



Lesson Plan: Fun with Balloons

Grade Level: 5

Subject Area: Science

Time Required: *Preparation:* 1 hour
Activity: 2-3 hours

National Standards Correlation:

Science (grades 5-8)

- Science as Inquiry Standard: Abilities necessary to do scientific inquiry.
- Science as Inquiry Standard: Understanding about scientific inquiry.
- Physical Science Standard: Motions and forces.
- Unifying Concepts and Processes Standard: Evidence, models, and explanation.

Summary: After reading aloud the book, *The Twenty-one Balloons* by William Pene du Bois, the students will design their own balloons, complete experiments with balloons filled with helium, and create math problems using factual information about balloons.

Objectives: Students will:

- Design a balloon and basket.
- Investigate how much mass can be carried by a regular balloon filled with helium by experimenting with objects of different masses and sizes tied to it.
- Create math problems using factual information about balloons.

Background: *The Twenty-one Balloons* is the story of Professor Sherman's trip around the world. He is a teacher who retires to travel in a hydrogen-filled balloon. The chapters tell what happened to him after he was discovered floating in the Atlantic Ocean with a raft and twenty-one balloons. While reading the book aloud to the class several activities will be completed involving balloons.

Materials: You will need:

- *The Twenty-one Balloons* by William Pene du Bois
- Drawing paper or poster board, 12" x 18" or larger
- Crayons, colored pencils or markers
- Balloons filled with helium
- Objects to tie to balloons – paper clips, weights, erasers, blocks, etc.
- Variety of nonfiction books about hot air balloons
- 3 kits – 9' Tall Balloons (see "Up, Up and Away with the Montgolfier Balloon" lesson plan at <http://www.nationalmuseum.af.mil/shared/media/document/AFD-090710-014.pdf>)

Procedure: *A. Warm-up*
Introduce the book to students. Encourage them to predict what it might be about and how it might fit into their discussion of flight. Read the first paragraph of the introduction. Discuss the two different attitudes toward travel that are mentioned. Ask students to list all the real or imagined ways to travel by the shortest route or using the fastest method. Then do the same for



the longest route or more leisurely method. Discuss how descriptions of these two trips might differ (amount of details and number of things seen, length, etc.). Have students share which way they would like to travel if they had the chance.

B. Activity

1. After reading chapters 1-3, ask how the author describes Professor Sherman's balloon and living quarters. Include details of what the basket and balloon look like, the functions of the different spaces, and how the Professor used the small space he had. Have students design their own balloons. Sketch it with pencil and paper, then use 12 x 18" drawing paper or poster board to complete a colored design. Make a detailed drawing of the inside of the basket on the back of the paper. Have students write what they would take on a trip like the professor's.
2. Have students investigate how much weight can be carried by a regular balloon filled with helium by designing and carrying out a series of experiments with objects of different weights and sizes tied to a balloon. Students can create charts summarizing their results and compare their conclusions to the information about hydrogen in the book.
3. Have students create math problems about the various things that can or cannot be lifted by a balloon or set of balloons. Use the factual information about balloons in the book and/or use other nonfiction books about them. Some of the information in the book that can be used to write problems are: various display balloons in San Francisco lift 6, 60, and 75 pounds; balloons on the escape raft are either 16,200 or 32,400 cubic feet each; hydrogen's lifting power is 70 lbs. per 1000 cubic feet.

C. Wrap-up

Divide students into 3 groups. Hand out materials to make a 9' tall hot air balloon in each group. Under adult supervision, they will assemble a hot air balloon by using the directions "Up, Up and Away with the Montgolfier Balloon." Students should compile lists of similarities and differences between the small helium balloons and the large hot air balloons. Discuss the use of hot air as a method of lifting balloons.

Assessment/ Evaluation:

Have students create skits, summaries or retellings of specific parts of the story. These should include the actual story line as well as the factual information about balloons that is included in the story. Students will also list the three different methods of lifting balloons that were discussed in this lesson.

Extension:

Use a world map to trace Professor Sherman's two balloon voyages. Identify each country and ocean he crossed. Invite students to write an imaginative scene that shows how people might have reacted when they saw the huge balloon pass over them.

Resources/ References:

Du Bois, William Pene. *The Twenty-one Balloons*. New York: The Viking Press, 1975.

McCarty, Tara and Staton, Hillary. *Science & Stories – Integrating Science and Literature*. Glenview, Illinois: GoodYearBooks, 1994.

