

To The Rescue: Simple Machines

By: _____

Date: _____

Oceans, Conservation, and Engineering

What do I know?	What do I wonder?	What have I learned?

Plastic Ducks and Bath Toys: Are They a Problem?

In 1992, a cargo ship from China was carrying giant containers with boxes of 29,000 plastic bath toys of yellow ducks, green frogs, blue turtles, and red beavers. The toys on the ship were headed to the United States. One stormy January night in 1992, the boxes of the bathtime toys were bumped overboard and the boxes broke open spilling the plastic animals into the eastern Pacific Ocean.

The toys were left to float in the water and get caught in **ocean currents** as they move. They have been found all across the world on beaches, in piles of ocean trash, and even still floating in the ocean.

Scientists have been tracking the toys' movements for information about the great ocean currents to learn how they work. By following the toys, scientists can know which direction the currents move. The toys also help the scientists to study **pollution** in the ocean and teach about how we can **conserve** the life in the ocean without polluting it.



Curtis Ebbesmeyer tracks the little ducks and their friends as they travel around the world. Photo By Dave Ingraham

These plastic toys were unique because they had no holes in them, and could float in the water for a very long time. Scientists think that is why it was possible for them to have been in the ocean for such a long time.

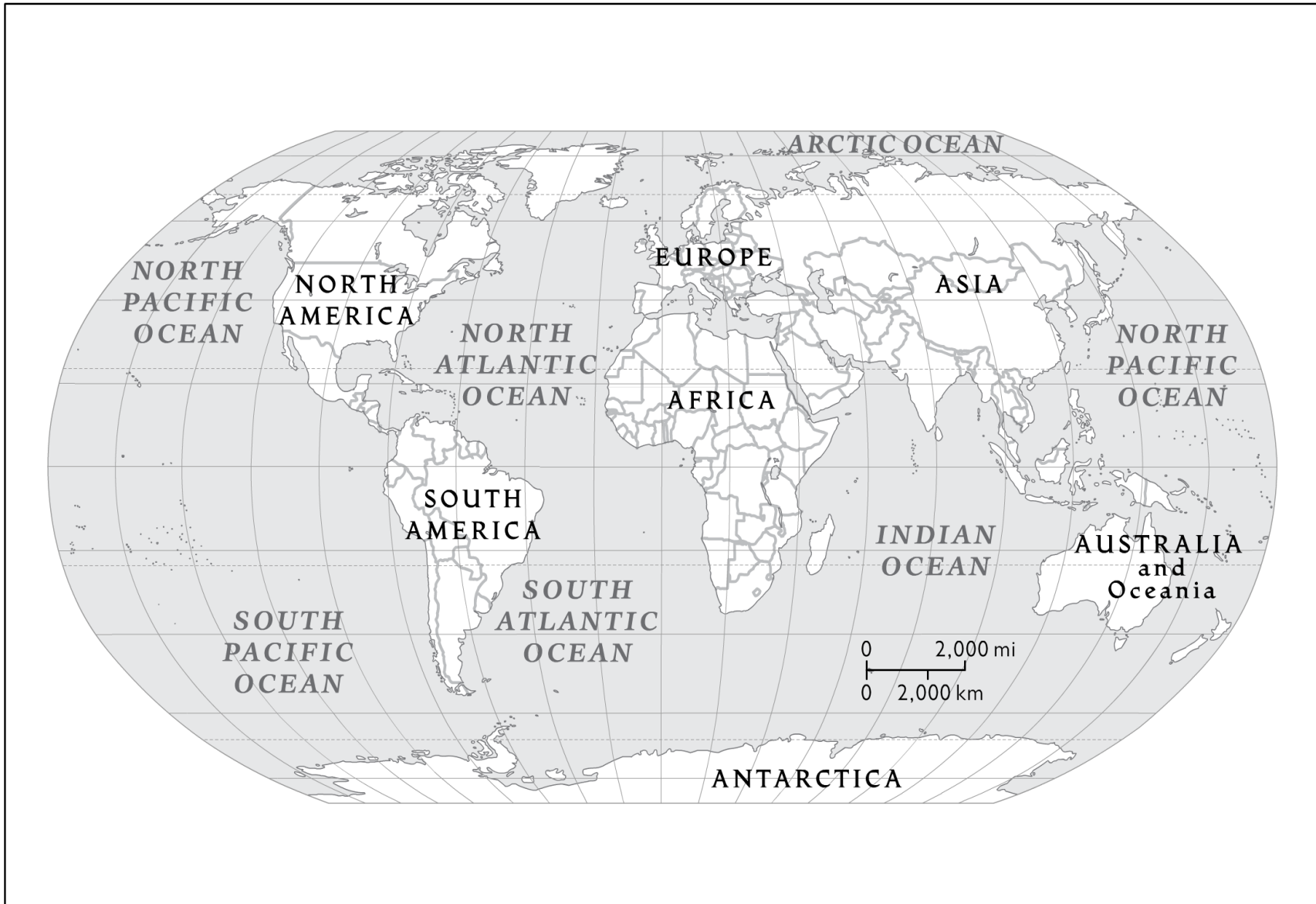
When plastic gets into the water, it can be very bad for the **environment** around it. Plastic will break down into smaller and smaller pieces over time but it will always be plastic. The more that plastic and other objects get dumped into the ocean, the more likely it is for animals, sea life, and humans to get hurt from it.

You can help to keep plastic out of the ocean by cleaning up after yourself and asking your family and friends to keep the ocean environment clean. What will you do to help?

