger sister. But I’d love to go again in the future if you ever get some tickets again. I really appreciate the invitation.

### ***Source***

Adapted from “Declining an Invitation”  
<http://www.cccoe.net/social/declininginvitations.htm>

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# Excuse Me, I'm Sorry to Interrupt

## *Topic*

Interrupting in appropriate ways

## *Level*

8th-12th grade

## *Duration*

Two 50-minute sessions

## *Objective*

The student will be able to appropriately interrupt a conversation or an activity.

## *Motivation*

Real-life scenario

## *Materials*

- Teacher-generated scripts (see example at end of lesson)
- Poster paper or binder paper and binder
- Markers

## *Background*

Students with fragile X syndrome can have difficulty displaying appropriate behavior in social situations and can thus benefit from modeling of such behavior.

## *Preparation*

The teacher should prepare a poster that visually depicts the steps of appropriately interrupting a conversation appropriately. Each step should be represented by a picture and as few words as possible. An alternative to a poster is a binder that contains each of the visually-represented steps. See picture suggestions at end of lesson.

Teachers should also have several prepared scripts for students to read, for the two persons having a conversation and the interrupter. See sample script at end of lesson.

## *Activity*

Session One

1. Introduce the lesson by presenting brief humorous and serious scenarios. Explain that more humorous, informal, everyday conversations can be interrupted, while more serious, formal, and important conversations should not be interrupted except for emergencies. Example scenarios could include: two people arguing about whether Coke or Pepsi tastes best (informal); a mother is saying goodbye to her son before he goes off to college



(serious, formal). The teacher and the assistant/paraprofessional should present approximately three scenarios. At the end of each scenario the teacher will ask students whether or not it would be appropriate to interrupt the conversation (yes or no).

*Note:* This represents the point at which the individual determines whether or not the conversation is an appropriate one to interrupt. This kind of determination involves many skills, including eavesdropping in a such a way as to be undetected while still being able to determine the nature of the conversation, and picking up on the social cues and expressions of the speakers, which give hints about the nature of the conversation. See the “Adaptations” section below for a discussion of the importance of being polite when a mistake is made.

2. The teacher, the assistant/paraprofessional, and one student will role-play a scenario (e.g., interrupting a conversation) by using the scripts. It is recommended that the student and the assistant/paraprofessional play the roles of the people in conversation and the teacher play the role of the interrupter. Scripts should be placed on an overhead transparency so that the teacher and the assistant can finger-point as they read each word of the script. Students will be asked to listen and track the words on the overhead or on a student copy at their desks.
3. Students will break up into groups of three to read the scripts. (Assistance may be needed.)
4. Once students have read through the scripts, ask them to act out the scene in groups of three. Each person in the group will take turns playing a different role, either being in conversation or as the interrupter. The teacher and the assistant/paraprofessional will roam/float during this time, offering guidance and feedback. The key is familiarizing students with the language that is used in interrupting a conversation or activity appropriately.
5. After students have acted out the scripts, bring them back as a whole class to discuss the various steps in the task. Lead students to identify the following steps in interrupting a conversation or activity.
  - Determine if the other people are available to speak with you.
  - Attempt to make eye contact or get within their view.
  - Try to interrupt during a pause in the conversation or activity.
  - Interrupt by saying, “Excuse me” or, “I’m sorry to interrupt.”
  - Wait for the others to acknowledge you and then say, “Thank you.”
  - Thank the others after you have finished what you need to say or ask.



### Session Two

6. Review the six steps. Teach each step to students by showing them the picture that represents each one and demonstrating each of the steps one by one. Lead students in discussion about how each picture tells the interrupter what to do.
7. Break the class up into groups of three. Give the two people in conversation their scripts again. Invite the interrupter to use the poster or a picture binder instead of the script. Either way, interrupters will be asked to provide their own reasons for interrupting. (Or, you can write this into the script.) Each person in the group will take turns playing each role. The teacher and the assistant/paraprofessional will roam/float, offering guidance and feedback.
8. Invite groups to perform in front of the class and assess their performance using the provided rubric. Each student is assessed on the interrupter portion of the role-play. If student groups do not wish to perform in front of the class, the teacher or assistant can assess their performance during guided practice.
9. Close the lesson by having students do a sentence completion task in which you review each of the steps. For example, the teacher would say, “The first thing that you need to do if you want to interrupt someone is determine if the other people are available to \_\_\_\_\_.” In this way, students are prompted to provide a word such as “talk” or “speak.”

