

# CLASSIC STEM PACK



## INTRODUCTION:

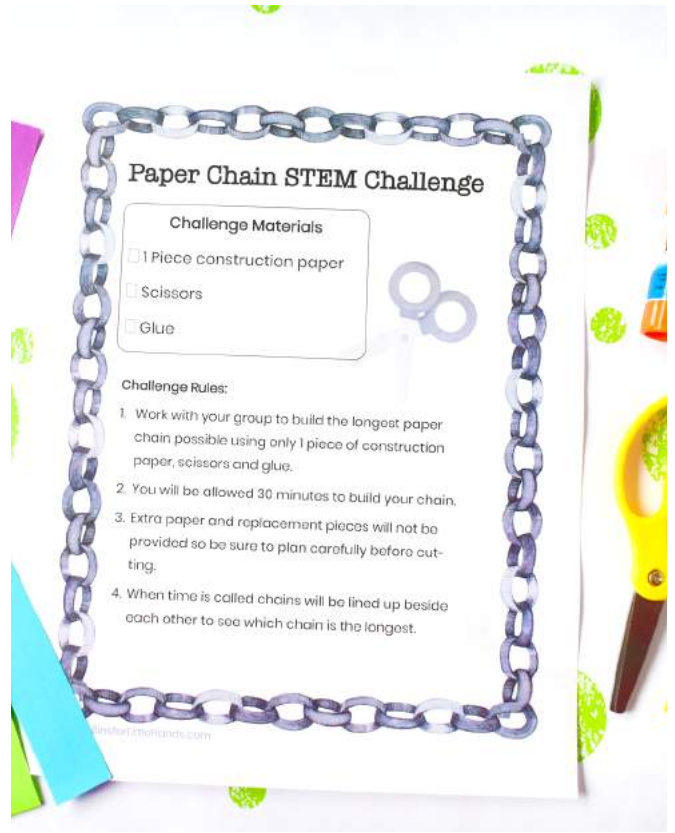
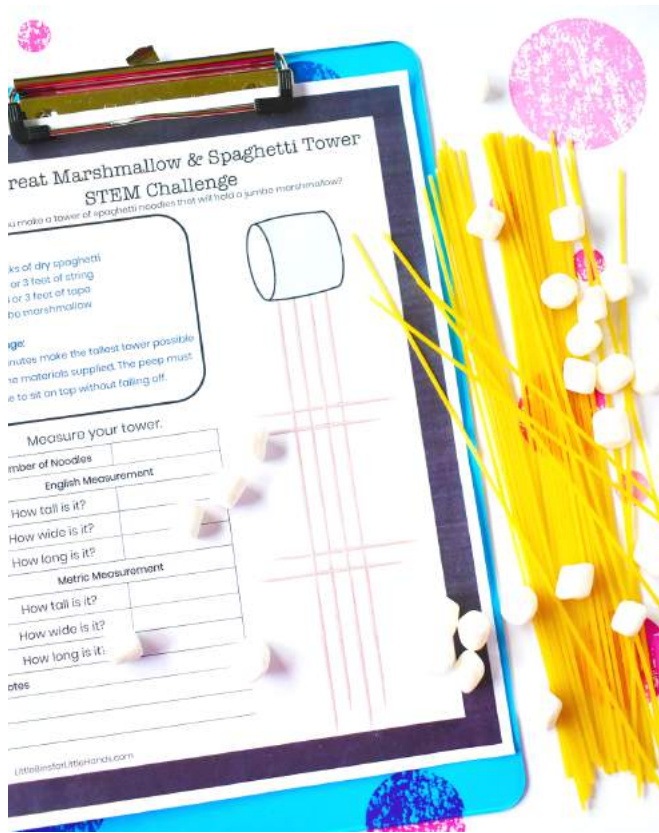
Welcome to your Classic STEM Pack! I hope it sparks creativity and curiosity within your young inventors and engineers!

This STEM pack includes fun and classic STEM projects. Explore architecture, bridges, and more including classic STEM challenges! NEW! This pack features a STEM story filled with adventure the kids will love!

Feel free to use this pack with one junior inventor or a whole group of junior engineers. You may copy activities as many times as you like for your class, but please send your friends to grab their own pack instead of sharing files.

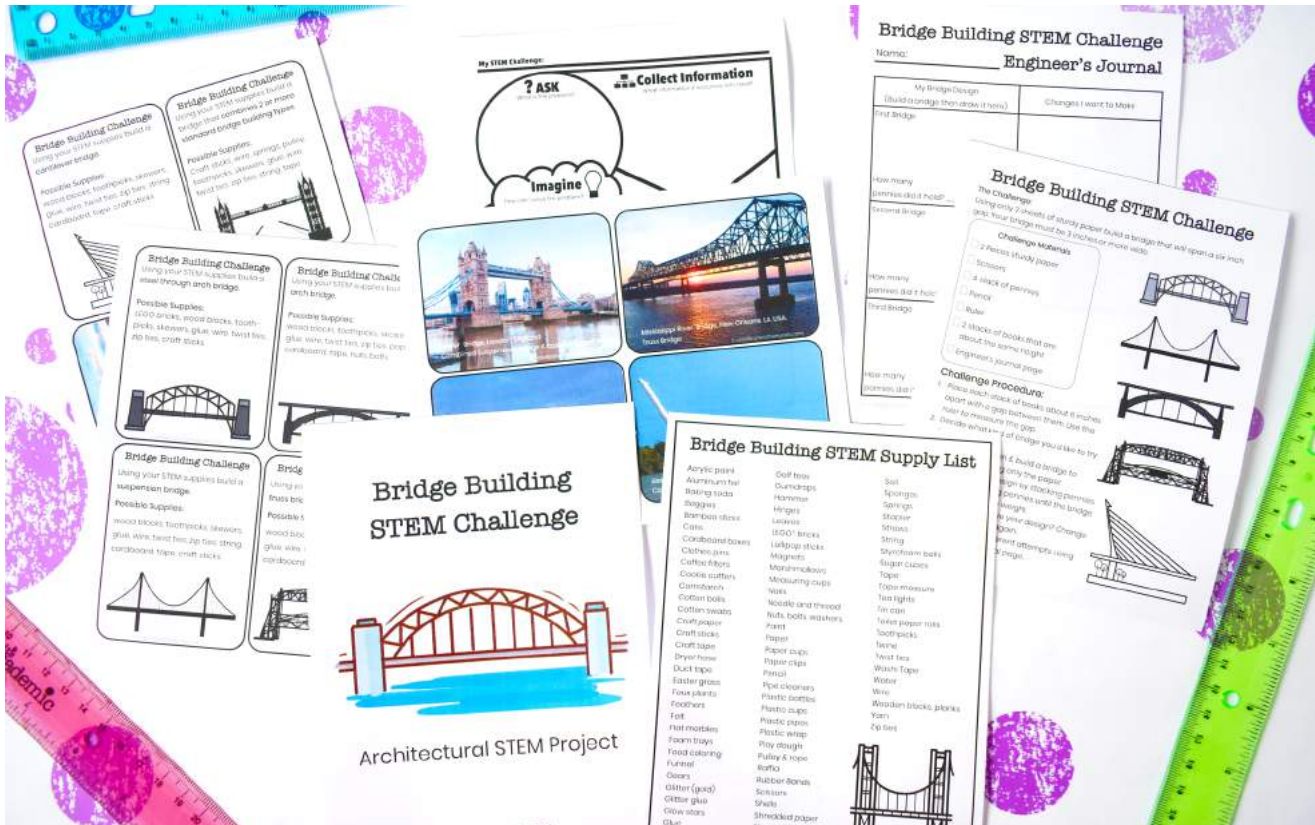
~ Thank you!

# CLASSIC STEM PACK EXTRAS



# STEM: STRUCTURE CHALLENGES

Build the best bridge. Perfect for centers!



## What's Included:

- Bridge Building Challenge
- STEM Journal Page
- STEM Supply List
- Famous Bridge Cards
- Bridge Building STEM Challenges

# STEM: STRUCTURE CHALLENGES

Explore architecture and take the tallest tower challenge!



What's Included:

- Tallest Tower Challenge
- STEM Journal Pages
- STEM Supply List
- Famous Building Cards
- Architectural STEM Challenges

# STEM: STORY CHALLENGE

Go on a STEM filled adventure with this pack! Read the story and solve the challenges.



## What's Included:

- Engaging STEM Story
- STEM Challenges
- STEM Journal Pages
- STEM Supply List
- STEM Drawing Page

# STEM: THREE LITTLE PIGS

Combine a favorite fairy tale with STEM! Pair this STEM project Pack with the book, the Three Little Pigs by Steven Guarnaccia.

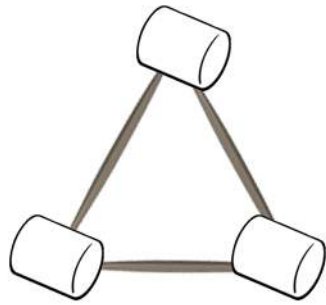
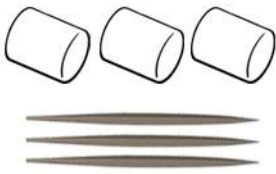


## What's Included:

- Three Little Pigs Coloring Page
- Design A House STEM Challenge
- STEM Journal Pages
- STEM Supply List
- Describe Your House STEM Challenge

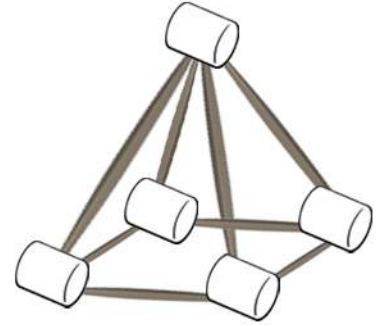
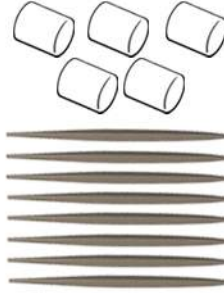
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YOU NEED



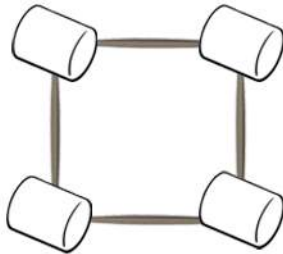
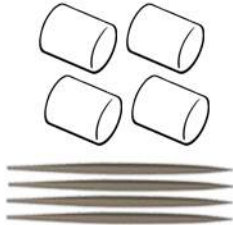
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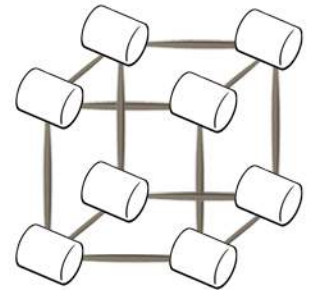
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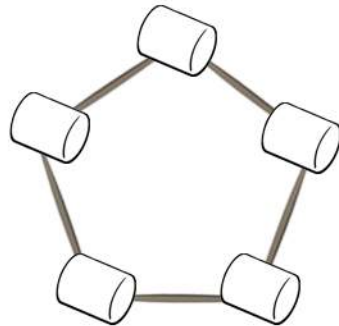
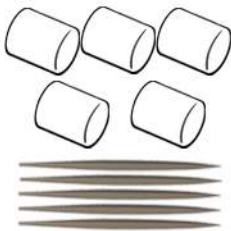
## CREATE A CUBE (3D)

YOU NEED



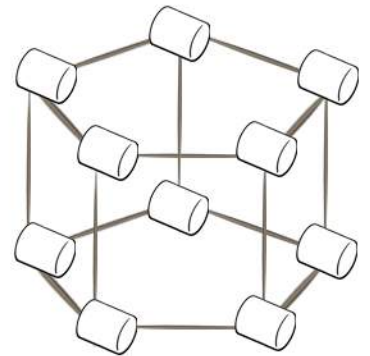
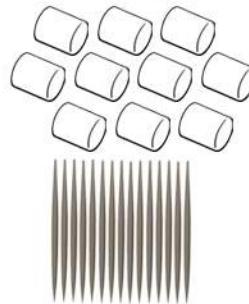
## CREATE A PENTAGON (2D)

YOU NEED



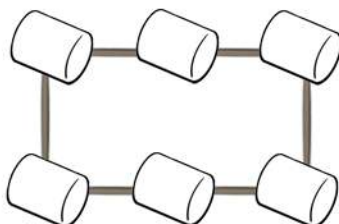
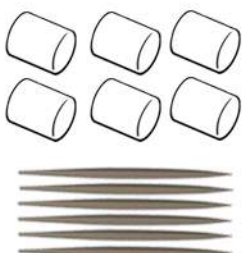
## CREATE A PENTAGONAL PRISM (3D)

YOU NEED



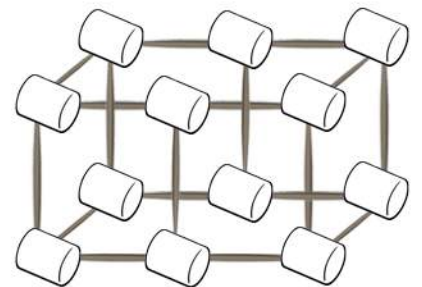
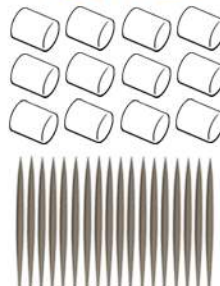
## CREATE A RECTANGLE (2D)

