

## INDEPENDENCE SEAPORT MUSEUM ACTIVITY PACKET

Grades 4-6

### Dear Teacher:

We are so excited that you scheduled a visit to the Independence Seaport Museum with your class! To complement your students' visit to the museum, we have created this packet to use on board the boat and in the classroom. We hope the activities included will enhance your visit and inspire your students to want to learn more.

### About the Packet:

The activities in this packet are designed to encourage creative thinking and introduce students to the topics of boats and sailors. In the classroom activities are split into three. The first activity asks students to think aloud about exploration and travel. The second and third activities can be done individually or in small groups.

### In the classroom activities:

#### Activity 1: *What Kind of Boat Is This?*

Discuss what kind of boat is shown on each paper. Ask students what the boat is used for and which boat they would use if they wanted to go out on the water and why.

#### Activity 2: *The Scientific Method of Hull Shape*

Discuss with the class different kinds of hull shapes. Students will use knowledge of displacement and also expand their knowledge of the concept of buoyancy.

#### Activity 3: *How do you build a boat?*

Students will identify the different steps that boat builders take in order to build a boat from the first to final step.

US Standards: NSS-USH.5-12.7, NSS-USH.5-12.8, NS.5-8.2, NS.5-8.5, NS.9-12.2

PA Standards: 1.6, 2.1, 2.3, 3.4, 8.1

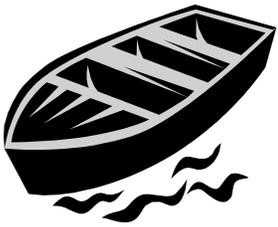
NJ Standards: 6.RP.1, 5.1, 6.1, 6.3, 8.2

DE Standards: 9-12.G.CO5; Science 1, 3; History 1; Technology TPA6



In the classroom activities

Activity one: what kind of boat is this?



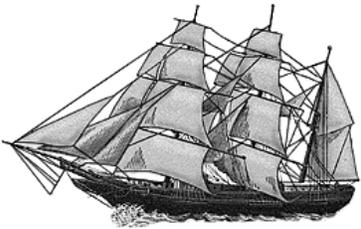
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**Yacht**



\_\_\_\_\_

**Sail Boat**



\_\_\_\_\_

**Fishing Boat**



\_\_\_\_\_

**Canoe**



Activity two: the scientific method of hull shape

\_\_\_\_\_

**Ship**

## Objectives:

Students will be able to:

1. Define the terms **buoyancy** and **displacement** by testing the displacement of a clay bar.
2. Apply their knowledge of displacement by examining the hull shape of images of boats and deciding which shape displaces the most water.

## Materials:

1 Aquarium tank	12-14 bars of clay
1 Plastic model boat	Penny
6-7 Clear plastic bowls/ buckets filled with water and a long line of masking tape on each container	Shipbuilding Challenge worksheets Pencils and markers

## Procedure:

Toss a penny into an aquarium tank. Ask: Why does a penny sink but a huge ship made of steel float? [It's shape and the way it is built makes it float.] The correct term for floating in shipbuilding is called **buoyancy**. When a boat is buoyant it means it floats. Why is it important for a boat builder to know if something floats? [If a boat doesn't float, it doesn't work]

*Explain: Today you are going to do a scientific experiment to determine if clay can float. Boat builders are like scientists, they test different designs to see if they are going to work. You are going to test to see if clay is a good boat building material.*

What are some of the steps in doing an experiment? Write down the steps on the chalkboard or large piece of paper.

1. Come up with a question/Observe the data. What is happening?
2. Classify the data. What are the possible relationships in what's happening?
3. Make a hypothesis. Make a statement that you think accurately explains what you've observed.
4. Conduct experiments to "test" the hypothesis.
5. Form a theory about the results of the experiments and the hypothesis or a revised one. What happened, and why?
6. Explain: Today we are going to test the displacement of the clay using

the scientific method.

Place the plastic model boat into the tank. Explain: When a boat goes into the water, the water doesn't disappear; it has to make room for that boat. If it is designed to float, it will push aside water to make room for that boat. Pushing aside water is called **displacing** water. You can remember that displace rhymes with replace.

*Ask: Does a penny displace water?* [No. The penny cannot keep out water with its shape so it does not displace water. The object displaces water because it keeps out water.]

*Explain: Now I want you to see if you can determine if these clay shapes displace water.* Divide class into teams of three or four and pass out 1 set per team: 1 worksheet, 1 plastic container filled with water, 2 clay bars, markers (3 different colors), pencils. Go over instructions on worksheet and ask them to complete experiment.

After 10 minutes ask them to report on what they discovered in their experiment. What conclusions did they draw?

Activity three: how do you build a boat?

Put the steps in order from the first to the last by placing the number next to the step.

Build a backbone\_\_\_\_\_

Launch boat\_\_\_\_\_

Build the deck and insides\_\_\_\_\_

Draw a picture or make a model\_\_\_\_\_

Build a frame around molds\_\_\_\_\_

Add propulsion: steering, mast, rigging, sails, oars, engine\_\_\_\_\_

Make full size patterns and molds\_\_\_\_\_

Add planking to form the skirt\_\_\_\_\_