### *Assessment*

Assess students using the following rubric.

| <i>Performance Indicator</i>   | <i>Observed</i> | <i>Not Observed</i> |
|--|-----------------|---------------------|
| 1. Determine if the other people are available to speak with you.        |                 |                     |
| 2. Attempt to make eye contact or get within their view.                 |                 |                     |
| 3. Try to interrupt during a pause in the conversation or activity.      |                 |                     |
| 4. Interrupt by saying, “Excuse me” or, “I’m sorry to interrupt.”        |                 |                     |
| 5. Wait for the others to acknowledge you and then say, “Thank you.”     |                 |                     |
| 6. Thank the others after you have finished what you need to say or ask. |                 |                     |



### *Adaptations for Fragile X Syndrome*

Students with fragile X syndrome may have difficulty making eye contact, so be sure to discuss substitutes for eye contact, such as head position and body location in relation to the other person.

The complex process of interrupting a conversation or activity is modeled in its entirety as a whole process first, before it is divided into steps. This takes advantage of these students' tendency to process information simultaneously. However, determining whether a conversation is informal or more serious may be very difficult for students with FXS. Providing a script in which people complain about the interruption and the interrupter apologizes will help students learn that politeness helps tremendously in a situation in which mistakes have been made.

Steps are taught using photographs or pictures to represent each step. This adaptation builds on the visual processing strengths of many students with FXS. Social skills instruction by its very nature takes advantage of these students' desire to participate in meaningful and real-world activities.

The use of familiar partners during this activity may help reduce anxiety levels for students with FXS. In addition, short breaks can be planned during the lesson for students who experience sensory overload.

You might need to use the students' real names on the scripts to avoid confusion.

### *Extensions*

Have students practice identifying pauses in conversations by viewing television sitcoms. For example, students could clap or say, "Now!" when they identify a natural pause in the conversation.

Role-play inappropriate and appropriate ways to gain a person's attention. (For example, tugging on someone's sleeve as opposed to sitting down near him and waiting patiently.)

### *Suggested Pictures*

- Determine if the other people are available to speak with you.

*Picture that shows two people who appear to be in serious conversation. You might choose pictures depicting businesspeople in conversation, or people who appear to not be smiling. Under the picture write the word "Serious" followed by a question mark.*

- Attempt to make eye contact or get within their view.

*Picture of an eye to remind students to make eye contact and/or move within view, to get the person's attention. Under the picture write the word "Attention" followed by a question mark.*



- Try to interrupt during a pause in the conversation or activity.  
*Picture of two people positioned for conversation, but with mouths closed and not making eye contact. Under the picture write the word “Pause” followed by a question mark.*
- Interrupt by saying, “Excuse me” or, “I’m sorry to interrupt.”  
*Picture of a person speaking to another person with the words “Excuse me” under the picture.*
- Wait for the others to acknowledge you and then say, “Thank you.”  
*Picture of a person raising his hand with the words “Thank you” underneath the picture.*
- Thank the others after you have finished what you need to say or ask.  
*Picture of someone shaking another person’s hand or patting him/her on the back. Under the picture write the words “Thank you.”*

### **Sample Script**

*Person 1* So who do you think is going to win the baseball game?

*Person 2* I’m not sure. I like the Giants best, but I’m not sure if they can win this one.

*Person 1* They’re going to have to do really well to beat this team! I can’t wait to see the game.

*Interrupter* (Trying to make eye contact and get within the view of the other two people).  
Excuse me.

*Person 1* Hey, [insert name]. What’s going on?

*Interrupter* Thanks! Do either of you know how to get to the main office building?

*Person 2* Oh yeah. Sure. Just walk down this hallway and take a right at the double doors.  
You should see the main office on your left.

*Interrupter* Thanks for your help.

*Person 2* No problem.

### **Related IEP Goals**

- Demonstrate appropriate social conventions.
- Demonstrate appropriate decision-making skills.