YOU NEED

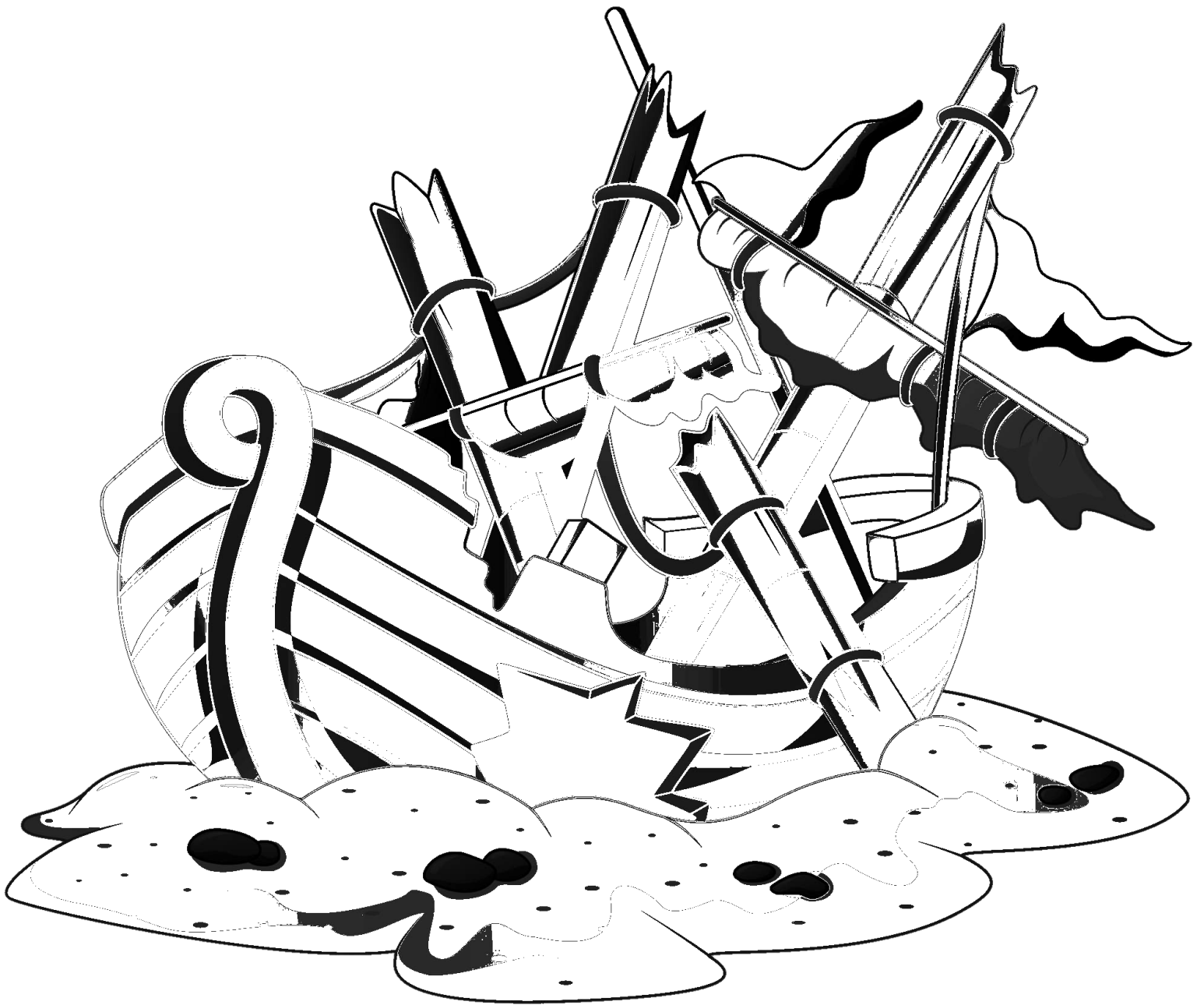


## CREATE A RECTANGULAR PRISM (3D)

YOU NEED



# Adventures on STEM Island





# Adventures on STEM Island Story STEM Challenge

Adventures on STEM Island is a story STEM adventure. The goal is for the story to serve as the spine for the STEM study. The story prompts the student to help the characters solve problems. Using information within the story students can brainstorm ways to resolve the problems. Using the STEM challenge cards (cut these out) students are given a challenge related to the story.



They will need to brainstorm resources available to them. Make decisions on how to best utilize those materials to resolve the problems. Then through experimentation they will work through their ideas to see what works and what doesn't work.

#### NOTE:

The story booklet is designed to print on 8.5x11 pages and is designed in booklet format. Which means you will need to print double sided. Then stack your pages according to page number, fold the booklet in half, and staple together.

Even though being stranded on STEM island was scary, all four children had skills to stay safe and make it home from STEM island.

How would you help them build a shelter, raft, and water container and build a fire to keep them safe?

The children would use their problem-solving skills to make things to survive and leave the island.

How would you help them in their tasks?

# Adventures on STEM Island

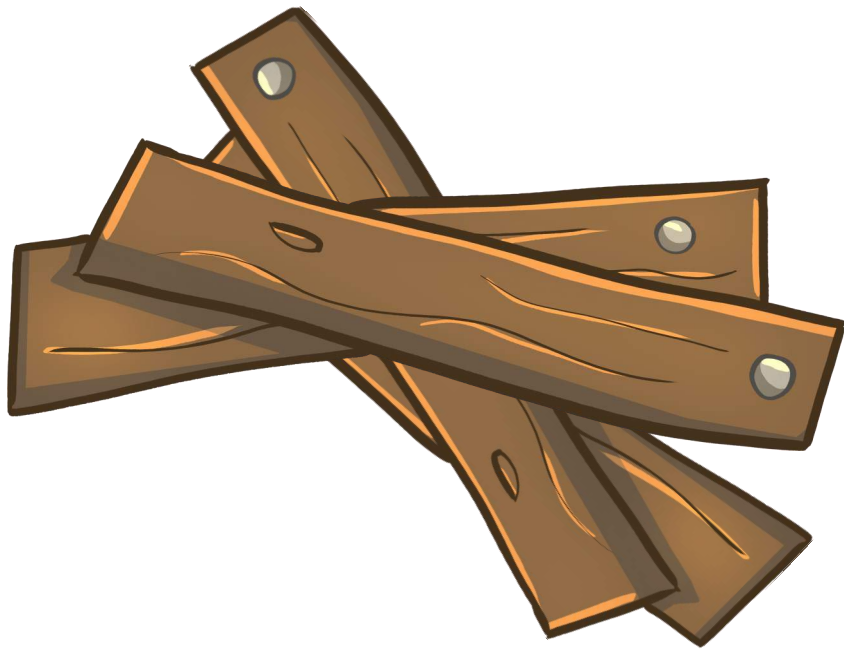




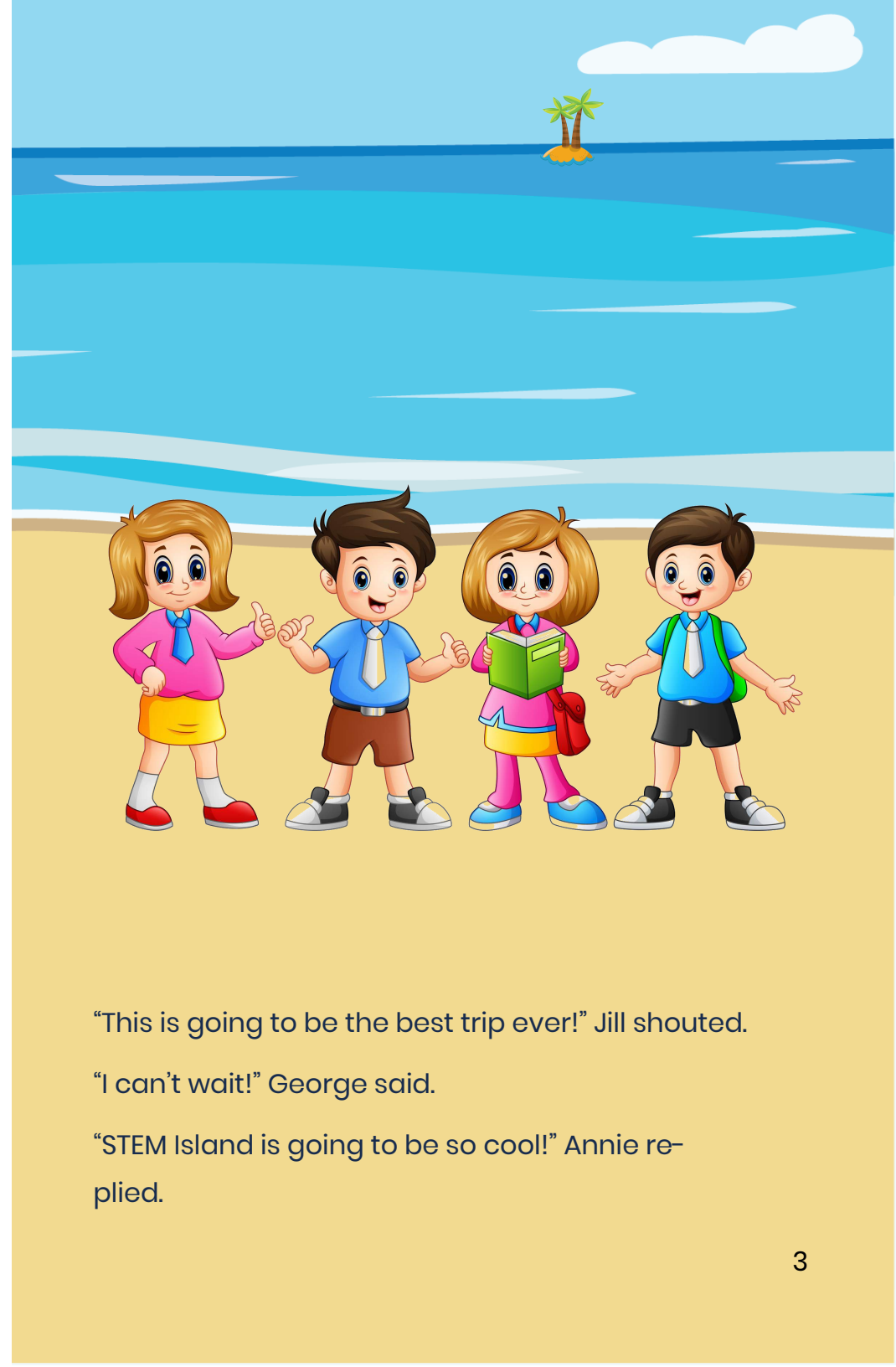
It was going to be a fun trip to STEM Island. Annie, Bill, George, and Jill were going to the island on a boat. They were so excited about all the fun games they would play, the animals they would see, and the laughs they would have.

Finally, the children would need to make sure they had drinking water. What type of container could they make to hold water? What materials would they use?





Next, the children would need to build a raft to help them sail the seas and make it back home. What materials could they use to build a raft that would hold four people safely? Would some people stay behind while others went for help?



“This is going to be the best trip ever!” Jill shouted.

“I can’t wait!” George said.

“STEM Island is going to be so cool!” Annie replied.



Bill was also excited to have a fun trip, but he was scared when the rain began. Everything changed when the storm came. Rain poured on the children. Thunder roared. The wind blew so hard that the boat broke. All that was left were small pieces of wood and a sail. The children swam to land and noticed how dark it had gotten. They were scared but knew they could use their own skills to survive the night.

First, the children would need to build a shelter to protect them from the storm. What materials could they use to build a place to keep four children safe? How would it stand up to the rain and wind?





Escaping STEM Island would not be easy, but Annie, Bill, George, and Jill had many science, technology, engineering, and math skills they learned in school. They got all the materials they could find including several small pieces of wood from the broken boat, a ripped sail, big leaves from the palm trees, sand, rocks, sticks, and shells. The children would need to complete tasks in order to survive and make it back home.



Each child on STEM Island had their own special talent. Annie was good at numbers. She knew how to add and subtract. She began to count what they would need to build a shelter and a raft.

Bill liked to build things and started to search for materials to build their shelter to stay safe from the rain. He also wanted to make a raft to find their way back home.

George loved science and knew they would need to boil the water over a fire to make it safe. He started looking for materials to start and build a fire. His friend Jill also began to gather things to build a water holder.

# Adventures on STEM Island

## Supply List

Being shipwrecked on a deserted island means your supply list will be very limited. Listed below are supplies listed in the story booklet. Brainstorm to think of other resources that might be available on a deserted island, beach, and wrecked boat. List them below.

- Small pieces of wood from the wrecked boat
- Ripped sail
- Palm leaves
- Sand
- Rocks
- Sticks
- Shells

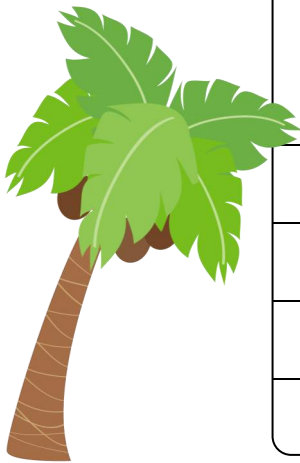
What other resources might be available?



