The InvestiGator Club™ Prekindergarten Learning System

Investigations

TEACHER'S EDITION

Integrated Activities for Exploring, Experimenting, and Making Discoveries

Wet and Wonderful Water

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Part 4 How Does Water Change?

Water is amazing. It can be a solid or a liquid. Water can disappear altogether as a gas. Children are amazed to see these changes take place. Melting ice is the most familiar experience children have with changing the state of a substance. Tell children: *During this Investigation we'll mix a whole lot of science with some math, art, music, movement, language, motor skills, and dramatic play to learn more about the ever-changing nature of water. So let's start investigating!*

Science/Math/Language

Is it water or is it ice? Children discover the ever-changing nature of water.

Materials

- water
- Ziploc® plastic bags
- paper toweling or newspaper

Presto Change-O

Have children put water in two Ziploc® bags and seal. Place one bag of water in a freezer. Leave the second bag at room temperature. Ask: *Will the water in both bags stay the same or will the water in one bag change?*

- Once frozen, remove the bags from the freezer. In case of spills, have children place both bags on paper toweling or newspaper to examine. Talk about how the liquid water moves in the bag, whereas the solid water does not move. Ask: *How are the bags the same? How are they different?*
- As time passes have children watch the bag of ice and describe how it continues to change. Ask: *What happened to the solid ice once it melted?* (It changed into a liquid—water.) Talk about how the water changed from a liquid to a solid and back to a liquid again.

Movement/Music/Math

Children become icicles, snowflakes, and raindrops to demonstrate different forms of wet weather.

Materials

- musical recording
- tape or CD player

Freeze Like an Icicle

Talk about the different forms of water in the weather: ice, snow, rain. *What happens when snow falls and piles up? What happens when snow or ice melts? What makes icicles or snowflakes change shapes? What forms when a lot of rain falls?* Engage children in creative movement:

- Have children twirl around like snowflakes as you play music. Count from 1 to 10 together, then stop the music and have them freeze in place like an icicle.
- Start the music again and have the icicles start to melt into a puddle while you count down together from 10 to 1.
- Play different music and have children dance like raindrops.
- Play again and have them skate on ice.
- Ask which kind of wet weather they liked being the best.

Health/Science

What happens when you mix a little science with a healthful food? Children have a tasty treat to enjoy!

Materials

- fruit juice
- paper cups
- craft sticks

Fruity Ice Pops

Explain to children that favorite fruit drinks are part water. Ask: *What do you think will happen if we put fruit juice in a freezer?* Follow these steps to make ice pops:

Make Ice Pops

Fill a paper cup with a favorite fruit juice.

Place the cup in a freezer.

When partially frozen, place a craft stick in the pop.

Once the juice is totally frozen, peel away the paper cup.

Enjoy the icy pop!

Science/Math

Children estimate how long they think it will take for an ice cube to melt in a variety of locations.

Materials

- self-stick color-coded dots
- ice cubes
- paper
- marker

Disappearing Cubes

This is a great experiment for a warm day. Give each child a self-stick dot with their initials and have them place it on an ice cube. Take the cubes outdoors and let the investigating begin!

- Have each child place the ice cube on different surfaces such as the grass, a wooden surface, a brick or concrete surface, a rock, dirt, or sand. Place some in the sunlight and others on the same surfaces but in a shadier area.
- Have children estimate how long they think it will take for their ice cube to melt. Record on chart paper each child's initials, where the cube was placed, and the estimated time.
- Have children watch closely to look for signs of melting. As the cubes melt, the self-stick dots can be placed on the chart with the exact time for melting.
- Ask many questions: *Which cubes melted the fastest? Which took the longest to melt? Why do you think some melted faster than others? Did the cube take more time or less time than your guess? Did the cubes melt in different ways?*

Indoor Option:

If you prefer doing the experiment indoors, place the cubes in cups and place them in various places throughout the room—near a window; near a heat source; away from a light or heat source; in the refrigerator; in cold, warm, or hot water.

Art /Science/Fine Motor Skills

Children observe how salt melts ice and create colorful designs using blocks of ice.

