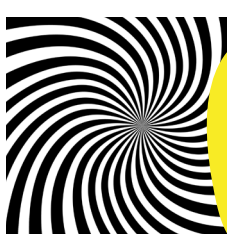




**BOREDOM  
BUSTER  
ACTIVITY PLAN**



HELLO  
BOREDOM  
BUSTERS!

# CONTENT



5

## EXPLORE

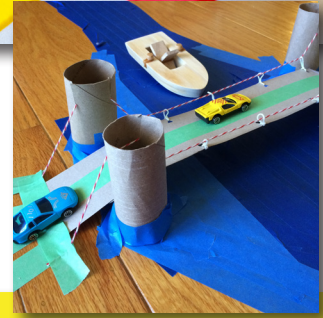
Explore the backyard with weaving, rocks, and eat some chocolate rocks for Explore Day!



9

## CODE

Code your way through secret messages and backpack charms and eat some computer chips for Code Day!



15

## BUILD

Explore the magical engineering world of bridges, even edible ones for Build Day!



19

## CREATE

Make weather, some polymer jigglers, and make your own movie for Create Day!

23

## COLOR

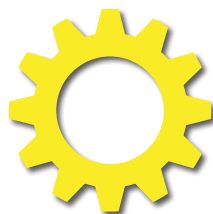
Dripping watercolor houses, scribble art, and rainbow smoothies make Color Day bright!

29

## PLAY

Just print and play for some fun activities like mazes, color by coding, and more!

# WELCOME TO THE BOREDOM BUSTER ACTIVITY PLAN!



## WHAT'S INSIDE THIS FUN ACTIVITY PACK:

**EACH DAY'S THEME HAS THREE ACTIVITIES: ONE QUICK STEAM, ONE IN-DEPTH PROJECT, AND ONE STEAM SNACK. YOU CAN DO THESE PROJECTS WHEN AND HOW THEY WORK FOR YOU AND THE KIDS.**

Plus, this wouldn't be STEAM without helping kids learn a little bit about the meaning and lessons behind the projects. Look for the "What's the STEAM Behind It?" section to learn things like how bridges hold us and some art history. You'll have fun with the Fun Facts, STEAM Funnies, and Printables sections too!

## WHAT IS STEAM?

**STEAM IS THE ABBREVIATION FOR SCIENCE, TECHNOLOGY, ENGINEERING, ART, & MATH.**

It's an integrated approach to learning that encourages students to think more broadly about real-world problems.

## WHY DO WE NEED THE A IN STEAM?

Because art makes STEM better! Here are some of the concrete benefits of incorporating the arts into science:

- It helps remove idea inhibition (there's no wrong answer in art!).
- It focuses on the process which helps drive innovation.
- It teaches the power of observation, of people and your surroundings.
- It helps hone spatial awareness and mathematical concepts like geometry.

## SAFETY FIRST!

**STEAM EXPLORERS PROJECTS ARE INTENDED TO BE PERFORMED UNDER ADULT SUPERVISION.**

Appropriate and reasonable caution is recommended when activities call for any items that could be of risk, including, but not limited to: sharp tools, hot glue, chemicals, batteries, scissors, and small items that could present a choking hazard. If you are unsure of the safety or age appropriateness of an activity, please consult your child's doctor.

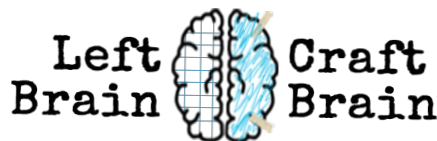


## HOW TO JOIN THE LEFT BRAIN CRAFT BRAIN COMMUNITY

Left Brain Craft Brain (and STEAM Explorers and STEAM Kids, too) is a global community! Come get activity ideas, chat about STEAM, and share your pictures with us on both Facebook and Instagram. We love to see all of the ways you incorporate STEAM into your kids' worlds!

[LEFT BRAIN CRAFT BRAIN FACEBOOK PAGE](#)

[LEFT BRAIN CRAFT BRAIN ON INSTAGRAM](#)



inspiring young engineers, one craft at a time

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<https://leftbraincraftbrain.com/steamexplorers>



**NO SCHOOL? NO WORRIES!  
WE'VE GOT A PLAN FOR THAT!**



# ACTIVITY PLAN SUPPLIES

## ACTIVITY SUPPLIES:

- Wide popsicle sticks
- Empty cereal box
- 4 toilet paper rolls
- Masking tape
- String
- Small rubber bands
- Sticks
- Grass, leaves, and flowers
- Rocks
- Printer paper
- Cardboard
- Toys
- Colored paper
- Unscented epsom salts
- Food coloring or liquid watercolors
- Sticks
- Plant cuttings like flowers and leaves
- White cardstock
- Brass fasteners
- Markers or colored pencils
- Beads in two colors
- Alphabet beads (optional)
- 140 lb watercolor paper
- Box cutter
- Pipettes, droppers, or brushes
- Dish soap

- Water
- Vinegar

## ACTIVITY TOOLS:

- Hole punch
- Scissors
- Printer
- Cell phone or tablet
- Stop Motion app
- Measuring cups
- Glass bowls or cups
- Spoon
- Jar with lid

## RECIPE INGREDIENTS:

- Grapes
- Crackers
- Cheese
- Jello
- Water
- Chocolate chips
- Rice Krispies, nuts, or other mix-ins
- Chips
- Dip
- Multicolored fruit and vegetables
- Yogurt
- Honey (optional)
- Juice (optional)

- 
- 
- 

## RECIPE TOOLS:

- Microwave safe bowl
- Microwave
- Aluminum foil
- Toothpicks
- Measuring cups
- Blender





**BOREDOM  
BUSTER**  
ACTIVITY PLAN

**EXPLORE**

# EXPLORE

EXPLORE THE BACKYARD WITH THESE CREATIVE STEAM ACTIVITIES.

## DID YOU KNOW?

- Not all lady bugs are ladies! Both male and females are called lady bugs.
- An average size tree has enough wood to make 170,000 pencils.

## FUN FACTS

HOW DO YOU GET A BABY ROCK TO SLEEP?

YOU ROCK IT.

## STEAM FUNNIES

## STEAM SNACK

### CHOCOLATE ROCKS

#### INGREDIENTS

- Chocolate chips
- Aluminum foil
- Microwave safe bowl
- Rice Krispies, nuts, or other mix-ins

#### RECIPE

1. Place chocolate chips in a microwave safe bowl. Heat on medium power for 30 second intervals, stirring in between, until melted.
2. Cut a 6" square piece of aluminum foil and shape into a bowl shape.
3. Carefully pour melted chocolate into aluminum foil bowl to make an igneous rock. For sedimentary rocks, add a mix-in. Refrigerate for 1 hour or until hardened. For metamorphic rocks, repeat with another layer of a chocolate.

## ROCK HUNT

## QUICK STEAM



### WHAT'S THE STEAM BEHIND IT?

There are three types of rocks, igneous, metamorphic, and sedimentary. What type of rock do you think you have in your back yard? Go on a hunt and find out!