### **Source**

Adapted from “Interrupting Appropriately”

<http://www.cccoe.net/social/SWPinterrupting.htm>

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# Make An Appointment

## *Topic*

Calling to make an appointment (e.g., doctor/dentist's office, pastor/rabbi/priest)

## *Level*

8th to 12th grade

## *Duration*

Two 50-minute sessions

## *Objective*

Given a scenario (e.g., calling to make a doctor's appointment), the student will be able to request an appointment using appropriate social behavior.

## *Motivation*

Real-life scenario

## *Materials*

- Two real or pretend phones per student group of two
- Teacher-created scripts for students to read
- Poster paper or binder
- Markers
- Calendars or schedule books (one per student pair)
- Pencils
- Scrap or notebook paper

## *Background*

Students with fragile X syndrome can have difficulty with executive functioning, leading to difficulty in performing complex tasks such as calling to make an appointment. They can also experience difficulty displaying appropriate behavior in social situations, and can thus benefit from modeling of such behavior.

## *Preparation*

The teacher should prepare a poster that displays each of the steps involved in the task. Each step should be represented by a picture and as few words as possible. An alternative to a poster is a binder that contains each of the pictorially-represented steps.

Teachers should also have two prepared scripts for students to read. The first script will be for the caller—the person making the appointment. The other script will be for the receptionist. See sample script.





### *Activity*

#### Session One

1. Introduce the lesson and ask students to watch you role-play.
2. The teacher and the assistant/paraprofessional will role-play a scenario (e.g., making an appointment to see a doctor) by using the script. Script should be placed on an overhead transparency so that the teacher and the assistant can finger-point as they read each word. Students will be asked to listen and track the words on the overhead or on a student copy at their desks.
3. Students will break up into pairs to partner-read the two scripts. Teacher and assistant help as necessary.
4. Once students have read through the scripts, ask them to act out the scene in pairs. Each pair will take turns being the caller and receptionist. The teacher and the assistant/paraprofessional will roam/float during this time, offering guidance and feedback. The key is familiarizing students with the language used in making an appointment.
5. After students have acted out the scripts, bring them back as a whole class to discuss the various steps in the task. Lead students to identify the following steps in calling to make an appointment.
  - Calendar/schedule nearby.
  - Select several dates and times for which you would like to schedule the appointment.
  - Have telephone number.
  - Dial the telephone.
  - Identify yourself and state why you are calling.
  - If prompted, share preferred dates and times.
  - Restate appointment time and date to confirm.

#### Session Two

6. Review the seven steps. Teach each step to students by showing them the picture that represents each step and demonstrating each of the steps one by one. Lead students in a discussion about how each picture tells the caller what to do.
7. Break the class up into pairs again. Give the receptionist the script. Invite callers to use the poster or a picture binder instead of the script. Either way, callers will be asked to select their own dates and times and to dial the number. (If needed, provide example dates and times for the students.) Each pair will take turns being the caller and receptionist. The teacher and the assistant/paraprofessional will roam/float during this time, offering guidance and feedback.



8. Invite pairs to perform in front of the class and assess their performance using the provided rubric. Each student is assessed on the caller portion of the role-play. If student pairs do not wish to perform in front of the class, the teacher or assistant can assess their performance during guided practice.
9. Close the lesson by having students do a sentence completion task in which you review each of the steps. For example, the teacher would say, “The first thing that you need to do if you want to make an appointment is make sure that you put your \_\_\_\_\_ nearby.” In this way, students are prompted to provide a word such as “appointment book” or “calendar.”

#### *Assessment*

Assess students using the following rubric.

| <i>Performance Indicator</i>                              | <i>Observed</i> | <i>Not Observed</i> |
|---|-----------------|---------------------|
| 1. Places calendar/schedule nearby.                       |                 |                     |
| 2. Writes down at least three preferable dates and times. |                 |                     |
| 3. Places the telephone number next to the phone.         |                 |                     |
| 4. Dials the phone.                                       |                 |                     |
| 5. Introduces self and states reason for calling.         |                 |                     |
| 6. If prompted, shares preferable dates and times.        |                 |                     |
| 7. Restates appointment date and time to confirm.         |                 |                     |

#### *Adaptations for Fragile X Syndrome*

The complex process of making an appointment is modeled in its entirety first before it is broken up into steps, to take advantage of students’ general strengths in processing information simultaneously. In this way, students with FXS see the whole process and its purpose before the act itself is broken up into different steps.

