

Summer Reading Challenge

Step 1

Fill up two glasses or containers of water. Label one glass "fresh water" and the other "salt water."

Step 2

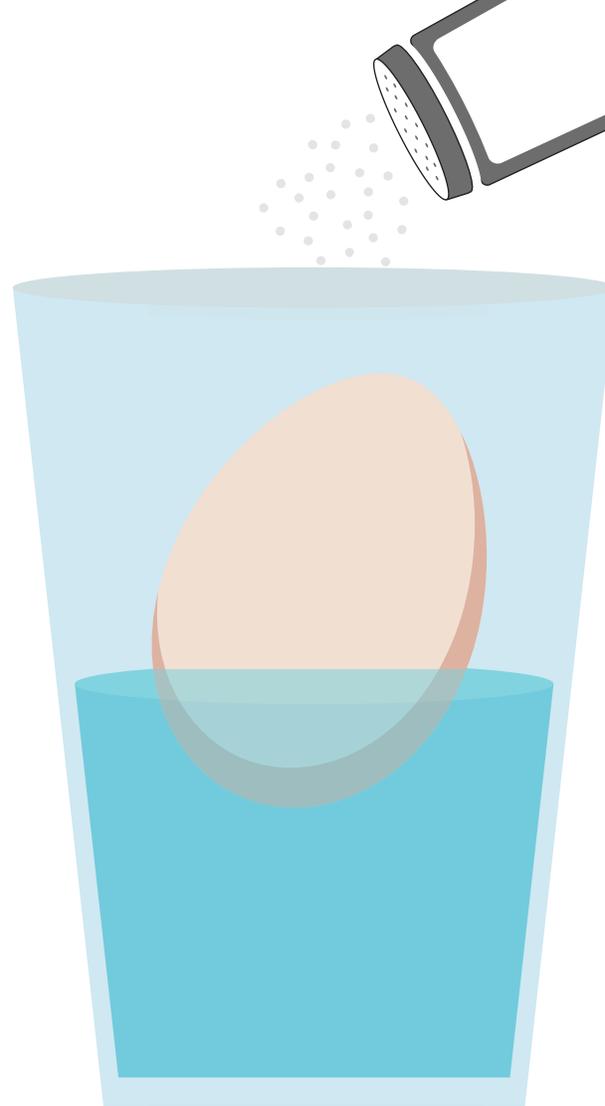
Fill the one labeled "salt water" with ~6 tablespoons of salt, and feel free to increase if results aren't conclusive.

Step 3

Gently drop an egg into both glasses and see what happens. After trying this example, try adding other objects to the water, such as a jar or a bouncy ball, and see how those behave in the water.

Follow-Up Questions:

1. Which egg floats closer to the top?
2. What happens as you add more salt to the water?
3. When fresh water rivers meet the ocean, how do you think the waters interact?
4. Which body of water do you think it would be easier to float in, a freshwater lake or the ocean?



Understanding Beach Erosion

In science you may have learned about erosion which is the process in which weather forces remove and move little bits of our earth's crust. Below is a quick little exercise you can do to better understand how our beaches currently erode!

Step 1

Grab your disposable paint tray, and fill the very bottom of it with a little bit of sand, and then cover that with water. You don't need to put too much water just yet!

Step 2

Take the sand or soil that you are using and pack it at the top end of the paint tray. If your tray is too steep, you can use some water to wet your materials to help stabilize things (similar to how you use wet sand when making a sand castle).

Items you'll need

A disposable paint tray

Water

Sand

You can use soil as a substitute if you need!
Both materials can be eroded

Bonus if you have some pebbles

Did you know?
Some coastlines are receding at up to 25 feet per year! The U.S. alone spends roughly \$150 million each year to combat this.

-U.S. Climate Resilience Toolkit

Understanding Beach Erosion

Step 3

Now that you have everything set up, you can fill up your water until it meets the edge of the sand that sits on the ramp of the tray. Once you do that, you can use your hand as a wave machine! Move your hand back and forth slowly, and watch as you create small ripples in the water.