**IGNEOUS ROCKS** are made from magma from the earth's core or other rocks that have melted, crystalized, cooled, and hardened.

**SEDIMENTARY ROCKS** are made up of sediment and small pieces of rock that have been broken apart by weathering or erosion. The rocks form when the sediment undergoes significant pressure, pushing the pieces together.

**METAMORPHIC ROCKS** are igneous or sedimentary rocks (and sometimes other metamorphic rocks, too) that have been exposed to a combination of heat, pressure, and mineral-rich fluids and the rock changes form.

#### SUPPLIES:

- Rocks
- Magnifying glass

#### INSTRUCTIONS:

1. Gather rocks in your yard or in the park.
2. Observe what they look like and inspect closely with the magnifying glass.
  - Can you see small bits of other types of rock? This is likely a sedimentary rock.
  - Is the rock more uniform? This may be an igneous rock.
  - Do you see stripes of different types of rock in bands? This may be a metamorphic rock.



# NATURE WEAVING



**DIFFICULTY:** ●●●●

**TIME:** 30 MINUTES

**SUPPLIES:**

- 2 sticks, approximately 1 foot long each
- String
- Scissors
- Assorted grasses, flowers, and leaves
- Cardboard
- Masking tape

## WHAT'S THE STEAM BEHIND IT?

Weaving is an ancient art form that continues to be done today for both display and function. To weave, two different directions of fibers (or in this case plants) are interspersed at right angles. The warp of the loom are the strings that go vertically and are attached to the sticks. The weft are the fibers woven horizontally.

In this activity, you'll build technology (a tool... the loom itself...), and then weave your own creation that is made completely unique with nature. Since every leaf or flower is different from another one picked from the plant, this activity can be repeated over again to get a completely different art work.



## INSTRUCTIONS: EXPLORE OUTSIDE FOR PARTS

1. Head outside and search for the following items:
  - 2 sticks, approximately 1 foot long each and 1/2" in diameter
  - Long blades of grass
  - Leaves
  - Flowers

## INSTRUCTIONS: MAKE THE LOOM

1. Cut 8 x 1 foot long pieces of string.
2. Create the loom warp by tying the pieces of string to one stick, spacing the string evenly across the stick. Tape the stick to the piece of cardboard, making sure the tape only attaches the stick, not the strings to the cardboard.
3. Now tie the strings to the other stick, pulling the string taut and striving to make them the same length..
4. Tape the second stick to the cardboard as well.

## INSTRUCTIONS: WEAVE

1. Now it's time to weave! Feed pieces of grass, leaves, and flowers through the strings. Alternate above and below the strings to hold the pieces in place.

## HOW TO ADJUST FOR DIFFERENT AGES

Building the loom may be challenging for younger hands. Have older kids help build the loom for the little kids to weave on.





**BOREDOM  
BUSTER  
ACTIVITY PLAN**

**CODE**

# CODE

EXPLORE THE LANGUAGE OF COMPUTERS THROUGH CRAFTS AND CODES.

## DID YOU KNOW?

- The Z1 was the first programmable computer. It was invented by Konrad Zuse in Germany between 1936 and 1938.
- There are over 250 programming languages in the world. Python, C++, and Java are three of the most commonly used languages today.

## FUN FACTS

WHY DID THE COMPUTER SQUEAK?

BECAUSE SOMEONE STEPPED ON ITS MOUSE.

## STEAM FUNNIES

## STEAM SNACK

COMPUTER CHIPS & DIP

### WHAT'S THE STEAM BEHIND IT?

A computer chip is the brains inside your electronics. It's a piece of electric circuitry that holds the processing and memory inside your computer, phone, or tablet.

### INGREDIENTS

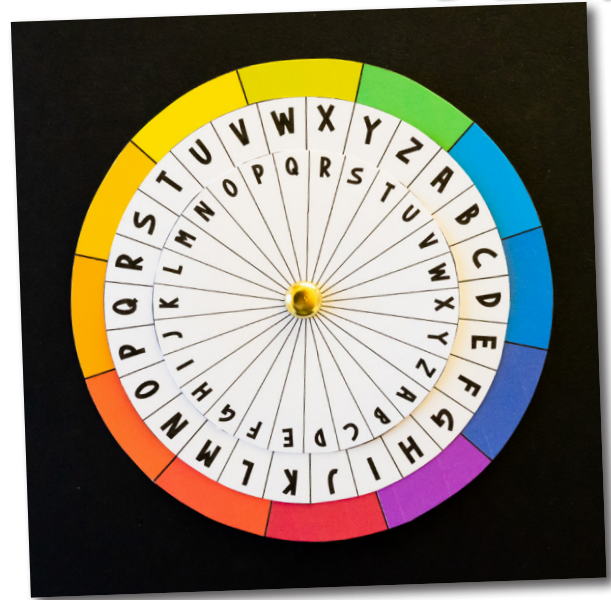
- Chips
- Dip

### RECIPE

Set out a plate of your favorite potato, corn, apple, or veggie chips and some dip. Some fun flavors are peanut butter and honey, ranch, or hummus.

