

## Orange You Glad You Are Learning about Density?

**Objective:** Students will explore the concept of object density by completing a simple investigation.

Standards: SL.K.1a K-PS2-1 SP3 SP4

Subject(s): Science

 60 minutes

### Opening - 10 minutes

In this lesson, the students are really going to be surprised when they test whether an orange floats or sinks. Getting an unexpected result can challenge our students' thinking, opening up new ideas and drawing new conclusions.

To begin the lesson, I remind the students about some of the learning that has taken place on density by asking them some questions.

*What determines whether an object sinks or floats?*

*What is density?*

*Does something float or sink if it has high density?*

*Do big items always sink?*

*Can you tell the density of an item by just looking at it?*

*Do you think lifting and feeling an object is enough to determine if something will sink or float?*

*You have learned a lot about the different types of things that sink or float. Today, we are going to make some predictions involving something you might have eaten for lunch, an orange. Let's go back to our work stations and get ready for experiment.*

### RESOURCES



Orange.jpg <https://betterlesson.com/lesson/resource/3211808/orange-jpg>

### Investigation-Part I - 15 minutes

#### Materials Needed for Each Work Station:

- **Large container full of water**  
I use empty pretzel and animal cracker containers. You are able to get a large amount of water in them and the students can view the investigation through the clear sides See [photo](https://betterlesson.com/lesson/resource/3211682/work-station-set-up) (<https://betterlesson.com/lesson/resource/3211682/work-station-set-up>).
- **4 oranges**  
Check each one to make sure it floats prior to the experiment. As a general rule, they do, but there can always be that exception.  
I pass the oranges out to each work group. I have the students make and share a prediction with their group members (see [video](https://betterlesson.com/lesson/resource/3211810/orange-you-glad-prediction-mp4) (<https://betterlesson.com/lesson/resource/3211810/orange-you-glad-prediction-mp4>)).

Once everyone has made their predictions, we count down and we drop the orange into the water. The students are surprised by the results.

I ask the students what happened? I then help guide the students through a discussion about what might be impacting why the orange floats. My goal is to get the students to think about the peel of the orange. Through our discussion, the students brought up (with some guidance) that the orange peel may be a factor in why the orange floats. Click on [video](https://betterlesson.com/lesson/resource/3211818/orange-you-glad-discussion-mp4) (<https://betterlesson.com/lesson/resource/3211818/orange-you-glad-discussion-mp4>) link to hear our discussion. This discussion will lead us to the next step in our investigation.

## RESOURCES



Orange You Glad Prediction.mp4 <https://betterlesson.com/lesson/resource/3211810/orange-you-glad-prediction-mp4>



Orange You Glad Discussion.mp4 <https://betterlesson.com/lesson/resource/3211818/orange-you-glad-discussion-mp4>

## Investigation and Discussion-Part 2 - 20 minutes

For our next step in our investigation, I instruct the students to peel the oranges. I assist them with this by pushing a spoon under the peel of the orange and lifting it away and then allowing them to continue peeling the orange.

Make sure they don't through the peel away because it will be used in just a bit.

Once the orange is peeled, I have the students pass it around and they make a prediction as to whether the orange will sink or float now (yes, sticky hands).

After everyone has made their prediction, the students hold the peeled orange over the water and we count off.

The students drop the orange into the water. At first it appears that the orange is going to float, but it slowly moves to the bottom of the water. See [video](https://betterlesson.com/lesson/resource/3211838/peeled-orange-drop-mp4) (<https://betterlesson.com/lesson/resource/3211838/peeled-orange-drop-mp4>).

After the students drop the orange, I have them each throw a piece of the orange peel into the water to see what happens. I use their observations from this to guide our discussions

We then discuss the results as a group. I ask them some questions

*I have heard some of you say that things that are heavy will sink. We took the peel off the orange, well now it weighs less because it doesn't have the peel, why did it sink even though it weighs less?*

*When you threw the peel in the water, what happened? So what do you know about the peel?*

*How could the peel effect whether the orange floats or not?*

The students came up with the peel has a low density and when it wraps all the way around the orange, it can support the inside's high density. Wow! I was impressed with their thinking.

To wrap up the lesson, I pose some questions for them. The questions start out very basic and build to a more complex question that allows them to apply the knowledge from the basic questions. This scaffolding helps the students feel more successful and take risks at challenging questions. It also provides modeling for the students how basic concepts can be linked to help our understanding of a more complex topic.

*What would happen if we dropped a lemon in the water? Would it sink or float? What if we peeled the lemon?*

I have them discuss this with a partner, but I tell them to keep their thoughts until tomorrow. Guess what we will be doing???

## RESOURCES



Peeled Orange Drop.mp4 <https://betterlesson.com/lesson/resource/3211838/peeled-orange-drop-mp4>



### INVESTIGATION, INVESTIGATION, INVESTIGATION: Connection to Prior Knowledge

The students have now participated in several lessons that have buoyancy and density as their focus. Someone might look at all of these lessons and wonder...why so many? Isn't one enough to help students understand sinking and floating and the concept of density? My answer...no.

By allowing the students to participate in a variety of investigations, they start making important connections. They are able to apply new concepts using background knowledge that has been developed. They are able to solve problems and think about new things to investigate. The interconnectedness of concepts and ideas plays out for the students. They also become proficient with related vocabulary as they are given multiple opportunities to use these words.

I am amazed at the connections that my students have made during our investigations. I honestly forget at times that they are just kindergartners. They are showing a thought process that surpasses anything I could have imagined! I am so proud of them.

Not only do these investigations develop my students' scientific skills, they also instill a love for learning through the excitement that each activity generates. The cheers and responses to each activity and the incessant questioning "Is it time for science?" tells me that I am on the right track. I am thinking now about how I can refine and enhance other units that I have created by adding more investigations.