Here is a list of where the plastic toys have been found:

- **eastern Pacific Ocean** January 1992
- **Alaska** November 16, 1992
- **Australia and South America** 1992-1995
- **Japan** 1995
- **Arctic waters** 1995-2000
- **Maine and Massachusetts** 2000
- **Scotland** 2003.
- **England** 2007

Read more: <http://www.dailymail.co.uk/news/article-464768/Thousands-rubber-ducks-land-British-shores-15-year-journey.html#ixzz5CJY6JwUW>



Vocabulary Practice

My brother loves all the fish and animals that live in the ocean. He likes to study the **ocean currents**. He also thinks it is important to study the **conservation** of the ocean **environment** to keep it clean and safe for those who live there. When he grows up, he wants to be an **engineer**, so he can build **machines** that will keep **pollution** out of the water.

Draw a picture in the box next to each vocabulary word to show the meaning of the word.

Word	Draw a picture
ocean currents	
conservation	
environment	
engineer	
machine	
pollution	

Name: _____

The Engineering Design Process

Step 1: Ask what is our problem or challenge? Write it down.

The problem is _____

Step 2: Imagine how you can create a solution to the problem or challenge. Write/draw your ideas.

What will you do with the plastic once it is all collected?

Once the plastic is collected from the ocean, I will _____

Step 3: Plan what to build and what it will look like. What type of tool or machine do you picture using? How are you going to build it? What materials do you need? Draw a picture.

Step 4: Create your invention! As a group, decide which design you want to build. Choose ONE design and then begin working as a group to build your invention. Name your invention.

Step 5: Test and improve your invention.

a) Did your group's invention work to solve the problem? Circle your answer.

YES

NO

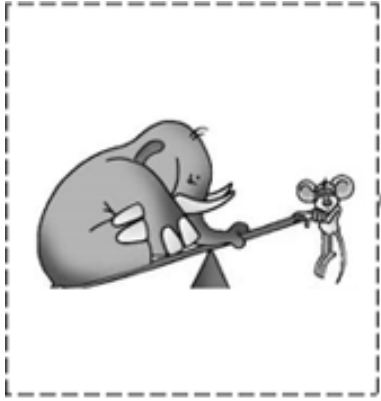
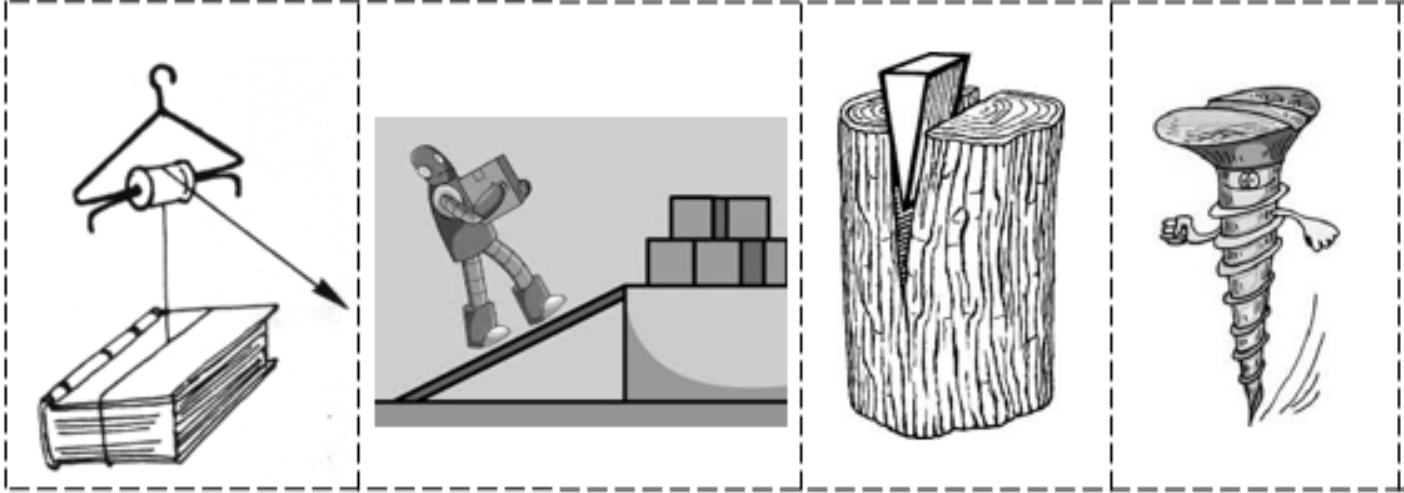
b) What would you change about your invention?

c) Was the designing and building process easy or difficult for you?

Simple Machine Match

Directions: Cut out the pictures and glue them into the correct box.

Wheel and Axle	Pulley	Screw
Ramp/Inclined Plane	Lever	Wedge



Group Presentation of Simple Machines

During your talk:

- Describe what your invention is. Does it have a name? What does it do? How will it solve the problem?
- Was it easy to design? Was it easy to build?
- What was challenging about the process?
- What would you do differently next time?
- Each member of your group should have a chance to speak.
- Speak clearly and slowly.
- Speak loud enough for all to hear.

Group Names _____

Requirements	Points	Score and Comments
The group described their invention and how it works.	4	
The group explained how they designed and built the machine.	4	
The group mentioned what they would do differently next time.	2	
Each student took responsibility for part of the presentation.	4	
Each student spoke at an understandable pace for other students.	3	
Each student spoke loudly.	3	
Total Points	Possible 20	Total