The process is taught using photographs or pictures to represent each step. This adaptation builds on the visual processing strengths of many students with FXS. Social skills instruction by its very nature takes advantage of these students’ desire to participate in meaningful and real-world activities.

The use of familiar partners during this activity may help reduce anxiety levels for students. In addition, short breaks can be planned during the lesson for students who experience sensory overload or who need an opportunity to take a break.

Scripts may need to contain actual students’ names to avoid confusion. Scripts can be simplified as needed. Modeling asking for the receptionist to repeat the information more slowly may also be useful.



### ***Related IEP Goals***

- Demonstrate proper phone etiquette.
- Use a telephone for a variety of purposes.

### ***Suggested Pictures***

- Calendar/schedule nearby.  
*Picture of a calendar with the word “Nearby” underneath the picture.*
- Select several dates and times for which you would like to schedule the appointment.  
*Picture of a calendar with several dates selected and a picture of a clock. Underneath the picture write the words “Select dates and times.”*
- Have telephone number.  
*Picture of a phone with a phone number listed underneath it.*
- Dial the telephone.  
*Picture of someone dialing the phone with the word “Dial” underneath the picture.*
- Identify yourself and state why you are calling.  
*Picture of someone talking on the phone with a dialogue bubble containing the words, “Hi. My name is John, and I was calling to make an appointment.”*
- If prompted, share preferred dates and times.  
*Picture of someone talking on the phone with a dialogue bubble containing the words, “Can I make an appointment for Friday at 3 p.m.?”*
- Restate appointment time and date to confirm.  
*Picture of someone talking on the phone with a dialogue bubble containing the words, “So the appointment is for next Tuesday at 10 a.m.?”*

### ***Sample Script***

*Receptionist* Dr. Brown’s office. This is [insert name]. How may I help you?

*Caller* Hi, this is [insert name]. I am calling to make an appointment with Dr. Brown.

*Receptionist* O.K., I have two slots open tomorrow from 10:30 to 11 a.m. and from 1:00 to 1:30 p.m. I also have slots open next Thursday morning, from 8:30 a.m to noon. Will any of those times work for you?

*Caller* No, I will be at school during that time. Do you have slots in the afternoon this Wednesday?

*Receptionist* Yes, you can come this Wednesday at 4:30 p.m. Will this work for you?



*Caller* Yes. You said this Wednesday at 4:30 p.m. Correct?

*Receptionist* That's correct.

*Caller* O.K., thanks for your help.

*Receptionist* O.K. [insert name of caller], we'll see you then. Bye.

*Caller* Bye.

***Source***

Adapted from "Making an Appointment"

<http://www.cccoe.net/social/PVSappointment.htm>

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## A Note on Therapy Assistance

Please note that in constructing an educational program for students with fragile X syndrome, it is very important to get the input of an occupational therapist (OT) who is trained in sensory integration issues. Teachers can request an OT assessment from the school. Physical therapy and medical assessments and interventions are also frequently warranted.

Students with FXS also frequently require adaptive PE due to their low muscle tone, fine motor deficits, and other sensorimotor problems. They often need speech and language therapy (many are delayed in speaking and begin by learning sign language and/or via augmentative communication devices; most then transition to regular speech). Teachers can also request an assistive technology assessment.

*Tap into adaptive resources*

With an abundance of services available to students with FXS, and parents who are increasingly aware of their child's need for those services, the school setting frequently acts as the locus around which a wide variety of assistive services can coalesce.

*We have learned how critical it is for children with FXS to have a team behind them. With the development of school and community resources that can increasingly meet their needs, these uniquely challenging students are once again demonstrating our society's capacity to adapt to new knowledge and new insights on the varieties of learning experience.*



# References

## Books

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Braden, Marcia, *Fragile, Handle with Care*. Spectra Publishing, 2000 (revised edition). A comprehensive review of diagnostic, developmental, sensory, behavioral, social, and educational aspects of FXS, from adolescence to adulthood. Available from the National Fragile X Foundation.

Dixon Weber, Jane, *Children with Fragile X Syndrome: A Parent's Guide*. Available from the National Fragile X Foundation. A comprehensive resource for parents (including educational needs & goals).

