

## CRITICAL THINKING

### What is “Critical Thinking” and how is it seen in *George Shrinks*?

As “complex” as this concept sounds, “critical thinking” really just means using thinking skills that are focused and disciplined. It is actually a process instead of an end result – like the “out-loud reasoning” we do while working on a problem (versus the answer, itself). Key processes involved in critical and logical thinking are often associated with “acting as a young scientist” and include: analyzing, comparing, hypothesizing, sorting, classifying, making predictions, experimentation, interpreting clues, and deductive reasoning.

*George Shrinks* provides fertile ground for growth and development in thinking. As a “natural” at thinking and problem-solving, George sees new uses for household objects and toys—and uses them to solve his “size” issues and to get different jobs done. He is a “doer,” demonstrating willingness to try new tasks and problems even when they seem “huge.”

### Why is learning to think “critically,” important?

The earlier that children develop sensitivity to the standards of sound thought and reasoning, the more likely they will develop desirable intellectual habits and become open-minded persons responsive to reasonable persuasion.

–Dr. Richard Paul, National Council for Excellence in Critical Thinking

Thinking is one of the “magic words” in education today. Research shows that our children need more experience with “using” information in experiences that take them beyond the simple steps of memorizing facts and regurgitating them. Students should be asked to truly think about the concepts they are learning, to compare their own thoughts and ideas with those explained by the teacher – and to explore ideas in both large and small group conversations. Many schools from PreK through high school are instituting an active thinking skills component into their programs.

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The following activities provide opportunities for children to practice making their own choices and decisions. Note that learning areas and themes can be strengthened by first taping and showing the associated *George Shrinks* episode (listed at the top of each page), reading and discussing any associated story or book – and then conducting the hands-on activity or lesson with children. Be sure to tie together the common themes of the show, book and activity with plenty of discussion and analysis!

## **JUST THE SIZE OF GEORGE**

Using estimation and non-standard measurement.

**Learning Area:** Predicting, Comparing, Validating Estimations

**Episode: "George UnShrinks" Synopsis:** George is fed up with being 3-inches tall and wants to be "regular sized." After dreaming that his family has changed into different "extreme" heights, George comes to appreciate his own size and abilities.

### **Objectives:**

Children will:

- \* Estimate which things in the classroom might be three inches tall.
- \* Validate their estimations using standard measurement tools.
- \* Use standard and non-standard measuring tools to measure familiar items.
- \* Record measurement data on clipboards.

**Grades:** K-2

**McRel Standard(s):** Math Standards - Standard 2.1, Understands symbolic, concrete and pictorial representations of numbers.

**Core Curriculum Area(s):** Math

**Materials Needed:** colored crayons or markers, handout, clipboards (one for every two children, paper

### **Think & Do Activity Preparation:**

Photocopy the reproducible handout "Just the Size of George" — one per child.

### **Think & Do Activity Description:**

1. Gather everyone together for a circle time. Show a picture of George Shrinks and explain that he is only three inches tall. Ask if children can find something in the classroom they think also might be three inches. Bring items to the circle to share. Explain that when they guess for size, they are "estimating."
2. Ask: "How can we check for accuracy of size?" (By using a ruler or tape measure – standard measuring tools, etc.)
3. Distribute the handout (a 3-inch illustration of George) to color and cut out. Tell students to check, with a standard measurement tool, to see if their George is really three inches tall. Tell them they will now use George to measure things (using his picture as a non-standard measurement tool).
4. Divide children into pairs. Tell them that first, they will estimate the size of things in the classroom that they believe to be exactly three inches tall. They should then check for accuracy using their George Shrinks measuring tool.
5. Children should record their findings on paper attached to clipboards either by drawing what they find to be the same size as George or by writing the name of the measured item.

#6-8 Continued on next page

### **Suggested Reading**

"Inch by Inch" by Leo Lionni  
"Doctor De Soto" by William Steig

### **Home Connections**

Suggest that parents can extend this activity at home by finding a place to start recording their child's growth (i.e., a wall in the garage). This measurement could be recorded monthly.

### **Teacher Tips**

Follow-up by measuring things with other non-standard measuring objects (e.g. How many shoes tall are you? How many markers from the door to the sink?)

