

1-13-2015

Theme B: Day 4 Plan

Purdue University College of Education

Follow this and additional works at: <http://docs.lib.purdue.edu/swresources>

Recommended Citation

Purdue University College of Education, "Theme B: Day 4 Plan" (2015). *“Becoming a Spacewalker: My Journey to the Stars” Teacher Resources*. Paper 16.
<http://docs.lib.purdue.edu/swresources/16>

This document has been made available through Purdue e-Pubs, a service of the Purdue University Libraries. Please contact epubs@purdue.edu for additional information.

THEME B

Becoming a Spacewalker: My Journey to the Stars by Astronaut Jerry L. Ross

DAY FOUR STEM EXTENSION TO ACCOMPANY DAY FOUR SHARED READING of *KID STUFF*

To Ponder: As a child growing up in Indiana, Jerry Ross was creative and inventive. For instance, there were no public swimming pools in his town, so Jerry and his sister made their own pool. However, Jerry never learned how to swim because he sank in the water like a rock tossed into a pond. I wonder what invisible force pulled him down? I wonder what items will float or sink in water?

SCIENCE/TECHNOLOGY/ENGINEERING/MATHEMATICS (STEM) ACTIVITIES:

Science Investigation: To explore floating or sinking using simple available materials

Vocabulary: gravity, transport, investigate, countryside, marsh

Goal: To investigate floating and sinking with simple “kid stuff” and to discover that gravity and weight are important forces that impact whether an object floats or sinks.

Purpose of science activity: To investigate and test predictions about objects that float or sink in water, for example: a basketball, beach ball, golf ball, baseball, soccer ball, and a marble. To classify objects according to whether they sink or float. To analyze results and interpret data by ranking objects according to their weight measurement.

Materials: 3” × 5” index cards, binder ring, basketball, tub of water, objects for experiment, science notebook/journal/iPad/computer/SmartBoard, pencil, large towel

Before Activity

- **Introduction:** Repeat “to ponder” question. I wonder what simple items will float or sink? I’m curious . . . Jerry “sank in the water like a rock tossed into a pond. Every time.” He never learned how to swim, and I’m curious if gravity was the cause. Investigating sinking and floating might be very interesting. Let’s transport some water into a clear plastic tub, observe, and test simple objects. Which will float and which will sink?
- **Activate prior knowledge:** From day three’s science investigation, what do we know about the effects of gravity, weight, and G-forces on the body?
- **Prompts to encourage prediction:** Using your prior knowledge, what items do you think will float and sink?
- **Draw on personal experience:** In the past, when you have gone swimming, did you float or sink? What forces were acting on your body causing you to float or sink? How do these forces compare to Jerry Ross’s?

- Set a purpose for experiment: Link prior knowledge and experience to Jerry's swimming experience. What happened when he tried to swim? What could happen to other objects? (Make a prediction.)
- Draw or write prediction for each object in science notebook or use graph: Design a T graph to show predictions and results.

During Activity:

Which items do you think will float and which do you think will sink? Make your predictions below and summarize in your science notebook/journal/iPad/computer/SmartBoard.

<u>Item</u>	<u>Predictions</u> <u>Float</u>	<u>Sink</u>
1. Basketball (1.36 lb/.61 kg)		
2. Beach ball (.14 lb/.07 kg)		
3. Golf ball (.10 lb/.075 kg)		
4. Baseball (.32 lb/.15 kg)		
5. Soccer ball (1.76 lb/.35 kg)		
6. Softball (.40lb/.18 kg)		
7. Lacrosse ball (.32 lb/.15 kg)		
8. Table tennis ball (.1 oz/0.0 kg)		
9. (Your choice)		
10. (Your choice)		

1. Share predictions with your partner. Discuss in large group and compare predictions.
2. Steps:
 - a) Transport water and fill clear tub with four inches of water.
 - b) Slowly lower one item into the water. Observe. Record what happens on the results chart.
 - c) Remove the item from the water. Place on large towel and dry. Test the next item. Observe and record data.
 - d) Continue testing each item, observing and recording results.
 - e) Now that you have had a chance to observe, make a few free choices of your own. Test them and observe, while recording data in the results chart.

<u>Item</u>	<u>Results</u> <u>Float</u>	<u>Sink</u>
1. Basketball (1.36 lb/.61 kg)		
2. Beach ball (.14 lb/.07 kg)		
3. Golf ball (.10 lb/.075 kg)		
4. Baseball (.32 lb/.15 kg)		
5. Soccer ball (1.76 lb/.35 kg)		
6. Softball (.40lb/.18 kg)		
7. Lacrosse ball (.32 lb/.15 kg)		
8. Table tennis ball (.1 oz/0.0 kg)		
9. (Your choice)		
10. (Your choice)		
3. After completing the experiment, take some time alone to think about your predictions and the results. Compare and contrast your predictions with the results. Were there any surprises? How would you complete this sentence: My evidence shows that _____.		
Can you explain what happened? Which objects floated and which ones sank? Why? _____.		
4. Share with your partner. Remember to listen to your partner and learn. Classify the tested items into groups. Can you and your partner reach any possible conclusions? How could you finish this sentence: My partner and I think that _____.		
5. In large group, listen to the students' responses. Were there any surprises? How were the items classified? What was learned? _____.		

After Activity: What does your evidence show?

- Reflection: When analyzing predictions and results, it was discovered that _____.
- I was surprised by the fact that the evidence shows that _____.
- When interpreting the results, my conclusions are _____.
- Knowing now what I have discovered about gravity, this is what I learned about floating and sinking _____.

Extensions: To further investigate floating and sinking in water and Jerry’s spacewalking training, explore these websites:

Resources:

Mark 111 Suit Test Evaluation in WETF with Jerry Ross

<https://www.youtube.com/watch?v=DY8tBAui2ug>

Love My Science: Floating and Sinking—Float or Sink

<http://www.lovemyscience.com/floatorsinkexercise.html>

Metric Conversion Chart

<http://www.metric-conversions.org/weight/pounds-to-kilograms.htm>