GOOGLE Notebook Student Tools

1 When you open your STEM All Year Digital Notebook for the FIRST time only:

>Click FILE.
>Click MAKE A COPY.
>Type YOUR NAME before the file name.
>Click OK.

2 Type your responses in the text boxes according to your teacher's instructions. If you need more room for your response, you can change the number in the middle of the toolbar at the top to make the text size smaller.

3 To insert a TEXT BOX:

>Click the T button on the top toolbar.

>Click and drag to draw a text box.
>Click and drag to move the text box to the part of the page that you'd like.
>Type inside the text box.
>Use the toolbar at the top to adjust the size, color, and style of your text.

GOOGLE Notebook Student Tools

4 To insert a DRAWING:

>Click INSERT.
>Click LINE or SHAPE.
>Choose a LINE or SHAPE.
>Click and drag to draw the line or shape.
>Use the Toolbar at the top to change the fill color or line color.

5 To insert a PHOTO:

>Click INSERT.
>Click IMAGE.
>To insert a photo from your computer, click UPLOAD and select the image you'd like to insert.
>To insert a Google Image, type your search term in the search bar, then double click on the image you'd like to add.
>Click and drag to change the size of the image and move it to where you'd like on the page.

6 To SHARE your completed notebook with your teacher:

>Click the blue SHARE button in the top right hand corner.
>Type your teacher's name and/or email address.
>Type a note, if necessary.
>Click SEND.

December STEM christmas challenges

NAME:

santa's parachute

Santa's sleigh broke down!

Construct a parachute with basket that will help him land safely on target and upright on the ground.

MATERIALS:

CHOICES FOR PARACHUTE:

- Coffee filter
- Plastic tablecloth (10" x 10")

CHOICES FOR BASKET:

- Mini cup
- 4 index cards

- string, yarn, or fishing line
- Scotch tape
- Paper Santas
- pennies to adjust weight

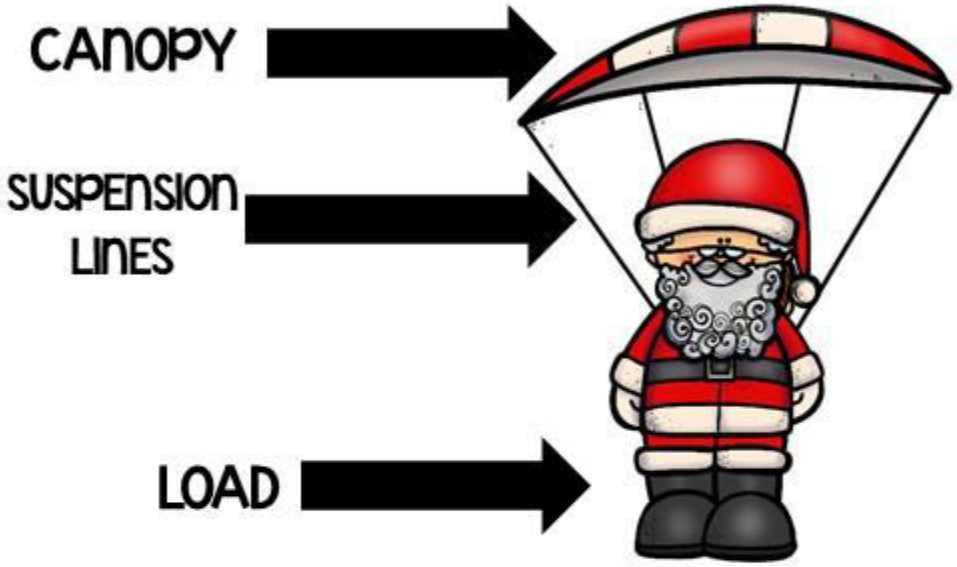
EXPLORE PARACHUTES

santa's parachute

REAL WORLD EXAMPLES

What is similar? What is different?