***Think & Do Activity Description: Cont'd***

6. Next they should guess: How many "Georges" are in a ruler? A book cover? Their hand?
7. Then they should measure items and body parts that are larger than George. They should first estimate how many "Georges" tall each item/body part is—then check for accuracy.
8. Estimates and "accuracy check" results should also be recorded.

REPRODUCIBLE PAGE  
**JUST THE SIZE OF GEORGE**



**VISITORS IN MY GARDEN**

Learning to observe and document changes in a garden.

**Learning Area:** Critical Thinking, Observation, Deductive Thinking, Respect

**Episode: "Journey to the Center of the Garden" Synopsis:** Something or someone has been eating at the Shrinks' garden. George develops a newfound respect for the world that lies out of sight beneath his garden.

**Objectives:**

Children will:

- \* Discuss how to respect living things.
- \* Plant their own miniature garden.
- \* Hypothesize as to what could be living in the garden.
- \* Draw and record their observations in a class journal.

**Grades:** K-2

**McRel Standard(s):** Life Science - Standard 6.1, Knows that plants and animals need certain resources for energy and growth (e.g. food, water, light, air).

**Core Curriculum Area(s):** Life Science

**Materials Needed:** container for garden (large pot, planter box or dish washing basin), enriched potting soil, gravel or sand, seeds, magnifying glasses, journals, colored pencils, clip boards, observation recording handout

**Think & Do Activity Preparation:**

Define a small garden area. Options include utilizing a large clay pot, planter box or dish washing basin.

**Think & Do Activity Description:**

1. Talk with children about scientists and the importance of observations to their work. Explain that one thing scientists should do is be respectful of the environments and creatures they study (since all living things, great and small, are of value and deserve our consideration).
2. By observing, writing, and drawing about nature, scientists may explore living creatures without too greatly disturbing them. Explain that in this activity, children will be making their own scientific observations and recording them pictorially on observation sheets (handout).
3. Discuss with students what all living things need: water, food, shelter, love.
4. Prepare an area for planting. Line the bottom of closed containers with gravel or sand to promote drainage and fill the pot with enriched soil (super soil or potting soil).
5. Have children plant their seeds (radishes, carrots and beans sprout quickly). Note: soaking the beans overnight in water prior to planting them hastens the sprouting time.

#6-9 Continued on next page

**Suggested Reading**

**Home Connections**

**Teacher Tips**

"The Carrot Seed" by Ruth Krauss  
 "Inch by Inch" by Leo Lionni  
 "Inch by Inch: The Garden Song" by David Mallett  
 "One Bean" by Anne F. Rockwell, Megan Halsey

Each child may be given a handful of lima beans and instruction on how to start a garden at home. Have child(ren) record their observations weekly. Date each entry and sequence them in a book.

***Think & Do Activity Description: Cont'd***

6. Add water and place the garden out in a sunny area.
7. Select 2 children daily to document their observations. Have seeds begun to sprout? Are there any other living things that have come to live in the garden? Check leaves for signs (nibbles, holes, or threads from spider webs). Look for visitors like butterflies and birds.
8. Note which guests stay (worms, snails, smaller insects, sow bugs). To encourage greater visitation, put up the sign, "Invited-All Insects Needing a Vacation Home."
9. If there is no interest on the part of nature, then encourage it with bread-crumbs, birdseed, or grass seed—or place a snail or sow bug in to see whether or not it will stay.

REPRODUCIBLE PAGE

**GARDEN VISITORS: WHAT I OBSERVED TODAY!**

**Help George find visitors from the garden...**



## **INSECT SAFARI**

Distinguishing insects from other creatures.

**Learning Area:** Analyzing Information, Classifying, Validating Judgment

**Episode: "Round Up the Usual Insects" Synopsis:** After George and Becky collect different insects for their science fair project, Jr. accidentally releases them at a party! The kids quickly work together to round up the bugs so that the festivities aren't ruined.

### **Objectives:**

Children will:

- \* Learn about the characteristics of insects.
- \* Distinguish between insects and other "bug types."
- \* Work together to construct insects out of clay or playdough.
- \* Complete the reproducible "Insect Safari."

