

ACTIVITY 5: MODELING SHIPBREAKING WITH LEGO BRICKS

The purpose of this activity is to teach students about recycling and the importance of reusing materials by modeling shipbreaking by taking pre-built LEGO structures, break them down into individual component pieces, and then build new structures with the very same pieces.

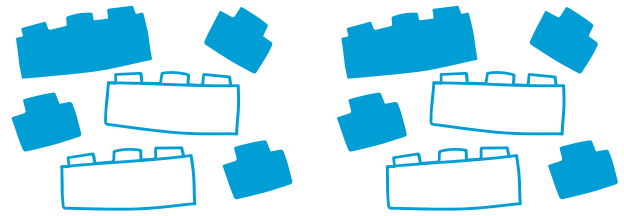
Teaching Tip: Consider using LEGO Creator 3in1 sets, which offer three different builds using the same pieces. Alternatively, you can provide an assortment of LEGO bricks or encourage students to donate their unused LEGO parts/sets from home for this activity.

Materials:

- Pre-built LEGO structures (one per student or small group)
- LEGO bricks of various shapes and sizes
- Work surface for building
- Paper and pencil for sketching designs
- Optional: bin or container for collecting LEGO pieces

First ask students about their past experiences with LEGO building. Introduce the concept of recycling and reusing materials to create something new, and draw a parallel between LEGO building and repurposing reusable parts from structures like freighters.

Next, inform students that they will be taking a pre-made LEGO build, breaking it down into individual parts, and creating an entirely different build from the pieces. Give each student or group a pre-built LEGO structure to examine and observe. Give them time to take the structure apart and to organize the individual pieces out on the table. Encourage them to work carefully and patiently, as some pieces may be difficult to separate. You can have tools on hand for this, if necessary. Have students keep tally of how many of each type of brick they have from the build on their paper. As you monitor their progress, remind them to start thinking about their challenge: to build an entirely new structure that will reuse as many of the bricks from the original build as possible, but they may add in additional non-reused bricks from a common bin of extra bricks.



Then, give them some time to plan and sketch out what they're going to build. Have them account for the number of each type of brick that will go into their build. Instruct them that they may use additional, non-recycled, bricks in their build from the common brick bin. Keep track of how many of each type of non-reused brick were incorporated into the new build.

Have them count how many of each type of brick they have left after the final build. Subtract the total that were left from the total started with (only with the recycled bricks) and that will be how many recycled bricks were used in this build. Divide the number of recycled bricks used by the total number of bricks started with from the prior build to get the **conservation rate** (expressed as a percent) for their recycling build, e.g., the percentage of your starting build they were able to reuse. If any additional bricks were used in the new build, account for those to calculate a **percent reused materials** for the new build. Take the number of recycled bricks divided by the total number (non-reused and recycled combined) of bricks in the new build. This figure will report what percent recycled materials the new build is made of.

Last, have all the students show off their new builds and present their calculations. Discuss with different groups how they arrived at their builds and achieved their conservation rates as well as percent recycled materials. Help students to see the connections to the materials industry where common household products often display a percentage of recycled materials that the product contains. Ask students about their experience breaking down the pre-built structures and building new structures, and what they learned from the process about shipbreaking, recycling, and reusing materials.