## COLOR WHEEL CODE BREAKER

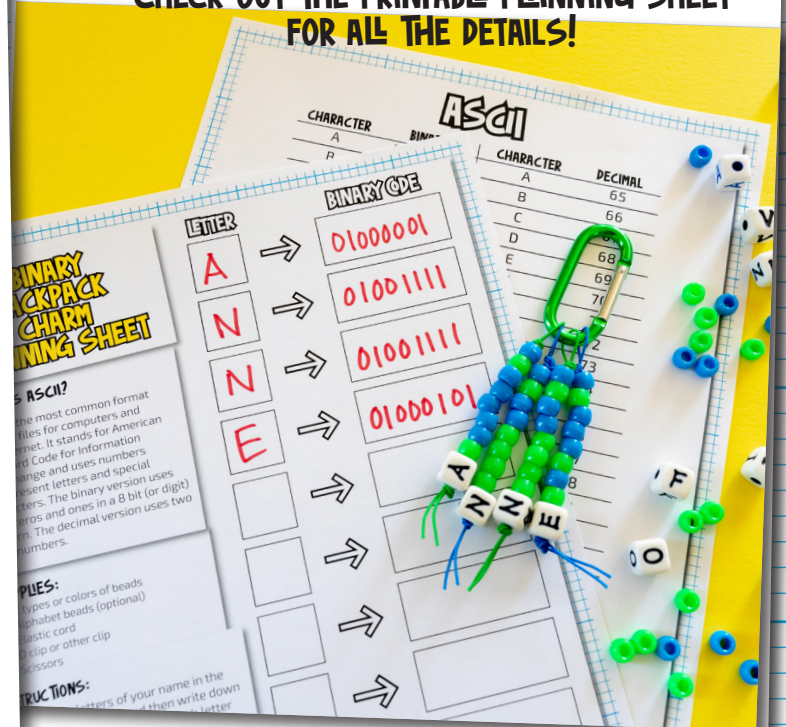
## QUICK STEAM



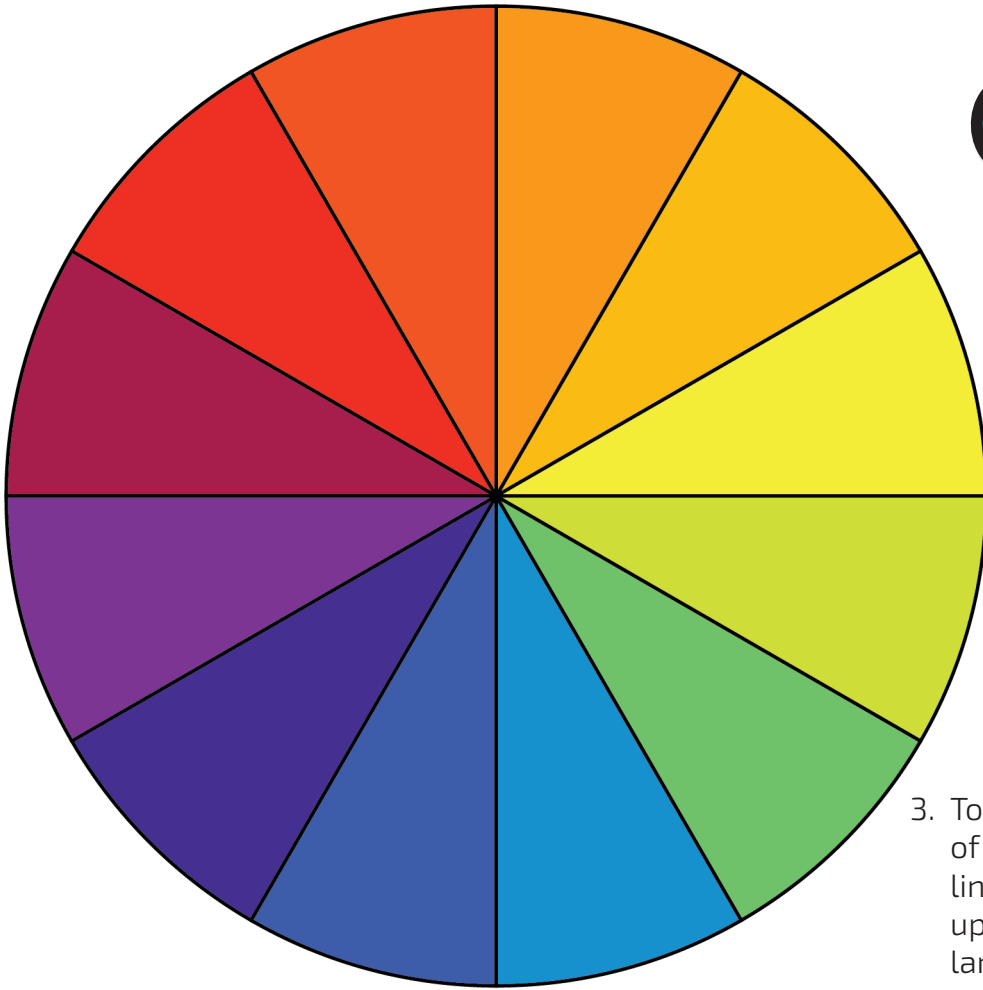
Build the code breaker on the next page to send secret messages to your friends and family. These code breaker wheels are called ciphers and have been used since ancient times to hide secrets.

## BINARY BACKPACK CHARM

CHECK OUT THE PRINTABLE PLANNING SHEET FOR ALL THE DETAILS!



# COLOR WHEEL CODE BREAKER

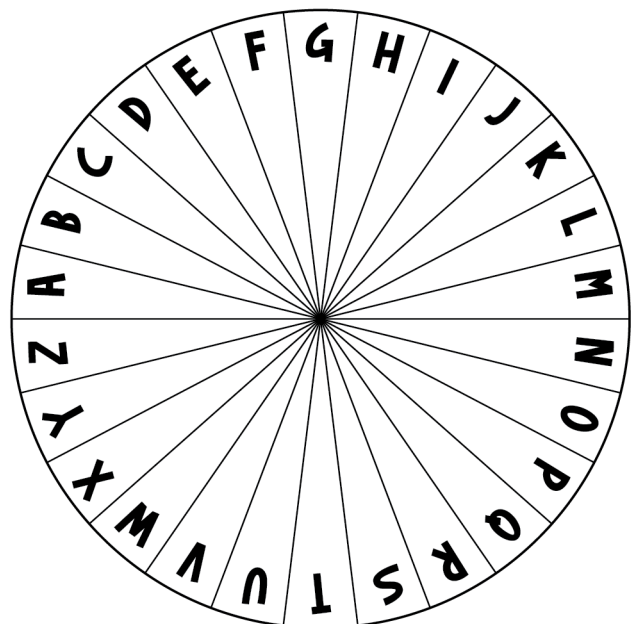
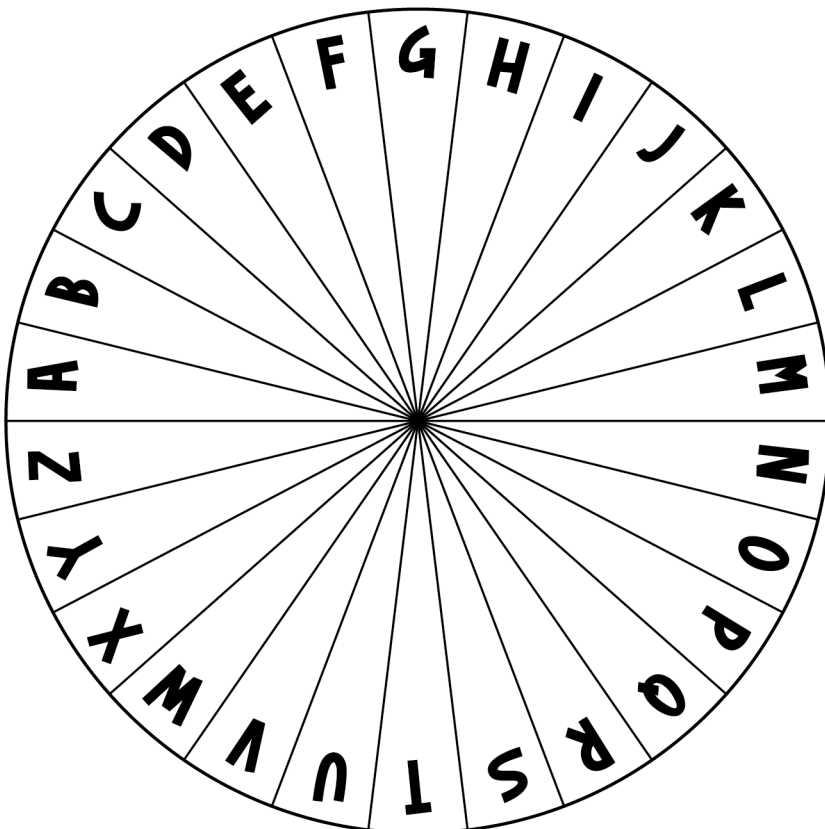