# My STEM Island Adventure Challenges

## Build a Shelter

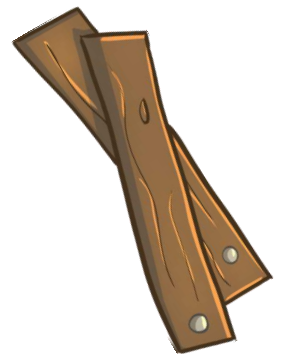
The children need to build a shelter to protect them from the storm. What materials could they use to build a place to keep four children safe? How would it stand up to the rain and wind?



What building materials might be available?


## Build a Raft

The children need to build a raft to help them sail the seas and make it back home. What materials could they use to build a raft that would hold four people safely? Would some people stay behind while others went for help?



What building materials might be available?


## Build a Fire

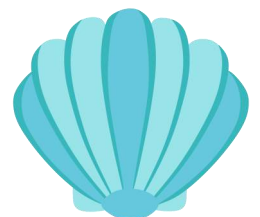
The children need to build a fire to boil their water, and also to help them stay warm during the night? How can they build a fire on the island? What materials would they need? What can they use instead of matches to light a fire?



What building materials might be available?


## Build a Water Carrier

The children need to make sure they had drinking water. What type of container could they make to hold water? What materials would they use?



What building materials might be available?




# My STEM Island Adventure Challenge:

## ? ASK

What is the problem?



## Collect Information

What information & resources will I need?

## Imagine

How can I solve the problem?



## Plan

What materials do I have/need?



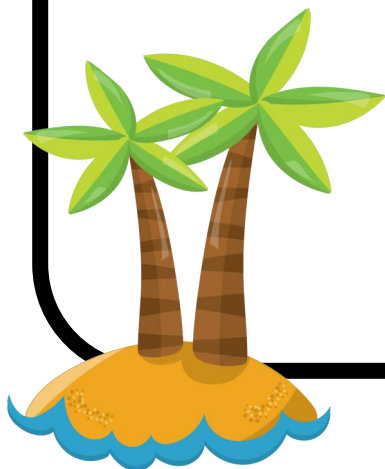
## Create

I will test my solution,



## Improve

What changes can I make



# My Draw & Tell STEM Island Adventure

Draw a picture of the deserted STEM Island, and then tell what you think it would be like to be on the island.



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# 101 Stem Supplies

## BASIC PANTRY STAPLES

Baking soda  
Cooking oil  
Corn starch  
Corn syrup  
Eggs  
Food coloring  
Fizzing tablets  
Food coloring  
Gumdrops  
Lemons  
Maple Syrup  
or molasses  
Marshmallows  
Peeps  
Plastic wrap  
Rubbing alcohol  
Salt  
Skittles  
Sugar, sugar cubes  
Water  
White vinegar  
Whole milk

## BASIC SUPPLIES

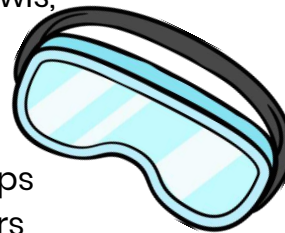
Acrylic paint  
Adhesives (hot glue,  
glue dots, duct tape, tape)  
Aluminum foil  
Baggies  
Balloons  
Cardboard  
Clothes pins  
Coffee filters  
Coins  
Cotton balls  
Cotton swabs

Craft paper  
Craft sticks  
Craft tray, baking dish, or cookie  
sheet (for containing messes)  
Dryer hose  
Empty water bottles  
Faux grass, plants  
Feathers  
Felt  
Flat marbles  
Food coloring  
Funnel  
Gears  
Glitter glue  
Glow stars  
Golf tees  
Hammer  
Hinges  
Jumbo craft sticks  
Leaves  
LEGO® bricks  
Lollipop sticks  
Magnets  
Marbles  
Nails  
Needle and thread  
Paper clips  
Paper towels  
Paper plates, bowls,  
cups, spoons  
Pencils  
Pipe cleaners  
Plastic bottle caps  
Plastic containers  
Plastic pipes  
Pom-poms  
Rubber Bands

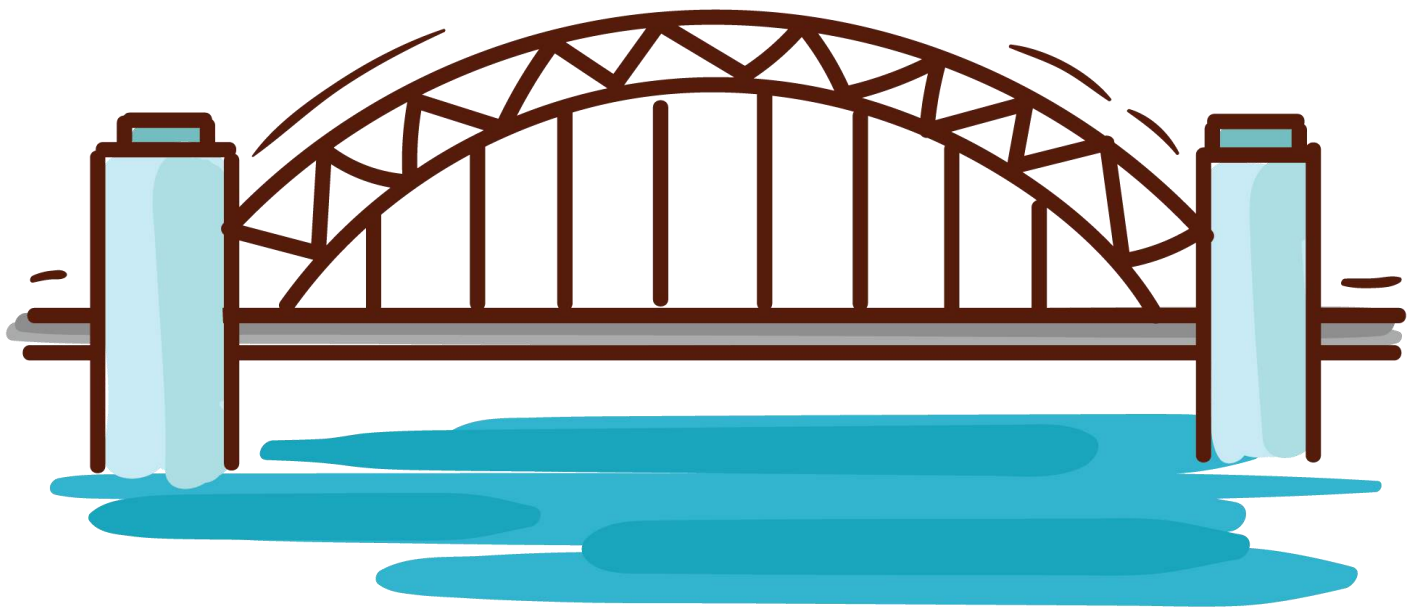
Seeds  
Scissors  
Shells  
Skewers  
Soil  
Sponges  
Springs  
Stapler  
Straws  
String, raffia, ribbon  
Styrofoam balls  
Tape measure  
Tea lights  
Tin cans  
Toilet paper rolls  
Toothpicks  
Twine  
Twist ties  
Washi Tape  
Water  
Whirly gig  
White shallow bowl  
or dish and cups  
Wire  
Wooden planks  
Yarn  
Zip ties

## BASIC SCIENCE TOOLS

Pipettes  
Meat Basters  
Squeeze bottles  
Measuring cups  
Measuring spoons  
Magnifying glasses  
Safety glasses  
Smocks or old clothes



# Bridge Building STEM Challenge



Architectural STEM Project

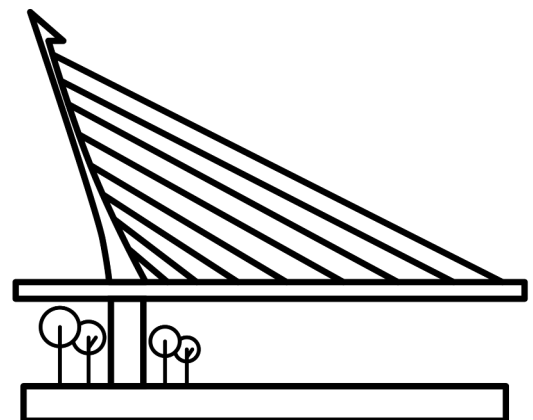
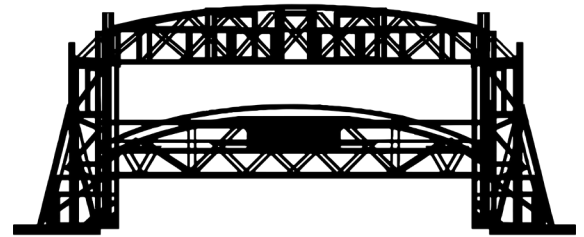
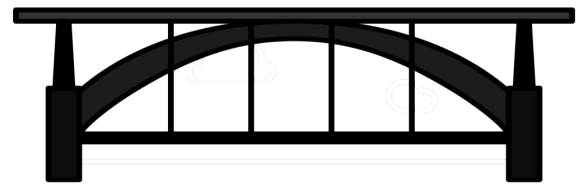
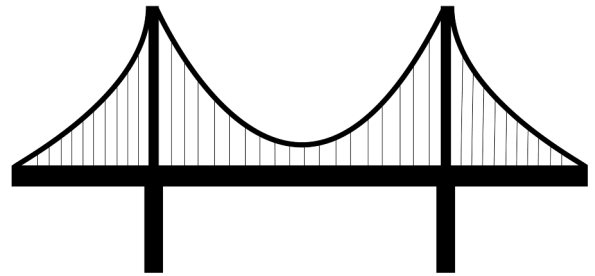
# Bridge Building STEM Challenge

## The Challenge:

Using only 2 sheets of sturdy paper build a bridge that will span a six inch gap. Your bridge must be 3 inches or more wide.

### Challenge Materials

- 2 Pieces sturdy paper
- Scissors
- A stack of pennies
- Pencil
- Ruler
- 2 stacks of books that are about the same height
- Engineer's journal page



## Challenge Procedure:

1. Place each stack of books about 6 inches apart with a gap between them. Use the ruler to measure the gap.
2. Decide what kind of bridge you'd like to try to build.
3. Experiment! Design & build a bridge to span the gap using only the paper.
4. Test your bridge design by stacking pennies on top, keep adding pennies until the bridge collapses under the weight.
5. How can you improve your design? Change your bridge and try again.
6. Keep track of the different attempts using your engineer's journal page.

# Bridge Building STEM Challenge

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

## Engineer's Journal

My Bridge Design (Build a bridge then draw it here)	Changes I want to Make
First Bridge        How many pennies did it hold? _____	
Second Bridge        How many pennies did it hold? _____	
Third Bridge        How many pennies did it hold? _____	

**My STEM Challenge:**

**? ASK**

What is the problem?



**Collect Information**

What information & resources will I need?

**Imagine**

How can I solve the problem?



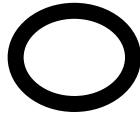
**Plan**

What materials do I have/need?



**Create**

I will test my solution,

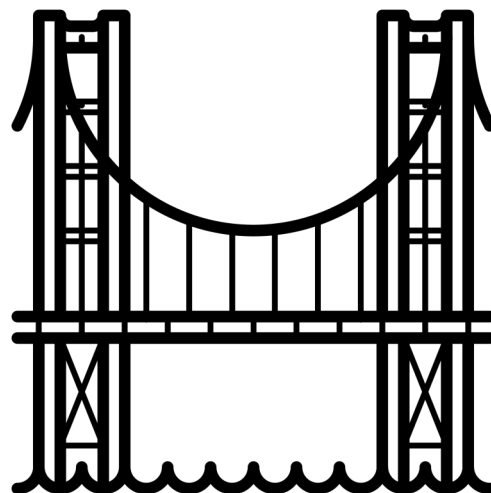


**Improve**

What changes can I make

# Bridge Building STEM Supply List

Acrylic paint	Golf tees	Soil
Aluminum foil	Gumdrops	Sponges
Baking soda	Hammer	Springs
Baggies	Hinges	Stapler
Bamboo sticks	Leaves	Straws
Cans	LEGO® bricks	String
Cardboard boxes	Lollipop sticks	Styrofoam balls
Clothes pins	Magnets	Sugar cubes
Coffee filters	Marshmallows	Tape
Cookie cutters	Measuring cups	Tape measure
Cornstarch	Nails	Tea lights
Cotton balls	Needle and thread	Tin can
Cotton swabs	Nuts, bolts, washers	Toilet paper rolls
Craft paper	Paint	Toothpicks
Craft sticks	Paper	Twine
Craft tape	Paper cups	Twist ties
Dryer hose	Paper clips	Washi Tape
Duct tape	Pencil	Water
Easter grass	Pipe cleaners	Wire
Faux plants	Plastic bottles	Wooden blocks, planks
Feathers	Plastic cups	Yarn
Felt	Plastic pipes	Zip ties
Flat marbles	Plastic wrap	
Foam trays	Play dough	
Food coloring	Pulley & rope	
Funnel	Raffia	
Gears	Rubber Bands	
Glitter (gold)	Scissors	
Glitter glue	Shells	
Glow stars	Shredded paper	
Glue	Skewers	



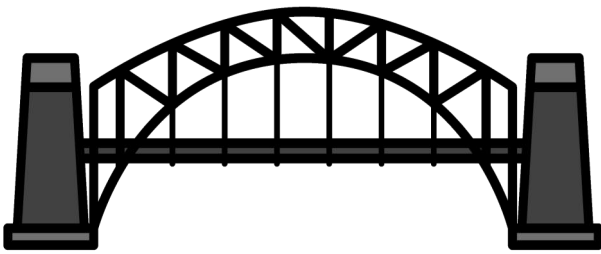


## Bridge Building Challenge

Using your STEM supplies build a steel through arch bridge.