Step 4

Look and see how the waves are interacting with the sand. Is your little stretch of land shrinking? Is more and more sand falling to the bottom of the ocean?

Step 5

Now that you can visualize the shoreline receding, take your pebbles and other materials and try engineering your own shoreline protection! There are no wrong answers here! Experiment and play around with different designs and see what works! And research online to see which models engineers already use!



Can you think of some reasons why beach erosion is such an important issue?

The Speedsters of the Ocean

Read the passage below, then answer some questions to test your knowledge!

What do you think is the fastest sea creature? According to the National Ocean Service, the sailfish is widely considered one of the fastest sea creatures out there!

A sailfish is easily spotted due to the HUGE sail-like dorsal fin, which can often span near the entire length of its body! At its fastest, it can travel at a speed of up to 68 mph. By contrast, the fastest swimmers can only reach up to speeds of about 6 mph.

Often working in pairs or groups to hunt, sailfish will use teamwork and their fast speeds to disrupt schools of fish. They've even been seen using their long bills and huge dorsal fins to separate fish from one another!

Sailfish prefer to live in the warmer waters throughout both the Atlantic and Pacific oceans. And while they are related to other billfish species like swordfish, spearfish, and various marlin fish, the sailfish is not an endangered species.

Sailfish are beautiful and impressive creatures to see in the wild. Watching them zip by can take your breath away!

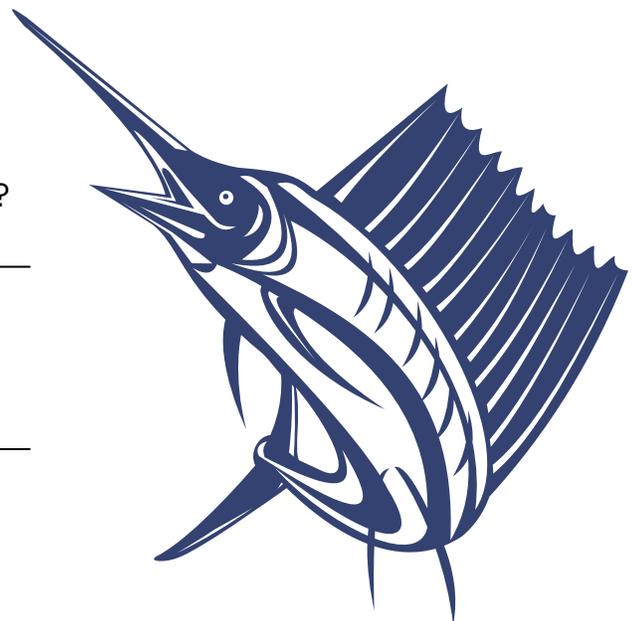
Questions

- Are sailfish herbivores, carnivores, or omnivores?

- How much faster is a sailfish than a top swimmer?

- By doing some research, what relatives of the sailfish are endangered species?

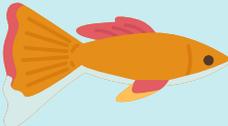
- Based on the passage above, are sailfish social creatures?



Fishy Math

Instructions:

Look at the chart below and answer some questions. Plus, learn some fun facts too!

 Guppy 1 inch	 Neon Tetra 1.5 inches	 Betta Fish 3 inches
 Clown Fish 4 inches	 Goldfish 6 inches	 Koi 20 inches

What is the median length of these fish?

What is the average fish length?

What is the range of fish lengths?

If we were to only look at freshwater fish, how much would the average length change by?

Here's a hint: There is a famous movie about one of these fish! Where did that take place?

Did you know? The oldest known koi fish lived to be 226 years old!

Have you ever heard of the saying, "I have the memory of a goldfish"? It turns out that's a myth! They actually have great memories, and some have even learned tricks!

There are over 70 different species of betta fish! They are often classified by color as well as fin size.

Clown fish actually communicate with each other by making popping and clicking noises!

Fishy Math Part 2

Instructions:

A group of students went to the aquarium and wrote down which species of fish they saw. Based on the measurements found to the right, as well as the students' reporting below, create a line plot, and then answer some questions.