Hagerman, Randi Jenssen, M.D., and Amy Cronister, M.S., eds., 1996. *Fragile X Syndrome: Diagnosis, Treatment, and Research*. Second Ed. Baltimore: The Johns Hopkins University Press.

Spiridigliozzi, Gail, *Educating Boys with Fragile X Syndrome: A Guide for Parents & Professionals*. Available from the National Fragile X Foundation. Brief enough to expect a teacher to actually have time to read it!

## Education Related Software & Websites

### *General*

The National Fragile X Foundation

[www.fragilex.org](http://www.fragilex.org)

The publisher of this volume. Educational resources and updates to this binder can be found on the website.

Ability Hub

<http://www.abilityhub.com/>

A web portal for information on assistive and adaptive technology.

Council for Exceptional Children

<http://www.ideapractices.org/>

Includes links to many resources for teachers.

ED.gov

<http://www.ed.gov/index.jhtml>

U.S. Department of Education website with materials for teachers. Topics include educational technology, math, reading and science.



Adaptive Technology Resource Centre, University of Toronto

<http://www.utoronto.ca/atrc/resources.html>

Information on adaptive technology, such as articles comparing software.

ABLEDATA

<http://www.abledata.com/>

1-800-227-0216

A web portal for information on assistive and adaptive technology. Sponsored by the National Institute on Disability and Rehabilitation Research, U.S. Department of Education.

The FRAXA Research Foundation

<http://www.fraxa.org/>

Focused on medical research for fragile X syndrome. Hosts a listserv for parents and others, including exchange of educational information.

National Center to Improve Practice in Special Education

<http://www2.edc.org/NCIP/library/toc.htm>

Information on assistive technology, multimedia, and teaching with technology.

Wisconsin Assistive Technology Initiative

<http://www.wati.org/>

Best practices and materials for assistive technology.

### *Mathematics*

Finger Math

<http://klington.cs.iupui.edu/~aharris/chis/chis.html>

An informal technique of using one's fingers in specific ways to help teach math calculations. Use a search site such as google.com or altavista.com to find others.

Homeschool Math Site

<http://www.homeschoolmath.net/>

A web portal for homeschooling that includes links to math activities, lessons, and tips.

IntelliMathics 3<sup>®</sup> from IntelliTools<sup>®</sup>, Inc

<http://www.intellitools.com/Products/IntelliMathics/home.htm>

1-800-899-6687

A mathematics authoring program that uses virtual manipulatives (e.g., photos of a group of 3 apples to represent the number "3"; base-ten blocks; fraction pieces) to help students visualize mathematical relationships. Students get audio and written feedback. Teachers can use 50+ pre-designed activities, and can author additional manipulative-based activities.



The Math Forum@Drexel

<http://www.mathforum.org/te/index.html>

Free math lessons for all grade levels, hosted by Drexel University.

Time Timer

<http://www.timetimer.com/home.htm>

1-877-771-8463

A special timer that shows elapsed and remaining time visually through the use of color on a clock face. Helps student learn concept of time.

TouchMath®

[www.touchmath.com](http://www.touchmath.com)

1-800-888-9191

TouchMath® is a multi-sensory teaching approach for learning numbers and calculation. Each digit from 1 through 9 is represented with “Touchpoints” corresponding to the digit’s quantity. For example, a number “2” will have two touchpoints, which the student can touch and count aloud to arrive at the number.

### *Literacy*

Co:Writer® 4000

<http://www.donjohnston.com/>

1-800-999-4660

Co:Writer® 4000 is software that can accompany any word processor or email program. It adds word prediction, grammar, and vocabulary support. When the student begins typing a word, Co:Writer provides a pop-up list of correctly spelled possibilities to assist the student in quickly generating the correct spelling. Each word is “spoken” in audio as the student clicks on the choices. Other word prediction programs can be searched on the web using the phrase “word prediction software.”

Edmark® Reading Program, Level 1

<http://www.riverdeep.net/edmark/>

1-617-778-7600

A whole-word reading program used by many teachers. Software also available.

Letterland®

<http://www.letterland.com>

Materials for teaching reading, writing, and spelling. Uses mnemonics and visual images to reinforce sounds and grammatical rules.





