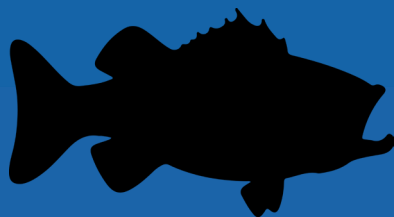


# STEM FISHING



AN EDUCATIONAL AND CREATIVE INTRODUCTION TO THE WORLD OF FISHING



SAMPLE CURRICULUM

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# FISHING BEST PRACTICES

## CATCH AND RELEASE:

Catch and release fishing is a practice in which fish are caught and then returned to the water rather than being kept for consumption or other purposes. Catch and release fishing is often used as a conservation measure to help protect and preserve fish populations, and it can also be a way for anglers to enjoy the sport of fishing without taking fish out of their natural habitat.

Here are some best practices for catch and release fishing:

**Use the appropriate tackle:** Choose tackle that is appropriate for the size and species of fish you are targeting, as well as the type of water you are fishing in. This will help ensure that the fish is not over-stressed during the catch and release process.

**Handle the fish carefully:** When handling fish, be gentle and avoid squeezing or grasping the fish too tightly. This can cause damage to the fish's internal organs or scales.

**Keep the fish in the water:** If possible, keep the fish in the water while removing the hook. This will help reduce the amount of time the fish is out of the water, which can stress the fish.

**Use barbless hooks:** Barbless hooks are easier to remove and cause less damage to the fish than barbed hooks. Consider using barbless hooks when practicing catch and release fishing.

**Use a landing net:** A landing net can help prevent the fish from being injured when it is being removed from the water. Make sure to wet the net before using it to help prevent the fish from getting damaged.

**Release the fish quickly:** The longer a fish is out of the water, the more stress it will experience. Release the fish as quickly as possible to help reduce stress.

**Don't release fish that are injured or exhausted:** If a fish appears to be injured or exhausted after being caught, it is best to release it back into the water as soon as possible. If the fish is severely injured, it may be necessary to humanely euthanize it to prevent suffering.

## CONSERVATION AND ECOLOGY:

Supporting and protecting our ecosystems is more important than ever. The loss of habitat, invasive species, and changing climates all contribute to a decline of native species.

There are several national and state agencies dedicated to preserving our natural resources. US Department of Fish and Wildlife operates nationally, offers several programs including educational and volunteer opportunities.

State fish and wildlife departments play a vital role in the management and conservation of fish and wildlife resources within their states. Most notably, they issue and enforce permits and licensing, set and enforce regulations related to fishing and hunting, including season dates, bag limits, and size limits. They work within their local communities to provide education, outreach, as well as research and monitoring.

## OBJECTIVE:

Craft a fishing lure designed to catch a specific type of fish.

## MATERIALS:

- Photocopies of Lesson and Activity Sheet       Crafting Supplies from page 38       Pencil

## ACADEMIC VOCABULARY:

Mimicking, predatory, bioluminescence

## HISTORY:

In fishing, real bait always works best. Both live and artificial bait plays into the fishes' natural predatory desires including smell, color, and taste. The key to fishing with bait is knowing what bait to cast to match the specific creatures diet. Equally important, if not more important, is knowing what the fish are feeding on during that season, because it changes throughout the year.

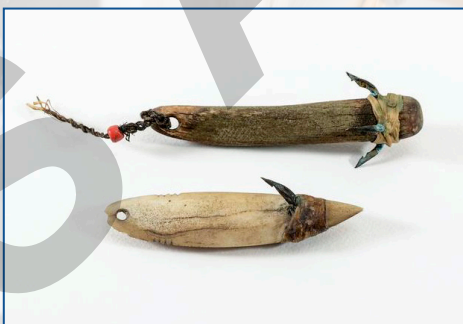
Working with live bait brings many challenges. Shortly after people starting using live bait, came the use of lures as people sought out a better, less finicky option.

A fishing lure is designed to help attract and catch the fish by mimicking the appearance and movement of natural prey. The lure is attached (tied) to finishing line which winds into the reel.

The first lures were made by Chinese or Egyptian fisherman around 2,000 BC. Lures were made from bone or bronze, as were the hooks.

It wasn't until the middle of the 18th century until we started seeing lures resemble realistic creatures such as bugs, flies, and worms, that not only looked like the creature itself, but also moved or spun, attracting even more fish. In the mid-19th century, companies started mass producing lures.

*Early Native American Fishing Lure & Jig*



*Comstock Flying Hellgrammite*



Today, lures are designed to mimic a variety of different bait. While they are all made from different materials, they all have a very specific function. Modern lures are made from wood, plastic, rubber, metal, cork, as well as natural materials such as feathers, animal hair, and string.