Materials

- water
- clean half-gallon paper milk cartons
- powdered tempera paint or food coloring
- paper cups or plastic containers
- coarse salt in shakers
- eyedroppers
- magnifying glasses
- tray layered with newspaper

Ice Block Designs

Beforehand, freeze water in half-gallon paper milk containers and make colored water using powdered tempera or food coloring and place in paper cups or plastic containers. When the water has frozen, tear off the cardboard and place each block of ice on a tray layered with newspaper.

Invite children to spend a little time examining the block of ice with a magnifying glass and reporting what they see. Continue with the following experiments:

- Have children sprinkle coarse salt on the blocks. Ask: *What happens to the ice?*
- Have children use eyedroppers to drip various colors of water on the ice. Ask children to describe what they see. They can examine closely using magnifying glasses. (Tunnels of color are created as the salt melts through the ice.)
- If the weather is agreeable, place the blocks outdoors and have children observe and describe what happens over time.

Literacy/Language/Science

Children listen for and generate rhyming words while learning about seasonal weather.

Materials

- Rhyming Pictures Activity Sheet

Ice Is Nice

Teach children the following rhyme about the seasons:

Wintertime is very nice
I go skating on the ice.
In wintertime I like to go
And build a snowman in the snow.
In spring dark clouds come floating by
Then rain drip-drops down from the sky.
Summertime means lots of fun.
Swimming and playing out in the sun.

- Repeat the rhyme, telling children to listen for rhyming words. Then ask: *Do the words* nice *and* ice *rhyme?* Repeat with these word pairs: *go, snow; by, sky;* and *fun, sun.* Ask children to repeat the rhyming words after you.
- Recite the rhyme again, pausing before the words *ice, snow, sky,* and *sun.* Ask children to say the missing rhyming word.
- Distribute copies of the Rhyming Pictures Activity Sheet. Send a note home to parents asking them to help children name and match pictures whose names rhyme.

Fine Motor Skills/Art/Science

Children create works of art using frozen colored water as their medium.

Materials

- water
- ice-cube trays
- powdered tempera paints or food coloring
- craft sticks
- finger-paint paper
- plastic gloves (an option you may want to use if food coloring has been used to color the water)

Ice Artists

Mix red, yellow, and blue powdered tempera with water and pour the colored water into ice-cube trays to freeze. Another option is to use 8 to 10 drops of food coloring in the water. (See note in Materials list.) Once the cubes are partially frozen, place a craft stick in each one to use as a handle.

Have children hold the colored ice cubes by the "handle" to color on paper. Ask: *What happens when you mix more than one color? What new colors did you make?* As another option, children can place some of the colored cubes into glasses of water. Have them observe and describe what happens.

What Happened

The water melted on the paper.

The ice cube made pretty colors.

I mixed red and yellow and made orange.

I put a blue ice cube in the water and the water turned blue.

Science/Music/Language

Children investigate mixing solids and liquids and discover what will dissolve in water and what will not.

Materials

- clear plastic cups
- plastic spoons
- water
- sugar
- salt
- sand
- cereal
- rice
- Kool-Aid®
- Jell-O®
- chart paper
- markers

All About Mixing

Display all the solids you want to mix with water. Remind children that a solid has a definite shape. Examples to use are sugar, salt, sand, cereal, rice, and Kool-Aid®. Ask: *What do you think will happen when we mix each of these things with water? Will the water change? Will the solid change?*

Have children work with a partner to investigate different mixtures. Provide children with plastic spoons and clear plastic cups to investigate. Begin by asking one pair of children to put water in the glass and add a teaspoon of sugar. Have it sit for a moment to see what happens. Then have the children stir the sugar while the group sings the following song to the tune of "Frere Jacques."

Stirring, stirring, stirring, stirring.
Water and (sugar), water and (sugar).
What happens to the water?
What happens to the (sugar)?
Will it change? Will it change?

- Invite children to respond to the question in the song. (The sugar dissolves, or changes into a liquid. The sugar is still there, though, because the water tastes sweet.) Explain that when a solid, such as the sugar, turns into a liquid, it dissolves.
- Repeat the process using different mixtures. Insert the name of what is being mixed with the water as you repeat the song. Find out what dissolves and what doesn't.
- As a finale, have children mix Jell-O® with water and chill. Discuss what changes take place here—solid + liquid = solid. Then enjoy!