### Write:OutLoud®

<http://www.donjohnston.com/>

1-800-999-4660

Write:OutLoud® is a talking word processor. It can be used alone or in conjunction with Co:Writer® 4000. As the student types, words are “spoken” in audio by the software. The student can play back each sentence. The program beeps and flashes to indicate spelling errors.

### Recording for the Blind & Dyslexic®

1-866-732-3585

<http://www.rfbd.org/>

A subscription service for books on tape. Students with fragile X syndrome may qualify for this service through their school library or special education department.

### Handwriting Without Tears®

[www.hwtears.com](http://www.hwtears.com)

1-301-263-2700

A handwriting program designed by an occupational therapist, and approved for use by several state boards of education. Provides tactile materials to help with learning writing. Teaches letters in a progression according to the letter shapes. Provides visual cues to help with memory of letter shapes. Printing and cursive programs available.

### Slingerland® Institute for Literacy®

<http://www.slingerland.org/>

1-425-453-1190

Provides teacher training on a multisensory approach to teaching literacy in the classroom.

### LeapPad® from LeapFrog®

<http://www.leapfrog.com>

1-800-701-LEAP (5327)

Electronic pad with stylus that holds a variety of talking books and cartridges. Student touches words to hear them spoken aloud. LeapFrog® also has TurboTwist® hand-held units for spelling and math. Available at department and toy stores.

### Picture Me Reading

<http://www.picturemereading.com/>

Teaches alphabet and Dolch words (frequently used words) using visual/pictorial images to reinforce sounds and whole words.



## Select Additional Bibliography

### Reading

|   |   |
|---|---|
| Appletree   | Dormack, Inc.<br>PO Box 270459<br>San Diego, CA 92128-0983  |
| Cloze Stories for Reading   | Walker Education Book Corporation<br>720 Fifth Ave.<br>New York, NY 10019                         |
| Developing Every Day Reading Skills   | Educational Design Inc.<br>47 West St.<br>New York, NY 10011                                      |
| Edmark Reading Program, Levels I & II<br>Edmark Functional Word Series<br>Edmark Reading Milestones | Edmark<br>PO Box 9702<br>Redmond, WA 98073-9721   |
| First Sight Word Lotto  | Lakeshore Learning Materials<br>2695 E. Dominguez St.<br>PO Box 6261<br>Carson, CA 90749          |
| High Hat  | American Guidance Services<br>Circle Pines, MN 55014-1796   |
| Interactive Reading Books   | Greenhouse Publications<br>PO Box 802742<br>Santa Clarita, CA 91380-2742<br>Joangreen2000@aol.com |
| Logo Reading System   | Marcia L. Braden, Ph.D.<br>100 E. St. Vrain #200<br>Colorado Springs, CO 80903<br>1-719-633-3773  |
| The Master Blender  | Walker Education Book Corporation<br>720 Fifth Ave.<br>New York, NY 10019                         |



## Spelling/Writing

Spell Master

Chieftain Products Inc.  
265 Champagne Dr.  
Downsview Ontario Canada M3J 2C6

Right Line Paper

Pro Ed  
8700 Shoal Creek Blvd.  
Austin, TX 78757-6897

## Math

Big Money Market

Edmark

Budget Town

PO Box 9702

Classroom Cash

Redmond, WA 98073-9721

Edmark Time Telling

Edmark Touch Money

Look'n Cook

Dino Math Tracks Game

Learning Resources  
380 N. Fairway Dr  
Vernon Hills, IL 60061

Good Apple Math

Grimm & Mitchell  
Good Apple  
Box 299  
Carthage, IL 62321

Math-Equivalence Board

Braden-Lang Associates  
100 E. St. Vrain #200  
Colorado Springs, CO 80903  
1-719-633-3773

Money Skills Package

Attainment Company  
PO Box 930160  
Verona, WI 53593-0160

Racko Game

Parker Brothers  
CPG Products Corp.  
Beverly, MA 01915

Touch Math

Innovative Learning Concepts  
6760 Corporate Dr.  
Colorado Springs, CO 80919-1999



