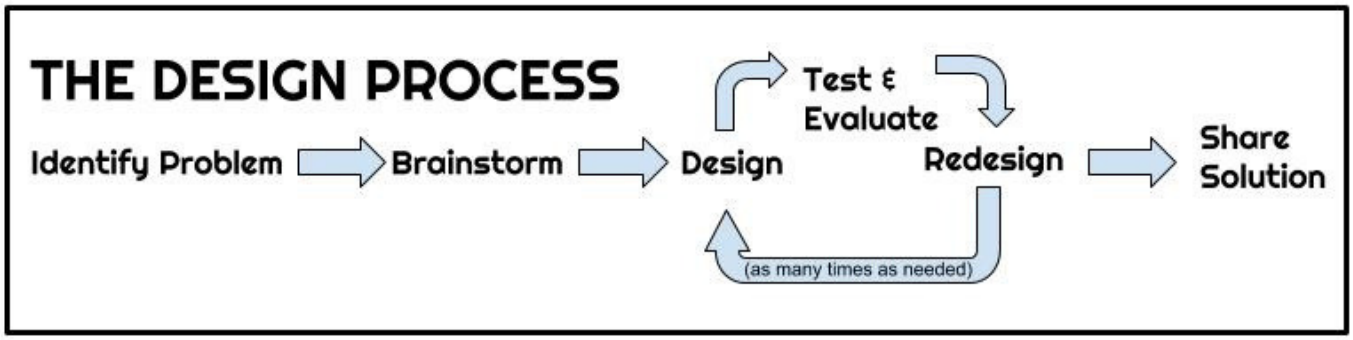
BUILD A CLOCK TOWER

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 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.

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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?

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.

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?

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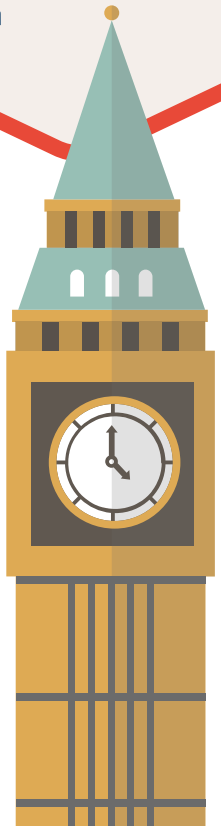
BUILD A CLOCK TOWER CONT.

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?

READ ALL ABOUT IT!

- **Ticktock Banneker's Clock** by Shana Keller
- **Bats Around the Clock** by Kathi Appelt
- **What Time Is It, Mr. Crocodile?** By Judy Sierra



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)

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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.