

Name: \_\_\_\_\_

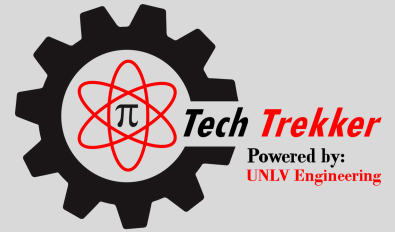
# Skyscraper Challenge!

**Materials Needed: Paper, Tape, and Books (used for weight)**

In this challenge, you will follow the actual engineering design process that engineers use to solve problems. Engineers design structures to help us build our houses or buildings to support the heavy weight. How do you think engineers design these structures in a way that they can support tall buildings?

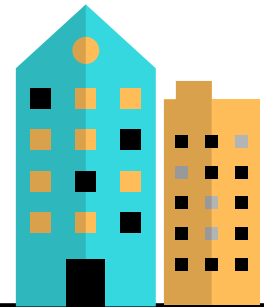
## Scenario:

You've been contracted to build the strongest structure in Las Vegas. Find the design for a base strong enough to support the most weight, such as the base of a building.



## Brainstorm

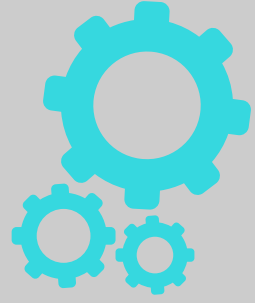
Think about the following questions: What types of shapes are possible? What structures do you see in real life? What kind of materials would be best to build a skyscraper?



## Client Call

**Uh oh!** You got a call from the client, and they decided that they want the structure to be made out of a single sheet of paper and tape only. Using a sheet of paper and tape only, what is the strongest base you can build?





# Design

Draw and plan a couple of structures of what you're going to build. Think about where you'll fold the paper, where the tape will go, what shape will be created.

**Design A**

**Design B**

**Design C**

# Build

Now that you have designed a structure, choose one and have fun creating it!  
Make sure you only use a sheet of paper and tape.

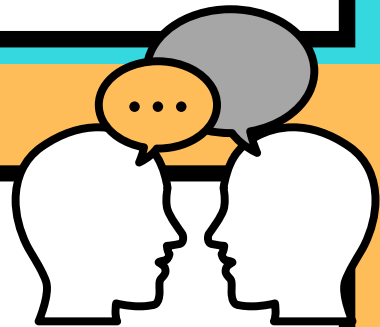


## Test and Evaluate

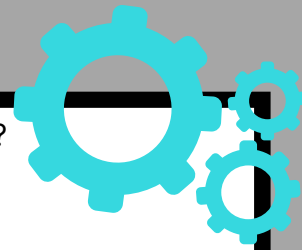
Find a heavy object that you can use to test your structure, such as books! To start, you can slowly add a book, one at a time, to see how many books your structure can hold. How many books did your structure hold? In this box, record what happened to your structure when you put more books on it.

## Discuss

Share with your classmates your results. What did your classmates do?  
Why do you think that design worked or didn't work?



# Redesign



What were the problems with your design? How can you improve your design?  
Draw your redesign in the box below.

# Rebuild



Build your new structure based off your redesign box and have fun creating it!



# Retest and Reevaluate

Find a heavy object that you can use to test your new structure, such as books!  
To start, you can slowly add a book, one at a time, and see how many books your structure can hold. How many books did your structure hold? In this box, record what happened to your structure when you put more books on it.

# Discuss

Share with your classmates your new results. What did your classmates do differently this time? Which of your classmates made the best design? Why do you think that design worked or didn't work?



## Class Findings vs. Science Findings

Take notes on the scientific explanation for the strongest structure.



# Communicate the Solution

Why did your design succeed or not succeed? Which design would you want to use in the real world? Where have you seen this design in real life?



## Extension

Take a picture or a screenshot of the winning structure and show the picture to your parents or your teacher!

