Robogals
Science Challenge

Minor Challenge Set #1
STEM Field: Chemistry / Chemical Engineering
Level: Junior
Challenge Name: Will This Fruit Float or Sink?
Project cost: 0-20 USD
Materials Required:

- 3-5 large glasses, bowls or containers of roughly the same size
- 2 oranges
- Pen and notebook
- 3-5 pieces of other fruits or vegetable, for example:
    - Grape
    - Lime
    - Apple
    - Mushroom
    - Potato
    - Tomato

Duration:

- This challenge takes approximately 1 hour to finish, however, the time guideline is an estimation only, and students and mentors can complete the tasks around their schedules.

Introduction

How do objects float on water? Have you ever tossed a rock into a lake or river, or seen a ship or boat float on water? A little rock is definitely not as heavy as a ship, but why would a rock sink and the huge ship float on top of water?

In this project, we will conduct an experiment to see if different pieces of fruits or vegetables will sink or float in water. At the end of the project, we will do some investigation of a scientific concept called **buoyancy**.

Instruction

1. Fill each container about half way full with water.

2. Predict if the orange with peel will float, and record your prediction in table 1.

3. Slowly and carefully place an orange in one of the containers. What happens to the orange? Record the result in table 1.

4. Remove the peel from the second orange. Predict if the orange without peel will float, and record your prediction in table 1.

Fruit / Vegetable	Prediction (Float / Sink)	Result (Float / Sink)
Orange with peel		
Orange without peel		

Table 1. Record prediction and experiment result of if a particular piece of fruit of vegetable will float or sink

5. Place the orange into one of the containers. Does it float? Record the result in table 1.

6. Choose 3-5 other pieces of fruits or vegetables you would like to experiment with. Record your prediction of if it will float or sink. Then place the pieces of fruits or vegetables into the container. Record the results in table 1.

So, what happened?

An orange with peel is heavier than an orange without peel. However, the peel is filled with tiny air pockets. These pockets of air help increase the **buoyancy** of the orange. This means the orange becomes less dense than the water, so the orange with the peel floats in the water. You can think of these air pockets as tiny floatation devices for the orange.

Reflection Questions

- Are there any improvements you would make to this challenge?

- From your experiment, which items floated, and which items sank?
- Why do you think some fruits sink, while others float on top of water?
- From your research, can you explain what buoyancy means?
- This concept of buoyancy can be found in real world applications such as ships, or boats floating on water. Can you think of 2 more applications of buoyancy?
- (Extension) From what you have learned about buoyancy, can you explain why ships float on water? They are enormous, but what keeps them afloat? (Hint: the air inside a ship).

Submission Guidelines

- Submit pictures of your experiment, the result, and answers to the reflection questions.

> Note: Remember, if you want to upload pictures of your Minor Challenge that also include you, please check if it is OK with your mentor first.

- The submission form is on the Minor Challenges page: https://sciencechallenge.org.au/index.php/minor-challenges/ Fill out the details and make sure you upload your submission.

Learn More! Resources

- This video provides an explanation of buoyancy and why something float or sink: https://www.youtube.com/watch?v=nMlXU97E-uQ

Bibliography

- Cool Science Experiments Headquarters. 2022. *Why Does the Heavier Orange Float Science Experiment*. [online] Available at: <https://coolscienceexperimentshq.com/why-does-the-heavier-orange-float/> [Accessed 8 February 2022].