**Grades:** K-2

**McRel Standard(s):** Life Science - Standard 5.2, Knows that plants and animals have features that help them live in different environments.

**Core Curriculum Area(s):** Language Arts, Life Science

**Materials Needed:** books about insects, large drawing of an insect and its parts, handout, colored markers, playdough or clay, chart paper, marker

### **Think & Do Activity Preparation:**

1. Photocopy the reproducible handout Insect Safari—one per child.
2. Set up an Insect Learning Center where children can construct insects using clay or playdough.
3. Make a large (simplistic) wall chart-drawing of an insect and its parts using a book on insects as reference.

### **Think & Do Activity Description:**

1. Bring in books and pictures about insects. Ask the children if they know what an insect is. (Record their responses on a chart.)
2. Talk about scientists and ways that they work together to solve problems (i.e., read books by other researchers, make observations and compare findings, or talk with people or groups with greater knowledge, etc.). Tell them that today, as a class, they will act as scientists who study bugs: entomologists.
3. Make a list of all the things they would like to know about insects.
4. Referring to the wall chart, introduce the different body parts of an insect: the head, the thorax, the abdomen (the body), six legs (three on either side of the abdomen) and antenna. Also include the fact that some insects have wings. Stress the fact that all insects must have these body parts and must have six legs, no more and no less.
5. Share some picture books about insects with the children (see list below).

#6-7 Continued on next page

### **Suggested Reading**

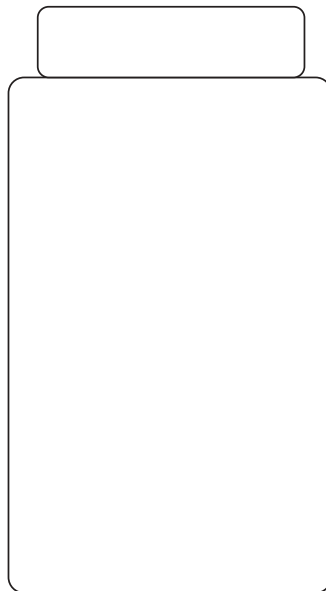
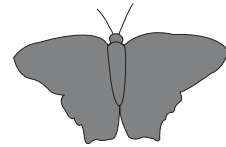
"The Big Bug Search" by Ian Jackson, "The Very Quiet Cricket" by Eric Carle, "The Grouchy Lady Bug" by Eric Carle, "Eye Wonder Bugs" by Penelope York, "Bugs. Bugs. Bugs." By Bob Barner, "Backyard Bugs" by Millicent E. Selsam, "Have You Seen Bugs?" by Joanne Oppenheim, "Bugs" by Nancy Winslow Parker and Joan Richards Wright



***Think & Do Activity Description: Cont'd***

6. Encourage children to work together at the Insect Learning Center. Suggest that they talk with one another and help each other complete different insects. When they have finished one, ask them to name the body parts to you and to count to see if they have the right amount of legs.
7. Introduce the handout Insect Safari (on which children will identify bugs that are insects – and ones that are not). Make it available to fill-out at another Learning Center.

REPRODUCIBLE PAGE  
**INSECT SAFARI**  
Circle the true insects



Cut out the jar, then identify, cut and paste true insects into jar.

## **SPIDER HUNT**

Working together to learn about spider characteristics.

**Learning Area:** Analyzing Information, Comparing, Sorting and Classifying

**Episode:** *“Round Up the Usual Insects,”* **Synopsis:** After George and Becky collect different insects and spiders for a science fair project, Jr. accidentally releases them at a party! The kids quickly work together to round up the bugs so that the festivities aren’t ruined.

### **Objectives:**

Children will:

- \* Learn the characteristics of spiders.
- \* Name the body parts of a spider.
- \* Work together to construct cookie spiders.

**Grades:** K-2

**McRel Standard(s):** Life Science - Standard 5.2, Understands that plants and animals have features that help them live in different environments.

**Core Curriculum Area(s):** Life Science, Math, Language Arts

**Materials Needed:** books about spiders, large drawing of a spider and its parts, colored markers, playdough or clay, chart paper, marker

### **Think & Do Activity Preparation:**

1. Make a large (simplistic) wall chart-drawing of a spider and its parts using a book on spiders as reference.
2. Set up a Cooking Center where children can construct spiders from cookie dough.