Main Parts of a Parachute

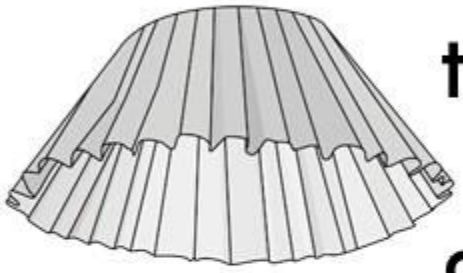


How Parachutes Work

How Parachutes are Useful

WORDS TO KNOW

canopy



the main upper component of a parachute

gravity

the force of attraction of objects to the center of the Earth

drag

a type of force or air resistance that reduces forward motion

mass

the amount of matter in an object

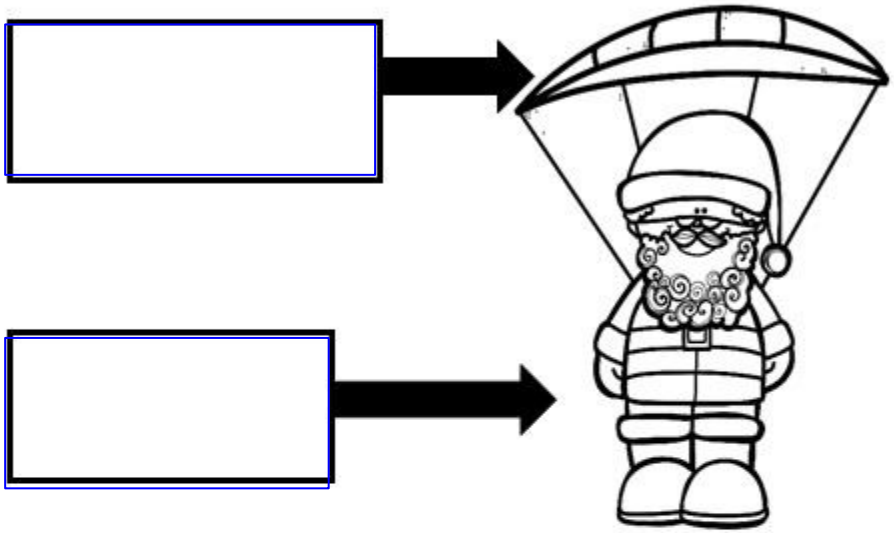
santa's parachute

Name: _____

MY BLUEPRINT

Draw a picture of your parachute and basket.

Label the CANOPY and LOAD.



Draw the materials you used.

Did Santa land UPRIGHT?

YES NO

Did Santa land on the TARGET?

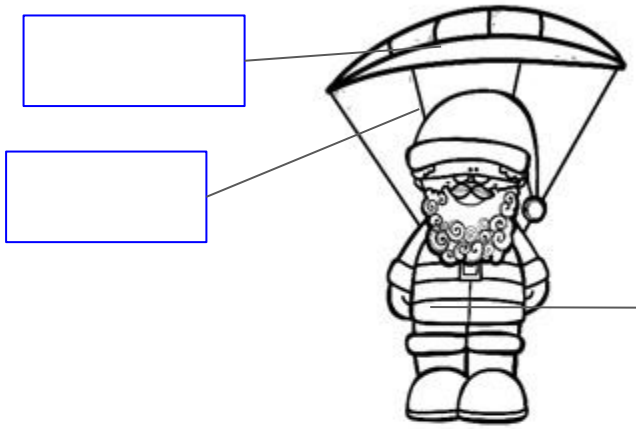
YES NO

santa's parachute

Name: _____

BLUEPRINT

Label the CANOPY, SUSPENSION LINES, and LOAD.



TESTS	Did Santa land upright?	Did Santa land on the target?
TEST 1		
TEST 2		
TEST 3		

What improvements did you make to your parachute design?

LET'S REFLECT!

- What was most difficult about this challenge?
- How are parachutes useful?
- Which materials were most effective for your parachute and why do you think so?
- How did drag (air resistance) affect your parachute's drop?
- How did gravity affect your parachute's drop?
- How did mass and weight affect your parachute's drop?
- What are some features of real parachutes that are important for them to function effectively?
- If we completed this challenge again, what would you do differently next time?