## SUPPLIES:

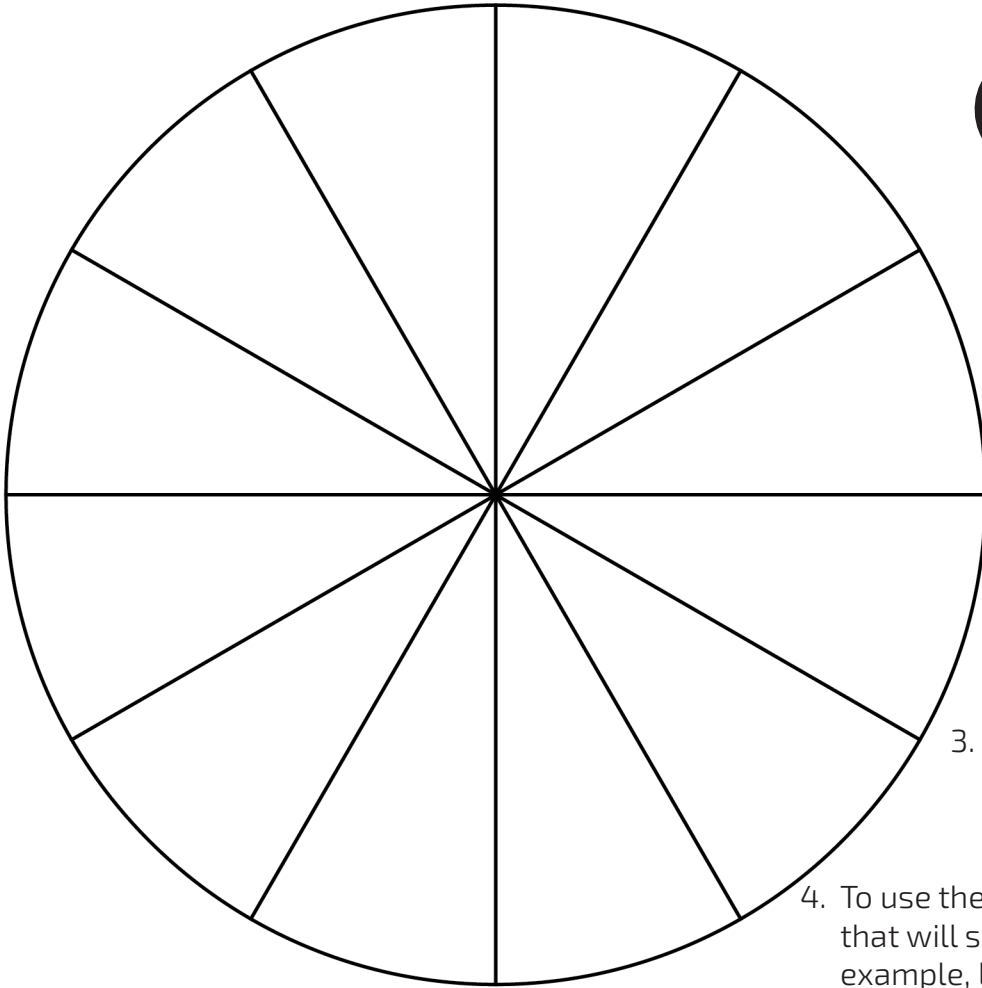
- White cardstock
- Brass fastener
- Scissors

## INSTRUCTIONS:

1. First make the code breaker cipher wheel by cutting out the three wheels.
2. Poke a hole in the center of each circle and stack the circles with the largest on the bottom and the smallest on top. Connect with a fastener.
3. To use the code breaker, pick a pair of letters that will set the code and line up the circles. For example, line up A on the small wheel and J on the large wheel.
4. To write a message, find the letter in your desired word on the large wheel. Then find the corresponding letter on the small wheel. Write the small wheel on the message. Be sure to give the person receiving your message the code breaker cipher wheel and the letter pair.



# COLOR WHEEL CODE BREAKER

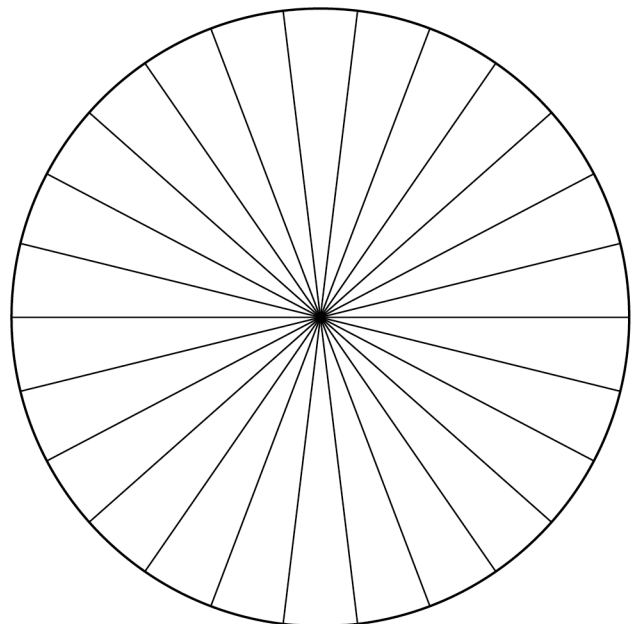
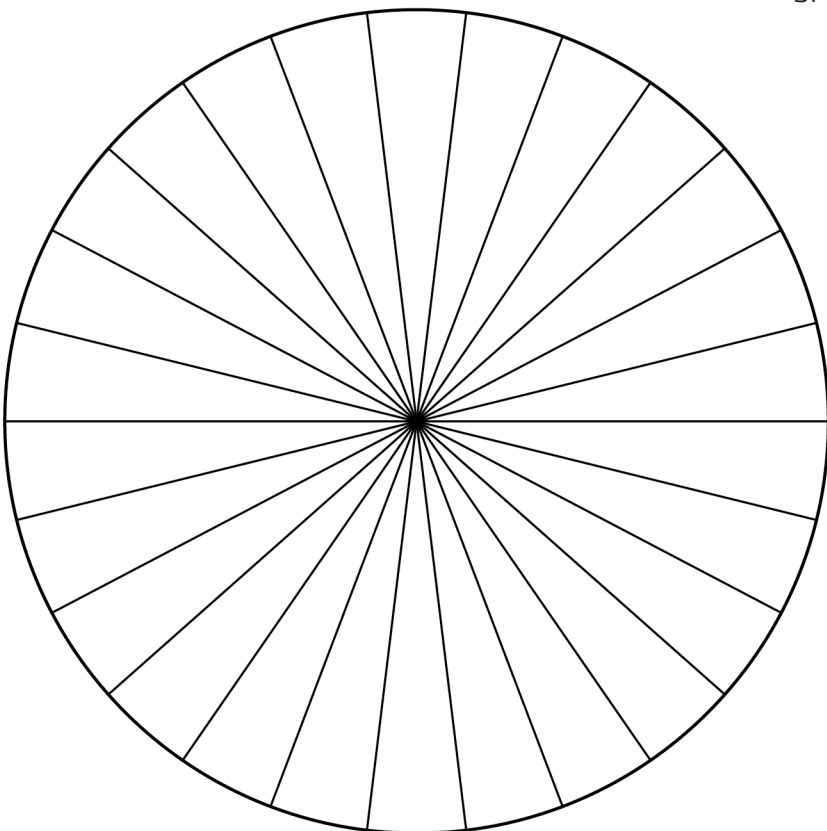