### Possible Supplies:

LEGO bricks, wood blocks, toothpicks, skewers, glue, wire, twist ties, zip ties, craft sticks



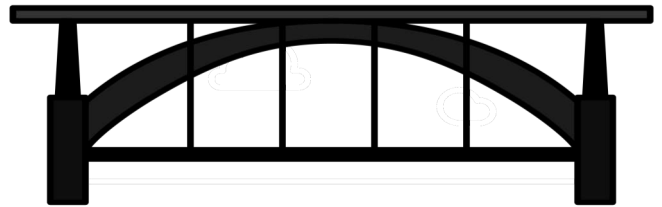
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## Bridge Building Challenge

Using your STEM supplies build an arch bridge.

### Possible Supplies:

wood blocks, toothpicks, skewers, glue, wire, twist ties, zip ties, paper, cardboard, tape, nuts, bolts



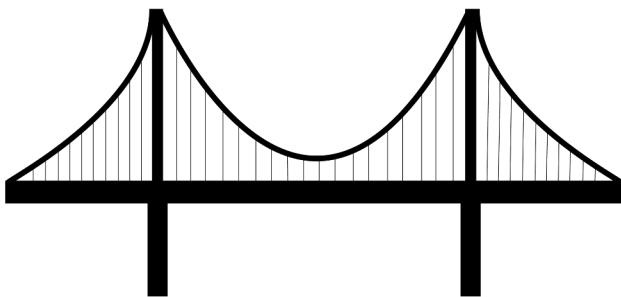
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## Bridge Building Challenge

Using your STEM supplies build a suspension bridge.

### Possible Supplies:

wood blocks, toothpicks, skewers, glue, wire, twist ties, zip ties, string, cardboard, tape, craft sticks



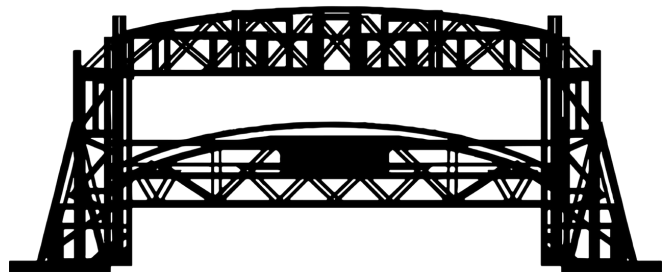
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## Bridge Building Challenge

Using your STEM supplies build a truss bridge.

### Possible Supplies:

wood blocks, toothpicks, skewers, glue, wire, twist ties, zip ties, string, cardboard, tape, craft sticks



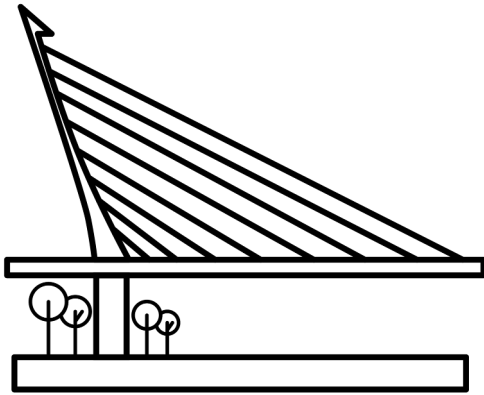
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## Bridge Building Challenge

Using your STEM supplies build a cantilever bridge.

### Possible Supplies:

wood blocks, toothpicks, skewers, glue, wire, twist ties, zip ties, string, cardboard, tape, craft sticks



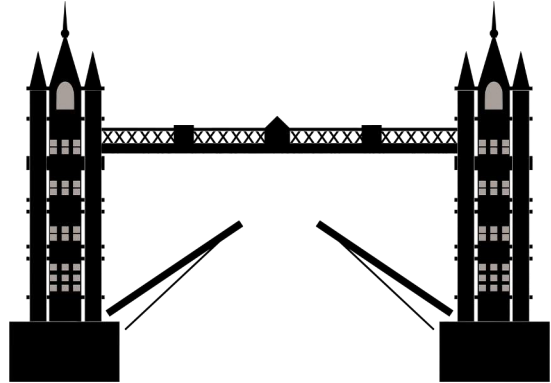
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## Bridge Building Challenge

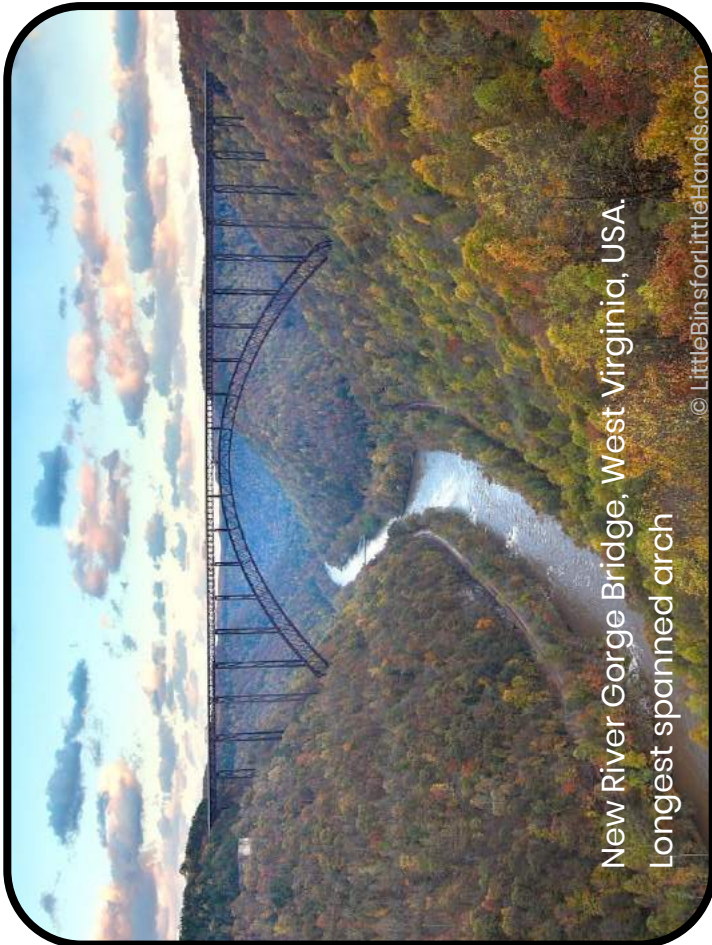
Using your STEM supplies build a bridge that combines 2 or more standard bridge building types.

### Possible Supplies:

Craft sticks, wire, springs, pulley, toothpicks, skewers, glue, wire, twist ties, zip ties, string, tape



© LittleBinsforLittleHands.com



New River Gorge Bridge, West Virginia, USA.  
Longest spanned arch

© LittleBinsforLittleHands.com



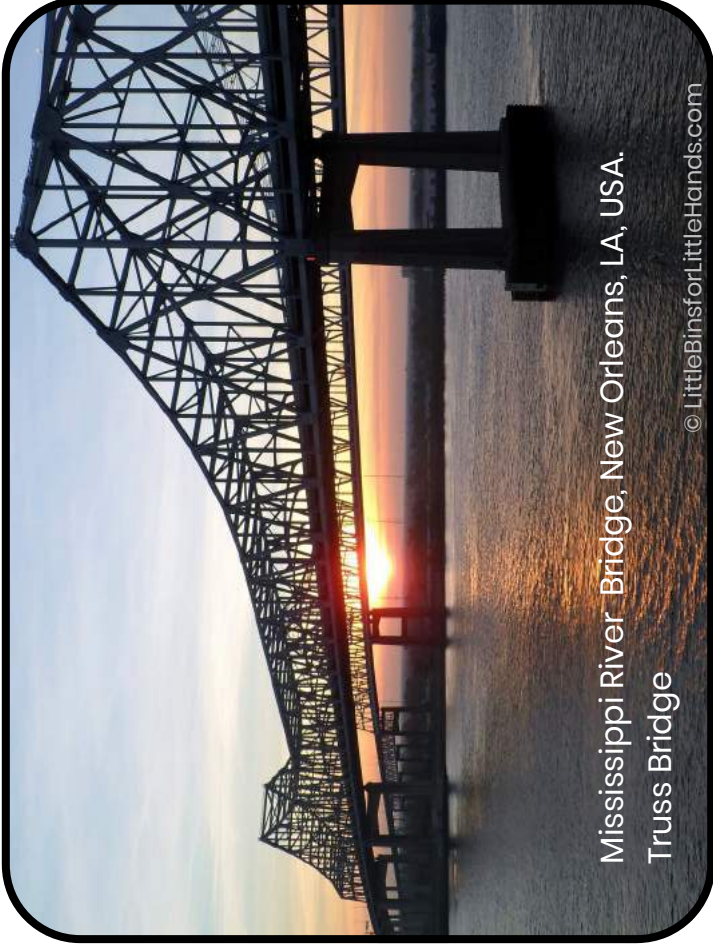
Golden Gate Bridge, San Francisco, CA, USA.  
1 Mile wide suspension

© LittleBinsforLittleHands.com



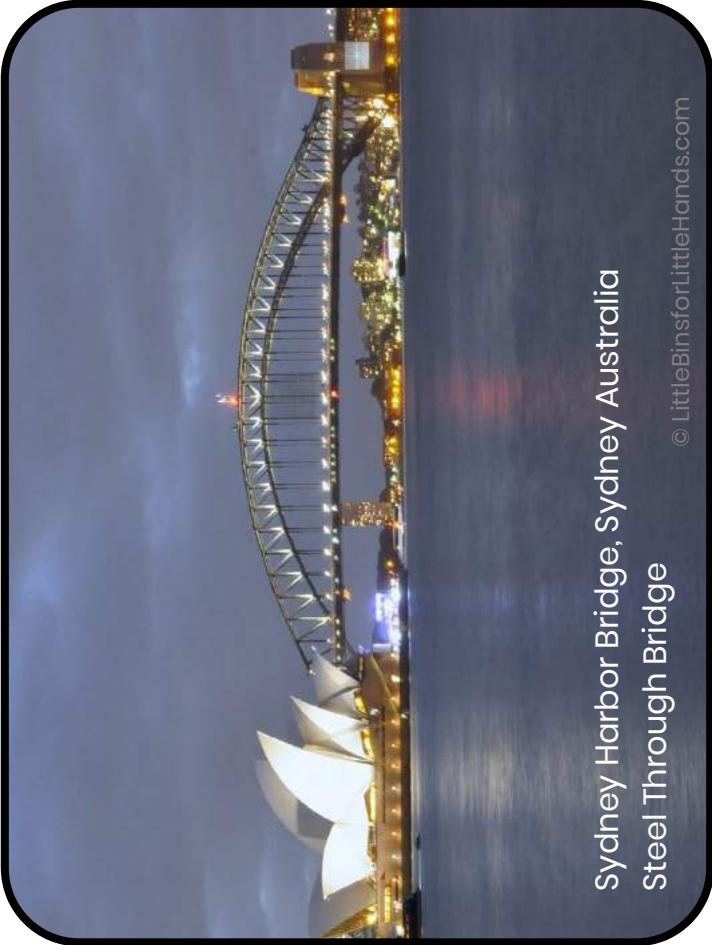
Tower Bridge, London, England  
Combined Suspension Bridge & bascule (drawbridge)

© LittleBinsforLittleHands.com



Mississippi River Bridge, New Orleans, LA, USA.  
Truss Bridge

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Sydney Harbor Bridge, Sydney Australia  
Steel Through Bridge

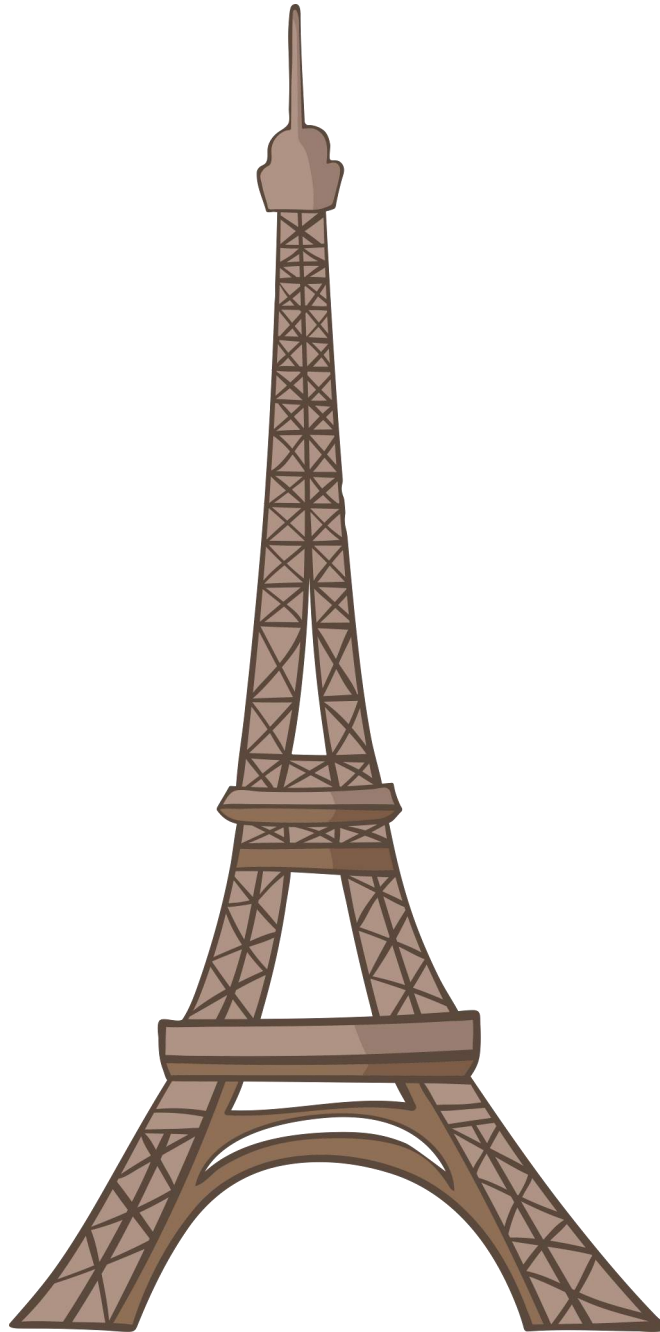
© LittleBinsforLittleHands.com



Alamillo Bridge, Seville, Spain  
Cantilever bridge.

