

MATERIAL MATTERS (*Sink & Float*)

Description

Sometimes adults put objects at the water table we know will sink and float without thinking deeply about the impacts of the material itself on sinking and floating. In *Material Matters* we ask you to be thoughtful about the items at your water table by focusing on the material of the objects. Allowing children to explore objects of the same size and shape that are made from different materials gives them the opportunity to begin to understand that material affects whether something sinks or floats in water.

Learning Objective(s)

- Children will explore and describe how different materials behave when placed in water.
- Children will learn and use the words *sink* and *float*.



Vocabulary

- float (*flotar*)
- modeling clay (*plastilinaa*)
- shape (*forma*)
- sink (*hundirse*)
- wood (*madera*)
- metal (*metal*)
- plastic (*plastico*)

Literature

For children

- *Who Sank the Boat*, by Pamela Allen

For teachers

- *Exploring Water with Young Children*, by Ingrid Chalufour and Karen Worth
- Investigating Water (MESS), by Head Start:
http://eclkc.ohs.acf.hhs.gov/hslc/tta-system/teaching/eecd/domains%20of%20child%20development/science/investigating_water_508checked.pdf

Website(s) for teachers

- PEEP and the Big Wide World - Explore Water:
www.peepandthebigwideworld.com/guide/water.html
- Sesame Street Science: Sink or Float? - START THE EXPERIMENT HERE
<https://www.youtube.com/watch?v=dyOS1Pv0eOE>

Tips for DLLs

Although the vocabulary words for this experience may not particularly be new, the materials will require meaningful conversations so as to emphasize the learning objectives effectively. It will be important to intentionally use specific words to both name and describe materials as they are used (e.g., “These items are all balls, but they are not made of the same material. What makes them different? How do they look how do they feel?”). Use of very specific words to model rich descriptions is important.

Materials (All examples of the same kind of object, e.g. bracelets, should be the same size and shape.)

- Balls (clay, metal, Styrofoam, wood, rubber)
- Blocks (metal, wood, foam)
- Clothespins (plastic, wood)
- Eggs (plastic, wood)
- Screws (metal, plastic)
- Spoons (metal, plastic, wood)
- Water
- Water smocks
- Water table or dishpan

Preparation

1. Collect the materials listed above for an exploration of sink and float. If you don't have all of the materials, it's okay. The idea is to be sure that examples of the same object (e.g., spoons) are the same shape and size. The only way they should differ is in the material they are made from.
2. Be prepared to explore sink and float over many days.
3. Consider having a Science Talk once a week with the whole group to share and reflect on student observations and discoveries about water (and other discoveries!).



Procedure

1. After developing an initial understanding of whether an object will sink or float during *Play Matters*, children are ready to explore one specific aspect of the same object, specifically, the material from which it is made. During your Morning Meeting or Circle Time, show children balls (or choose another set of similar shaped objects, like clothes pins or cubes) of the same size made from different materials. Be sure to choose at least one that will sink and one that will float. "I wonder which of these materials will float and which will sink? We will find out today!"
2. With a small group of children, talk about the objects you showed them earlier. Let the children touch and feel the objects. What do children notice? What are the objects made of?
3. Based upon their experiences with the materials, ask what they think will happen if they put the object in water. Will the metal ball sink or float? What about the wood ball? Why?
4. Note children's responses for use during your discussion after the lesson.
5. If the balls (or other objects) behave differently than children expected, talk about this with children. Ask them if they have noticed other objects made from the same material that behave the same way. The idea is to give children opportunities to understand that an object's material makeup (the material it is made out of) contributes to whether it will sink or float.
6. Reinforce this idea by introducing another set of objects (e.g., cubes) that are the same size and shape as each other, but differ in material.
7. Ask children whether they think the item selected will sink or float. (Make sure to allow them to hold the objects.)
8. Check if children have learned that (see also *Check for Understanding* below):
 - a. objects that are wood tend to float
 - b. objects made of metal tend to sink. (Plastic usually sinks, but not always.)
 - c. what an object is made of is related to whether it sinks or floats
9. Record children's thoughts so during your Science Talk or a whole group discussion, you can refer to your notes to help guide a conversation and questions about sink and float based upon the object's material makeup.

Tips for DLLs

When children respond to questions or prompts, the teacher should add to children's ideas or descriptions in English with new words and grammatical constructions. (e.g., Child: "the white ball floats. Teacher: "Yes, the Styrofoam ball does float, is there another one that does the same thing?"). This is an important point to consider when thinking about concept mastery and how it differs from language proficiency.

Include these materials at your Discovery or Science center or near the water table where children can continue to play and exploring.

Lesson Extensions

- *Testing out the Theory.* Children may be excited to try out their new theory that wood tends to float and metal tends to sink. Let children find something in the room made of wood and then metal and ask the class to predict what they think will happen.
- *Light & Heavy/Big & Small.* Now that the children have had experiences with, and developed ideas about sink and float, address the issue of heavy and light. Make certain children have had experience with the terms 'heavy' and 'light' in other contexts and that dual language learners understand the meaning (use their home language, if possible). Based upon their experiences, challenge children to predict which will sink or float (1) grape vs. grapefruit, (2) carrot vs. lime, or (3) wood block vs. coin. Have children share their ideas about the outcome of each. Does the heavier thing always sink? Does the bigger thing always sink? These experiences help children build knowledge that is important to (eventually) understanding density. We don't use the word *density* here, but we do provide relevant experiences to help children avoid the incorrect idea that heavy or big things always sink, and light or small things always float.

Check ✓ for Understanding - *Show Me!*

- Do children know what sink and float mean? TO CHECK – Say: "Point to an object in the tub that is floating."
- Can children tell you that wood tends to float? TO CHECK – Say: "What will this wooden ball do if I put it in water?"

Teacher Reflection Questions

1. How does developing children's understanding of an object's composition or material makeup help build a foundation for later understanding of sink and float?
(Possible responses: This activity supports understanding of sinking and floating through experimenting. Preschoolers – and some older people! – do not understand density, and they don't think about the relationship between the density of an objects' material and the density of water when predicting whether an object will sink or float. By helping children focus attention on the role of material in sinking and floating, we help them build a foundation for thinking about density and about sinking and floating not just as a property of a single object (It sinks. It floats.), but as a relationship between the object being placed and the liquid in which it is being placed.)
2. Why should a study of the same object made from different materials be included in your study of sink and float?
(Possible responses: By using examples of items that are the exact same size and shape, we isolate material as the attribute that is causing the item to float or sink. When they see, for example, a wooden spoon floating, a metal spoon sinking, and a plastic spoon sinking, they have first-hand experience that shows them that it is not that a spoon always sinks (or floats), or that a spoon-shaped thing always sinks (or floats), rather the material of the object plays a critical role. It is not the only factor, of course (Shape Matters!), but material matters.)