## Computerized

|                           |                        |
|---------------------------|------------------------|
| Math House                | Edmark                 |
| Sticky Bears Math         | PO Box 9702            |
| Mille's Math House        | Redmond, WA 98073-9721 |
| Bailey's Book House       | Edmark                 |
| Sticky Bears Reading Room | PO Box 9702            |
|                           | Redmond, WA 98073-9721 |
| Science House             | Edmark                 |
| The Backyard, Playroom    | PO Box 9702            |
|                           | Redmond, WA 98073-9721 |
| Number Skills Series      | Edmark                 |
|                           | PO Box 9702            |
|                           | Redmond, WA 98073-9721 |

## Language

|                             |                         |
|-----------------------------|-------------------------|
| Apple Tree Language Program | Edmark                  |
| Write-Right Now             | PO Box 9702             |
|                             | Redmond, WA 98073-9721  |
| Show Me Spelling – CD Rom   | Attainment Company      |
| Word Wise Language Kit      | PO Box 930160           |
| Photo Language Series       | Verona, WI 53593-0160   |
| The Mayer-Johnson Series    |                         |
| Blues Clues Game            | University Games        |
|                             | 2030 Harrison St.       |
|                             | San Francisco, CA 94110 |
|                             | 1-415-503-1600          |



## Social/Emotional

All Feelings Are OK  
Face Your Feelings

Center for Applied Psychology, Inc.  
PO Box 1587  
King of Prussia, PA 19406

Social Skills Lessons & Activities

The Center for Applied Research in Education  
West Nyack, NY 10994

The Social Skills Game

Jessica Kingsley Publishers  
116 Pentonville Rd  
London NI9JB England

Ups & Downs With Feelings

Carole Gesme  
4036 Kerry Court  
Minnetonka, MN 55345  
1-612-938-9163

## Community Life/Functional Skills

Stepping Out  
Eating Skills  
(Life Skills Games Series 1)

Edmark  
PO Box 9702  
Redmond, WA 98073-9721

Shopping Smart Curriculum  
Home Cooking Curriculum

Attainment Company  
PO Box 930160  
Verona, WI 53593-0160

## Sex Education

Changes in You: An Introduction to  
Sexual Education Through an  
Understanding of Puberty

Peggy Sigel  
James Stanfield Publishing Co.  
[www.stanfield.com](http://www.stanfield.com)

Circles: A Multi-Media Package to  
Aid in the Development of Appropriate  
Social/Sexual Behavior in the  
Developmentally Disabled Individual

Marilyn Champagne  
Leslie Walder-Hirsch  
James Stanfield Publishing Co.  
[www.stanfield.com](http://www.stanfield.com)

Life Horizons: "Sexuality and the  
Mentally Handicapped"

Winifred Kempton  
James Stanfield Publishing Co.  
[www.stanfield.com](http://www.stanfield.com)



- The Family Education Program Manual Katherine Simpson  
Planned Parenthood: Shasta-Diablo  
1291 Oakland Blvd.  
Walnut Creek, CA 94596  
1-510-935-4066
- Human Sexuality: A Portfolio  
for Persons with Developmental  
Disabilities, 2nd ed. Victoria Livingston  
Mary E. Knapp  
Planned Parenthood of Seattle-King Co.  
2211 E. Madison St.  
Seattle, WA 98112-5397  
1-206-328-7716
- Positive Approaches: A Sexuality  
Guide for Teaching Developmentally  
Disabled Persons Lisa Maurer  
Planned Parenthood of Delaware  
625 Shipley St  
Wilmington, DE 19801  
1-302-655-7293
- Safe and Okay: Elementary Level.  
A NO-GO-TELL! Curriculum for  
Disabled Children (Grades 3-6) Shella Brener  
Elizabeth J. Krents  
Child Abuse & Disabled Children Prog.  
The Lexington Center, Inc.  
30th Ave. & 75th St  
Jackson Heights, NY 11370  
1-718-899-8800
- Sexuality Lecture Series on DVD Marcia L. Braden, Ph.D.  
100 E. St. Vrain #200  
Colorado Springs, CO 80903  
1-719-633-3773
- Special Education: Secondary  
F.L.A.S.H. (Family Life and Sexual  
Health) A Curriculum for 5th  
through 10th grades. Jane Stangle  
Seattle-King Co. Dept. of Health  
Family Planning Publication  
110 Prefontaine Ave. South, Ste 300  
Seattle, WA 98104  
1-206-296-4672