Shelf for the Elf

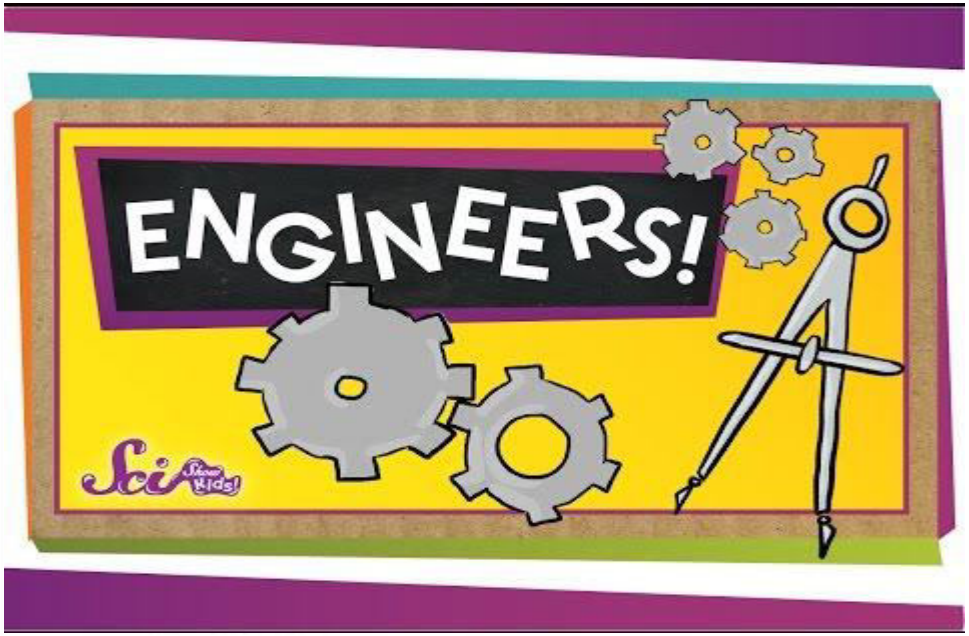
The elf needs a safe and high place to sit that cannot be reached by children.

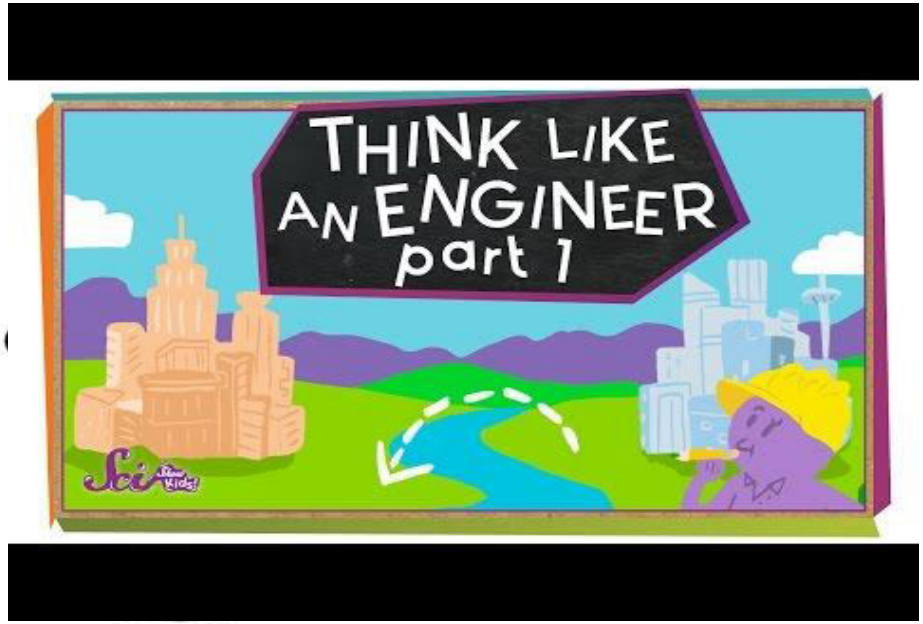
Construct the tallest shelf possible that will hold the elf.

MATERIALS:

- Playdough (1-2 cans per group)
- Popsicle sticks (20 per group)
- Paper elves
- Rulers

EXPLORE SHELVES





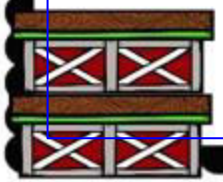
Shelf for the Elf

REAL WORLD EXAMPLES

What is similar? What is different?