Dramatic Play/Science/Fine and Gross Motor Skills

Children discover how heat causes water to evaporate while engaging in a dramatic play experience.

Materials

- painter's caps
- water
- buckets
- paint trays
- paint brushes
- paint rollers

Calling All Painters!

Invite children to pretend to be painters. Have them help fill buckets and paint trays with water. This will be their "paint."

Tell children to put on their caps and grab a brush or paint roller and head outdoors. They can "paint" the sidewalk, the steps, the building, the playground equipment, and so on.

Have children observe and discover what happens when the sun shines on the water after a while. Ask: *What do you think will happen as the sun shines on the water? Where does the water go?* Help children understand how the warmth from the sun heats the water and changes it from being a liquid to being a gas and disappearing in the air. Make a connection to the home when children may have seen a pot of boiling water or a tea kettle with all the steam rising as the water heats up.

Science/Math/Language

Children make a mixture called goop and discover that sometimes it's hard to tell if something is a liquid or a solid.

Materials

- water
- cornstarch
- one-cup measuring cups
- bowls
- spoons
- Liquid or Solid? Activity Sheet

The Magic of Goop

Use the following recipe to have each small group of children make goop:

Goop

2 cups of cornstarch
1 cup of water

1. Measure the cornstarch and place in a bowl.
2. Measure the water. Slowly add the water while stirring.
3. Continue stirring until the mixture thickens.

- Invite children to put their hands in the goop. They can try to pick up and roll it between their hands to make a ball. Then stop rolling and let the goop ooze away. They can use spoons to tap on the goop or stir it around.
- Allow children to continue playing to make their own discoveries. Ask questions such as: *How does the goop feel in your hands? What happens when you pick it up and squeeze it? When does the goop act like a liquid? When does it act like a solid?*
- Have children try changing the goop by adding more cornstarch or more water. *What happens now?*
- To explore the ever-changing nature of water, distribute copies of the Liquid or Solid? Activity Sheet. Have children circle L for the pictures that show water as a liquid, and S for the pictures that show water as a solid.

Music/Language/ Movement/Science

Children think about how the heat from the sun evaporates water while singing a familiar song using puppets.

Materials

- Itsy Bitsy Spider Activity Sheet
- scissors
- drinking straws
- tape
- large paper cups

