



# TALLEST TOWER CHALLENGE

Explore the tallest structures in the Adventure Playground at the Gathering Place to see how they were designed and what materials were used. Then work with others to develop the tallest tower that can support the weight of a toy or stuffed animal for 2 minutes.

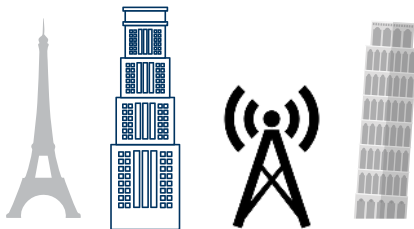
## WHAT YOU'LL NEED:

- 15 straws
- 5 pieces of paper
- Tape
- Paper & pencil
- Recycled materials: paper towel or toilet paper tubes, plastic bottles, cardboard boxes, newspaper, and more!

## KEY ACTIVITY TERMS:



- **Structural Engineer** - an engineer who designs buildings, roads, bridges, towers, and other structures that support or resist loads. This is YOU for this activity!
- **Force** - a push or a pull
- **Gravity** - an invisible force that pulls objects with mass toward each other
- **Compression** - the force of squeezing or pressing something together. The weight of your tower will create a compressive force in the body of the tower.
- **Tension** - the force of stretching something or when something is stretched. Items such as paper clips and pipe cleaners will experience tension if they are used to hold your tower together.



## INSTRUCTIONS:

1. Spend a few minutes examining the different towers you see at a playground or tall buildings you've seen.

## DID YOU KNOW?

At 2,716 feet, the Burj Khalifa in Dubai has reigned as the world's tallest building since 2010.

### Consider the following:

- How big is the base (or bottom part) of the tower compared to how tall it is?
- What are different features of the tower that provide stability?
- What is the tallest building you've ever seen? How was it similar and different to the towers at the Gathering Place?
- How can you manipulate the materials provided to help build the tower?

VISIT OUR FAMILY NIGHT WEBSITE:



<https://tulsastem.org/family-night/>

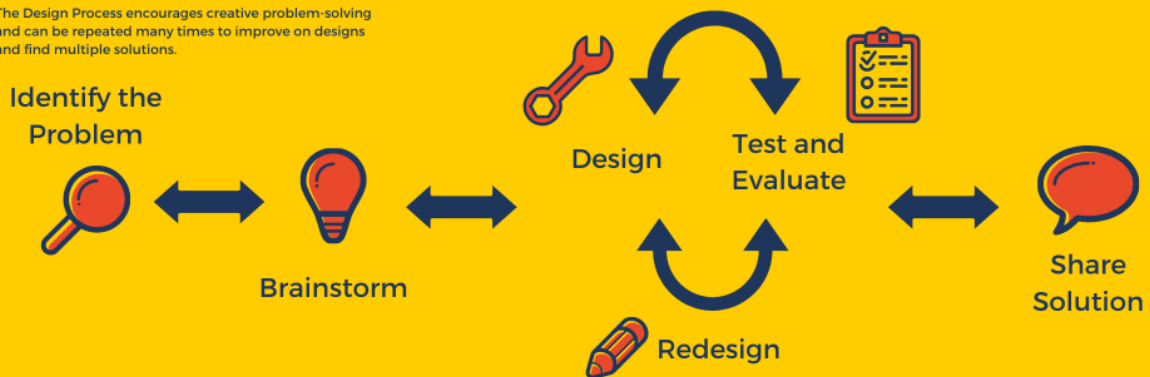




# TALLEST TOWER CON'T

## The Design Process

The Design Process encourages creative problem-solving and can be repeated many times to improve on designs and find multiple solutions.



2. Use the steps of the Engineer Design Process to complete your challenge.

- Sketch your plan on a piece of paper and think about which of the materials you'd like to use and how many.
- Build the tower! Think about what materials would be best to help create a strong base for your structure.
- Test your structure by placing a toy, stuffed animal, or book on top to see if it supports the weight for a full 2 minutes.
- Now is your chance to improve upon your design! Did it successfully support the weight? Great! See if you can redesign it to be taller and carry even more weight. If it can't support the toy, how can you improve your design?

## MORE TO EXPLORE:

- Engineer Design Process explained:  
<https://youtu.be/fxJWin195kU>
- Engineers are the inventors and problem solvers of the world. Learn more about different types of engineering specialties:  
<https://bit.ly/33VANzg>
- Burj Khalifa Tower Design and Construction:  
[www.burjkhalifa.ae/language/enus/the-tower.aspx](http://www.burjkhalifa.ae/language/enus/the-tower.aspx)

## NOW THINK ABOUT:

- How similar was your design to the actual tower you built?
- Did you make any changes to your design during the building phase? Why or why not?
- Did you use all the parts provided? Were any of the parts used only to increase the height of the tower?
- What other materials would have helped with this challenge?
- What do you think engineers have to think about when they are designing and building structures like towers?

## READ ALL ABOUT IT!

**Iggy Peck, Architect**  
by Andrea Beaty

**Little Leonardo's Fascinating World of Engineering**  
by Bob Cooper

**Ellie, Engineer: In the Spotlight**  
by Jackson Pearce

## SHOW US YOUR CREATION

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