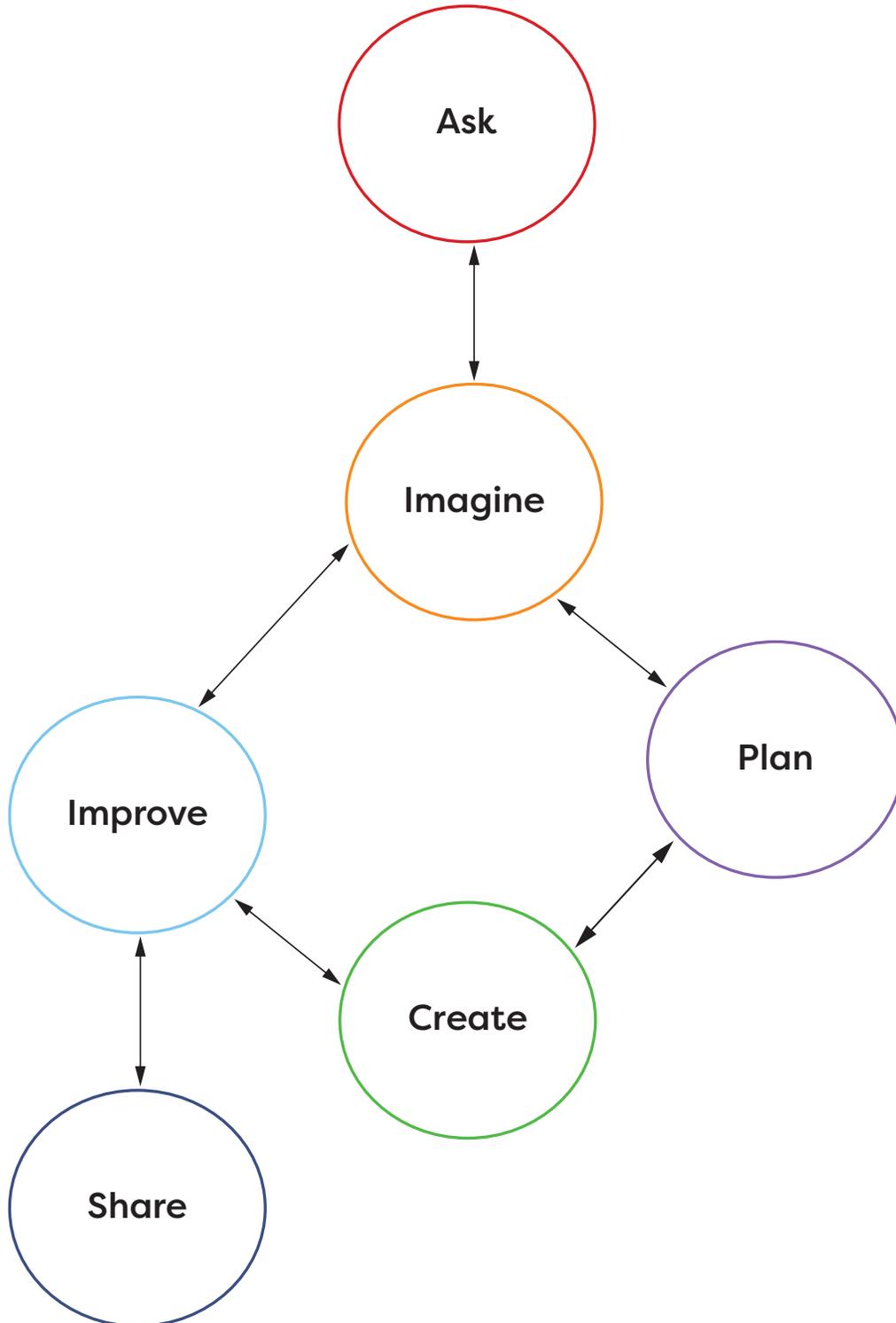
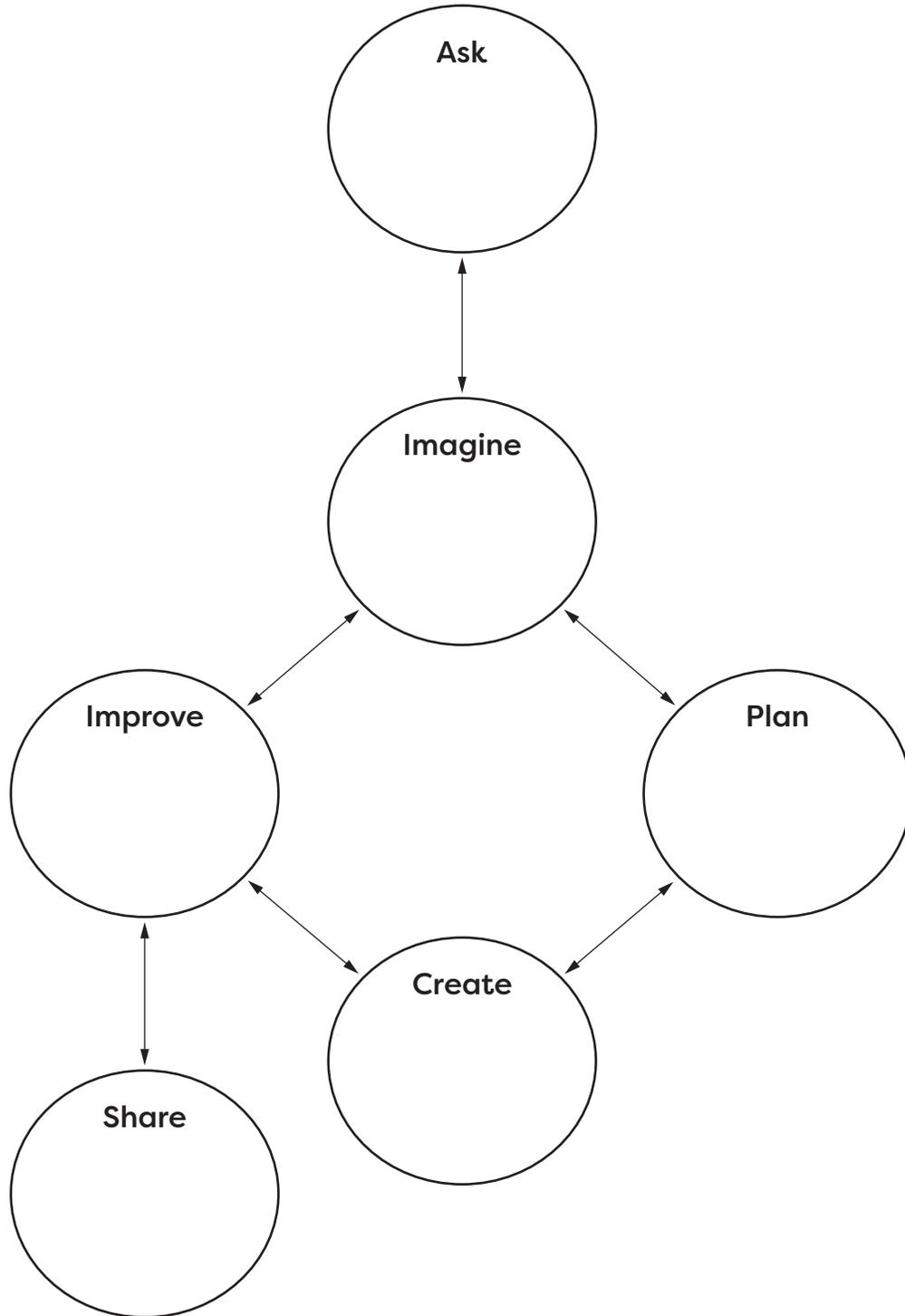


