

# Shipbuilding: 101

**Context:** This is a 5<sup>th</sup> grade STEM activity for Social Studies. We have been studying famous explorers during early exploration and their impact on America's history. Students have explored the numerous important explorers during this time period. This activity will bring an awareness to students of the challenges shipbuilders and explorers faced during a time of discovery.

**Skills Needed:** The ability to use scissors, glue, crayons, markers, and additional materials deemed necessary to construct a buoyant structure that is capable of being propelled at least 12 inches in water. Students also need to understand and apply the concept of density, mass, motion, pneumatics, energy and force.

**Goals of Activity:** To create a ship (buoyant structure) that will be capable of staying afloat for the duration of the voyage and be propelled at least 12 inches in water in some way.

**Literature:** *Ferdinand Magellan* by Elaine Landau – read to students over a 1 week time period about the history of Magellan. Students will also have access to their textbook.

**Time Frame:** Five 30 minute class periods to complete

**Group Size:** Groups of 4 or 5

**Materials:** Straws, cardboard, duct tape, masking tape, chenille sticks, plastic containers, Styrofoam, construction paper, glue sticks, popsicle sticks, recycled materials, paper fasteners/brads, fabric, tooth picks, yarn, and additional unlimited craft supplies

**Tools:** Scissors, hot glue gun, hole punch, markers, crayons, colored pencils, stapler, Crop-O-Dile, safety goggles, exacto knife, rubber bands, paper clips

**Safety Measures:** Review use of safety procedures for provided materials

**Classroom Set-Up:** Tables/desks, hot glue station and exacto knife (teacher only), student-safe tools and materials in a central location. Teacher will be assisting students and walking around to provide support.



## QUICK VIEW

**Grade:** 5

**Time:** Five 30 minute sessions

**Groups:** 4 or 5 students

**Safety:** Review skills for materials provided

**Goals:**

- Critical thinking skills
- Research skills
- Problem solving skills
- Science – force, energy, motion, density, mass

**Standards:**

**Virginia SOL**

Social Science: USI .4

Science: 4.2, 5.1, 5.4

**Standards for Technological Literacy**

STL2, 3, 4, 6, 7, 8, 9, 10, 11, 16, 18

# Shipbuilding: 101



**Background:** You are a shipwright under King Charles I. He has commissioned you to build a new ship for the famous Portuguese explorer, Ferdinand Magellan.

**Challenge:** Your challenge is to design and create a new ship (buoyant structure) for Ferdinand Magellan, who is looking for a westward water way to the Spice Islands. Your structure must float and be propelled, in some way, a total distance of at least 12 inches in a tub of water. It also must contain at least one moveable part. You must work together with your fellow shipwrights to complete your orders from the King.

## Criteria:

- Must float for the duration of the voyage
- Must be propelled in some way
- Must move a total distance of at least 12 inches in a tub of water
- One moveable part
- Creative

## Materials:

Straws, cardboard, duct tape, masking tape, chenille sticks, plastic containers, Styrofoam, construction paper, glue sticks, popsicle sticks, recycled materials, paper fasteners, fabric, tooth picks, yarn, and additional unlimited craft supplies

## Tools:

Scissors, hot glue gun, hole punch, markers, crayons, colored pencils, stapler, Crop-O-Dile, brads, safety goggles, exacto knife, rubber bands, paper clips

STL Standards 2, 3, 4, 6, 7, 8 Elements of Design, Technology, Engineering  
9, 10, 11, 16, 18

SOL Social Science  
SOL Science

Exploration to Revolution: Pre-Columbian Times to the 1770s  
Force, Investigations, Matter

Created by Maggie Carey  
5<sup>th</sup> grade Design Brief  
Greenville Elementary

Portfolio: Shipbuilding 101

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**1. What is the problem?**

State the problem in your own words.

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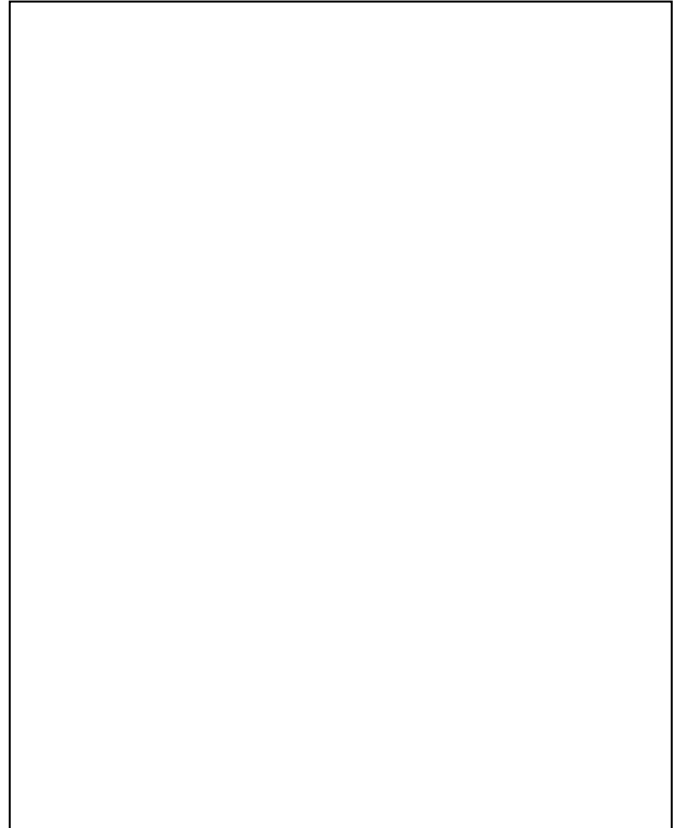

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**2. Brainstorm solutions.**

Sketch or describe possible ideas and solutions.



3. **Build your ship!**

4. **What is your moveable part?**

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5. **What are you using for propulsion and how did you create your design?**

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6. **What issues did you come across while building your ship and how did you solve them?**

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Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Rubric for: Shipbuilding 101**

<b>Criteria Assessed</b>	<b>Beginner</b>	<b>Apprentice</b>	<b>Master</b>	<b>Expert</b>
<b>Portfolio</b>				
<b>Completion</b>	3 or more incomplete sections, lacking detail, complete sentences and understanding of project	No more than 2 sections incomplete, lacking some detail and some complete sentences	All questions answered, but lacking details and some complete sentences	All questions answered in detail and in completed sentences
<b>Ship Structure</b>				
<b>Floatation</b>	Did not float at all	Stayed afloat for 6 inches or less of the voyage	Stayed afloat for 6 to 10 inches of the voyage	Successfully stayed afloat for the duration of the voyage
<b>Moveable Part</b>	Did not include a moveable part	Moveable part included, but did not function properly	Moveable part included and functioning	Moveable part included, functioning, and creatively designed
<b>Propulsion Feature</b>	Did not include a propeller	Propeller included, but did not function properly	Propeller included and functioning, but did not move 12 inches or more	Propeller included, functioning, and successfully moved 12 inches or more
<b>Creativity</b>	Lacking in creativity and little effort shown	Shows some creativity, but did not meet all criteria	Shows creativity and met most criteria	Shows a higher level of creativity and successfully met all criteria