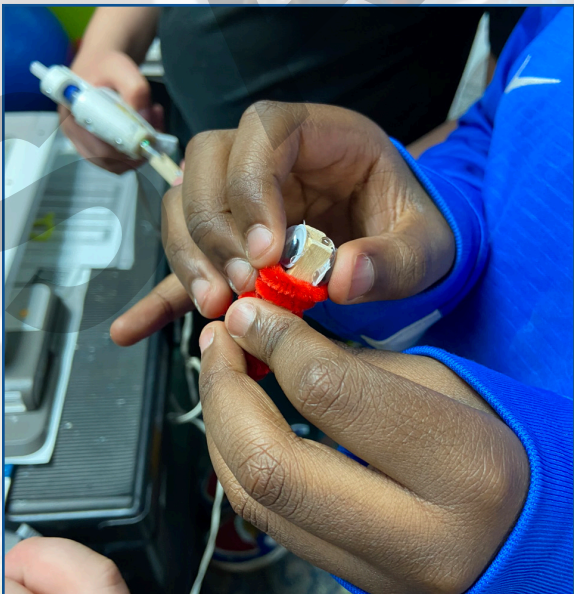
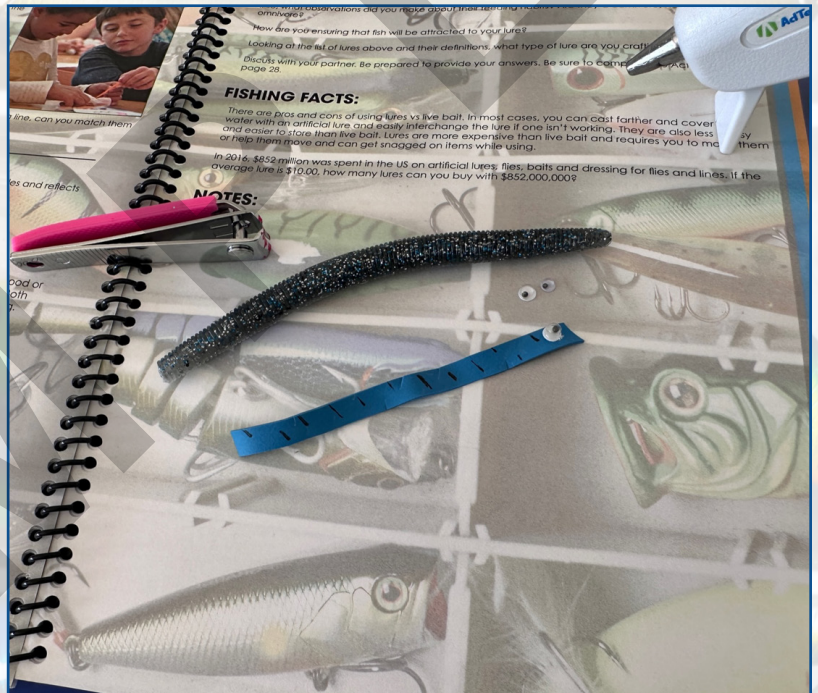
## ACTIVITY:

With your partner, using the materials provided, design and construct a fishing lure with the intention of catching a specific type of fish. Your lure should contain identifiable features and characteristics. Get creative! Do you paint on the eyes or use the googly eyes? Do you use a spoon for glue clothes pins together? Different options such as eyes, wings, arms, legs, color, and even motion are all possible. Make sure you create a way to secure fishing line to your lure.

Before you start on your lure, study one of the soft bait worms provided. After analyzing the worm, it's time to create one of your own. To do this, cut one side of the rubber bands in half, creating one long, wiggly piece of rubber. Using the materials at your disposal, how can you improve the lure to make it more realistic? How will you attach it to the line? Will it work? How do you know?

Once you have completed your soft bait worm, let's transition to the design of your main lure project. It is important to apply lessons learned from your soft bait worm to the overall success of your lure project.

You and your partner will design and construct your own lures, separately.






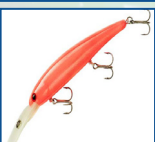



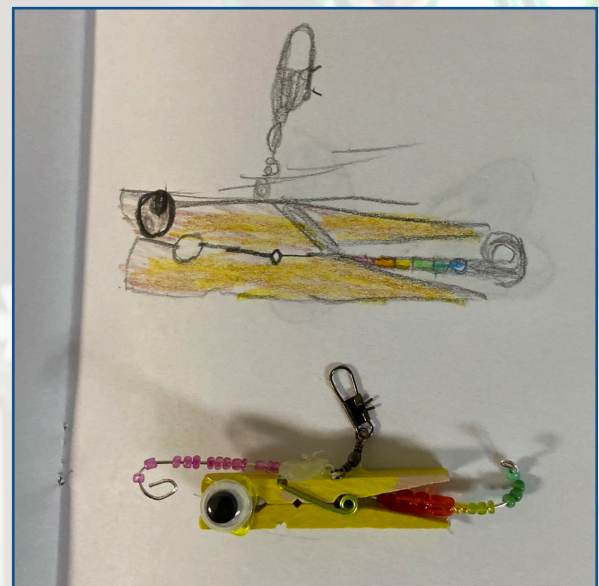
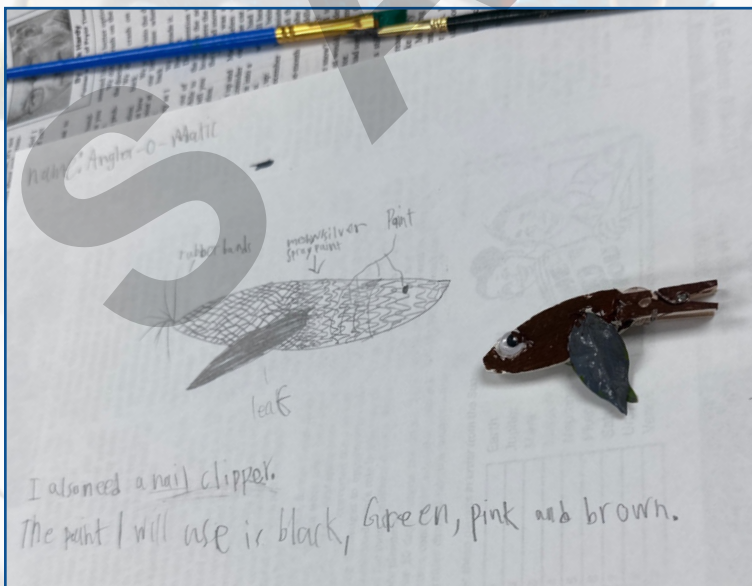


