



## South Carolina Academic/Career Development Integration Activity (DRAFT)

**Title**                    **And the Winner Is.... (S-3)**

**Subject**                **Science**

**Grade Level(s)**      **8**

**SC Content Standard** – Scientific Inquiry – Grade 8. Standard 8-1. The student will demonstrate an understanding of technological design and scientific inquiry, including process skills, mathematical thinking, controlled investigative design and analysis, and problem solving.

8-1.1. Design a controlled scientific experiment.

8-1.3. Construct explanations and conclusions from interpretations of data obtained during a controlled scientific experiment.

### **National Career Development Guidelines Goal/Indicator**

Personal Social Development GOAL PS2. Develop positive interpersonal skills including respect for diversity.

Indicator PS2.A4. Demonstrate the ability to get along well with others and work effectively with them in groups.

### **Career Development Objectives**

1. Students will understand how to conduct a controlled scientific experiment.
2. Students will learn effective ways to work in a group to complete a project.

### **Assessment**

1. Students will conduct a controlled scientific experiment and document the results.
2. Students will identify ways to work effectively with others to complete a group project.
3. Students will complete the *Working in Groups – Self-Reflection* worksheet.

### **Preparation**

- Prior Learning—Instruction on scientific inquiry
- Handouts/Worksheets—*Ten Tips for Working in a Group* handout, *Working in Groups Self-Reflection* worksheet, *Float Your Boat Lab* worksheet
- Resources/Materials—writing materials, textbook, rectangular plastic container, water, paper clips, aluminum foil
- Time Required—1 class period

## **Procedures**

### **Part One**

- The purpose of this activity is for students to experience working on a controlled scientific experiment as part of a team.
- Randomly assign students to groups of four. Give students a copy of the *Ten Tips for Working in a Group* handout and briefly discuss it with them.
- Introduce the activity by telling students they will work as a team to solve a scientific problem. Their task is to build a “ship” from a single sheet of aluminum foil that will hold the maximum amount of “cargo” (paper clips). They will have four opportunities to experiment with different designs in their quest to create the most efficient “ship”.
- Give each group four equal sized pieces of aluminum foil and the other necessary resources to conduct the experiment.
- Remind students they are to work with members of their group to design a “ship” to hold as many paper clips as possible. Instruct students to build each “ship” using only one piece of foil.
- Tell students to use the experience of the first trial to help design a better “ship” for the trials that follow. For each trial, students must predict the number of paper clips that the “ship” will hold before they begin and then record the actual number of paper clips that the “ship” held. Have students enter data on the *Float Your Boat Lab* worksheet.
- Invite students to report their findings to the class. Discuss what they learned about conducting a scientific investigation.

### **Part Two—Career Development Connections**

- Engage students in a discussion about how they worked together to design the “ships”. Possible discussion questions:
  - What was helpful in getting the job done? What was not helpful?
  - Did everyone in the group participate?
  - What kinds of occupations require people to work together?
  - Is being able to get along with others important on most jobs?
- Have students complete the *Working in Groups – Self-Reflection* worksheet.

## **Crosswalks**

### **SC Career Guidance Standard/Competency**

Learning to Work Standard 4. Students will demonstrate a positive attitude toward work and the ability to work together.

Competency 4.2. Translate the importance of interpersonal relationships and demonstrate positive interaction with others.

### **Key Employability Skills**

Thinking Skills—Reasoning

Thinking Skills—Creative thinking

Interpersonal Skills—Works well on a team, contributes to group effort

\* Adapted from *Career Development Tool Kit Grades 6-8*, Linda Kobylarz & Associates, 2000. Used with permission.

# Float Your Boat Lab Worksheet

Name\_\_\_\_\_

Date\_\_\_\_\_

## Part 1

Directions:

- A. Research Question—What shape boat holds the most cargo? Why?
- B. Setting Up the Experiment—You and your team will have 4 trials to build the boat (aluminum foil) that can hold the most cargo (paper clips) without sinking into the harbor (plastic container).
- C. Data Gathering—Before each trial, sketch your boat and predict how much cargo (clips) it will hold. Record your prediction and the actual amount of cargo for each trial.

## Float Your Boat Design Trials

Trial Boat Design	Cargo Prediction	Cargo Actual Amount
Trial #1		
Trial #2		
Trial #3		
Trial #4		

# Float Your Boat Lab Worksheet

## Part 2 Conclusions

1. Describe which boat shape worked the best.
2. Why do you think this shape worked the best? Give specific reasons.
3. Your team "learned" as you did more trials. Describe how and what you learned doing this experiment. For example, did your predictions become more accurate with each trial?
4. If your group were to repeat this experiment using liquid cargo (oil), what would you do differently? Why? How could you make accurate predictions for oil based on the data you gathered from the "paper clip" experiment?