Itsy Bitsy Spider

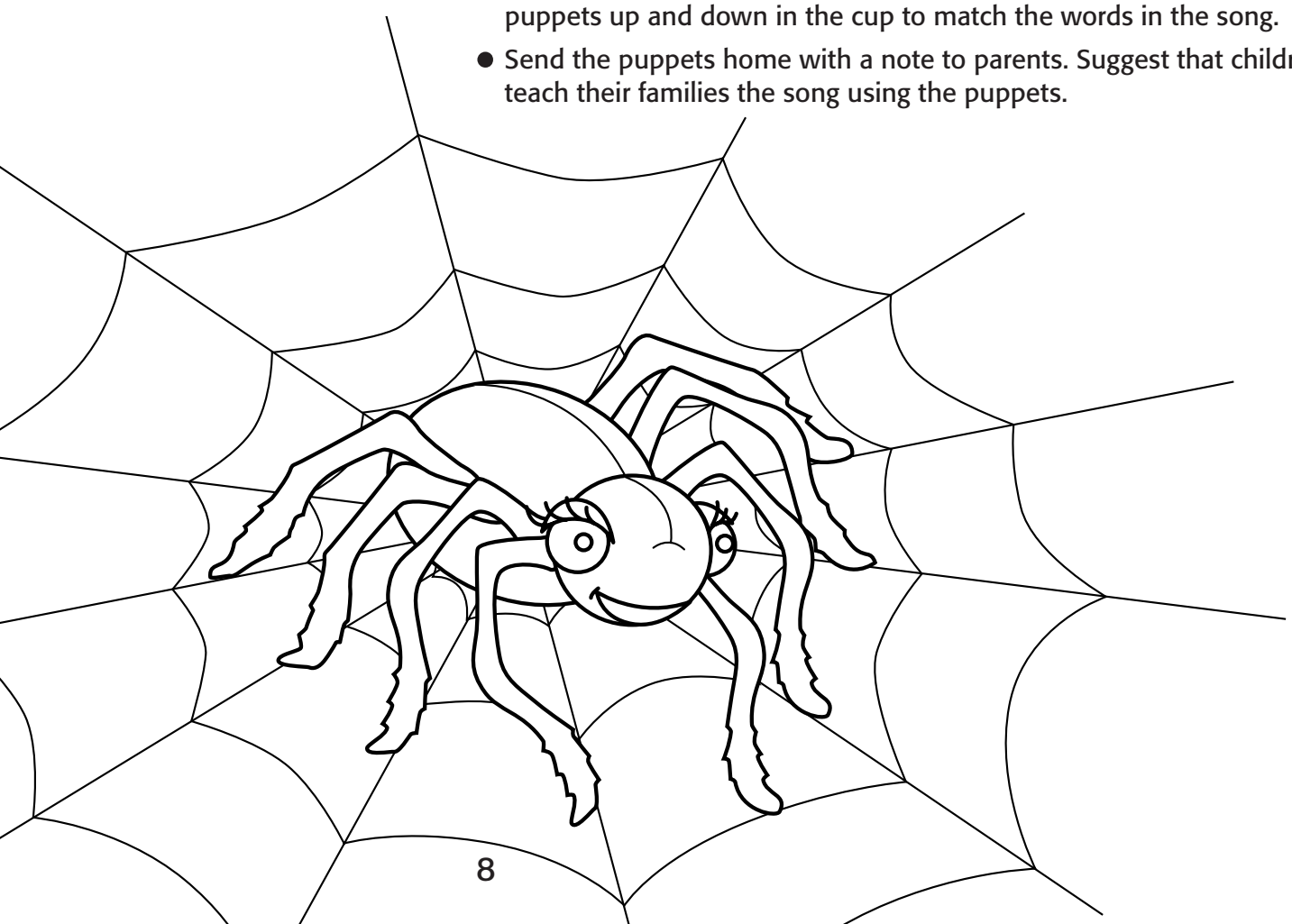
Sing or recite with children the traditional rhyme about the Itsy Bitsy Spider:

The itsy bitsy spider went up the water spout.
Down came the rain and washed the spider out.
Out comes the sun and dries up all the rain.
So the itsy bitsy spider went up the spout again.

Repeat the song and include hand motions. Then ask: *When the spider crawled up the water spout was the spout dry or wet? What happened when the rain fell? Why was the spider able to walk up the water spout again?*

Remind children that Great Auntie Lu loves to tell stories. They can tell the story of the itsy bitsy spider while singing the song using puppets!

- Distribute copies of the Itsy Bitsy Spider Activity Sheet. Help children cut out the patterns to make puppets in a cup. Have children color each picture and tape it to a drinking straw.
- Make three small holes in the bottom of each drinking cup. Children can push each stick puppet through a hole and pull the puppet down into the cup.
- Sing "The Itsy Bitsy Spider" again. As children sing, have them move the puppets up and down in the cup to match the words in the song.
- Send the puppets home with a note to parents. Suggest that children teach their families the song using the puppets.



Science/Math/Language

What can a child learn from a puddle? Some science mixed in with a little math!

Materials

- chalk

Puddle Watchers

What child can resist a puddle? Go outside after a rain shower to find some puddles. No rain? Make your own puddles. Talk about why water settles in certain places to form puddles.

Ask: *What do you think will happen when the sun comes out?* Then to keep an eye on the puddles, use chalk to have children draw a circle around each puddle to show the shape and size. Invite them to use size words to describe each puddle. *This puddle is big. This one is little. This puddle is the largest. This puddle is the longest.*

Visit the puddles later to see how they have changed. Use size words again to describe. *Did all the puddles become smaller? Did any grow larger?* Have your child mark the new size by drawing another circle. Continue a few times more until the puddles disappear.

Gross and Fine Motor Skills/ Cooperation

Children practice fine and gross motor skills while participating in a team sport.

