

# ACTIVITY 5

---

## MORE ROCKET SCIENCE

### Objective

Students gather data and create a simple graph to show the results of a science experiment.

### Standards

Science, Mathematics, Technology, Language Arts

### Materials

- Balloon experiment as outlined in *Activity 4*, page 21
- Chart paper, 3 pieces
- Interlocking cubes, assorted colors
- Markers, crayons, and pencils
- Journal or piece of paper, 1 per student

### Educator Information

- This activity works well as a follow up to *Activity 4*, page 21.
- Be sure to have all materials ready before the activity begins.
- Because of safety concerns, an adult should blow up the balloons.

- Review the experiment in *Activity 4*. In *Activity 5*, the experiment will be set up in the same way. There will be one variation in the experiment. In this lesson, students will evaluate whether the amount of air in the balloon changes the distance the balloon travels on the fishing line. Students will develop a graph to collect this data.
- Read the directions for this activity carefully. Be prepared to share this information with students.
- Draw a line on chart paper to create two columns. Label the two columns with the appropriate titles, *Number of Breaths* and *Distance Traveled*. For non-readers, drawings may be more appropriate.
- Decide where to set up the experiment in the classroom.

### Procedure

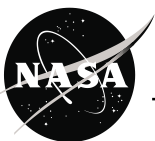
1. Set up the experiment as described in *Activity 4*. Discuss with students what they learned from the experiment in *Activity 4*.



2. Explain to students that in this lesson, the balloon experiment will also be repeated several times. Let students know there will be one difference in the experiment in *Activity 5*. Each time the class conducts the experiment, there is a different amount of air in the balloon. An adult blows the balloon up each time with a different number of breaths. The air is then released. Students observe how far the balloon travels on the fishing line. They determine whether the amount of air in the balloon changes the distance it travels on the fishing line.
3. After explaining the procedure, ask the students to develop a good guess, or *hypothesis*, about what will happen. Discuss whether the distance the balloon travels will change with the amount of air in the balloon.
4. Decide on a reasonable number of times to repeat the experiment.
5. Ask students to devise a method to collect the data from the experiment. All scientists, on Earth and in space, need to have a method to collect data. Discuss the type of data students need to record. Each time the class conducts the experiment, students need to record the number of breaths and the distance the balloon travels when the air releases. Use a simple two-column graph on chart paper. Label one column, *Number of Breaths*. Label the second column, *Distance Traveled*. Use drawings for non-readers. Students can also collect data individually.
6. Ask students to generate ideas about how to gather the data. Students can simply count the number of breaths. Record breaths on the graph by using tally marks.
7. Tell the students that they will need to measure the distance the balloon travels each time the experiment repeats. To measure the distance, create a nonstandard measurement tool out of interlocking cubes.
8. Have students put interlocking cubes of one color together in a group of 10. For example, make sets of *10 blue, 10 green, 10 yellow*. Connect the groups of ten together, alternating colors, on the floor underneath the fishing line. Make the line of cubes long enough to reach from one end of the fishing line to the other end. Students can measure the distance traveled by counting the interlocking cubes in groups of 10's and 1's.
9. To help students remember the sequence of events in the experiment, write directions or draw pictures to represent steps on chart paper. Display the chart in the classroom.

## Experiment

1. Have an adult fill the balloon with air. Make sure the adult stops between each breath so students can count the number of breaths. As the adult fills the balloon, ask students to count the number of breaths and record the data on the graph.
2. Tell students to observe the experiment closely. Release the balloon. Students note where the balloon stops on the line. Using the interlocking cube measuring stick and counting by 10's and 1's, the class measures how far the balloon traveled on the fishing line. Record the data on the chart paper. Be sure students practice using the correct unit of measurement when they record or talk about distance traveled. For example, *the balloon traveled 32 interlocking cubes*.
3. Repeat the experiment the number of times suggested by the class. Each time, the adult varies the number of breaths. Students count and record the number of breaths each time. Students observe where the balloon stops on the line. Count and record the number of interlocking cubes that represent the distance the balloon travels.



4. Carefully look at the information on the graph. Discuss the information on the graph and evaluate what students learned from the experiment.
  5. Help students use the information to reach a *conclusion* about the experiment. Students should be able to determine that more breaths result in the balloon traveling a greater distance.
  6. As students evaluate the results of the experiment, guide them in using math comparison words such as *more* and *less* in their statements.
  7. Write the statements on the graph.
- Encourage students to think of other forms of nonstandard measurement to determine the distance the balloon traveled. Suggestions could include plastic links, tiles, new crayons, and scissors. Repeat the experiment. Remind students to use the unit of measurement when they talk about distance traveled. For example, *the balloon traveled a distance of 17 crayons*.
  - Set up two balloon experiments side by side in the classroom. Let the students “race” two balloons at one time. Vary the number of breaths in the balloons. Let students evaluate the number of breaths and the distance the balloons travel.
  - Have students apply what they learned in this experiment. Ask students to consider whether the amount of fuel in a rocket determines how far it travels. Ask students to consider other factors such as size and weight that may affect the distance a rocket travels.
  - From the *Suggested Reading* list or other sources, select books that feature pictures and drawings of rocket launches. Encourage students to look at the depictions of rocket launches and think about what they now know about how a rocket works.

## ***Assessment***

- Request that students draw a picture of the experiment in their journal or on a sheet of paper. Ask them to write a sentence about the results of the experiment or describe the results orally. Evaluate.

## ***Enrichment***

- Repeat the experiment using groups of five interlocking cubes as a nonstandard measuring tool. Students gain experience counting by 5’s.

