

Student Worksheet: Astronauts – Floating or Falling?



Name _____ Date _____

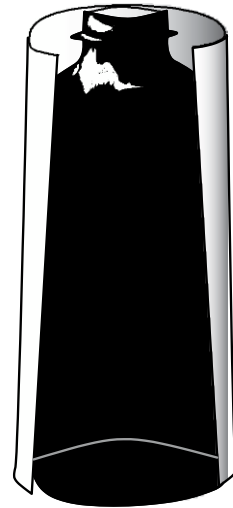
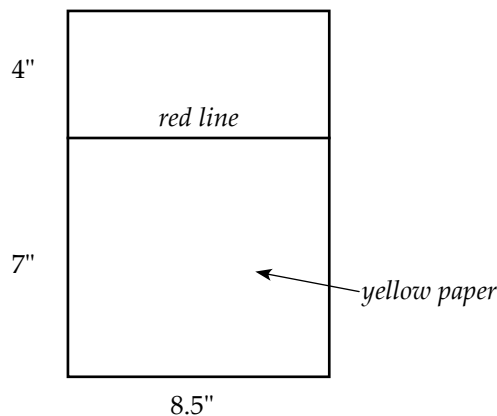
When astronauts are in space are they floating or falling?
Complete the following activity to find out!

Student Materials (Per team)

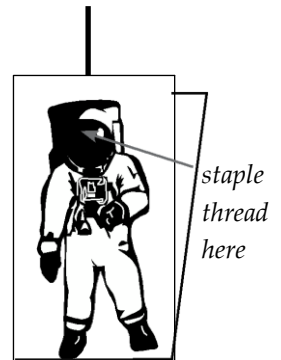
- | | |
|--------------------------------------|--|
| w Sheet of yellow construction paper | w Clear, 2 liter plastic bottle (completely dry) |
| w Red marker | w Stapler |
| w Transparent tape | w Thread (50 cm) |
| w Scissors | w 12-inch ruler |

Create a Model Astronaut and Space Shuttle

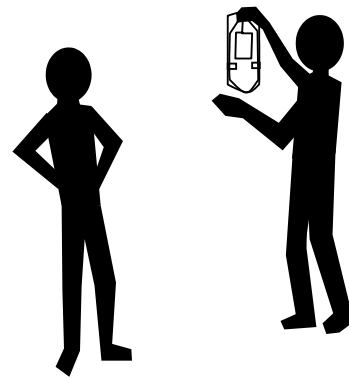
1. To create your model Space Shuttle, draw a thick red line four inches from the top of a piece of yellow paper. Tape the yellow paper lengthwise to the outside of a dry 2 liter bottle, so that the red line faces into the bottle. This area is now the back of the “Space Shuttle” bottle.



2. To create your model astronaut, cut out the rectangular picture of the astronaut located on the last page of the Student Worksheet. Fold the astronaut model in half, so that the astronaut has a front and a back, place the end of a 50 cm thread inside, and staple it together so that the string does not slip out. Do not cut the thread shorter!
3. Holding the thread, push the model astronaut into the bottle. Lower the model into the “Space Shuttle” bottle so that the astronaut’s head is at the level of the red line in the bottle.



4. Keep holding the “Space Shuttle” bottle and release the thread that holds the astronaut. What happens to the astronaut in relation to the red line? Explain.
5. Pull the thread out of the bottle so that the astronaut’s head is at the level of the red line once again. Hold onto the thread and bottle with your thumb and index finger. (See picture below.)
6. Ask your partner to stand across the room (about 20 feet away). Tell your partner to carefully watch the paper astronaut and the red line in the “Space Shuttle” bottle as you drop the bottle and thread (with astronaut) at the same time. Let go of the bottle and the thread at exactly the same time.
7. Where was the astronaut in relation to the red line in the “Space Shuttle” bottle during the fall?



8. Drop the “Space Shuttle” bottle and the paper astronaut four more times. Record your observations in the data table each time.
9. Exchange places with your partner and repeat steps 5-8 again.
10. Based on what you saw, explain why an astronaut feels weightless in space, even if he/she is falling.

Data Table

Drop	Observation
1	
2	
3	
4	
5	

Weightlessness on Earth

Describe the feeling you get when falling on a roller coaster, descending in an elevator, or driving over the crest of a hill. Write a couple of paragraphs about why you feel this way. If you were standing or sitting on a scale when this happened, what kind of change would you observe?