Materials

- plastic foam blocks
- tongs
- containers such as buckets

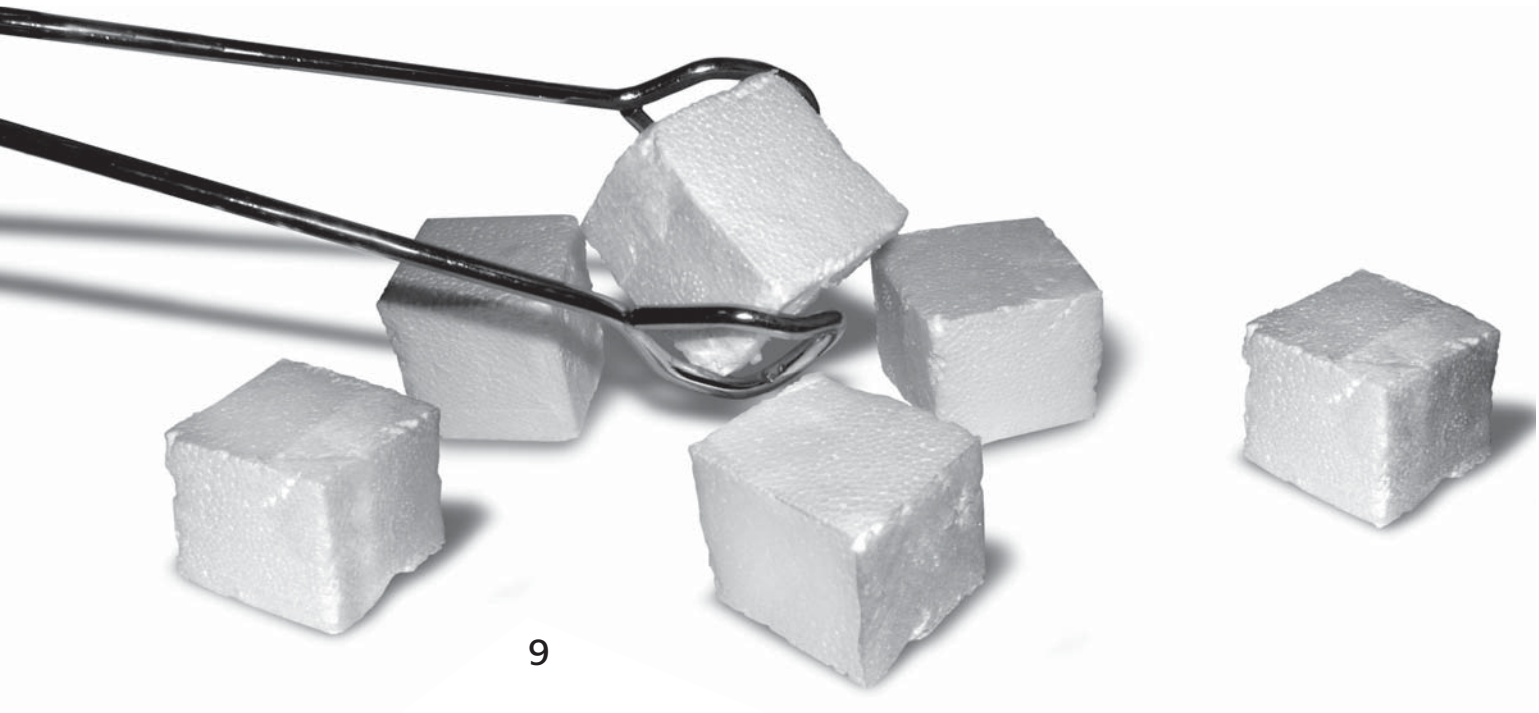
Ice-Cube Relay

Have children form teams. Mark off the race track. Place a container of "ice cubes" (plastic foam blocks) at the starting line of each team's track. Place an empty container at the finish line.

Demonstrate how team members will take turns using tongs to remove one "ice cube" (plastic foam block) from the container, race down and drop it into the second container, and race back to give the tongs to the next team member.

Sound the signal and let the race begin. As each team finishes, have them sit down until the others finish. Everyone is a winner because they finish the task.

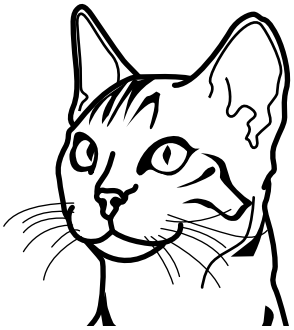
Change group members and play again or save for another day.

