Catch of the Day: Design Your Own Fishing Lure!

Materials Needed:

- **For Research:** Computer or tablet with internet access, notebook, pencil.
- **For Design:** Sketch paper, colored pencils or markers.
- **For Building (The "Tackle Box" of Craft Supplies):**
  - **Body:** Wine corks, small pieces of wood, bottle caps, old plastic spoons (handle removed).
  - **Attractors:** Aluminum foil, feathers, beads, brightly colored yarn or string, small bells, glitter glue.
  - **Hardware:** Paper clips (can be bent into hooks and eyelets), small screws, wire.
  - **Tools:** Hot glue gun (with adult supervision), strong craft glue, scissors, pliers.
- **For Testing:** A large clear bowl, sink, or bathtub filled with water.

Lesson Plan & Activities

Part 1: The Spark - Introduction & Brainstorm (15 minutes)

Goal: To spark curiosity and introduce the core engineering challenge.

1. **Engage with a Question:** Start by asking, "If you were a fish, what would make you want to bite a lure? What would it look like? How would it move? What sound would it make?"
2. **Examine Real Lures (if available):** Look at a few different types of real fishing lures. Discuss their parts.
   - What is the body shaped like? (e.g., a minnow, a worm, something abstract)
   - What colors are used? Are they shiny or dull?
   - What parts are designed to create movement or sound? (e.g., spinners, rattles, tails)
3. **Introduce the Challenge:** "Today, you are going to become a fishing lure designer! Your mission is to research a specific type of fish found in our area and then design and build the perfect lure to catch it using only these craft supplies."

Part 2: The Fish Detective - Research (20-30 minutes)

Goal: To use scientific inquiry to inform a creative design.

1. **Choose a Target Fish:** Together, choose a common local fish to be the "target" for the lure. Examples: Largemouth Bass, Bluegill, Crappie, or Trout.
2. **Guided Research:** Using the internet, guide the student to find answers to these key questions in their notebook:
   - **What does my fish eat?** (e.g., small insects, minnows, crayfish, worms) This will inform the lure's shape and size.
   - **What colors might attract it?** (e.g., Bass are attracted to crawfish red; Trout like shiny, flashy things that look like small fish).
   - **Where does it live in the water?** (e.g., Bluegill are often near the surface; Catfish are on the bottom). This will determine if the lure should float, sink, or suspend.

Part 3: The Inventor's Workshop - Design & Build (45-60 minutes)

Goal: To apply research and creativity in a hands-on engineering project.

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1. **Blueprint First:** On the sketch paper, have the student draw a "blueprint" for their lure. They should label the different parts and write a sentence explaining why they chose each feature based on their research. (e.g., "I added feathers to the back to look like a minnow's tail.")
2. **Gather Materials:** Let the student "shop" for their materials from the craft supply tackle box. Encourage them to think about how each item can be used. (e.g., "A bottle cap could be a wobbly body, and a bent paper clip can be the hook.")
3. **Build the Lure:** This is the time for creative freedom! Assist with any tricky parts like using pliers or a hot glue gun, but let the student take the lead on assembly. Remind them to think about how the lure will be attached to a line (by creating a paper clip eyelet at the front).

Part 4: The Test Tank - Application & Reflection (15 minutes)

Goal: To test the design and analyze its performance, just like a real engineer.

1. **First Test: Float or Sink?** Gently place the lure in the water-filled container. Does it float, sink slowly, or sink fast? Does this match the target fish's habitat (from Part 2)?
2. **Second Test: Action!** Tie a piece of string to the lure's eyelet. Pull it through the water. How does it move? Does it spin, wobble, or glide? What happens if you pull it faster or slower?
3. **Reflect and Revise:** Ask reflective questions:
    - "Did it move the way you expected? Why or why not?"
    - "If you could change one thing to make it better, what would you change?"
    - "Do you think your target fish would be interested in this lure? Why?"

Part 5: The Angler's Log - Assessment & Sharing (10 minutes)

Goal: To articulate the connection between the research, design choices, and final product.

1. **"Show and Tell":** Have the student present their lure. They should use their research notes and blueprint to explain:
    - The name of their lure.
    - Which fish it is designed for.
    - Why they chose the specific colors, shape, and materials.
    - What they learned from testing it in the water.
2. **Final Log Entry:** In their notebook, have them paste their blueprint and write a short summary of their design process and test results. This serves as a great record of their learning.

Differentiation & Extension Ideas

- **For Extra Support:** Provide pre-made templates for the lure body or a "recipe" card with a simple lure design they can follow or modify. Focus more on the creative decoration than the complex construction.
- **For an Advanced Challenge:** Introduce the concept of buoyancy. Have the student intentionally try to create a "suspending" lure that neither sinks nor floats. They can add or subtract materials (like foam for floating, or small weights like a metal bead for sinking) to achieve neutral buoyancy.
- **Extension Activity:** Create an advertisement or a package for the new lure. What would its catchy name be? What features would be highlighted to convince an angler to buy it? This adds a marketing and persuasive writing component.