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# Tallest Tower STEM Challenge



Architectural STEM Project

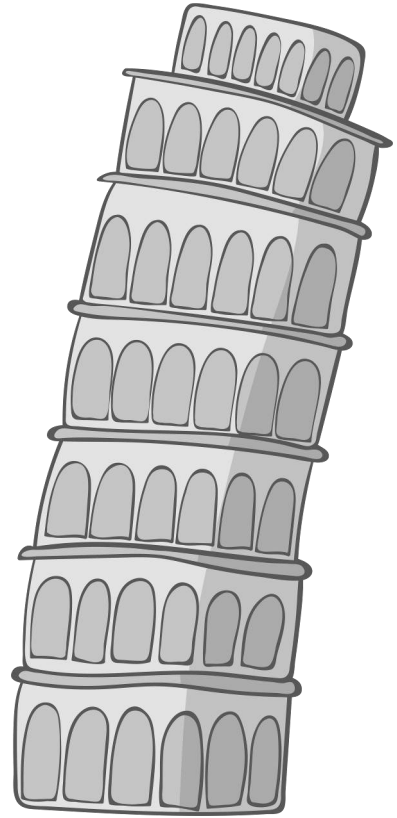
# Tallest Tower STEM Challenge

## The Challenge:

Using only 2 sheets of sturdy paper build a bridge that will span a six inch gap. Your bridge must be 3 inches or more wide.

### Challenge Materials

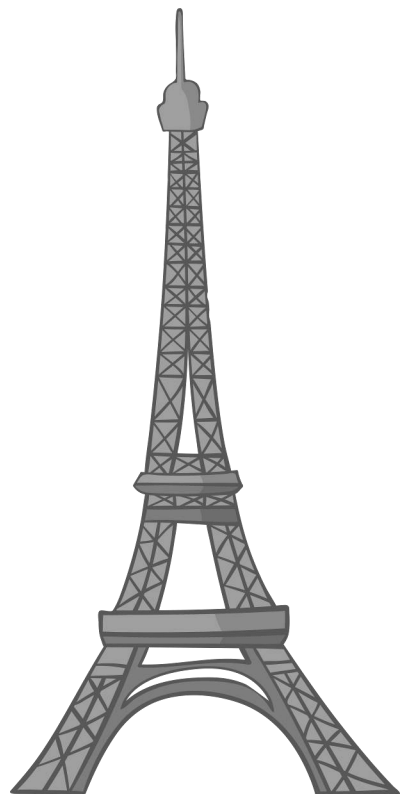
- Index cards
- Scissors
- A stack of pennies
- Pencil
- Ruler
- Engineer's journal page



## Challenge Procedure:

1. Decide what kind of tower you'd like to try to build.
2. Experiment! Design & build a tower using only the index cards.
3. Test your tower design by stacking pennies on top, keep adding pennies until the tower collapses under the weight.
4. How can you improve your design? Change your tower and try again.
5. Keep track of the different attempts using your engineer's journal page.

**Alternative:** Try these other materials for this challenge as well, paper cups, playing cards.



# Tallest Tower STEM Challenge

Name: \_\_\_\_\_ **Engineer's Journal**

My Tower Design (Build a bridge then draw it here)	Changes I want to Make
First Tower           How many pennies did it hold? _____	
Second Tower           How many pennies did it hold? _____	
Third Tower           How many pennies did it hold? _____	

**My STEM Challenge:**

**? ASK**

What is the problem?



**Collect Information**

What information & resources will I need?

**Imagine**

How can I solve the problem?



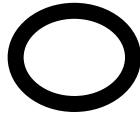
**Plan**

What materials do I have/need?



**Create**

I will test my solution,

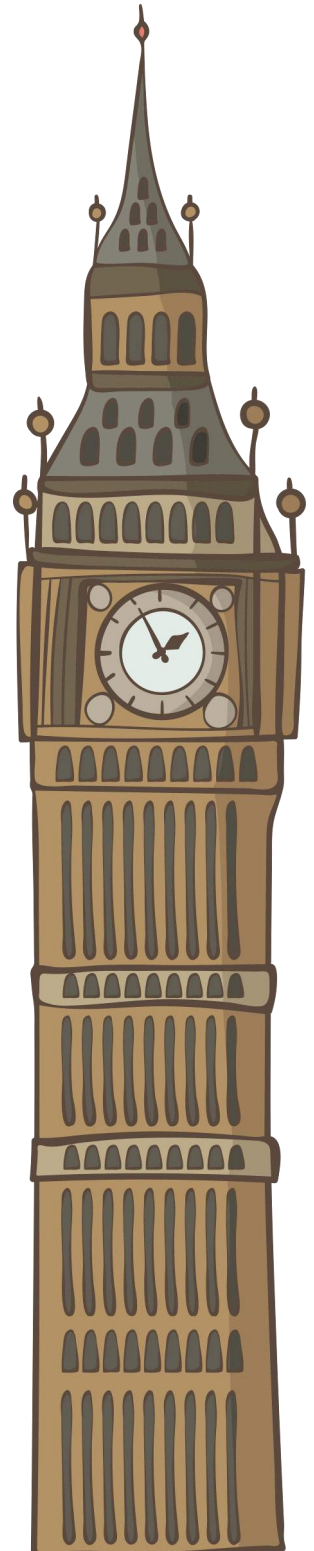


**Improve**

What changes can I make

# Tallest Tower STEM Supply List

Acrylic paint	Golf tees	Soil
Aluminum foil	Gumdrops	Sponges
Baking soda	Hammer	Springs
Baggies	Hinges	Stapler
Bamboo sticks	Leaves	Straws
Cans	LEGO® bricks	String
Cardboard boxes	Lollipop sticks	Styrofoam balls
Clothes pins	Magnets	Sugar cubes
Coffee filters	Marshmallows	Tape
Cookie cutters	Measuring cups	Tape measure
Cornstarch	Nails	Tea lights
Cotton balls	Needle and thread	Tin can
Cotton swabs	Nuts, bolts, washers	Toilet paper rolls
Craft paper	Paint	Toothpicks
Craft sticks	Paper	Twine
Craft tape	Paper cups	Twist ties
Dryer hose	Paper clips	Washi Tape
Duct tape	Pencil	Water
Easter grass	Pipe cleaners	Wire
Faux plants	Plastic bottles	Wooden blocks
Feathers	Plastic cups	Yarn
Felt	Plastic pipes	Zip ties
Flat marbles	Plastic wrap	
Foam trays	Play dough	
Food coloring	Pulley & rope	
Funnel	Raffia	
Gears	Rubber Bands	
Glitter (gold)	Scissors	
Glitter glue	Shells	
Glow stars	Shredded paper	
Glue	Skewers	



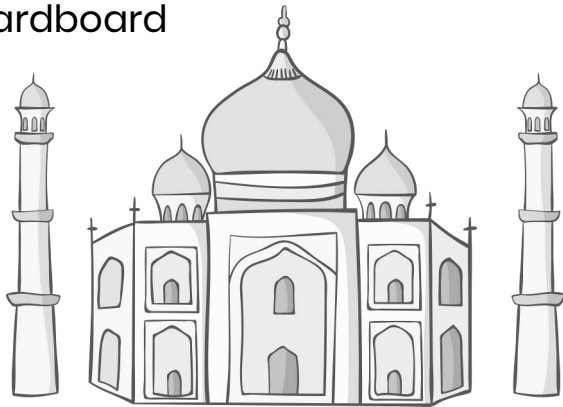


## Architectural Challenge

Using your STEM supplies build a model of the Taj Majal.

### Possible Supplies:

LEGO bricks, wood blocks, toothpicks, skewers, glue, wire, twist ties, zip ties, craft sticks, pipe cleaners, cardboard



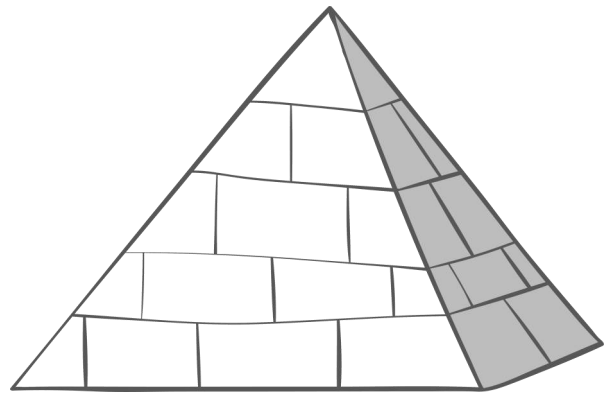
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## Architectural Challenge

Using your STEM supplies build model of the Pyramids of Giza.

### Possible Supplies:

wood blocks, LEGO blocks, cardboard, craft paper, tape measure,



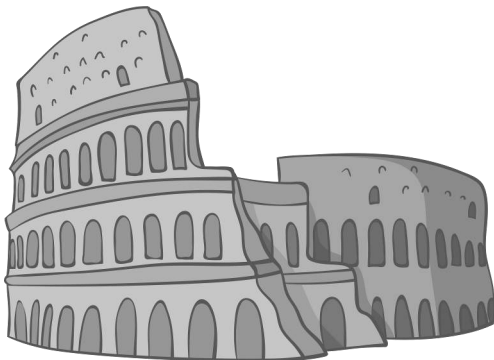
© LittleBinsforLittleHands.com

## Architectural Challenge

Using your STEM supplies build a model of the Coliseum of Rome.

### Possible Supplies:

wood blocks, toothpicks, skewers, glue, wire, twist ties, zip ties, string, craft paper, cardboard, tape, craft sticks, LEGO blocks



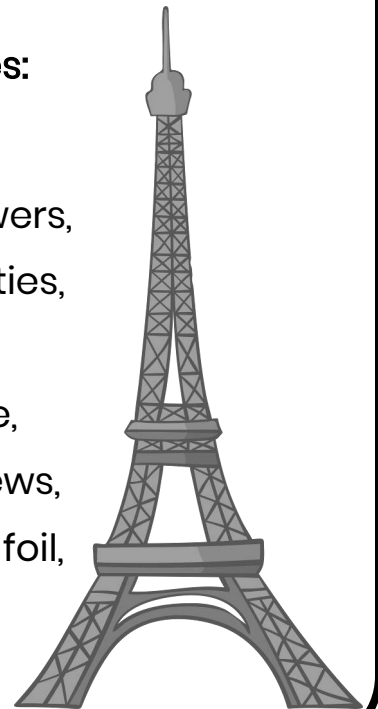
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## Architectural Challenge

Using your STEM supplies build a model of the Eiffel Tower of Paris.

### Possible Supplies:

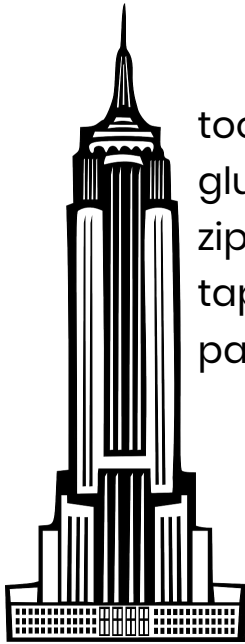
wood blocks, toothpicks, skewers, glue, wire, twist ties, zip ties, twine, cardboard, tape, craft sticks, screws, nuts, aluminum foil, LEGO blocks



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## Architectural Challenge

Using your STEM supplies build a model of The Empire State Building, of New York City.



