**SCL’s Cardboard Boat Challenge - Teacher's Lesson Plan**

**Objective:**

* Introduce STEM and discuss STEM-related careers (or provide examples if the presenter is not in a STEM field).
* Teach key scientific concepts: Density, Buoyancy, and Design Optimization.
* Develop students' engineering mindset through designing and building their own boats.

**Materials Needed:**

* Cardboard (thin enough for easy cutting with small scissors)
* Duct tape
* Scissors or utility knives
* Water source (large tub, or sink)
* Weights (to test boats)
* Smartboard or projector (for PowerPoint presentation)

**Lesson Breakdown:**

**1. Presentation & Discussion (20 minutes)**

* Use the provided PowerPoint presentation.
* Update slides: Include the school’s name and presenter’s photos/STEM role (if applicable).
* Explain key science concepts (Density, Buoyancy, and Design Optimization) using simple examples or objects.

**2. Introduce the Challenge (5 minutes)**

* Explain the Cardboard Boat Challenge and how students will construct their boats.
* Show an example or simple sketch of a boat design.
* Emphasize the goal: Create a boat that can hold as much weight as possible before sinking.

**3. Planning Phase (5 minutes)**

* Students draw out their boat design and build method.
* Review each students boat design; ensure feasibility within the 20-minute build time.
* Once approved, give each student a sheet of cardboard.

**4. Building Phase (20 minutes)**

* Students construct their boats using the provided materials.
* Teacher/presenter circulates to assist with tape and provide guidance.

**5. Testing Phase (10 minutes)**

* Split the class into groups for testing in the water source.
* Test procedure:
  1. Place the boat in water.
  2. Gradually add weights until the boat sinks or remains unsinkable.
* Discussion Questions in the groups
  1. How much weight could your boat hold?
  2. What design features helped it stay afloat?
  3. What would you change if you could build again?

**Wrap-Up & Reflection (5 minutes)**

* Recap key lessons learned about buoyancy, density, and engineering design.
* Ask students: "What would you do differently next time?"
* Encourage students to think about how these principles apply to real-world engineering.

**End of Lesson.**