

Building on a Budget!



Project Adapted from picklebums.com

What does an engineer do? Did you know there are over 40 types of engineers? Engineering involves using science and technology to design, build and make things work. However, most engineers do not have millions of dollars to create a design. They start with basic paper and pencil.

Objective: Explore the world of engineering by creating a simple 3-D structure using a continuous sheet of paper to create a 3-D shape. Go much further and design your own house, castle or even computer.

Project: Engineering- Bingo, Day 25

Ages: 1st-12th Grade

Time: 1 hour- 2 hour

Supplies:

- Paper (graph paper- optional)
- Pencil with eraser
- Scissors
- Glue or tape
- Ruler
- 3-D shape template- optional

Activity Directions:

1. Begin with one sheet of paper laying in a portrait position (short side up) and draw a 2-inch square located in the top center of the sheet.
2. How many sides does a cube have? Draw 3 more 2-inch squares in a straight line that are connected to the first square going down the page. (see the diagram below)
3. There should be 4 squares in a row now. Go to the second square in the sequence and draw a 2-inch square on the right and left side of it. The lines should match up.
4. At this point, there should be a "t" shape on your paper. On each side of the shape that is not touching something draw a flap. This will consist of a shorter line ($1\frac{3}{4}$ inches) outside the main line about $\frac{1}{4}$ inch from it. Connect the short line to the square with two diagonal line on each end.
5. Once each side of the shapes has its respective flap, cut out the shape in one piece. Remember to cut out the flaps as well.
6. Begin by folding the flaps up. Then starting with the first square drawn, fold the two-inch square over. Continue down the line until all four squares have been folded toward each other.
7. Finally fold squares 5 and 6 toward the rest of the box.
8. Push the flaps to the inside of the box and secure them with tape or glue.
9. Next, design and create your next shape.

Facilitation Questions:

- Are accurate measurements important and why?
- Can you list 5 different type of engineers and what they create?
- Why might be important to build something out of a single piece of uncut material verses cutting it up into smaller pieces and them reassembling them?
- Can you create something more complicated like a house or car?
- Which shape do you think is the strongest? Add some weight and test your theory.

Photo From:

<https://www.teacherspayteachers.com/Product/Distance-Learning-3d-Shapes-Activities-and-Centers-3181754>

