

## Making and Using Sieves (For children ages 4-8)

Exploring the properties of water using homemade sieves

| 30 – 40 minutes |

### Skills Developed:

- Comparing
- Fine motor skills
- Model making
- Using senses
- Eye-hand coordination
- Hypothesizing
- Using tools

### Materials Needed:

- Containers, such as recycled styrofoam bowls, vegetable packaging, and foil pans
- Pencils with dull points and ball point pens to make holes
- A large basin (sink or bathtub)
- Plastic measuring cup or small plastic pitcher
- Sponges and/or paper towels for clean up
- Newspaper or plastic to protect table and floor

### What's the Science?

Making sieves from various materials is actually model-making, the scientific process of creating something physical to explain a concept or idea. For example, we know water or sand flows through a sieve, but how quickly and easily depends on the size and number of holes; how much friction the container causes; and the smoothness or roughness of the holes. Experimenting with different models of sieves will illustrate some of the properties of water. For example, small holes will make water droplets form and large holes will let the water flow in a stream. This is because small holes let less water through, creating less water pressure, and the water molecules will naturally pull into a shape with the smallest surface area – a sphere. But larger holes let more water through the sieve, and the force of gravity pulls the water down into a flowing stream.

### Getting Ready:

Fill a basin about halfway with lukewarm water. Set up the containers, pencils, and pens on a table away from the basin of water, but nearby so you can move to the water when the sieves are completed.

## Activity:

1. Gather a variety of sieves from the kitchen, for example, a colander, strainer, or flour sifter.
2. Hold up one of the sieves and ask:
  - How do we use this? Do you know what we call it? Tell me everything you can discover about it (e.g., it has little holes, it's metal, you can see through it).
3. Explain to your daughter that she's going to be making her own sieve and using it to experiment in water.
4. Demonstrate how to use the pencil or pen to punch holes in the containers. It's easiest to do this with the containers turned upside down so the points don't mar the surface below. Then have your daughter choose a container and make a sieve.
5. As she works, ask questions to help her think and observe:
  - Are you making a lot of holes or a few holes? Shall we count them together?
  - Why did you choose that number of holes? Are they all the same size?
6. After she has made a few different types of sieves, move over to the water basin and have her use a measuring cup or small pitcher to pour water into one of the sieves while holding it above the basin. If she needs help, hold the sieve while she pours. As she works, you may want to ask a few questions to spur her observations: such as:
  - What happens when the sieve is up high? What about when it's down low?
  - Does the water sound different?

7. Have her try the activity with some of the other sieves.

Together, make a fountain with two or more sieves by holding one above the other and watching the water flow through each.

8. As a continuation, experiment with the sieves during bath time.
9. On a different day, take the sieves to the park or beach, and try using the sieves with sand instead of water. As she works, ask questions such as:
  - How is the sand different from the water? How is it the same?
  - Is the sand flowing fast or slow? Can you change the flow? How?
  - Does the sand sound different when the sieve is held up high? When it is held low?

## Additional activities for different age-levels:

### 4 year olds

Ask your daughter what words describe the sound and feel of the water, for example, drop, rain, sprinkle, splash. Write down her words and ask her to draw illustrations. Make a book with her words and pictures. If you also used sand, create a comparison chart. Encourage the use of words like dry, wet, scratchy, and cool to describe the sand and water.

*Activities for different age-levels (con't)*

### **5-6 year olds**

With your daughter, create a chart to record her observations about how the number and size of holes influence the quickness of the flow and how the height she holds the container and the force used in pouring influences the result. Count the holes in each sieve and draw the size of the drops they create. Design a symbol for fast flow and slow flow.

### **7-8 year olds**

Ask your daughter to make suggestions for other experiments with sand and water. Spark her thinking with questions like: What other tools can we use besides sieves to learn more about how sand and water flow? (Basters, straws, watering cans, and funnels are some possibilities.) Record the different experiments with drawings or charts.

## **If Your Child Has a Disability**

### **For a child who is blind or visually impaired:**

You can use things like wood or plastic knitting needles to make the holes in your sieves. Have your daughter place her hands under the sieve to feel where and how fast the water is flowing. Have her listen to the sound of the water as it flows from sieves with many or few holes and sieves with small or large holes, and ask her to describe the differences in sound.

### **For a child who is deaf or hard of hearing:**

Review ASL and English (or child's native language) vocabulary words and concepts, such as "sieve," "colander," "flow," and "sprinkle." Have her feel the water as it flows from sieves with many or few holes and sieves with small or large holes, and ask her to describe the differences in what it feels like. Draw a picture about the activity.

### **For a child who is physically disabled:**

Create easy-to-handle hole-making tools by taping on padding, such as a sponge or foam, to a pencil or knitting needle. Modify questions so they can be answered with "yes" or "no." Have your daughter feel the water and sand flowing through the sieve and listen to the sound of both materials. Ask her "yes" or "no" questions about the feeling and the sound, for example, "Does the sand feel tingly when it hits your hand? Does it sting? Does the water sound like rain? Does it sound like a shower?"

### **For a child who has learning/emotional disabilities:**

Create easy-to-handle tools. Closely supervise the sieve-making activity to ensure safety and help with coordination. Let your daughter focus on listening to the sound of the water or the sand as it flows and feeling it with her hands. Ask "yes" or "no" questions about what she hears and feels.



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**Science:  
It's a Girl  
Thing!**