Where Shelves Are Found

Types of Shelves



How Shelves are Useful

WORDS TO KNOW

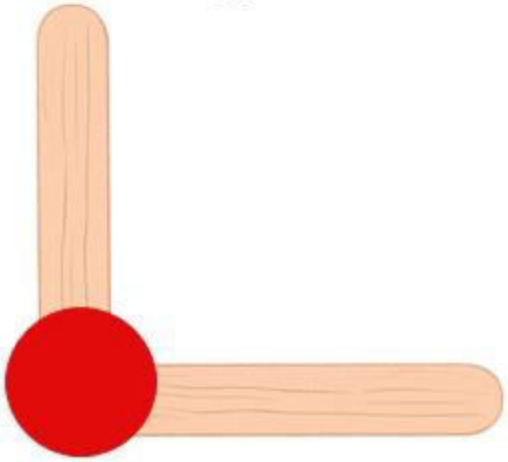
horizontal

side to side direction, parallel to the ground

vertical

up and down direction, perpendicular to the ground

joint



a point at which parts of a structure are joined

support

to bear weight or hold up

Shelf for the Elf

Name: _____

MY BLUEPRINT

Draw a picture of your shelf.

How high is your shelf?

TEST 1	
TEST 2	
TEST 3	

How many HORIZONTAL lines did you use?

How many VERTICAL lines did you use?

Shelf for the Elf

Name: _____

BLUEPRINT

How high is your shelf?

TEST 1	
TEST 2	
TEST 3	

How many HORIZONTAL lines did you use in your shelf?

How many VERTICAL lines did you use in your shelf?

How many JOINTS (vertices) did you use in your shelf?

Which 3D shapes did you use in your shelf design?

What improvements did you make to your shelf design?

LET'S REFLECT!

- What was most difficult about this challenge?
- How is your shelf similar to and different from the shelves in our classroom?
- How is your shelf designed to make it as sturdy and balanced as possible?
- What horizontal and vertical lines did you use in your shelf design?
- What are some different styles of shelves and how are they useful?
- What materials would you use to build real shelves?
- If we completed this challenge again, what would you do differently next time?

Tallest Tree

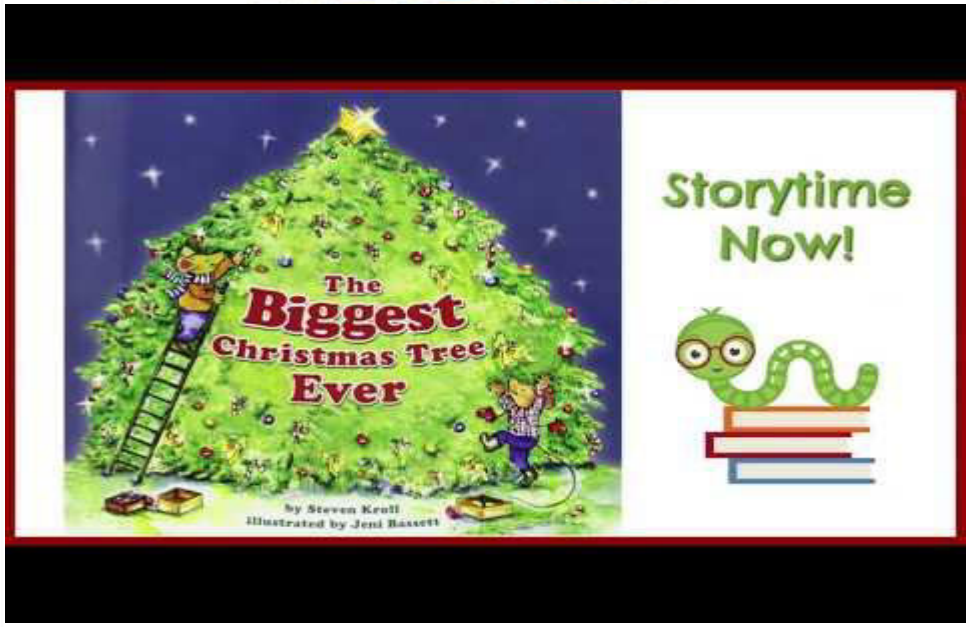
You have been asked to create a decorative tree for the holiday parade.