### **Think & Do Activity Description:**

1. In the *George Shrinks* episode, “Round Up the Usual Subjects” as George and Becky collect bugs for a science project, they accidentally refer to “spiders” as “insects.” In this activity, children will learn how spiders are actually different from insects. Begin by reviewing what children have learned about insects in “Insect Safari”.
2. Ask the children what they know about spiders. (Record their responses on a chart.)
3. Ask the children what they would like to learn about spiders. (Record on another chart.)
4. Talk about scientists and how they often work together to solve problems, i.e.: make observations and compare findings, collaborate on different parts of their research, etc. Tell them that today the class will act as scientists who study spiders: entomologists!
5. Referring to the wall chart, introduce the spider body parts: the cephalo-thorax (the head and thorax), the abdomen (the body), and eight legs (four on either side of the abdomen). Include the fact that most spiders have 8 eyes—and some have 12.

#6-7 Continued on next page

### **Suggested Reading**

“Anansi the Spider” by Gerald McDermott, “I Love Spiders” by John Parker, “The Itsy Bitsy Spider” by Iza Trapani  
“The Very Busy Spider” by Eric Carle, “The Magic School Bus Spins a Web” by Joanna Cole and Bruce Degen

***Think & Do Activity Description: Cont'd***

6. Share picture books about spiders and make them available for children in the classroom.
7. Encourage children to work together at the Cooking Center. As they collaborate on completing spiders, ask them to name the body parts to you and count to see if there are the correct number of legs.



**WHAT MADE IT HAPPEN?**

Working together to learn about volcanoes and chemical reactions.

**Learning Area:** Critical Thinking, Hypothesizing, Experimentation, Analysis

**Episode: "Round Up All The Usual Insects" Synopsis:** While looking for a science project idea, George comes across a treasured volcano he once made. He winds up going on an insect safari with Becky. But after Jr. accidentally lets their bug collection loose, George and Becky must use teamwork to quickly round them up again.

**Objectives:**

Children will:

- \* Learn about volcanoes and chemical reactions.
- \* Work together to build a volcano with water and sand.
- \* Observe as a chemical reaction (between vinegar and baking soda) causes the volcano to "erupt."
- \* Collectively Hypothesize about what caused the eruption.

**Grades:** K-2

**McRel Standard(s):** Nature of Science - Standard 12.1, Knows that learning can come from careful observations and simple experiments.

**Core Curriculum Area(s):** Science

**Materials Needed:** book about volcanoes, wall map of the world, an assortment of liquids and powders: [water, soda water, white vinegar, water colored with red food coloring, apple juice, sugar, flour, salt, baking soda, cornstarch], a sand area, chart paper, marker

**Think & Do Activity Description:**

1. Ask students what they know about volcanoes. On chart paper, make a list of all the information they offer. (Do not edit for incorrect information at this time.) Then ask what they would like to learn about volcanoes. On a separate sheet of chart paper, list these things. Next, ask them how a group can find out about something they are interested in. Make a list of responses. (Possible answers: ask an expert, look in books, make observations and compare findings, etc.) Make a trip to the school or local library to collect books on volcanoes.
2. Share information from the books gathered at the library and/or from the Internet. Locate some volcanoes on the world map. Mark them with a colored dot or a map pin.
3. Wet down the sand area in the play yard and divide the children into groups of 2 to 4. Each group will work together to build a volcano in the sand area.
4. In two different containers, bring vinegar and baking soda to the sand area. First pour vinegar into the top of the volcano. Next drop in some baking soda. Observe the reaction. (The volcano will fizz and overflow.) Repeat at each volcano.
5. Ask the groups to "hypothesize" about what caused the eruptions. Explain that 2 chemicals, combined, made the reaction happen.
6. On a table near the sand area, provide the household liquids and powders listed above. Invite groups to work together to try to recreate the reaction by experimenting with ingredients
7. Clarify that what happened to volcanoes in the sandbox today and what happens in real volcanoes is not the same!

**Suggested Reading**

**Home Connections**

**Teacher Tips**

<p>"Volcanoes" by Marc Simon, "Volcanoes" by Seymour Simon</p>		
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**WATER POWER**

Determining what will float and sink in water.

