Thinking BIG, Learning BIG:
Connecting Curriculum in a BIG Way

What Is Thinking BIG?

- Using science topics to connect math, literacy, language, art, drama and games.
- Inviting children to observe, question, explore, create.
- Immersing children in topics throughout the program indoors and out.
- Extending explorations over time.

Benefits of Thinking BIG

- Exploring children's interests & questions empowers them.
- Activities build cooperation & problem-solving.
- Behavior improves.
- Assessment is built in.
- School-home communication increases.

BIG Science

- Inquiry promotes an attitude of wonder.
- Science focus gives children time to observe and explore.
- Inquiry nurtures higher-level thinking.
- Action engages kids. Wind blows. Balls roll.

BIG Math

- Whole-body activities give a real feel for numbers.
- Gross motor games build math and physical skills.
- Children quantify observations.
- Graphing organizes information.

BIG Literacy

- Recording comments shows power of words.
- Labeling increases print awareness.
- Learning poems and songs boosts pre-reading skills.
- Acting out stories fully involves children.

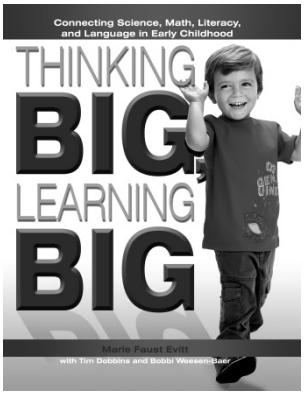
BIG Language

- Children learn rich vocabulary in context.
- Empowers speaking, reading and writing.
- Builds reading comprehension.
- Kids love BIG words like astronaut and Tyrannosaurus rex.

Activities meet national standards while children have fun.

Thermometer
by Tim Dobbins

Rising sun
And falling snow,
Hot is high
And cold is low.
Skinny red line tells us for sure
Exactly what's the temperature.



Thinking BIG means Learning BIG

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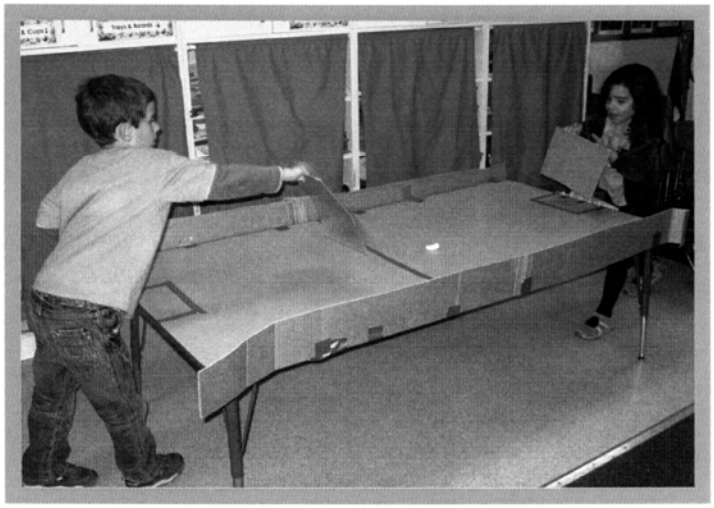
Thinking BIG, Learning BIG: Connecting Science, Math, Literacy and Language in Early Childhood, featuring activities from the Mountain View Parent Nursery School, is available from Gryphon House.

Air Soccer

WHAT TO DO



1. Work with a small group of children. Two children stand on opposite ends of the table, each holding an 8″ x 8″ cardboard piece. Invite them to fan their faces with the cardboard so they can feel the *air* move.
2. A third child places a packing noodle in the center of the table. The children with cardboard try to fan the packing noodle to the goal at the opposite end of the table. Tell them, "Use only *wind* power. No touching the noodle."
3. The children enjoy moving the packing noodle up and down the table. There is no need to keep score. If other children are waiting, set a timer to take turns.
4. Invite the children to observe where it works best to fan the packing noodle—behind it or above it. This is a good opportunity for you to reinforce directional vocabulary words, such as *above*, *behind*, and *in front of*.

SUPERSIZE IT!

The children can play *air* soccer indoors or outdoors with a light beach ball or partially inflated sturdy balloon on the ground. Remind the children not to kick the ball. Say, "In this game, only the *wind* can touch or move the ball." Several children may need to fan together to get a beach ball to move. **Safety note**: If a balloon pops, it is essential to pick up **all** the pieces.

DISCUSSION STARTERS

Use these questions to spark children's thinking during and after the activity:

- How can you make the packing noodle go where you want?
- Which type of fanning works best, light waves or strong waves?
- How is this game like any other games you have played?

SKILLS ASSESSMENT

Use these questions to determine a child's abilities and understanding:

- Can the child manipulate the cardboard?
- Does the child try different methods of fanning?
- Does the child enjoy the game?

