

GRAVITY BUCKET LAB

Stage 1

For stage 1, partner with another group. Both groups should have a gravity bucket and an assortment of balls.

1. Set your buckets so that they are flat and on a non-skid surface.
2. On one bucket, put the cue ball. On the other bucket, put a marble.

General Observations

- a. Which ball has a higher volume (is physically bigger)?
 - b. Which ball has more mass (weighs more)? Use a scale to weigh each ball and record the masses below.
 - c. Which ball has dipped farther into the bucket?
 - d. Draw a model of the system that you created and label each part. What do you think the balls represent? What about the fabric? What about the dipping?
-
3. Repeat the same procedure with a marble and a wood ball.
 - a. Which ball has a higher volume (is physically bigger)?
 - b. Which ball has more mass (weighs more)? Use a scale to weigh each ball and record the masses below.

- c. Which one has dipped farther into the bucket?
 - d. What do you think influences how far the ball dips? Why do you think this?
4. Challenge the other group that you have been working with to select the ball you each think will dip the lowest. Talk it out with your group and select a ball from your kit that you think will win.
- a. Which ball did you pick, and why did you pick it?
 - b. Which ball did the other group pick?
 - c. Which one has dipped farther into the bucket?
 - d. Did the winner support your reasoning? How? Do you think the way you released the ball affected the results?
5. Observe the fabric when there is a ball in the bucket.
- a. Where is the fabric the flattest?
 - b. Where is the fabric most curved down toward the ground?
 - c. Why do you think the fabric curves the way it does? How does that influence the model you have drawn?

Stage 2

For this stage, use only one bucket and work with only your group.

1. Take two balls of your choice and put them on different sides of the gravity bucket.
 - a. Do they make a dip in the fabric? Record all observations.

 - b. What happens to the balls?

2. Replace one of the balls with a steel ball.
 - a. Which ball makes a larger dip in the fabric?

 - b. What happens to the balls?

3. Take both balls out. Put a baseball in the center; this will represent the sun. Grab a marble; this will represent Earth. Your task is to try to have Earth “orbit” the Sun for a few rotations.
 - a. Did you achieve the task? What did you do for that to happen?

4. Put the steel ball back in the middle instead of the baseball. This ball represents a black hole. Again, try to have the marble “orbit” the steel ball.
 - a. Was this easier or harder?

 - b. Describe in general what happened.