**Learning Area:** Critical Thinking, Hypothesizing, Predicting, Classifying

**Episode: "Down the Drain," Synopsis:** George accidentally drops a diamond ring down the sink and enters the drain in order to retrieve it. In the process, he experiences a water-filled adventure and discovers treasure.

**Objectives:**

Children will:

- \* Learn about the properties of water and its importance to life on earth.
- \* Experiment with water to determine which things float and which things sink.
- \* Record the results of their experiments.

**Grades:** K-2

**McRel Standard(s):** Nature of Science - Standard 12.1, Knows that learning can come from careful observations and simple experiments.

**Core Curriculum Area(s):** Physical Science

**Materials Needed:** chart paper and crayons or colored markers, 2-3 plastic tubs, items to be used in "sink or float" water experiments such as: [cork, wood, metal, sea shells, stones and plastic items]

**Think & Do Activity Preparation:**

1. Photocopy the handout, George Shrinks Record Keeping Sheet - one per child.
2. Set up a Water Station with water in plastic tubs and various "sink or float" items displayed.
3. Write the word WATER in large letters on a piece of chart paper.

**Think & Do Activity Description:**

1. Brainstorm with children about water and its uses. (Record their ideas on the chart paper.) Questions: Why is water important? What living things need water? Are there any living things that do not need water? Is the water in the ocean the same as water in a lake or a swimming pool? Why is it important to conserve water?
2. Explore the concepts of "floating" and "sinking." What happens when things are placed in water? Do all things act the same way in water?
3. Introduce the Water Station and set rules and expectations. At the water station, children will test several different items for floating or sinking. Be sure that there are a variety of materials to experiment with.
4. Children should work independently. Instruct them to first sort items into two groups: "I think these will float." and "I think these will sink." Next, they'll test their hypotheses by placing one item at a time into the water. As students test an item, they should record how it responds on the George Shrinks Record Keeping Sheet.

**Suggested Reading**

Make this Center available for several days so that children will have the opportunity to work independently and unhurried. Findings can be recorded either pictorially or in words on the handout. Completed worksheets will indicate who has participated.

**Home Connections**

Send a note home asking parents and children to inspect their homes together looking for leaks or drippy faucets where water may be wasted. Encourage them to fix the problems!

**Teacher Tips**

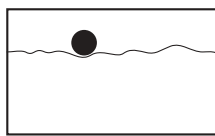
"The Magic School Bus at the Waterworks"  
by Joanna Cole

**REPRODUCIBLE PAGE**  
**WATER POWER**

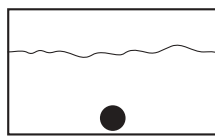


**George Shrinks Water Station • Will it float? Will it sink?**

**HYPOTHESIZE • EXPERIMENT • RECORD**







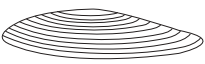

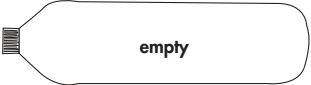


**FLOAT**



**SINK**

For each object below, please draw an X in the float or sink column indicating which category you think the object belongs to.

			<b>Pencil</b>
			<b>Button</b>
			<b>Plastic Spoon</b>
			<b>Cork</b>
			<b>Wooden Block</b>
			<b>Coin</b>
			<b>Shell</b>
			<b>Water Bottle (Full)</b>
			<b>Water Bottle (Empty)</b>

## **WATCHING WATER WORK**

Exploring how some things dissolve in water and some things do not.

**Learning Area:** Critical Thinking, Forming Hypotheses, Experimentation

**Episode: "Down the Drain" Synopsis:** When George accidentally drops a diamond ring down the sink. To retrieve it, George goes down the drain and has to conquer many water-filled obstacles before he can recover the ring.

### **Objectives:**

Children will:

- \* Explore how some substances respond differently when placed in water.
- \* Experiment with water to determine which substances dissolve, which do not.
- \* Record the results of their experiments.

**Grades:** K-2

**McRel Standard(s):** Physical Sciences – Standard 8.1, Knows that things can be done to materials to change some of their properties, but not all materials respond the same way to what is done to them. Nature of Science - Standard 12.1, Knows that learning can come from careful observations and simple experiments.