FOCUS AREAS

Science: experimenting with air movement

Gross Motor: practicing eye-hand coordination

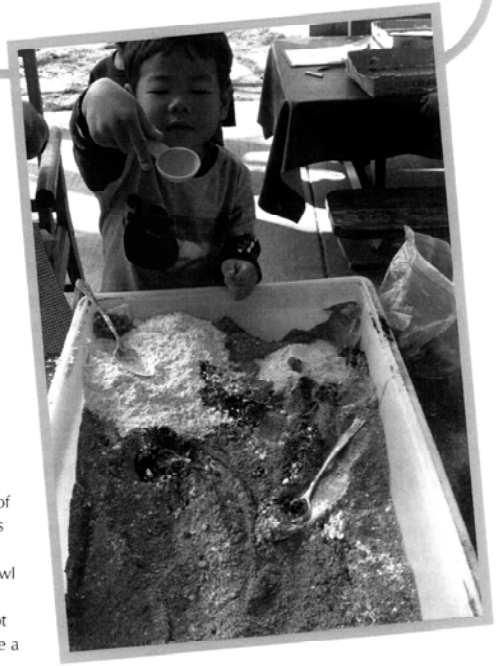
MATERIALS

Packing noodles
2 rigid cardboard pieces about 8″ x 8″
Cardboard strips about 5″ wide, enough to cover both long sides of a classroom table
Table
Masking tape
Sand timer (optional)

PREPARATION

- Create a "playing field" by taping strips of cardboard about 5″ high to the sides of a table.
- Make goals at the ends of the table with masking tape. (See photo)
- Mark the centerline with masking tape.
- Cut cardboard into two pieces that are about 8″ x 8″.

Make Pretend Moon Dust



FOCUS AREAS

Science: learning about the surface of the *moon*
Math: counting, measuring—volume, following a recipe
Language Arts: learning vocabulary
Sensory: feel of ingredients

MATERIALS

Chart paper
Marker
Assortment of 1 cup and ½ cup measuring cups
Spoons
Sturdy bowl or tub
Sensory table or other large flat container
Small rocks and pebbles (optional)
Toy *astronauts* and space vehicles (optional)
Variety of gloves, such as dishwashing gloves, so the children can pretend they are astronauts feeling "*moon* dust" **Note:** The gloves are an optional astronaut prop. "*Moon* dust" is safe for the children to handle without gloves.
Magnifying lenses

PREPARATION

- Ahead of time, ask a coffee shop to save used coffee grounds for you, the more the better. Dry out the grounds by spreading them out on cookie sheets in the sun or a 250° oven.
- Write the recipe on chart paper. Add illustrations of the ingredients or steps (optional).

WHAT TO DO

1. Invite a small group of children to take turns measuring the ingredients into a bowl or plastic tub. The measurements do not have to be exact. Use a variety of sizes of measuring cups to compare amounts: "How many of these smaller ½-cup measures will it take to fill this BIG 1-cup measure?"
2. The children take turns stirring with spoons and mixing with their hands. When mixed, add the "*moon* dust" to the sensory table.
3. Make as many batches as you need for your sensory table. Consider making additional batches for the following *crater experiment*. The mixture looks remarkably like the gray dust of the *moon*. The mixture compacts well and makes a nice squeaking sound when squeezed. The children enjoy adding "*moon* rocks" and *astronauts*.
4. Encourage the children to use magnifying lenses to examine the *moon* dust and *moon* rocks.

Moon Dust Recipe
For each batch you will need:

- 4 cups dried coffee grounds (Used grounds are free from some coffee shops)
- 4 cups cornstarch
- 2 cups sand

Measure ingredients and stir with spoons and hands.

DISCUSSION STARTERS

Use these questions to spark children's thinking during and after the activity:

- How does the "dust" feel?
- How does the "dust" sound when you squeeze it?
- What do you think it would feel like to walk in dust like this on the *moon*?

SKILLS ASSESSMENT

Use these questions to determine a child's abilities and understanding:

- Does the child note the difference between different size measuring cups?
- Does the child use the measurement vocabulary of *more than*, *less than*, *larger*, and *smaller*?
- Does the child use the sensory vocabulary of *soft*, *smooth*, or *powder*?

Crater Experiment: How Do Craters Form?