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### Possible Supplies:

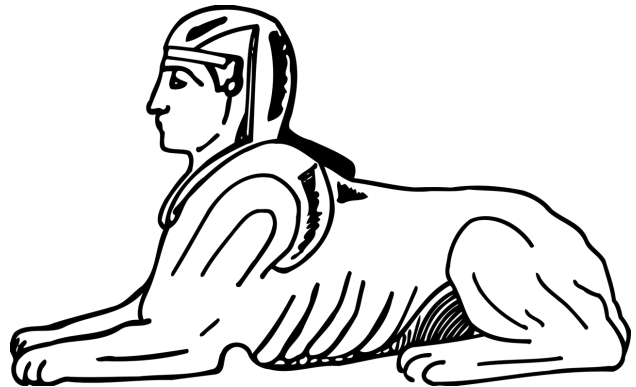
toothpicks, skewers, glue, wire, twist ties, zip ties, cardboard, tape, craft sticks, toilet paper rolls

## Architectural Challenge

Using your STEM supplies build a bridge that combines 2 or more standard bridge building types.

### Possible Supplies:

LEGO blocks, play dough, duct tape, toilet paper roll, Styrofoam balls, twine, needle, thread, fabric



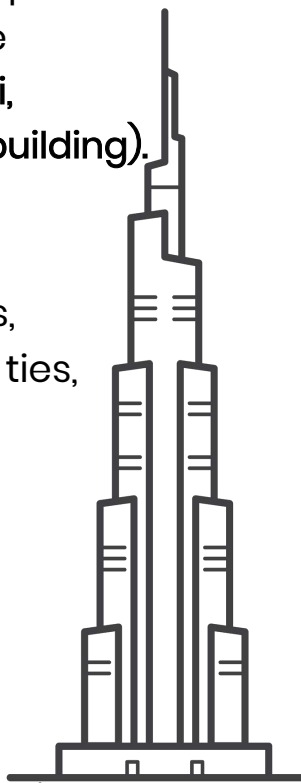
© LittleBinsforLittleHands.com

## Architectural Challenge

Using your STEM supplies build a model of the Burj Khalifa of Dubai, (the world's tallest building).

### Possible Supplies:

toothpicks, skewers, glue, wire, foil, twist ties, zip ties, twine, craft paper, cardboard, tape, craft sticks, LEGO blocks, play dough,



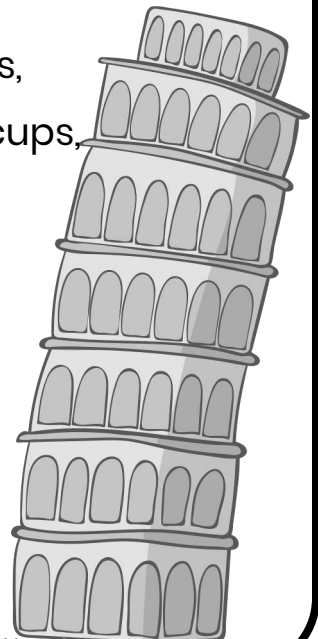
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## Architectural Challenge

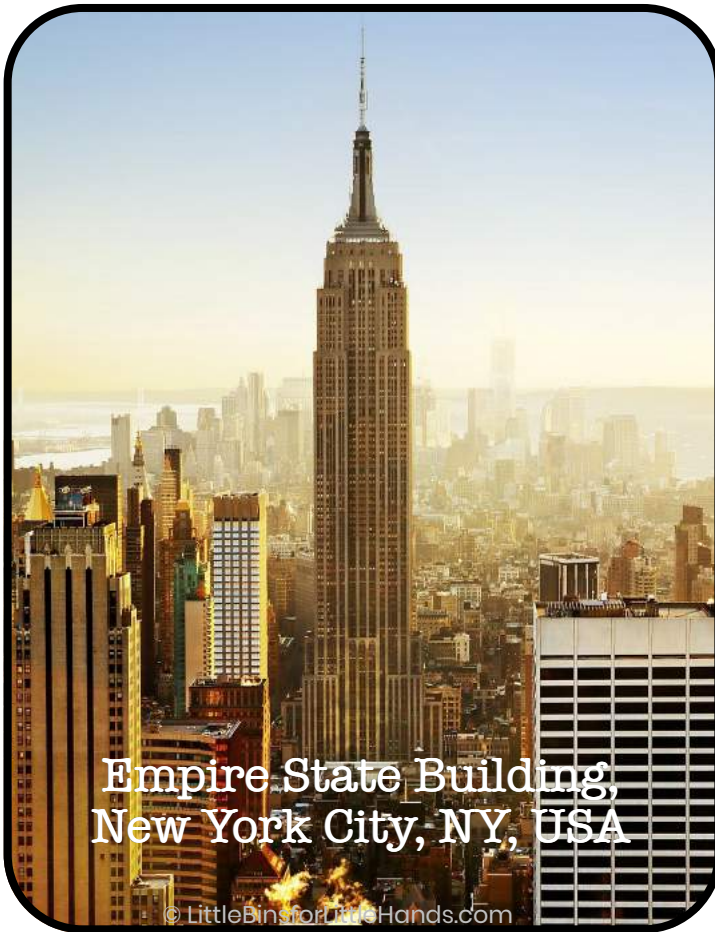
Using your STEM supplies build a model of the Leaning Tower of Pisa.

### Possible Supplies:

Play dough, skewers, cardboard, paper cups, LEGO blocks, wood blocks, craft paper, twist ties, duct tape, tape

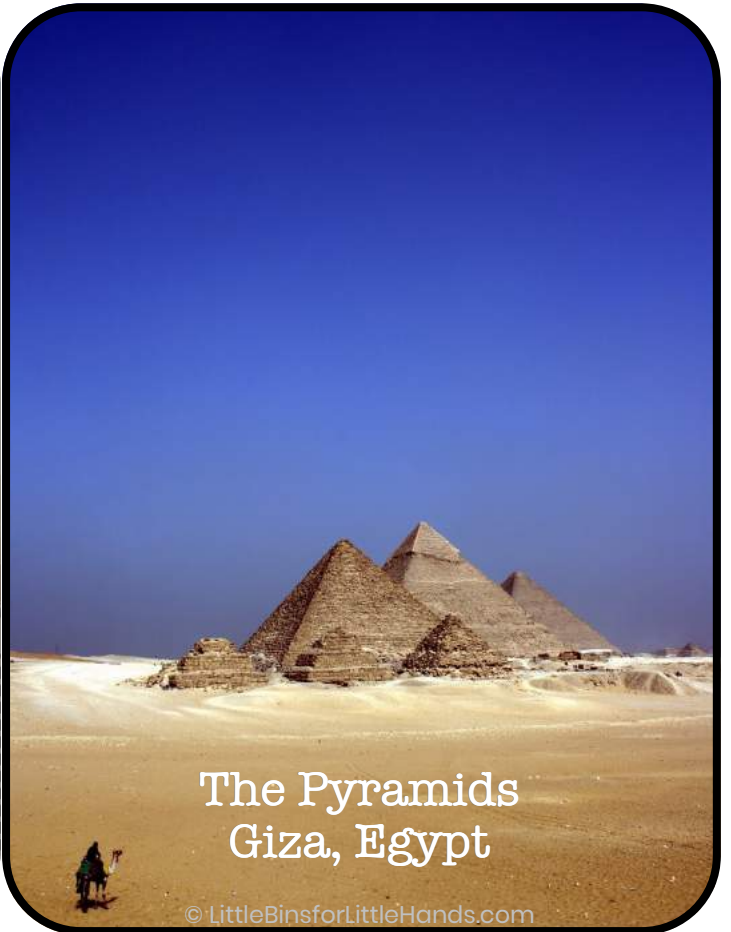


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Empire State Building,  
New York City, NY, USA

© LittleBinsforLittleHands.com



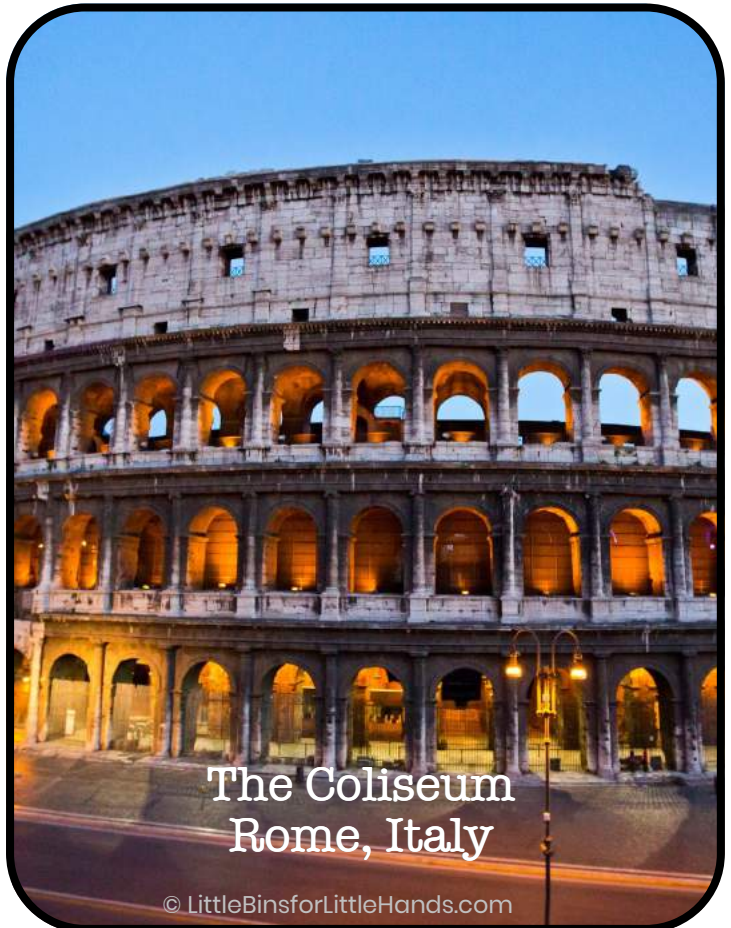
The Pyramids  
Giza, Egypt

© LittleBinsforLittleHands.com



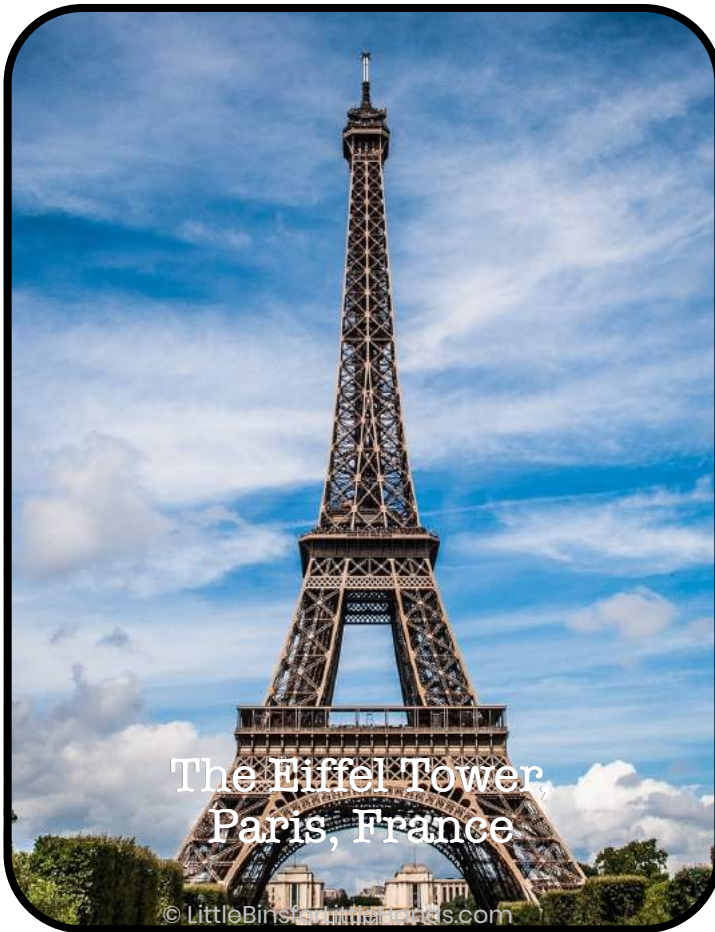
Burj Khalif,  
The World's Tallest Building  
Dubai, United Arab Emirates

© LittleBinsforLittleHands.com



The Coliseum  
Rome, Italy

© LittleBinsforLittleHands.com



The Eiffel Tower,  
Paris, France

© LittleBinsforLittleHands.com



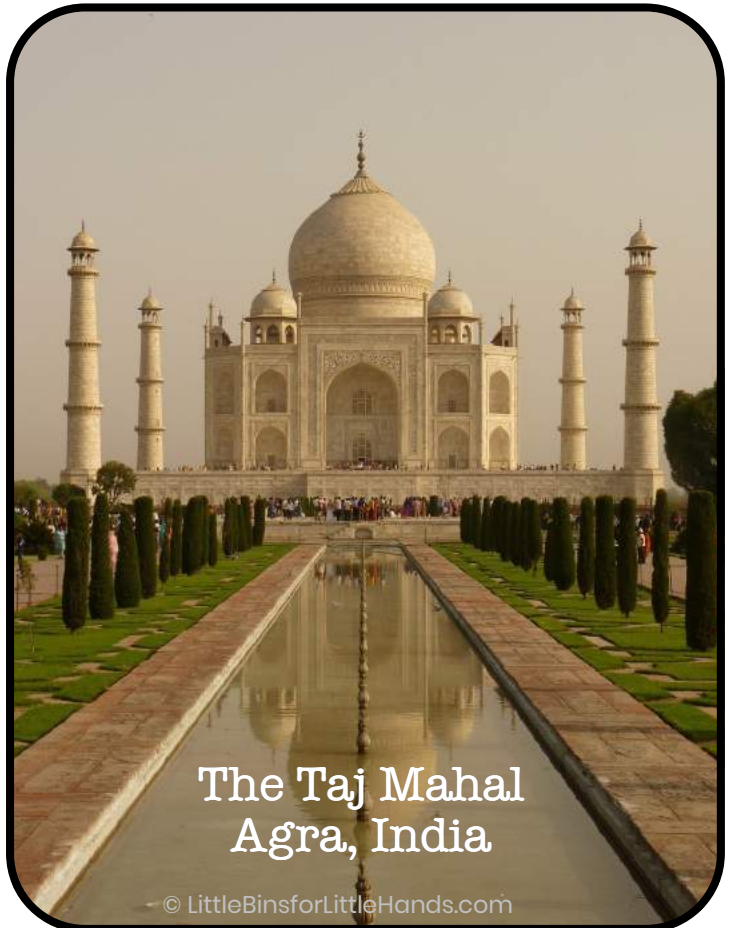
The Leaning Tower of Pisa,  
Pisa, Italy

© LittleBinsforLittleHands.com



The Sphinx,  
Giza, Egypt

© LittleBinsforLittleHands.com



The Taj Mahal  
Agra, India

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# The Great Marshmallow & Spaghetti Tower

## STEM Challenge

Can you make a tower of spaghetti noodles that will hold a jumbo marshmallow?