**Core Curriculum Area(s):** Physical Science

**Materials Needed:** chart paper and crayons or colored markers, clear disposable plastic cups, plastic water pitcher, labeled containers with the following items: [salt, sugar, flour, beans, rice, sand, baking soda], small spoons for measuring, plastic pail or tub for clean-up, handout

### **Think & Do Activity Preparation:**

1. Photocopy the handout, Watching Water Work - one per child.
2. Set up a Watching Water Work Station. Separate different experiment substances (salt, beans, etc.) into individual containers that are clearly labeled.

### **Think & Do Activity Description:**

1. Talk about water as a precious resource that can change forms. When frozen it becomes ice. When heated it becomes steam. When ice melts it becomes water again. Just as water can change forms, it can also change substances that are added to it.
2. Introduce the Watching Water Work Station. Demonstrate how to conduct water experiments. (Use items or substances different than the ones you want children to use in their own experiments.) Set rules and expectations including the number of students who can work at the Center at once and clean-up procedures.
3. Pose the following questions: "What happens when things are placed in water? Do all things act the same way in water?"

#4-5 Continued on next page

#### **Suggested Reading**

"A Drop of Water" by Walter Wick

#### **Home Connections**

Have children observe as parents cook or prepare meals. How does water change things and how do certain things change the water?

#### **Teacher Tips**

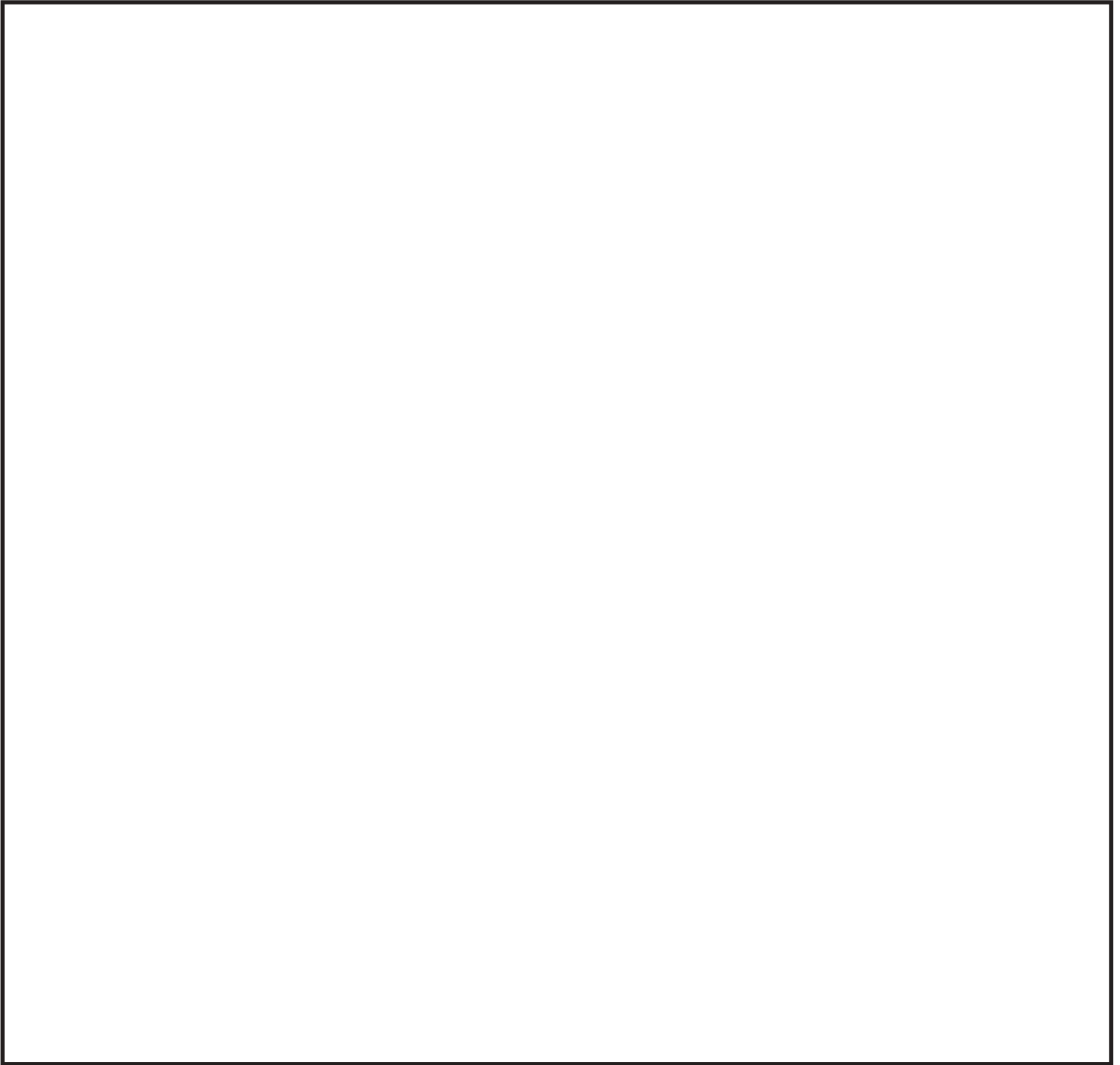
Have this center up for several days so that children will be able to work independently and unhurried. The completed worksheets will indicate who has participated.