FOCUS AREAS

Science: planning and conducting a simple investigation; using simple equipment and tools to gather data; learning about the position and motion of objects

Math: measuring—size, estimating

Language Arts: learning vocabulary

MATERIALS

Books with photo illustrations of the *moon* surface, (see Good Books for Facts and Fun on pages 222–224) or downloaded images from the Internet

Prepared "*moon* dust" from the sensory table

Assortment of marbles, golf balls, small stones, baseballs, and other balls

Metal baking pans or plastic tubs, the larger the better

Tongue depressors, craft sticks, or combs to smooth the "moon dust" surface

Standard and nonstandard tools to measure, such as rulers and Unifix cubes

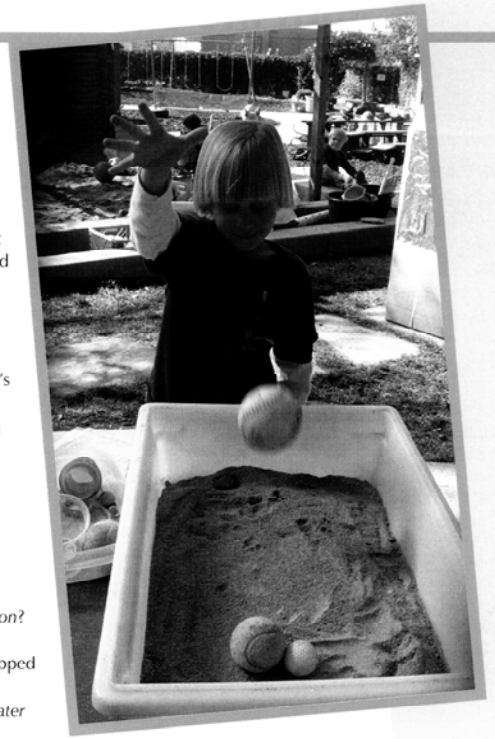
Assortment of round plastic or metal lids in different sizes, such as lids from milk jugs and yogurt and deli containers, washed thoroughly

TEACHER-TO-TEACHER TIPS

- It's possible to do the *crater experiment* in the sensory table but children may approach the activity more scientifically if they work in metal baking pans or shallow plastic tubs.
- Children often hesitate to make *predictions* because they don't want to be wrong. You can encourage *predictions* by making one yourself that is not likely to happen, such as saying, "I think this tiny marble will make a huge *crater*, much bigger than the one the golf ball made. Let's see if that's what happens."

WHAT TO DO

1. Show a small group of children photos of the *moon's* surface.
2. Introduce the word *crater*. A *crater* is a bowl-shaped hole created when a chunk of rock from space crashes into a *moon* or planet. *Craters* can be as tiny as the size of your fingernail or as BIG as huge cities. Say and clap out the syllables, **cra**-ter. Say *crater* as you act it out with your whole body, standing up, then crouching down, and standing back up while moving your outstretched arm in a giant arc from shoulder height down to the floor and back up. (**Note**: This is not an ASL sign.)
3. Tell the children they are going to do an *experiment* to explore how *craters* are formed on the *moon*. Remind the children that an *experiment* is a test to see what will happen. When scientists do an *experiment*, they predict what they think will happen. This is called a *prediction*. (See pages 40–41 for signs for *experiment* and *prediction*). Say, "When we do the *experiments*, you can make *predictions* about what will happen when we make *craters* like the ones on the *moon*."
4. The children choose a marble, pebble, or ball. Ask, "What do you think will happen when you drop it in the *moon* dust? Will the dust fly out? What's your *prediction*? Try it."
5. How wide across is the *crater* that formed? The children measure the *crater* with a ruler or Unifix cubes. Invite them to compare the *crater* with an assortment of round plastic lids. Is the *crater* bigger than the milk cap? Smaller than the jar lid?
6. The children then smooth out the dust with a tongue depressor or craft stick and choose a different size "space rock." Ask the children to *predict* whether that object will make the same size *crater* or a larger or smaller *crater*. Then they drop their object. What happens? (For younger children, have them drop two different items and compare the *craters* before smoothing out the dust.)
7. What happens if they drop the pebble from a much higher distance? What about a closer distance?
8. What happens if the children make a deep pile of dust and then drop a rock into the pile?



MORE IDEAS

- Try dropping objects that are different shapes such as a key, a stick, and a crayon. What shape *craters* do they make?
- To be more scientific, use large cardboard blocks to keep the drop height consistent. The children rest their wrist on the top of a block and then drop the pebble. Stack two blocks for higher drops.

DISCUSSION STARTERS

Use these questions to spark children's thinking during and after the activity:

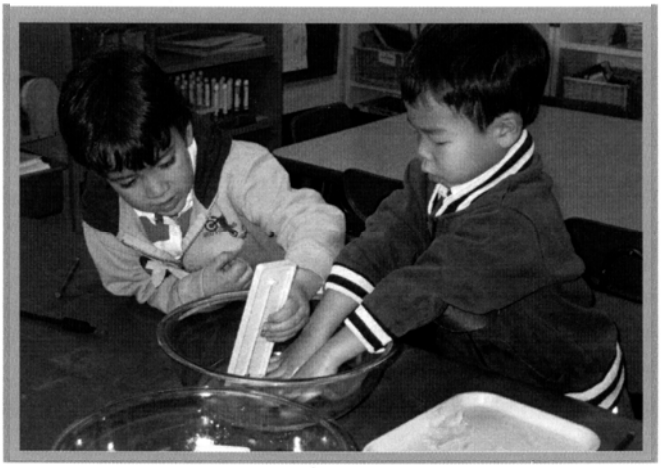
- What would it be like to climb in a BIG *crater* on the *moon*?
- What would it feel like to walk in *moon* dust?

