BUILD A CLOCK TOWER

Are you ready to use the Engineering Design Process? Engineers follow this process when they’re creating new products or designing solutions to problems. It's a set of steps that focuses on examining a problem, brainstorming solutions, and testing them out. Engineers don't always follow the steps in perfect order, and they often repeat a step more than once before they reach a solution that works.

THE DESIGN PROCESS

Identify Problem ➔ Brainstorm ➔ Design ➔ Test & Evaluate ➔ Redesign ➔ Share Solution (as many times as needed)

THE GOAL: Solve a design problem by building a clock tower prototype.

WHAT YOU NEED:

- Paper
- Pen or pencil
- Glue or tape
- Scissors
- Cardboard or empty cereal boxes
- Any additional craft supplies you want to use (Examples: Popsicle sticks, straws, pipe cleaners, etc.)

THE DESIGN CHALLENGE:

You are a timekeeper whose job is to take care of your town's clock tower. You have noticed that the tower has become shaky and there is a crack in the clock face. Create a design for a new clock tower that will be more sturdy. It should also have a clock face that you can remove in sections so that you can clean it.

Build a clock tower with a clock face that can be removed in four sections without making the tower fall.
BUILD A CLOCK TOWER CONT.

**DESIGN IT**

- Gather all of your materials and examine them. Think about how you might use each of them to build your clock tower.
- Architects draw blueprints of their buildings before they build them. A **blueprint** is a drawing of what you want your construction to look like, and it helps you plan how you are going to build something. Before you begin building, draw a blueprint of what you want your clock tower to look like.

**BUILD IT**

- Use your materials to build the clock tower that you designed in your blueprint.

**TEST IT**

- Your clock face should be divided into four sections. How many of these sections equals a quarter of an hour? How many of them equals half an hour?
- Remove a half hour worth of pieces from the clock face. Did your tower stay standing? Did the other pieces remain on the clock face? How sturdy is your tower?

**REDESIGN**

- How could you make your tower better? Think of changes you could make to your design.
- If you need to make improvements to your tower, draw another blueprint. Then rebuild your tower and test it out again. Did it pass the test this time?

**DID YOU KNOW?**

One of the most famous clock towers is located in London and is 315 feet tall! It has a bell named Big Ben that strikes every hour.
More to Explore

- Create a new design based on a real-life clock tower. Look at pictures of clock towers from around the world to get ideas.
- Learn about other things people have designed to help them tell time. How does an hourglass work? What about a sundial? Could you find a way to build them?

Standards

This activity aligns with the following Oklahoma Academic Standards:

- **Science**
  - K-PS2-2 Motion and Stability: Defining Engineering Problems
  - 1-ESS3-1 Earth and Human Activity: Developing Possible Solutions
  - 2-ESS2-1 Earth’s Systems: Optimizing the Design Solution

- **Math**
  - K.GM.1 Geometry and Measurement (basic 2D shapes)
  - 1.N.3 & 2.N.3 Number and Operations (foundational ideas for fractions)
  - 1.GM.3 & 2.GM.3 Geometry and Measurement (telling time)

Note: Instructions for this activity were adapted from STEAM Design Challenges by Michelle Powers, Teri Barenborg, Tari Sexton, and Lauren Monroe, published by Creative Teaching Press, 2017.