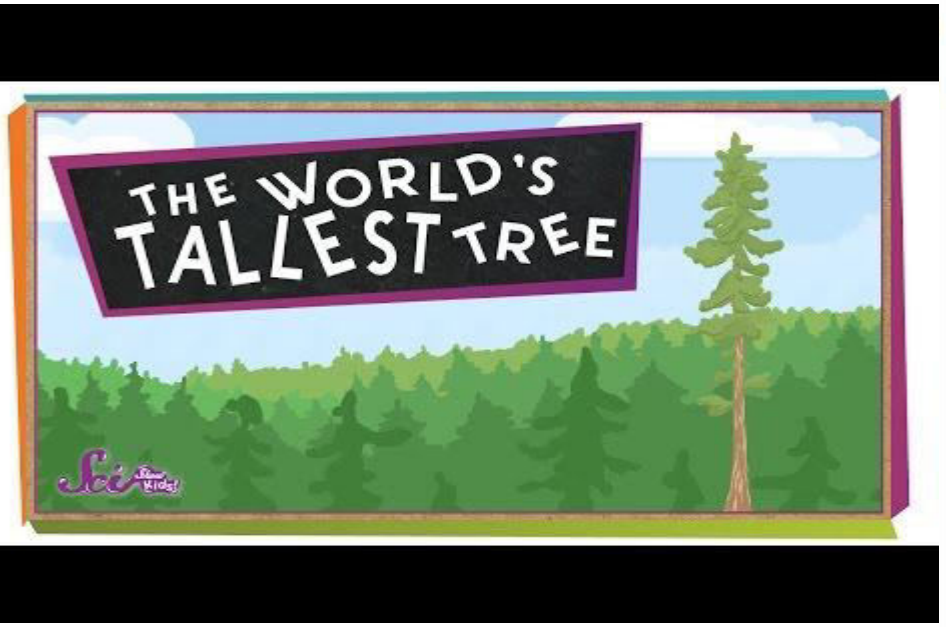
Use cups to construct the tallest tree possible.

MATERIALS:

- Cups
- Paper ornaments and tape to decorate cups (OPTIONAL)
- Yardstick

EXPLORE TREES





Tallest Tree

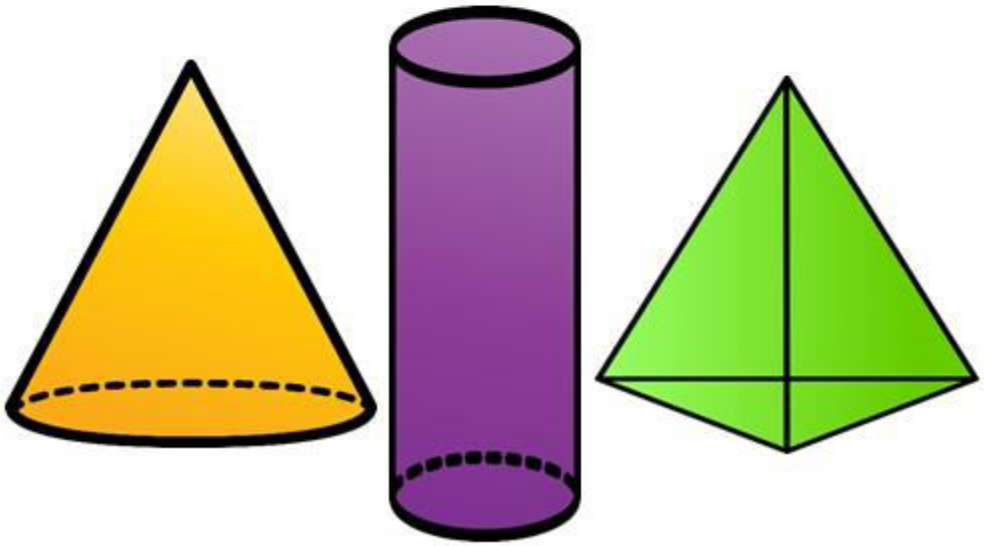
REAL WORLD EXAMPLES

What is similar? What is different?