## SUPPLIES:

- White cardstock
- Brass fastener
- Scissors
- Markers

## INSTRUCTIONS:

1. First make the code breaker cipher wheel by cutting out the three wheels. Color in the color wheel.
2. Write the alphabet in the blank spaces in both the large wheel and small wheel.
3. Poke a hole in the center of each circle and stack the circles with the largest on the bottom and the smallest on top. Connect with a fastener.
4. To use the code breaker, pick a pair of letters that will set the code and line up the circles. For example, line up A on the small wheel and J on the large wheel.
5. To write a message, find the letter in your desired word on the large wheel. Then find the corresponding letter on the small wheel. Write the small wheel on the message. Be sure to give the person receiving your message the code break cipher wheel and the letter pair.



# BINARY BACKPACK CHARM PLANNING SHEET

## WHAT IS ASCII?

ASCII is the most common format for text files for computers and the internet. It stands for American Standard Code for Information Interchange and uses numbers to represent letters and special characters. The binary version uses only zeros and ones in an 8 bit (or digit) pattern. The decimal version uses two digit numbers.

## SUPPLIES:

- 2 types or colors of beads
- Elastic cord
- Alphabet beads (optional)
- D clip or other clip
- Scissors

## INSTRUCTIONS:

1. Write the letters of your name in the boxes to the right and then write down the ASCII Binary codes for each letter using the code list on the next page.
2. Pick one color or shape of bead for zeros and a different color or shape of bead for ones.
3. Cut a 12" long piece of elastic cord. Fold in half and tie a knot on the doubled end, leaving a small loop that can be placed on the D clamp or ring.
4. Thread beads for the first letter in your name onto the elastic cord. Follow the binary pattern you listed on the planning sheet.
5. Add an alphabet bead if desired. Tie a knot in the end of the elastic to secure the beads and cut off the excess elastic.
6. Repeat steps 3-5 for the other letters in your name.
7. Hook bead strands onto the D clamp.

LETTER



BINARY CODE





























ZERO BEAD =  ONE BEAD =

# ASCII

CHARACTER	BINARY	CHARACTER	DECIMAL
A	01000001	A	65
B	01000010	B	66
C	01000011	C	67
D	01000100	D	68
E	01000101	E	69
F	01000110	F	70
G	01000111	G	71
H	01001000	H	72
I	01001001	I	73
J	01001010	J	74
K	01001011	K	75
L	01001100	L	76
M	01001101	M	77
N	01001110	N	78
O	01001111	O	79
P	01010000	P	80
Q	01010001	Q	81
R	01010010	R	82
S	01010011	S	83
T	01010100	T	84
U	01010101	U	85
V	01010110	V	86
W	01010111	W	87
X	01011000	X	88
Y	01011001	Y	89
Z	01011010	Z	90



**BOREDOM  
BUSTER  
ACTIVITY PLAN**

**BUILD**



# BUILD

EXPLORE THE  
ENGINEERING  
FUN OF  
BUILDING  
BRIDGES.

## DID YOU KNOW?

- The longest bridge in the world is the Danyang–Kunshan Grand Bridge in China. It's 102.4 miles long and was built for the Beijing–Shanghai high speed railway.
- Want a career designing bridges? Become a civil engineer!

## FUN FACTS

WHAT ANIMAL CAN JUMP  
HIGHER THAN THE  
SYDNEY HARBOUR BRIDGE?

ALL ANIMALS. BRIDGES CAN'T JUMP.

## STEAM FUNNIES

## STEAM SNACK

## FRUIT BRIDGES

### INGREDIENTS

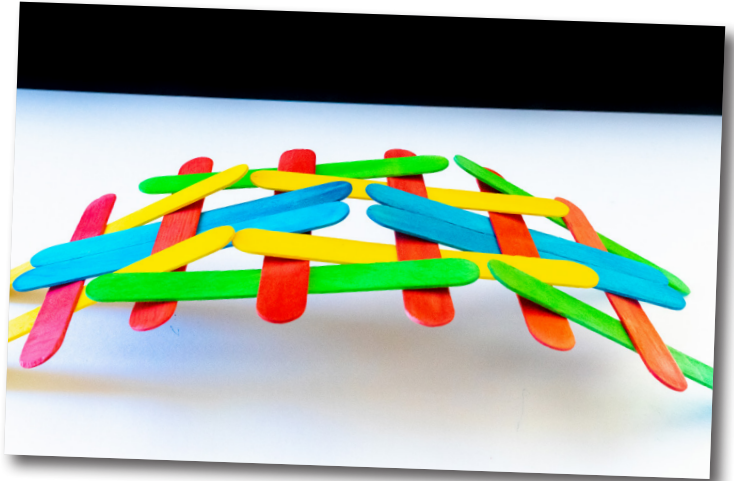
- Toothpicks
- Grapes
- Crackers or cheese

### RECIPE

Construct a bridge using grapes and toothpicks. Drape crackers or cheese over the top of the bridge as a roadway. Then try to roll a grape across your bridge.

## DA VINCI BRIDGE

## QUICK STEAM



### WHAT'S THE STEAM BEHIND IT?

Leonardo da Vinci was a painter, architect, and inventor who lived during the Renaissance era. In the late 1400's, he designed a bridge that required no nails or glue for support. It only required a specific placement of boards to create a structure with great strength. To add even more strength, he added notches to the logs to help them fit together. In this bridge, we'll use popsicle sticks instead of notched logs.

### SUPPLIES:

- 18 wide popsicle sticks

### INSTRUCTIONS:

Arrange popsicle sticks as shown in the picture above. Make sure that sticks overlap correctly. It helps to press down on the bridge to make it flat when moving sticks around. Watch the video for exact instructions!