Student 1: 3 Bettas, 1 Clown Fish, 1 Guppie
Student 2: 1 Goldfish, 2 Neon Tetra
Student 3: 2 Clownfish
Student 4: No fish
Student 5: 2 Goldfish, 1 Guppie
Student 6: 1 Betta, 1 Guppie, 2 Goldfish



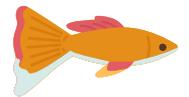
Neon Tetra
1.5 inches



Betta Fish
3 inches



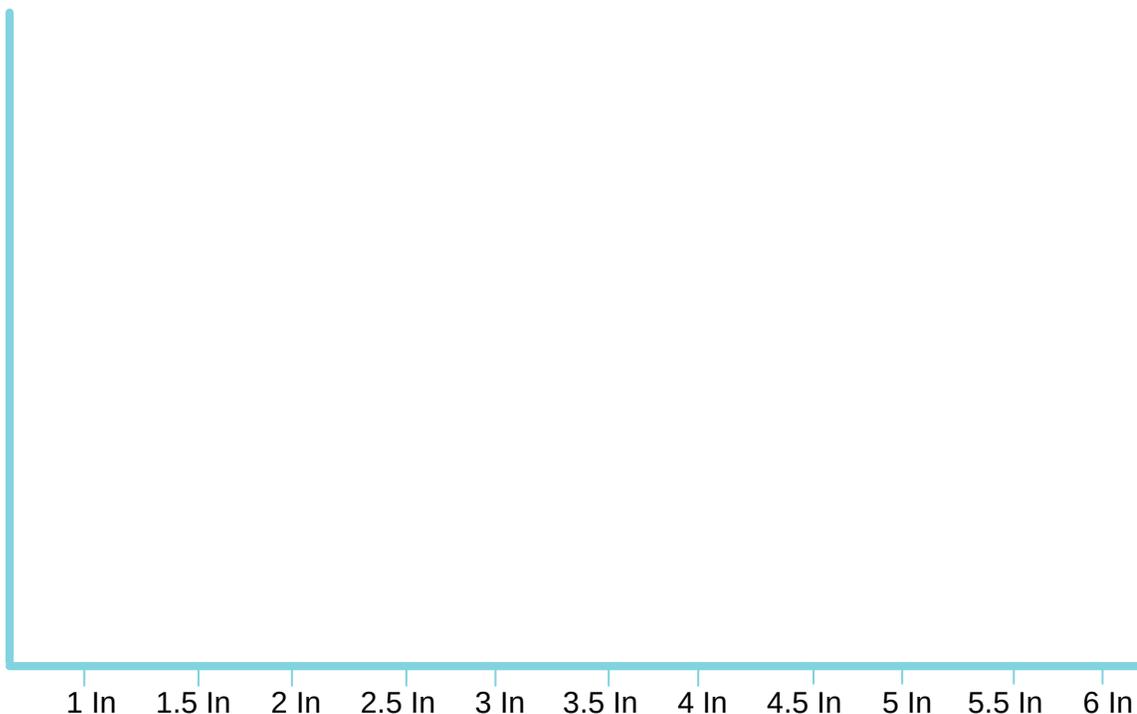
Clown Fish
4 inches



Guppie
1 inch



Goldfish
6 inches



What is the most common length found?

What is the least common length?

How many fish all together were found?

Deep Sea Adventure

Below is a depiction of the different layers of the ocean. The questions listed below will ask you to think about why the zones act the way they do:

Did you know?

According to the NOAA, more than 80% of the ocean is unmapped and unexplored!

Why do you think it gets darker the deeper you go?

In the sunlight zone, water can reach temperatures of over 90 degrees; meanwhile at the abyss zone, it drops down to just above freezing. Why do you think that is? (Hint: Think about how temperature works on the surface in your house!)

Many fish live in the sunlight zone because their main diet consists of plankton. Why do you think the plankton live in this zone? (Hint: Plankton have some striking similarities to plants, what could they be?)