### Supplies:

- 20 sticks of dry spaghetti
- 1 yard or 3 feet of string
- 1 yard or 3 feet of tape
- 1 jumbo marshmallow

### Challenge:

In 18 minutes make the tallest tower possible from the materials supplied. The peep must be able to sit on top without falling off.

Measure your tower.

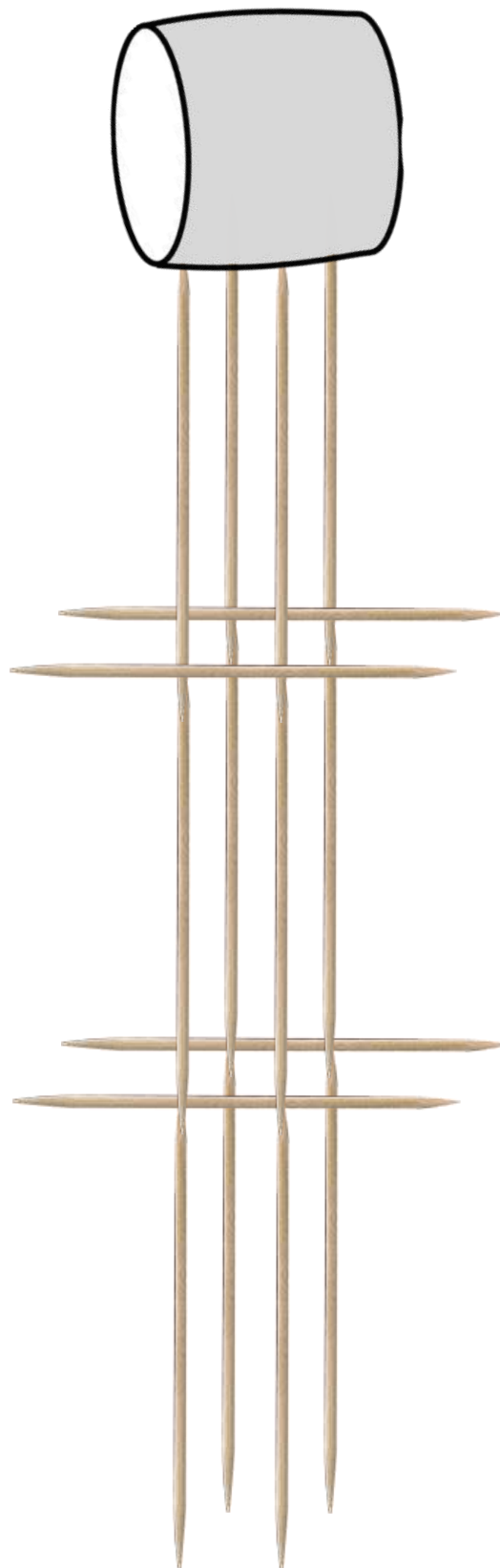
Number of Noodles	
English Measurement	
How tall is it?	
How wide is it?	
How long is it?	
Metric Measurement	
How tall is it?	
How wide is it?	
How long is it?	

### Notes

---

---

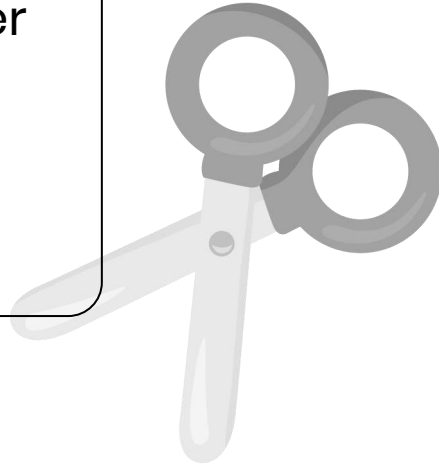
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# Paper Chain STEM Challenge

## Challenge Materials

- 1 Piece construction paper
- Scissors
- Glue

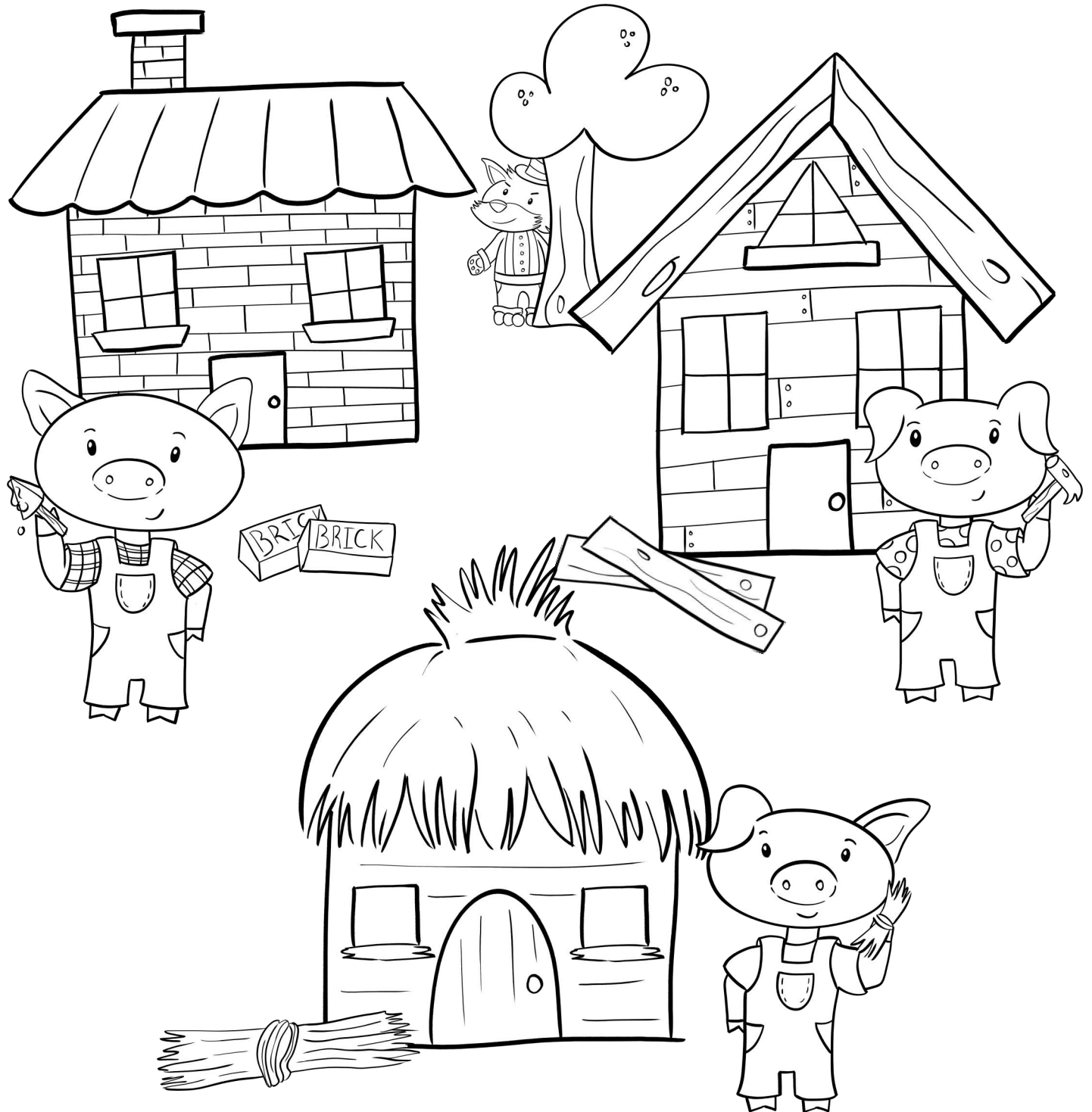


## Challenge Rules:

1. Work with your group to build the longest paper chain possible using only 1 piece of construction paper, scissors and glue.
2. You will be allowed 30 minutes to build your chain.
3. Extra paper and replacement pieces will not be provided so be sure to plan carefully before cutting.
4. When time is called chains will be lined up beside each other to see which chain is the longest.

# THE 3 LITTLE PIGS

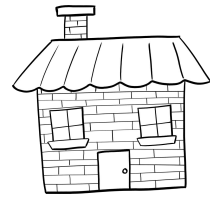
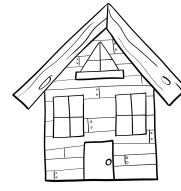
## Architectural STEM Project



# D



# ESIGN

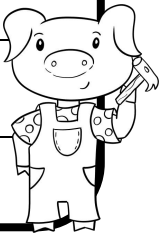


# A HOUSE

Name Your House:

Describe Your House

Building Materials



Draw Your House







# Y



# OUR HOUSE

Name Your House:

Describe Your House

What is Your House Made of?



Draw Your House



# THE 3 LITTLE PIGS

## Architectural STEM Project Supply List

Acrylic paint

Aluminum foil

Baking soda

Baggies

Bamboo sticks

Cans

Cardboard boxes

Clothes pins

Coffee filters

Cookie cutters

Cornstarch

Cotton balls

Cotton swabs

Craft paper

Craft sticks

Craft tape

Dryer hose

Duct tape

Easter grass

Faux plants

Feathers

Felt

Flat marbles

Foam trays

Food coloring

Funnel

Gears

Glitter (gold)

Glitter glue

Glow stars

Glue

Golf tees

Gumdrops

Hammer

Hinges

Leaves

LEGO® bricks

Lollipop sticks

Magnets

Marshmallows

Measuring cups

Nails

Needle and thread

Nuts, bolts, washers

Paint

Paper

Paper cups

Paper clips

Pencil

Pipe cleaners

Plastic bottles

Plastic cups

Plastic pipes

Plastic wrap

Play dough

Pulley & rope

Raffia

Rubber Bands

Scissors

Shells

Shredded paper

Skewers

Soil

Sponges

Springs

Stapler

Straws

String

Styrofoam balls

Sugar cubes

Tape

Tape measure

Tea lights

Tin can

Toilet paper rolls

Toothpicks

Twine

Twist ties

Washi Tape

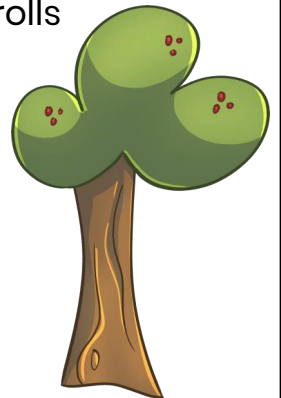
Water

Wire

Wooden blocks, planks

Yarn

Zip ties



# My STEM Challenge:

## ? ASK

What is the problem?

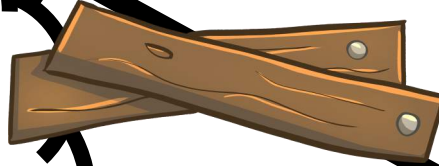


## Collect Information

What information & resources will I need?

## Imagine

How can I solve the problem?



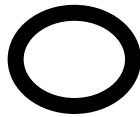
## Plan

What materials do I have/need?



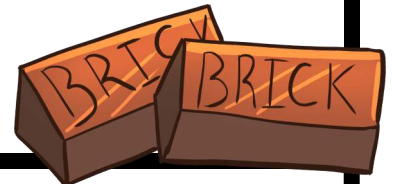
## Create

I will test my solution,



## Improve

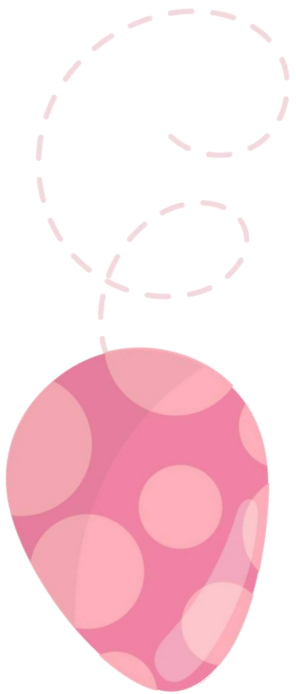
What changes can I make



EGG-TASTIC

EGG DROP

STEM

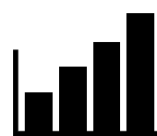


Challenge

&

Engineer's

Notebook

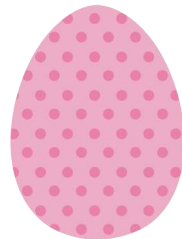


You can use this notebook for all the Sprint time STEM activities found in the pack.