# BUILDING BRIDGES



**DIFFICULTY:** ●●●●●

**TIME:** 30 MINUTES

## SUPPLIES:

- Cereal box
- 4 toilet paper rolls
- Masking tape
- String or twine
- Small rubber bands (rainbow loom bands work well)
- Hole punch
- Scissors

## WHAT'S THE STEAM BEHIND IT?

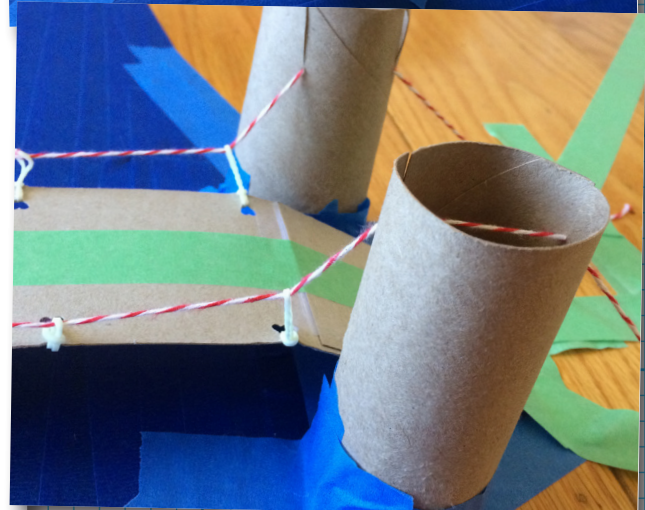
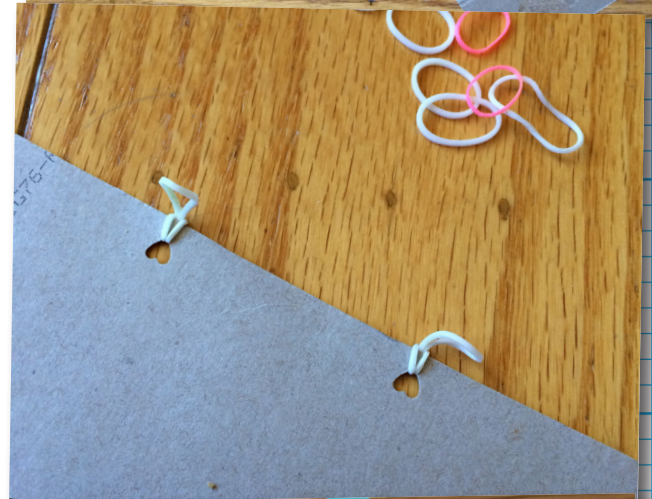
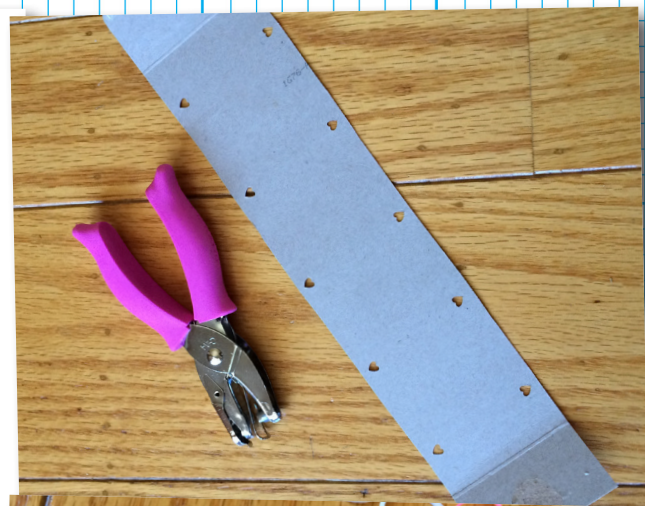
A suspension bridge is a bridge in which the deck (the part that you drive across) is hung below suspension cables on vertical suspender cables. Typically, suspension bridges are built with two tall towers and a cable that travels from one shore, through the two towers and to the other shore. Vertical suspender cables hang from the main horizontal cable and hold the weight of the deck. The weight of the deck is supported by carefully balanced forces on the two towers. The force pulling inwards on the towers is equal to the force pulling outwards on the towers towards land. Because the forces are balanced, the weight pulls straight down into the towers and into the ground. The Golden Gate Bridge shown above is one of the most famous suspension bridges in the world.

## INSTRUCTIONS: BUILD THE BRIDGE

1. Cut a strip of cardboard out of a flattened cereal box to make your bridge. You can tape on extra sections if you want to make a really long bridge.
2. Punch holes along the sides of the cardboard leaving a few inches on each end without holes. The un-holed section serves as the ramp to the "ground". Try to approximately line up the holes across the cardboard to help increase stability in the bridge.
3. Thread a rubber band through each hole and loop back through itself to hold in place
4. Create bridge towers by cutting two 1/2" slits in one end of the each tube. The slits should be slightly off the center and across from each other.
5. Tape down the toilet paper roll towers. This is the trickiest part because these towers support all the weight on the bridge just like a real suspension bridge. Also be sure that the slits line up with the direction of the bridge.
6. Cut two cables out of a length of baker's twine. Cut them about twice as long as your bridge to be safe (you can always cut the extra off later).
7. Feed each piece first through the slits in the towers and then through each of the rubber bands. Then pull the twine taught until the rubber bands stretch some and the bridge feels secure. Tape the ends of the twine to the floor.
8. Tape the road connectors over the bridge.

## INSTRUCTIONS: TEST THE BRIDGE

Explore the strength of your bridge by pressing on it or adding weight (rocks and coins work well). How well does it hold? What can you do to make it stronger?





**BOREDOM  
BUSTER**  
ACTIVITY PLAN

**CREATE**

# CREATE

MAKE WEATHER, POLYMERS, AND MOVIES  
IN THIS DAY'S STEAM PLAN!

## DID YOU KNOW?

- The Humpty Dumpty Circus, the first stop motion movie, was created in 1898
- The Cave of Crystals in Mexico contains some of the largest crystals ever found. These selenite crystals can be as big as 39 feet long!

## FUN FACTS

WHAT IS A ROCK'S  
FAVORITE CEREAL?

©©A PEBBLES.

## STEAM FUNNIES

## STEAM SNACK

### POLYMER JIGGLERS

#### WHAT'S THE STEAM BEHIND IT?

When you hear the word polymer, you may think of plastic. But polymers can be anything where a large number of similar molecules are connected together in a chain. Gelatin is a naturally found protein polymer. Its polymer chain is shaped like a triple helix (spiral) which allows it to swell when the liquid is added.

#### INGREDIENTS

- Water or juice if using unflavored gelatin
- Gelatin like Jello or Knox

#### RECIPE

Grab a box of your favorite gelatin and follow the instructions given to make some polymer jiggers!

## TORNADO IN A JAR

## QUICK STEAM



#### WHAT'S THE STEAM BEHIND IT?

Tornadoes are one of the most impressive weather phenomena. A tornado is a rotating column of air that forms between a cumulonimbus cloud and the ground. Inside a giant super cell thunderstorm cloud is a rotating vortex of air that pulls warm, humid air from the ground and pushes cold, dry air towards the ground. This creates a spinning funnel cloud that eventually is forced down to the ground and a tornado is born. Wind speeds inside tornadoes can reach well over 300 mph for the most destructive, but rare F5 category tornadoes.

In this experiment, you'll create a spinning vortex of water inside the jar that is shaped just like a tornado.

#### SUPPLIES:

- Jar with lid
- 2 cups water
- 1 teaspoon dish soap
- 1 teaspoon vinegar
- 1 drop of food coloring
- Spoon

#### INSTRUCTIONS:

1. Add water, vinegar, and food coloring to jar and mix until color is combined.
2. Add dish soap and stir gently until combined.
3. Close the jar tightly and swirl until you see the vortex.