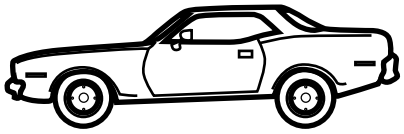


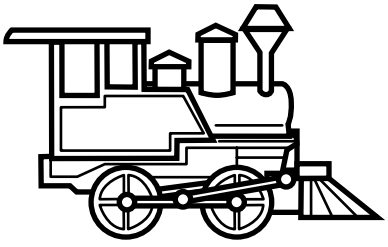
Name _____

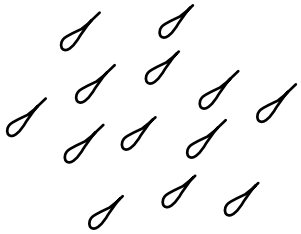
Rhyming Pictures

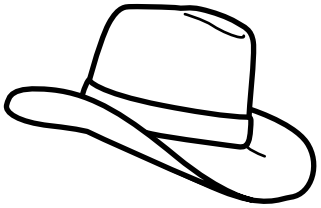
Draw a line to match pictures whose names rhyme.

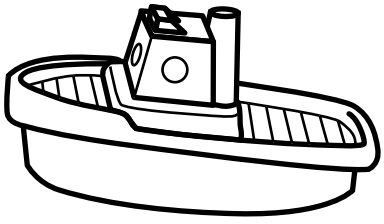


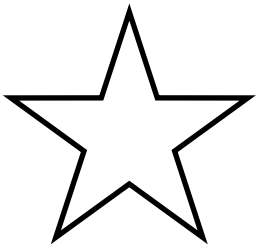










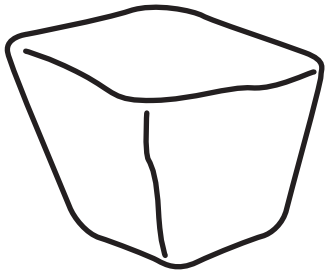


Investigation: Wet and Wonderful Water/Part 4

Name _____

Liquid or Solid?

Water can be a liquid or a solid. Circle **L** for **liquid.** Circle **S** for **solid.**



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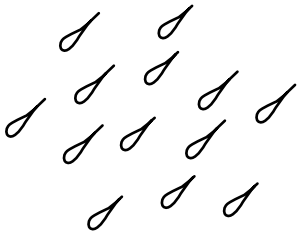

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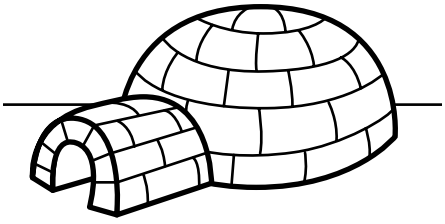

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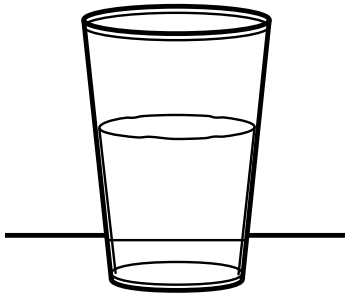

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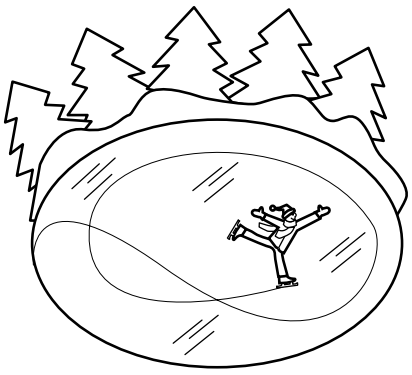

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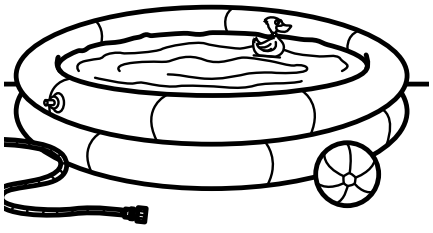