SKILLS ASSESSMENT

Use these questions to determine a child's abilities and understanding:

- Is the child able to make a *prediction*?
- Does the child see a connection between the size of the object dropped and the size of the *crater*?
- Is the child able to compare the *crater* size with a lid?
- Does the child enjoy repeating the process of making *predictions* and testing them?

What Is Your Cold Count?



My Cold Count Experiment				My Cold Count Experiment			
Name				Name			
Count Prediction		What Happened		Count Prediction		What Happened	
5	10	5	10	5	10	5	10

WHAT TO DO

1. Work with a small group of children. Invite each child to write with a pencil on their recording sheets. (They will write again later with a pencil when their hand is cold and compare it to this writing.) Older children can usually print their name. Younger children can make some letters or a squiggle.
2. Demonstrate the activity. Say, "I wonder how long I can hold my hand in the ice water. I *predict* I'll be able to keep my hand in the water for a count of five." Have the children count with you. It's up to you whether you keep your hand in the water for more or less time. (See Teacher-to-Teacher Tips on estimating and *predicting*.)
3. Invite the children to place a *thermometer* in the ice water and notice how the "skinny red line" goes down.
4. Challenge the children to predict how long they can hold their

FOCUS AREAS

Science: planning and conducting a simple investigation, communicating investigations and explanations, exploring properties of objects and materials

Math: counting, estimating, communicating results

Fine Motor: writing with pencil

MATERIALS

Bowl of ice water large enough to fit a child's hand
Paper towels
Pencils, 1 per child
Sturdy child-safe *thermometers* (not mercury)
Recording sheets, 1 per child

PREPARATION

- Prepare recording sheets for children to *predict* how long they can keep their hands in a bowl of ice water—five or 10 seconds. Make one copy for each child.

hands in the ice water. Help them circle the five or the 10. Older children may enjoy writing the number or choosing a different number.

5. The children put their hands in the ice water. They count to five or 10, or as long as they have their hands in the water.
6. The children write their names with their cold hand and circle their actual count or write the number. Is it longer or shorter than their prediction? Ask, "Is it easier or harder to write with an ice-cold hand?" (Our sense of touch doesn't work as well when we are cold.)
7. The children dry off their hands and rub them together to warm up.
8. Save the recording sheets in each child's portfolio.

MORE IDEAS

- After the children have done the first cold count, they coat an index finger in Vaseline. Ask them to feel the ice water with a bare finger and the Vaseline-coated finger. Do they feel a difference? The Vaseline is similar to blubber that Arctic animals have. Their blubber insulates them from the cold.

DISCUSSION STARTERS

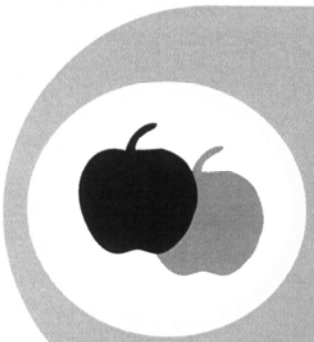
Use these questions to spark children's thinking during and after the activity:

- How does your hand feel when it is in the water?
- How does it feel when you take it out?
- How does your hand look when it is cold? What changes can you see?
- How does your body feel when your hand is cold?
- How can you warm up your hands when they are cold?

SKILLS ASSESSMENT

Use these questions to determine a child's abilities and understanding:

- Is the child able to count to 10?
- Does the child know the concepts of *more than* and *less than?*
- What is the child's pencil grip?



TEACHER-TO-TEACHER TIPS

- *Predicting* and estimating are tough skills for children to master, especially because they want to be right. You can help children understand that it is okay not to always be right by *predicting* incorrectly yourself. Say, "I predicted that I could leave my hand in the ice water while I counted to five but the water was so cold I could only leave my hand in the bowl for three."
- Don't worry if the children are not counting at an even pace. It's natural for them to speed up or slow down to make their *prediction* accurate.
- Many children can keep their hands in the ice water much longer than a count of 10.

My Cold Count Experiment

Name

Count Prediction		What Happened	
5	10	5	10

My Cold Count Experiment

Name

Count Prediction		What Happened	
5	10	5	10

CHAPTER 7 | THINKING BIG ABOUT ICE: BRRR, IT'S COLD! THINKING BIG, LEARNING BIG
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