# TOY ANIMATION



**DIFFICULTY:** ●●●●

**TIME:** 30-45 MINUTES

## SUPPLIES:

- Phone or tablet
- Stop motion app like Stop Motion or Stop Motion Studio
- Toys
- Props and backdrops like paper, other toys, books, your backyard, or anything else you'd like to use

## WHAT'S THE STEAM BEHIND IT?

Explore the art of film with stop motion animation! Stop motion is animation that is capture one frame at a time while objects (like your toys) are moved in between frames. This is the same process used in cartoons except photos are used instead of drawings.

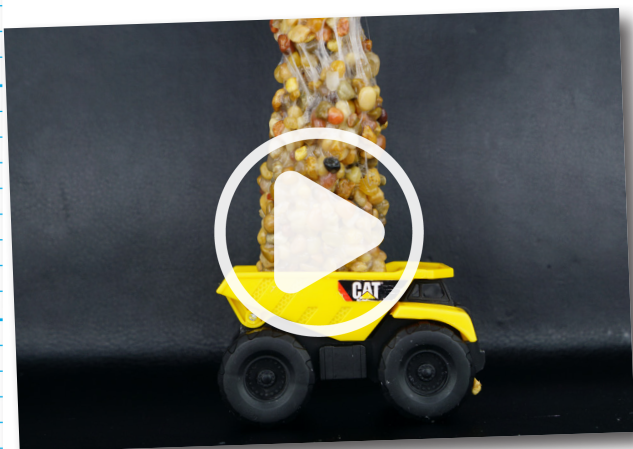
Stop motion animation works due to a phenomenon called persistence of vision. The human eye can only see 10 to 12 images per second and the brain can still be processing after the image disappears. If a new image replaces the first image while the brain is still processing, it will interpret the image as a combination of the two. If your toys make small movements and the movie has lots of pictures, your brain will interpret the movement as continuous.

## INSTRUCTIONS:

1. Download your preferred stop motion app onto your phone or tablet.
2. Plan your movie using the planning questions to the right.
3. Find a stable surface and set up your backdrop.
4. Prop up your phone or tablet in a sturdy location in front of the scene. You need to be able to click the take picture button without moving the device around.
5. Set up your toys in the position you want them to start in. Take a picture.
6. Now it's time to start moving them. Move the toys slightly and take another picture. The smaller the movements between photos, the smoother the stop motion movie will be.
7. Continue moving the toys around so they tell the story you want to tell, taking a picture at each small movement.
8. When you're done with all the movements, click the make movie button in the app.

Stop motion movies can take a little practice, so it can help to start with a small one. Make it, watch it, and make adjustments before shooting the whole movie.

See a Toy Animation in Action in this movie!



# TOY ANIMATION MOVIE PLAN

PLAN YOUR MOVIE  
BY ANSWERING  
THE QUESTIONS  
BELOW.

**WHAT IS THE MOVIE ABOUT?**

**WHICH TOYS ARE STARRING IN THE MOVIE?**

**WHAT ARE THE TOYS DOING IN THE MOVIE?**

**WHERE DOES THE MOVIE TAKE PLACE?**

**WHAT PROPS ARE NEEDED TO TELL THE STORY?**



**BOREDOM  
BUSTER  
ACTIVITY PLAN**

**COLOR**



# COLOR

EXPLORE COLOR  
THROUGH  
ARCHITECTURE,  
DRAWING, AND  
FRUIT!

## DID YOU KNOW?

- Love exploring color? You can get a degree as a color scientist. You'll explore the quantitative description of color through computer science, physics, chemistry, psychology, and more.
- Oregon Blue, the first new blue pigment discovered in over 200 years, was found by accident by a scientist looking for new materials for electronics.

## FUN FACTS

WHAT DID THE ARTIST  
DRAW BEFORE HE WENT  
TO BED?

THE CURTAINS!

## STEAM FUNNIES

## STEAM SNACK

## RAINBOW SMOOTHIES

### INGREDIENTS

- Fruit and vegetables in different colors
- Yogurt
- Honey (optional)
- Juice (optional)
- Blender

### RECIPE

Pick a few fruits and vegetables and guess what color smoothie they will make. Put 1 cup fruit and vegetables and 1/2 cup yogurt into a blender. Blend until smooth.

Can you make a green smoothie? A purple smoothie? What ingredients do you need?

## SINGLE LINE SCRIBBLE ART CHALLENGE

## QUICK STEAM



## WHAT'S THE STEAM BEHIND IT?

This art challenge is a fun way to explore geometry and one of the building blocks of visual art. Many famous artists have created stunning line drawings and line drawing is one of the first steps in art education. Pablo Picasso is famous for some of his continuous line drawings. Jackson Pollock used continuous paint drips in his iconic abstract paintings. Keith Haring is famous for his bold line drawings and Bridget Reilly, a pioneer of op art, used line drawing to create stunning optical illusions.

### SUPPLIES:

- Paper
- Black pen or pencil
- Markers or colored pencils

### INSTRUCTIONS:

1. First draw your single line scribble with black marker or pencil. The goal is to scribble across the entire page in one continuous line without picking up your marker. The lines can cross, curve, whatever you feel like!
2. Draw three large shapes over your scribble line. You can draw circles, squares, triangles, or another 2D shapes you prefer. For a more advanced project, try 3D shapes like pyramids or cylinders.
3. Next, pick 3 sets of two color coordinated markers. Color in the shapes with the markers.



# **WATERCOLOR HOUSES**

## INSTRUCTIONS: BUILD THE HOUSE

1. First print out the template on watercolor paper, cardstock, or even regular paper if that's what you have. Cut around the solid black lines. To cut out the windows, grab an adult and a box cutter.
2. Fold the house along the dotted lines. Also fold roof in half along dotted line.
3. Add double sided tape on each of the flaps and tape together. Add the roof and tape to the base.

## INSTRUCTIONS: PAINT THE HOUSE

Grab some liquid watercolors (or food coloring mixed with water) and a bunch of pipettes or brushes. Then try different techniques like dripping, splattering and brushing. Squirt guns would be fun too!! This is all about the process and exploring how the colors of the house come out. Or play house painter and be more exact. Your creativity is your guide.

## HOW TO ADJUST FOR DIFFERENT AGES

- The houses can be pre-cut and folded for younger kids, leaving the taping and watercolors for them to do on their own.
- For older kids, leave all the steps to them and use it as an opportunity to talk about tool safety.