There are dozens of types of lures. Here is a list of the more popular types. Drawing a line, can you match them with their definitions?

## LURE

## DEFINITION

- |    |   |                 |  |
|----|---|-----------------|--|
| 1. |    | Artificial Worm | <b>A.</b> Usually made of metal. Their shape wobbles and reflects light, attracting fish for a reaction bite.  |
| 2. |    | Swimbait        | <b>B.</b> Glow in the dark lures that closely mimics the bioluminescence of natural prey.  |
| 3. |    | Crankbait       | <b>C.</b> These come in two main types - one is made of wood or hard plastic and the other is made of soft plastic. Both are designed to resemble and imitate fish swimming. |
| 4. |    | Spoon           | <b>D.</b> Resembles a group of fleeing bait fish. Designed to create a lot of vibration to attract fish.   |
| 5. |   | Topwater        | <b>E.</b> Lipped or lipless. A moving bait made for catching the predatory species of fish under the surface as a moving animal imitating a baitfish in its environment.     |
| 6. |  | Glow Bait       | <b>F.</b> Soft plastic material, usually with a straight or curly tail. Can be scented or infused with salt.   |
| 7. |  | Spinnerbait     | <b>G.</b> Float on top of the water. Can be pulled to create "walking" or "skimming" motion.   |





## INVESTIGATIONS:

There are pros and cons of using lures vs live bait. In most cases, you can cast farther and cover more water with an artificial lure and easily interchange the lure if one isn't working. They are also less messy and easier to store than live bait. Lures are more expensive than live bait and requires you to move them or help them move and can get snagged on items while using.

Which fish are most common in your area of the country? What do they eat? What bait do anglers use to catch them?

Why did you select the lure that you did? Did you research the type of fish you are trying to catch and if so, what observations did you make about their feeding habits? Are they a carnivore, herbivore, or omnivore?

How are you ensuring that fish will be attracted to your lure?

Looking at the list of lures above and their definitions, what type of lure are you crafting?

Discuss with your partner. Be prepared to provide your answers. Be sure to complete the Activity Sheet on page 29.

## FISHING FACTS:

In 2016, \$852 million was spent in the US on artificial lures, flies, baits and dressing for flies and lines. If the average lure is \$10.00, how many lures can you buy with \$852,000,000?

One out of every one hundred dollars of all goods and services produced in the United States was due to hunting, fishing, and wildlife-associated recreation. Those numbers come from a preliminary report issued by the United States Fish and Wildlife Service, which estimates that roughly 90 million citizens, or 38 percent of the population age 16 or older, spent an estimated \$145 billion on wildlife activities in the U.S. last year.

Of that, roughly \$35 billion was spent on fishing.

## NOTES:



Scan the QR code for the Crafting Lures Activity Answer Key

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

1. Identify three different types of fish. What kind of fish are they? What do these fish eat? Draw a picture of the fish and what they eat.
2. Write out a definition for each of the following types of fish: carnivorous, omnivorous, and herbivorous.
3. On the back of this page, draw your lure and identify 4 major features of the product.
4. You were somewhat limited on materials for this project. If you were going to manufacture this lure with unlimited resources, what would you use to construct it? Make a detailed list below.
5. Why did you choose those specific materials?
6. What do you think the lure would cost to produce (wholesale) and what would you sell it for (retail)?
7. How did you come up with those figures? How does your lure compare to comparable lures?
8. If you were to test your lure in a bucket, bowl or sink, do you think it would sink or float? Why?
9. Do you think it will move in the water or reflect light? Why or why not?
10. If you have time, ask permission from your instructor to attach your lure to fishing line and see how it reacts in water.

Congratulations on creating your lure! Be sure to bring your project home!

Before you do, get permission to post your lure on Instagram and TikTok and tag @stemfishing



# ENGINEERING DESIGN PROCESS

