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## Theme B: Day 3 Plan

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## THEME B

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

### DAY THREE STEM EXTENSION TO ACCOMPANY DAY THREE INTERACTIVE READ ALOUD

**To Ponder:** In *Space Traveler*, invisible G-forces pinned the astronauts back into their seats. Jerry Ross felt like he weighed 600 pounds. Let's compare the weight of the basketball, beach ball, and *Sputnik 1* on earth as opposed to Jerry Ross and how he felt in space. I wonder what the results will show.

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

**Goal:** To compare actual earth weight and "felt like" weight in space.

**Purpose of Science Activity:** To investigate weight on earth as opposed to weight "felt like" in space (roller coaster on earth vs. Shuttle in space)

**Science Investigation:** Weight comparison on earth versus "felt like in space"

**Vocabulary:** Weight (on earth versus "felt like in space")

**Materials:** scale, basketball, beach ball, *Sputnik 1* information, chart paper, marker, science notebook/journal/iPad/computer/SmartBoard

**Link:** Upon liftoff of the Space Shuttle *Atlantis*, Jerry Ross experienced acceleration and invisible G-forces that pinned him back to his seat. Jerry felt like he weighed 600 pounds. What a sensation! Let's compare earth weight to how he felt in space.

#### Before Activity:

- **Activate prior knowledge:** Review data chart(s). Let's investigate comparing weight on earth and what it feels like in space. What do we know about weight and gravity? List three facts.
- **Prompts to encourage prediction:** Why is it that you must be a certain height or weight before riding on some amusement park rides? What height might be recommended?
- **Draw on personal experience:** Have you ever ridden on a roller coaster or traveled by airplane? In both instances, how did your body feel when you were making the climb up the ramp on the roller coaster or taking off in an airplane? What happened to your body at those moments in time?
- **Set a purpose for experiment:** To compare earth weight on earth and "felt like" weight in space
- **Draw or write prediction for each object in science notebook or use graph:** After discussing with students, model note-taking strategies for your students by making a list of student observations on chart paper in word and/or picture form. List at least three student observations. Display chart paper in classroom for future reference. (Utilize medium of choice.)

**During Activity:** Educator models "T" chart design on chart paper with two columns: (1) prediction chart and (2) results chart. Students draw chart and input their own predictions and results in science notebook/journal/iPad/computer/SmartBoard. (Select medium of choice/availability.)

Design a T chart and make predictions/results or provide students with T chart and "What does your evidence show" on paper for the students. Guide the students through the process.

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

| <i>Student Data</i>                  | <i>Student Data</i>  |
|--------------------------------------|----------------------|
| <b>Predictions Chart</b>             | <b>Results Chart</b> |
| 1. Jerry Ross (in space) = lb/272 kg | 1.                   |
| 2. Basketball =                      | 2.                   |
| 3. Beach ball =                      | 3.                   |
| 4. <i>Sputnik 1</i> =                | 4.                   |

- Predict the weights of examples 1–4 in "predictions chart." Can you predict the order by weight?
- Share with partner.
- Weigh each example and record in "results chart."  
"Results Chart" = Jerry Ross-600 lb/272 kg.; Basketball = 1.36lb/.61 kg; beach ball = .14 lb/.07 kg; *Sputnik 1* = about 184 lb/83 kg
- Share with class. Discuss findings and summarize.
- Extension: Design a line graph indicating the weight order 1–4 from < to >.  
(Beach ball = .14 lb/.07 kg, Basketball = 1.36 lb/.61 kg, *Sputnik 1* = 184 lb/83.6 kg, Jerry Ross = 600 lb/272 kg) [1 kg=2.2 pounds, 1 oz=28 grams; kg x 2 + 10% = lb]

**After Activity: What does your evidence show?**

- The prediction and results chart evidence shows that \_\_\_\_\_.*
- My conclusions about weight on earth compared to how it feels in space are \_\_\_\_\_.*
- Reflections: As a space traveler, Jerry Ross, experienced acceleration and liftoff that we can only imagine. He felt G-forces that acted on his body and made him feel like he weighed 600 pounds. On earth, we can simulate a similar experience by riding on a roller coaster or on an airplane. It is interesting to note the impact of gravity on weight here on earth and in space.*

**Extensions:** To explore gravity and investigate the STEM arc of shooting hoops and the science behind roller coasters.

**Resources:**

Basketball by Jai and Jonathan Basketball Research (Shooting Hoops and the "Arc")

<http://pbskids.org/dragonflytv/show/basketball.html>

Roller Coaster Design

<http://pbskids.org/dragonflytv/show/rollercoasterdesign.html>

Metric Conversion Chart

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