

# Let's Get Moving

## Summary

Students will predict and observe a variety of items and determine whether or not they will float or sink.

## Materials

Tub of water (similar to Rubbermaid)

A boat (you may wish to use a milk carton reserved from lunch cut in half lengthwise - you can glue the opening shut)

Various animals all the same size for each floating activity (don't mix sizes and weights together because the results would be difficult for the children to understand)

Items that sink and float for the initial demonstration (For example: paper clip, toothpick, pencil, rock, etc.)

Crayons

- [Who Sank the Boat?](#)  
(blackline) (pdf)

## Books:

- *Who Sank the Boat?*  
by Pamela Allen, ISBN: 13: 978-0698113732
- *Forces Make Things Move*  
, by Kimberly Brubaker Bradley, ISBN: 978-0-06-445214-4
- *Hands-On Science (Forces in Motion)*  
, by John Graham, ISBN: 978-0-7534-5348-3
- *What Makes a Magnet*  
, by Franklyn M. Branley, ISBN: 978-0-06-445148-2

## Background for Teachers

This is a discovery-type lesson in which students will predict and observe a variety of items and determine whether or not they will float or sink. The lesson begins with a short story about animals in a boat. Students often have a misconception that the last animal to get on the boat is the one who caused it to sink. Performing this experiment a variety of times and having an open-class discussion will often produce questions such as, "Whose fault is it?" and "Why is the last animal in the boat always the one that sinks it?" Through guided discussion, your students should come to the conclusion that the boat sinks when the weight becomes too heavy, regardless of which animal is the last in the boat. Some students may need an initial demonstration to help them clearly define floating and sinking. Helpful vocabulary words include float and sink. It is important for the teacher to let the students make this discovery on their own and not give too much direct instruction or information. When the children are allowed to experiment and try it out on their own, they will gain a deeper understanding and can then participate in the class discussion.

This lesson is only a small part of a larger unit about how objects move. Several additional activities at the end of this lesson may be used in conjunction with this lesson to provide students with a better understanding about how objects move. The lessons may be taught individually or in a small group rotation-type activity.

The math connection related to this lesson requires students to record information on a graph. The teacher may need to demonstrate simple graphing skills prior to this activity.

## Instructional Procedures

Invitation to Learn:

Launch (Introduction): (10 minutes)

Begin by reading the story, *Who Sank the Boat?* by Pamela Allen. Ask the children to think about why the boat would sink. Have them watch as you model what floating and sinking means with two objects. Quickly review vocabulary to assess if students have an understanding of the vocabulary. Invite them to act out the story for themselves to find out who really sank the boat and why.

Instructional Procedures:

Explore: (15 min.)

Divide children in small groups of 4 to 5 students per group. Fill large plastic tub 2/3 full with water and provide animals and a boat for each group. Allow the children time to put animals in the boat one at a time until the boat sinks. As the children are experimenting with this walk around and ask the following question: Which animal sank the boat?

Compare which animal sank the boats between individuals within the group. Students should observe that different animals "sank the boat." They may still have a misunderstanding that it is the last animal that sinks the boat, and not understand that it is the weight that sinks the boat. Encourage students to keep exploring by trying the same animals in a different order, or all of the same animals until the boat sinks.

Make connections between other groups (e.g., "Table one said it was the sheep's fault, is that what you found?" "Why didn't the sheep sink your boat instead of the cow?").

Continue using guided questions to help the children discover that it doesn't matter which animal sinks the boat; it is more important that the boat becomes too heavy.

Discuss: (10 min.)

Students return to the carpet where the teacher has a bucket, boat, and animals. Lead a discussion about each group's discoveries.

If students claim that a certain animal sank the boat, put that animal alone in the boat and question why it won't sink.

Did the same animal always sink the boat?

Further explore with students what many animals cause weight, and that the weight sinks the boat.

What does "too heavy" mean?

Solidify: (15 min.)

Students return to their desks with their math notebooks. Instruct them to respond to the prompt, "Why did the boat sink?" Students can draw pictures, write words, label, and draw arrows to explain their thinking. As they are doing this, interactively observe and question students' work, checking for understanding.

Practice: (15 min.)

Make copies of the attached blackline for each student.

Students will work in groups of four.

There are four blacklines per group.

Using one blackline, students take turns placing animals one at a time in the boat, coloring the corresponding square on the blackline to make a graph until the boat sinks.

Have them do this four different times working as a whole group, with each student having a turn to record the results.

Additional Lesson Activities:

Making Tracks

The purpose of this lesson is to teach the motions of "back and forth" and "zigzag." In the activity each student is given a cookie sheet, a piece of white paper that fits inside the cookie sheet, and paper plates with various colors of paint on each one. The students are also given several cars and some marbles (preferably one car and one marble for each paint color). The student will then roll the

car or marble in one paint color and place it on the cookie sheet. The student will pick up the cookie sheet and tilt it in various directions to make the tire tracks or marble tracks on the paper. The student may repeat this method as many times as he or she wishes using a variety of cars and marbles dipped in paint. Discussions following this lesson should emphasize the motion vocabulary back and forth, and zigzag.

### How Far Will It Go?

In this lesson students will explore the way objects roll. Divide students in to small groups and provide them with a ramp made from PVC pipe cut lengthwise and several balls of various sizes and weights, made of a variety of materials. Have the students angle the ramps using books or small boxes. Let the children explore by rolling each ball down the ramp and placing a piece of masking tape to show where the ball stopped. Students should keep the ramp at the same angle for each of the balls. After each one has been rolled and measured, change the angle of the ramp by adding more books or placing the ramp on a desk. Repeat the activity by rolling and measuring each ball as it rolls down the ramp. Children may change the angle of the ramp as many times as you would like. Discuss with the children whether or not changing the height of the ramp changes the distance each ball will roll.

### Extensions

Advanced learners will make predictions about how many of each animal the boat would hold before sinking. Additionally, you can guide them to understand that the placement of the animals in the boat will have an effect.

Formal assessment of non-typical learners can include verbal communication of what floats and what sinks.

Math integration: Students will analyze the graphs from their experiment. They will notice which graph had more animals, fewer, how many in total, etc. You may have to demonstrate graphing skills prior to this activity.

### Family Connections:

#### Assignments to do with parents:

Explore objects that float and sink in the bathtub or in the kitchen sink. Have students write/draw which objects they discovered floated or sank.

Students can make predictions before they place an object in the water. Will this float or will it sink? Why do they think it did or didn't float.

Students can create their own boats with objects that float. They can also explore with toys.

### Assessment Plan

Informal assessment will be the teacher observance of the answers to the guided questions.

Formal assessment will be the math notebook entry. Did the students understand what floating and sinking mean, and were they able to communicate that to you?

### Authors

[Stephanie Wall](#)