***Think & Do Activity Description: Cont'd***

4. Encourage children to work at the Watching Water Work station and provide them with 3-4 cups.
5. Children may work independently or in pairs. Have them pour water into the clear plastic cups. They should then test their hypotheses by placing one substance at a time into the water and recording what happens. Did it dissolve? Did it not? Use the hand-out to record experiment findings either pictorially or in words.

**WATCHING WATERWORK  
OBSERVATION PAGE**

A large, empty rectangular box with a black border, intended for students to write their observations during the activity.

**ME AND MY FAMILY**

Learning about those who love us.

**Learning Area:** Analyzing information, Comparing, Valuing Differences

**Episode:** A central theme in all George Shrinks episodes is the warm relationship George shares with his family. This activity may be used in conjunction with any George Shrinks show!

**Objectives:**

Children will:

- \* Listen to the story, "Families Are Different."
- \* Explore the idea of different family types and configurations.
- \* Draw pictures of their family.
- \* Help fill in a horizontal wall graph showing sizes of each child's family.
- \* Read the wall graph making contrasts and comparisons of family sizes.

**Grades:** K-2

**McRel Standard(s):** Behavioral Studies - Standard 2.1, Knows that people belong to some groups because they are born into them and to some groups because they join them.

Math – Standard 6.1, Understands that observations about objects or events can be organized and displayed in simple graphs.

**Core Curriculum Area(s):** Social Studies, Math

**Materials Needed:** large wall graph, drawing paper, crayons, or colored markers

**Think & Do Activity Preparation:**

Prepare a large, horizontal wall graph with children's names (vertically); and "Number of People In My Family" (horizontally).

**Think & Do Activity Description:**

1. Read the book "Families are Different" (or a similar story about family diversity) to the children.
2. Ask the class what they think "family" means. Help them to understand that a family is a group of people who may or may not live together – but always care about each other. Discuss the fact that there are many kinds of family units and that sometimes, if parents or guardians do not live together, a child might even have two families!
3. Ask students to talk about their families (which can be composed of parents, guardians, care providers, siblings, close friends – and even pets)!
4. Have children draw a picture of themselves with their family members.
5. Refer to the wall graph, explaining that a graph is a way to count. Tell the children that each of them will find their own name, and after it, color in a square for each family member. (Help younger children with this, as necessary.)
6. When the graph is complete, refer to it to make contrasts and comparisons such as: "How many families are there with 4 people? Who can find a family that is smaller than Paul's?" etc.

**Suggested Reading**

"Families are Different" by Nina Pellegrini  
 "Fathers, Mothers, Sisters, Brothers" By Mary Ann Hoberman

**Home Connections**

Prior to doing this activity, encourage child(ren) to talk with parents/guardians about family members that do not live in their home (i.e., aunts, uncles, close friends, etc.).

**Teacher Tips**

Add items to the dramatic play area that will encourage children to take on family roles.