L **S**

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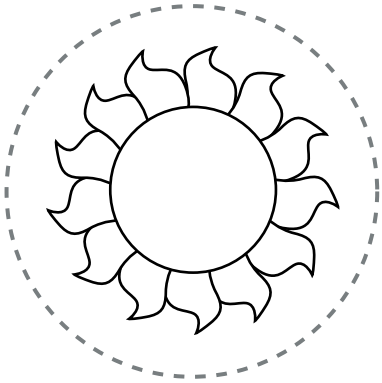
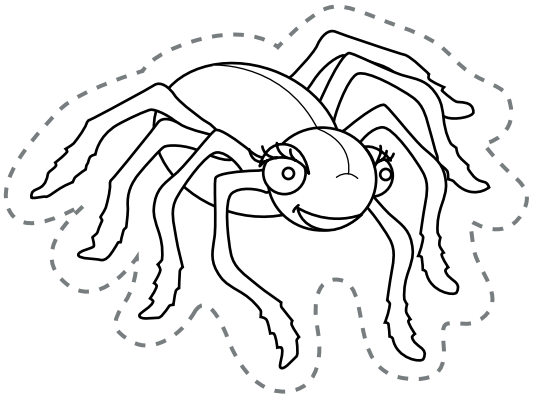
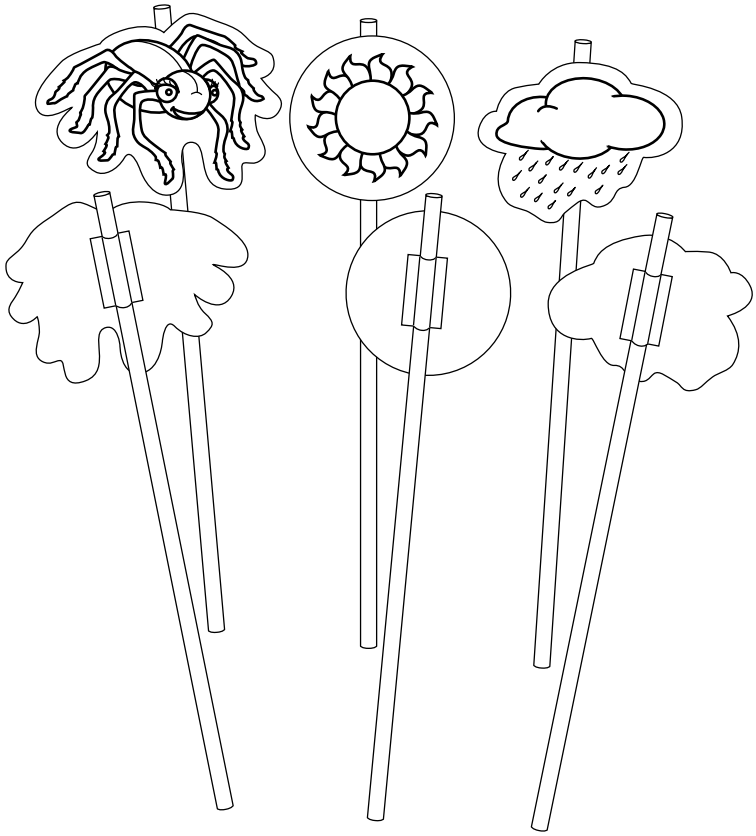
Activity Sheet

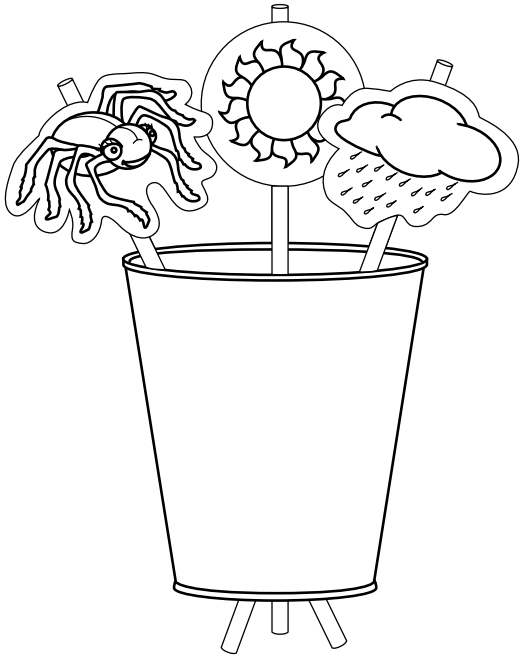
Name _____

Itsy Bitsy Spider









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Activity Sheet