LITTLE BINS FOR LITTLE  HANDS

# EGG-CELLENT EGG DROP CHALLENGE SUPPLY LIST

- |                 |                   |                      |
|-----------------|-------------------|----------------------|
| Baggies         | Lollipop sticks   | Sponges              |
| Balloons        | Magnets           | Stapler              |
| Boxes           | Needle and thread | Straws               |
| Cardboard       | Newspaper         | String               |
| Cereal          | Paper             | Styrofoam balls      |
| Coffee filters  | Paper cups        | Tape                 |
| Cornstarch      | Paper clips       | Tape measure         |
| Cotton balls    | Paper towels      | Tennis balls         |
| Cotton swabs    | Paper towel rolls | Tin can              |
| Craft paper     | Pencil            | Toilet paper rolls   |
| Craft sticks    | Ping pong balls   | Toothpicks           |
| Cup cake liners | Pipe cleaners     | Twine                |
| Duct tape       | Plastic eggs      | Twist ties           |
| Easter grass    | Plastic jars      | Vegetable containers |
| Faux plants     | Play dough        | Washi Tape           |
| Feathers        | Pom-poms          | Water                |
| Felt            | Pool noodles      | Wire                 |
| Flour           | Raffia            | Wooden planks        |
| Foam core       | Ribbon            | Yarn                 |
| Glue            | Rubber bands      | Zip ties             |
| Grocery sacks   | Rubber cement     |                      |
| Hosiery         | Scissors          |                      |
| Leaves          | Shredded paper    |                      |
| LEGO® bricks    | Skewers           |                      |



# EGG-CITING EGG DROP

## Challenge Goals

**Challenge:** Design and build a device that will hold an egg that when dropped from a height the egg in the device doesn't break.

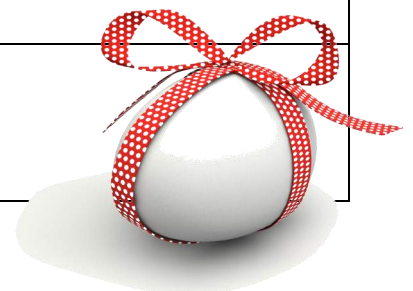
**Objective:** Design, engineer, build a device and be able to test your device by dropping it from a height. If your egg doesn't break at that height, test it at various heights.

### Checklist:

Your goals are to...

1. Use the STEM design process to design and build a device to protect an egg when dropped from a height.
2. Make sure to design your device so that the egg will fit inside of it.
3. Fill in engineers notebook page with design details and sketches.
4. Be able to demonstrate how your device works and what the results were following

Testing My Egg-mazing Device			
	Height	Device type	Success Y/N
1st Drop			
2nd Drop			
3rd Drop			



**My STEM Challenge:**

**? ASK**

What is the problem?



**Collect Information**

What information & resources will I need?

**Imagine**

How can I solve the problem?



**Plan**



What materials do I have/need?  
What steps do I take?



**Create**

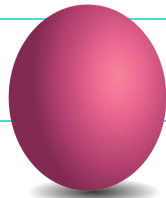
I will test my solution,  
and take or draw notes.



**Improve**

What changes can I make  
to improve my plan?

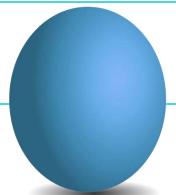
## My Research Notes



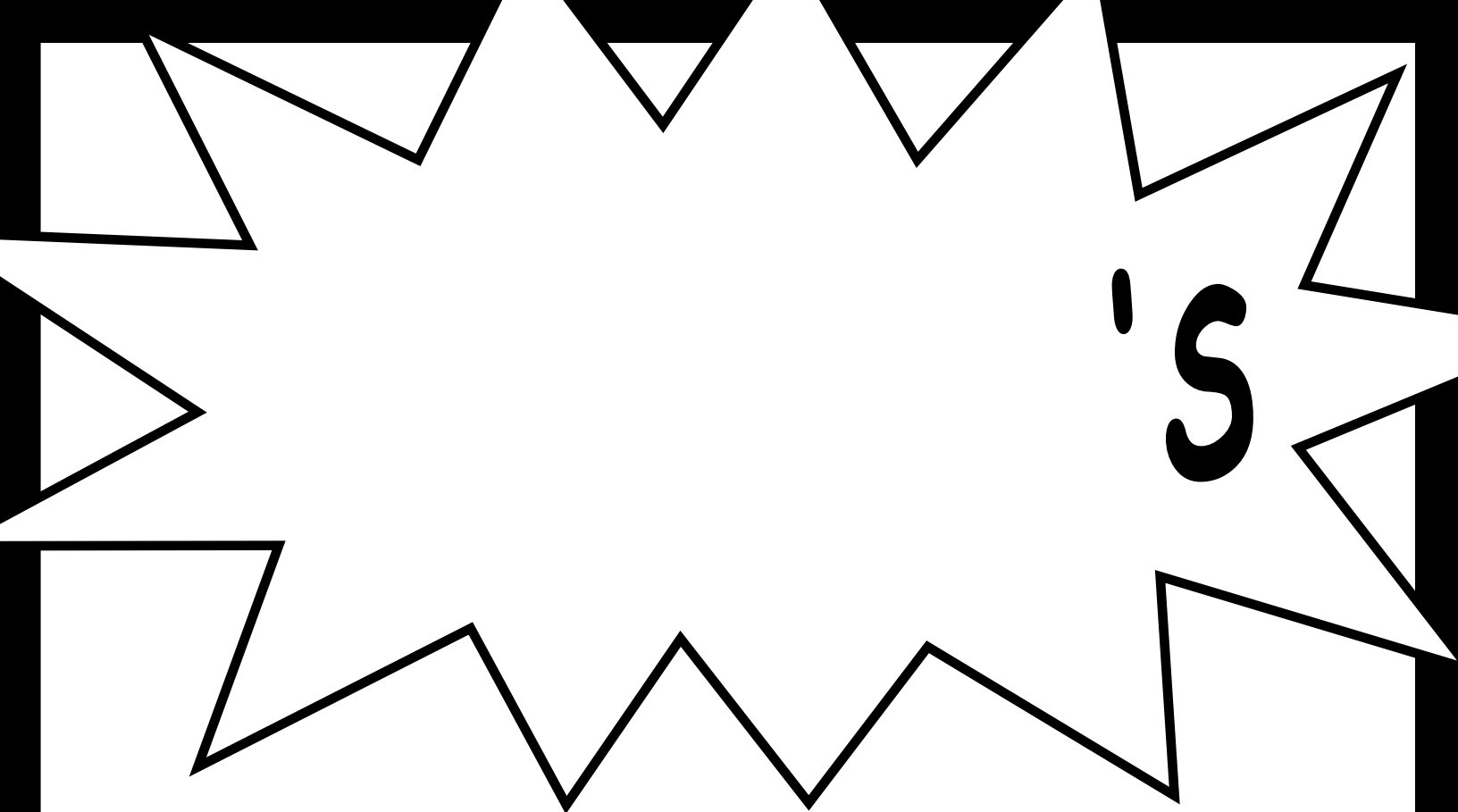
## Draw It

## Draw It

## My Next Plan







'S

**STEM**

**CHALLENGE**

**JOURNAL**

# HOW TO GET STARTED

## Quick and fun 5 day STEM challenge for kids!

Print and cut out individual **STEM Challenges** to give to each kid or group of kids. They may work individually or in small groups to accomplish each STEM challenge.

Use the included **STEM Design Process: Steps To Success** printable to help guide your kids through the design process from start to finish.

Give your kids the blank **STEM Journal** pages to broaden the activity for varied age groups.

Check out our list of cheap **STEM Supplies** to always keep on hand. Start filling your bins with great items for your upcoming challenges!

Learn more about NGSS and STEM by clicking [here](#).

# STEM CHALLENGES

## Marshmallow and Toothpick Tower

How high can you go!

Using 100 marshmallows build the tallest tower possible!

**Supplies:** Mini Marshmallows, toothpicks, and measuring tape

**Tips:** Have kids count out 100 marshmallows. Draw out a plan to get started.

## Egg Drop Challenge

Protect a raw egg from harm! Using a variety of materials or supplies on hand, design, build, and test a contraption that will protect an egg from breaking when dropped from a specific height.

**Supplies:** Raw Eggs, recycle bin items, and any other simple supplies on hand like bubble wrap, tissue paper, or straws.

**Tips:** Start by choosing a specific height to drop the egg from and use the same height each time. To reduce mess, incorporate zip top bags into the design process.

## Catapult Design Challenge

How far can you launch something with a homemade popsicle stick catapult. Which items fly the farthest? Plan, design, and build a working catapult.

**Supplies:** Popsicle sticks, rubber bands, bottle cap, glue or sticky dots, spoons, tubes, items to launch.

**Hint:** Use our easy [popsicle stick catapult design](#) or let the kids get creative with [LEGO](#), [pencils](#), [spoons and cardboard tubes](#)!

# STEM CHALLENGES

## Build An Unsinkable Boat

Build a boat that floats and can't be sunk! Using recycled items and supplies from around the house or classroom, build boats that will float in a tub of water. Take it a step further and build a boat that will hold a specific object such as a soup can!

**Supplies:** Tub with water, supplies to build boats, items to test flotation

**Tips:** Make sure to choose an item to test flotation that you have enough or that all weigh the same and are the same size! Think rolls of pennies, soup cans, large wooden blocks, small wooden cubes, etc.

**Hint:** You can also challenge kids to build tin foil boats with only a 12" square of aluminum foil!

## Build A Paper Bridge

Span that gap with a bridge building challenge! Set up two stacks of books and challenge the kids to build a bridge that spans the gap out of paper! Test the bridge with the weight of pennies!

**Supplies:** Computer paper (dig out the recycling bin), tape, pennies, and two stacks of books the same height..

**Tips:** Create a gap using two stacks of books that the bridge will need to span. Test the strength of the paper bridges by adding pennies to it. You can also compare other bridge building materials such as tin foil, wax paper, construction paper, or card stock!

# STEM Design Process: Steps To Success

## Observe/Ask



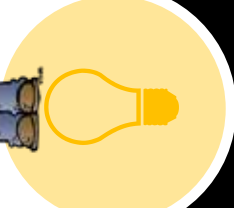
- What is the problem?
- What have others done to solve the problem?
- What are the constraints or limitations/guidelines?
- Who can help me solve this problem?

## Collect



- What information will I need to solve this problem?
- What resources do I have/need to solve this problem?

## Imagine



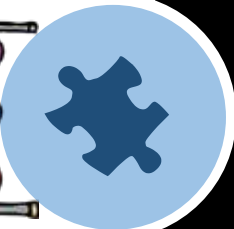
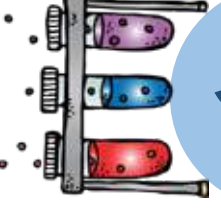
- How can I solve the problem?
- Have I found an out of the box solution?
- Do I have more than one solution?

## Plan



- What materials do I have/need?
- What steps will I take to solve the problem?
- What could go wrong?

## Create



- I will test my plan!
- I will take notes of the process/ my observations!
- I will draw/take pictures as I work for reference later!

## Improve



- I will reflect on my design.
- What changes can I make to improve my plan/solution?
- What does my data tell me about my first attempt?
- I will create another plan and retest!

# STEM JOURNAL

DATA &  
RESULTS

TODAY MY CHALLENGE IS:

What problem do I need to solve?

What questions do I have about my problem?

What are some solutions?

What materials do I need?

# STEM JOURNAL

DATA &  
RESULTS

TODAY MY CHALLENGE IS:

What is my plan?

Does my plan work? Test it!

What changes can I make to my plan?

# STEM JOURNAL

DESIGN & PLANNING PAGE for NOTES & SKETCHES

DATA &  
RESULTS



# STEM SUPPLIES

## 15 Cheap & Easy to use STEM Materials

Many of these items can be sourced from around the house or classroom or easily found at most dollar stores!

- Toothpicks
- Marshmallows/gum drops
- Tin foil
- Popsicle sticks
- Rubber bands
- Craft tape
- Cardboard/  
construction paper/paper
- Balloons
- Yarn/string
- Pipe cleaners
- Paper clips
- Straws
- Paper tubes
- Plastic cups
- Recyclables

## 3 Tips for Building Your STEM Supply Kit

Use large storage bins to collect unusual packaging materials, found items, and non-recyclable items. Keep one bin for recyclable items and one bin for non-recyclable items!

Visit dollar stores for holiday and seasonal items to add themes to your STEM activities. Save these items from year to year in zip tops bags.

Try a cleaning caddy for storing and displaying smaller items. Make sure to have plenty of paper, glue, markers, pencils, and pairs of scissors on hand for planning and design.