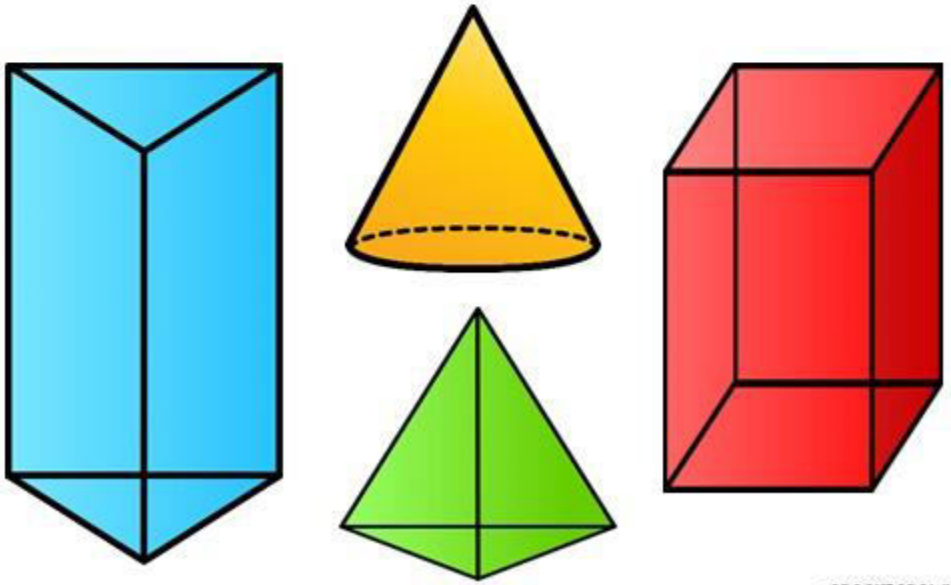
REAL WORLD EXAMPLES

What is similar? What is different?

Common 3D Shapes found in Trees



Common 3D Shapes found in Towers

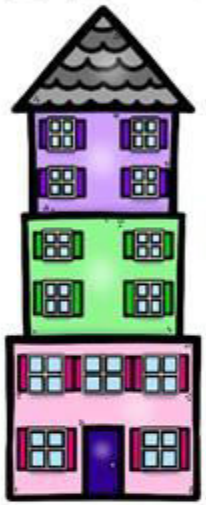


WORDS TO KNOW

architect

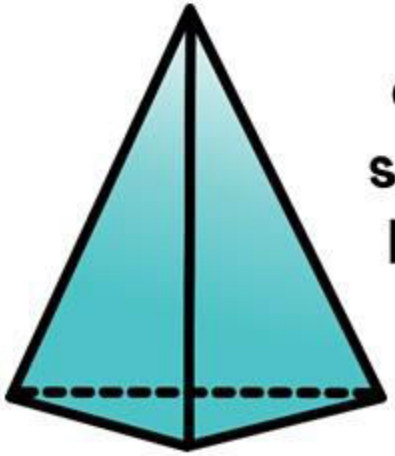
a person who designs buildings

structure



something that is built or constructed

pyramid



a three-dimensional solid with a polygonal base and triangular faces that meet at a point (apex)

cone

a three-dimensional solid that tapers from a circular base to a point

Tallest Tree

Name: _____

BLUEPRINT

1

HEIGHT:

BLUEPRINT

2

HEIGHT:

BLUEPRINT

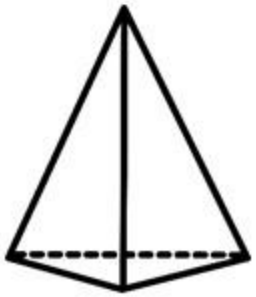
3

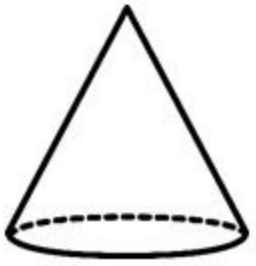
HEIGHT:

Which design worked best?

1 2 3

Color the 3D shapes that you used.