Engineering Design Process



Blank Engineering Design Process Chart



LESSON 21 RESOURCE C

Engineering Challenge Scenario



Scenario

You live in a coastal community that is likely to experience hurricanes. Many people build their homes on or near the coast like the homes in the photograph. Members of the community decide that a seawall is the best solution to protect these homes from potential flooding caused by storm surge during a hurricane. They want your help to design the seawall.

Engineering Challenge Material Preparation Instructions

Prepare a set of engineering challenge materials to show students before beginning Lesson 21. Then prepare a set of materials for each group before Lesson 23. Follow the instructions below to prepare the materials needed for each lesson.

Engineering Challenge Materials

Materials: 16.9-ounce plastic bottle filled with water, 1 pound of modeling clay, clear plastic bin (13.5" × 8" × 4.5" or larger) with hole, foil ramp

Note that the modeling clay must be wrapped to ensure that it does not dry out.

Plastic Bin and Foil Ramp Preparation

Materials: clear plastic bin (13.5" × 8" × 4.5" or larger) (per group), 12" × 5.5" piece of cardboard (per group), roll of aluminum foil, precision knife or scissors, ruler

Preparation

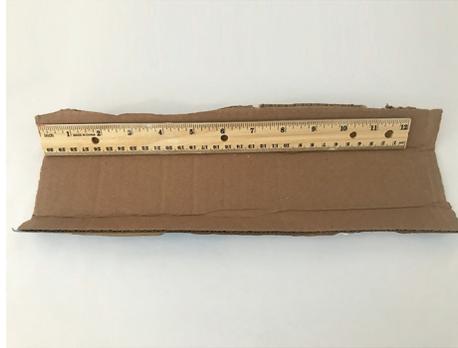
1. Use a precision knife or scissors to cut a rectangular hole in the plastic bin just below the top of the bin on one of the shorter sides. Make the hole about 2.5 inches by 1.5 inches.



2. Use a ruler to draw two parallel lines along the length of the cardboard approximately 2.5 inches apart. To do this, position the cardboard as shown below. Place a ruler along the width of the cardboard. Use the ruler to measure 1.5 inches from the top edge of the cardboard and make a mark. Move the ruler along the length of the cardboard piece and make another mark 1.5 inches from the top edge. Then repeat this process by measuring 1.5 from the bottom edge of the cardboard, making a mark, moving the ruler along the length of the cardboard piece, and making another mark. Then draw two lines through the two sets of marks along the length of the cardboard piece.



3. Use the ruler as a straightedge to bend the long side of the cardboard piece along each marked line.



4. Completely cover the cardboard ramp with aluminum foil.



5. Make sure that the foil ramp fits in the hole of the plastic bin prepared in step 1.