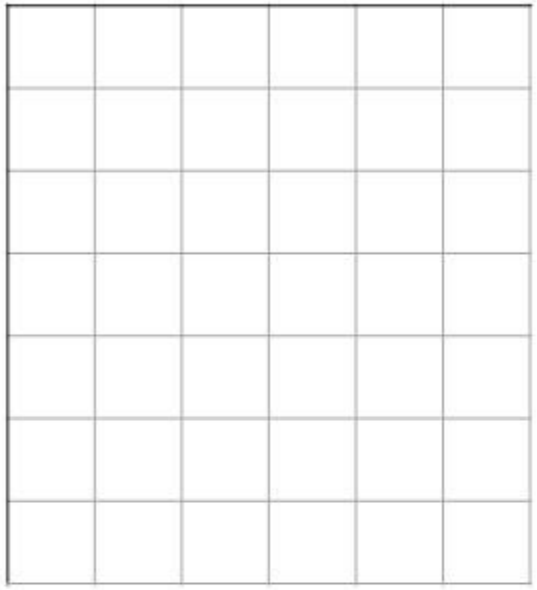




Tallest Tree

Name: _____

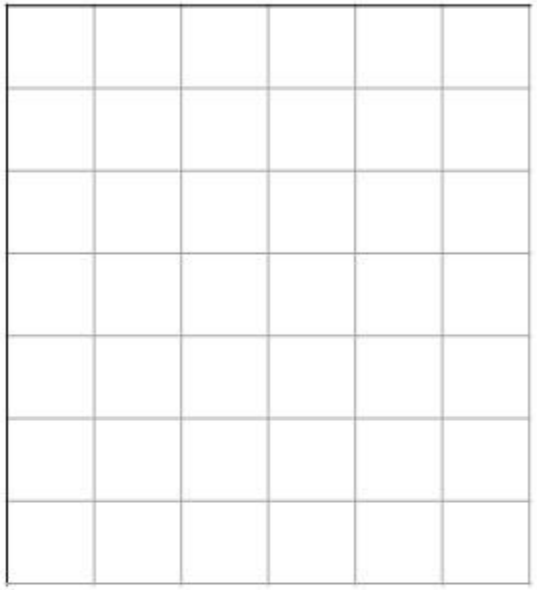
BLUEPRINT



1

HEIGHT:

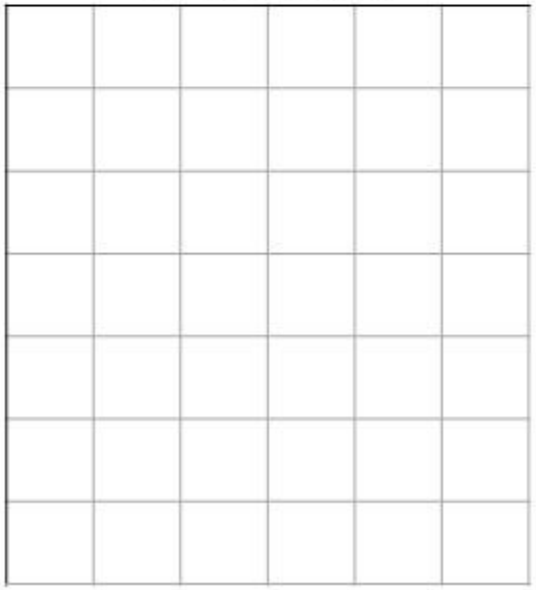
BLUEPRINT



2

HEIGHT:

BLUEPRINT



3

HEIGHT:

Which design worked best?

Why do you think it worked best?

What 3D shapes did you use in your design?

LET'S REFLECT!

- What was most difficult about this challenge?
- Which tree design was the tallest and why do you think so?
- How does the design of your tree affect its balance and stability?
- How are buildings designed using these same concepts?
- Which three-dimensional shapes are represented in your tree tower?
- If we completed this challenge again, what would you do differently next time?

BRAINBUILDER

Gingerbread Escape

Work with your team to create a working zipline for your gingerbread man.

You will need a paper gingerbread man, paperclip, and fishing line.

Gingerbread Escape

Name: _____

BLUEPRINT

Our zipline stretched from _____ to _____.

It measured _____ long.

Our gingerbread man went over these objects:

1. _____
2. _____
3. _____