**DIFFICULTY:** ●●●

**TIME:** 30 MINUTES

### SUPPLIES:

- Watercolor houses printable template
- Paper or cardstock
- Scissors
- Box cutter
- Ruler
- Liquid watercolors or food coloring with water (you can use regular paint too!)
- Pipettes, droppers or paint brushes

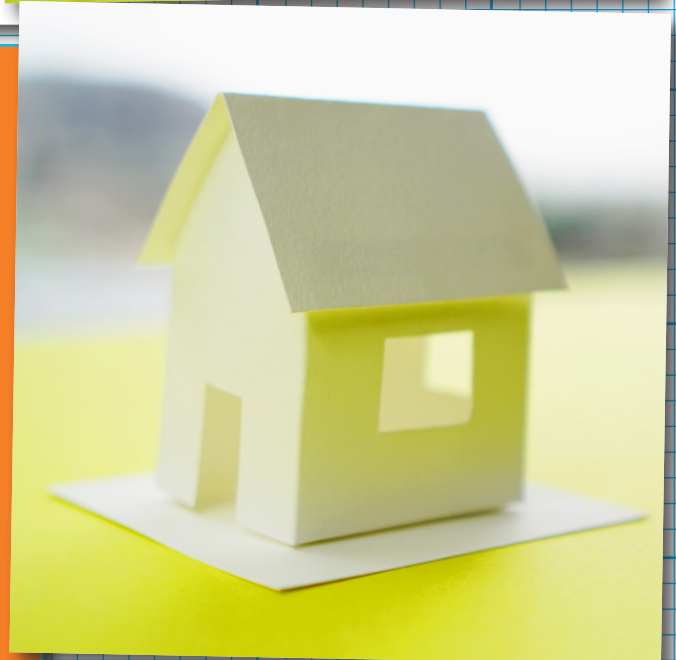


## WHAT'S THE STEAM BEHIND IT?

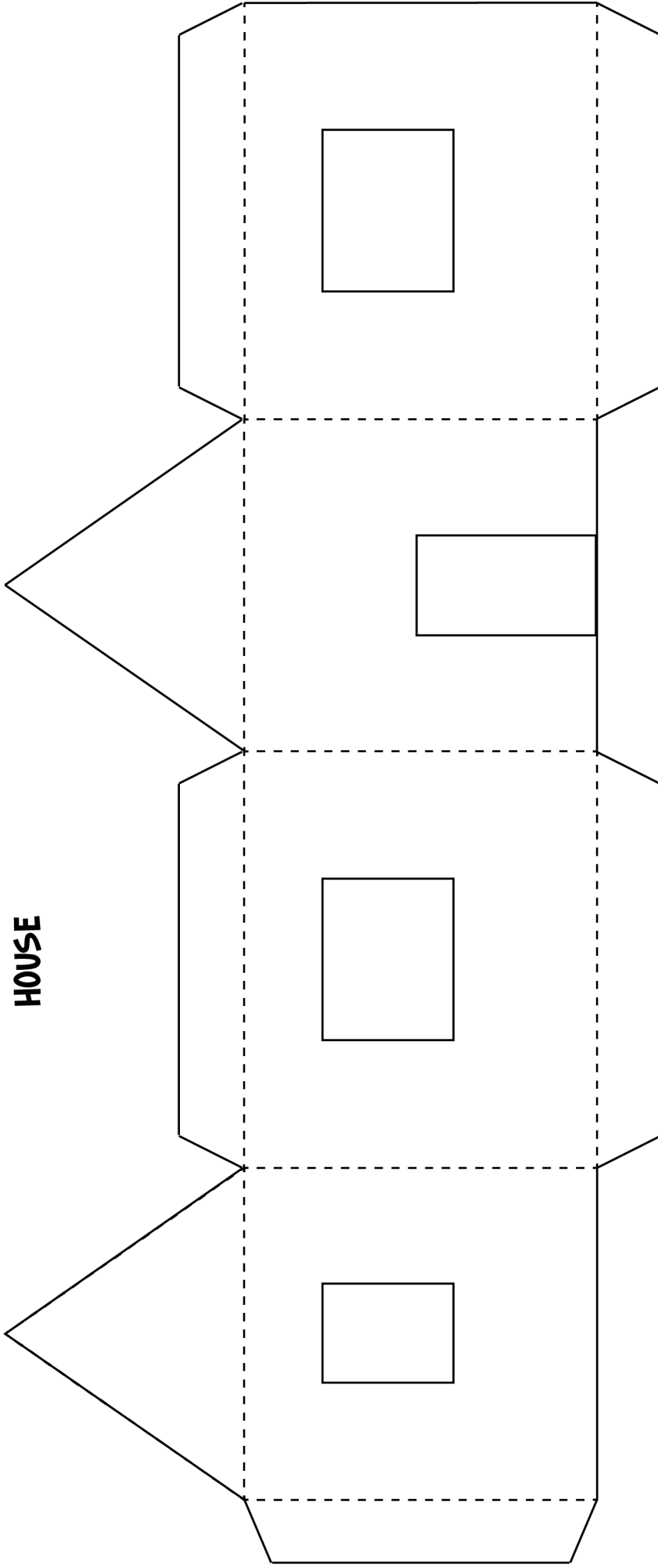
Architecture is the ultimate STEAM career!

Architects have to:

- Learn the concepts of science (physics, gravity, forces, motion).
- Incorporate and use technology to design their structures.
- Utilize engineering to develop systems that support the building and environment.
- Use art and design to create something beautiful and fitting for the environment they are designing for.
- Utilize mathematics through geometry to define the spatial form of a building.



## HOUSE



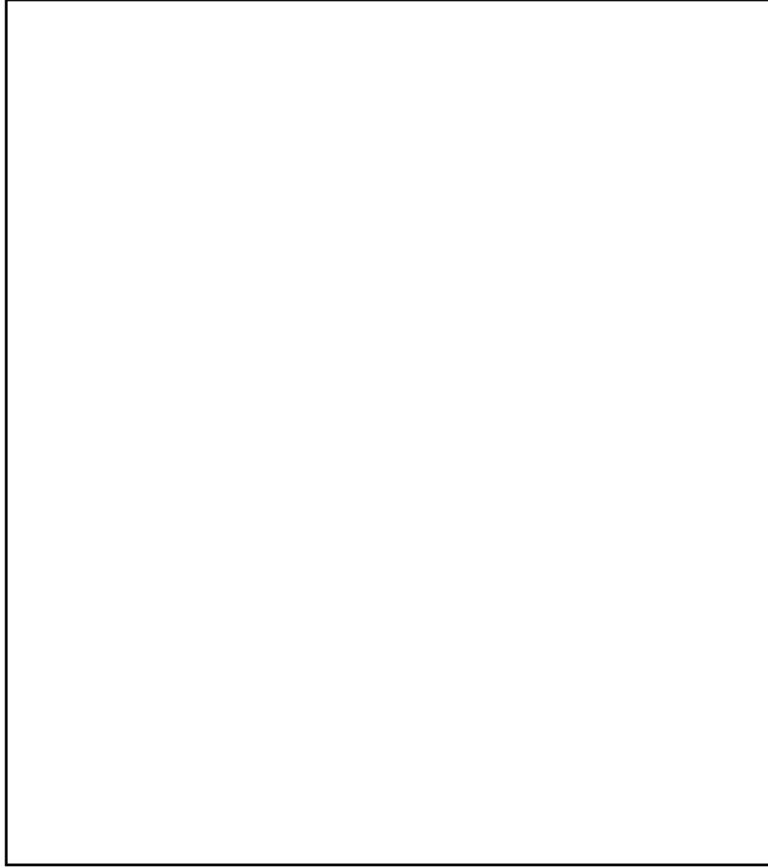
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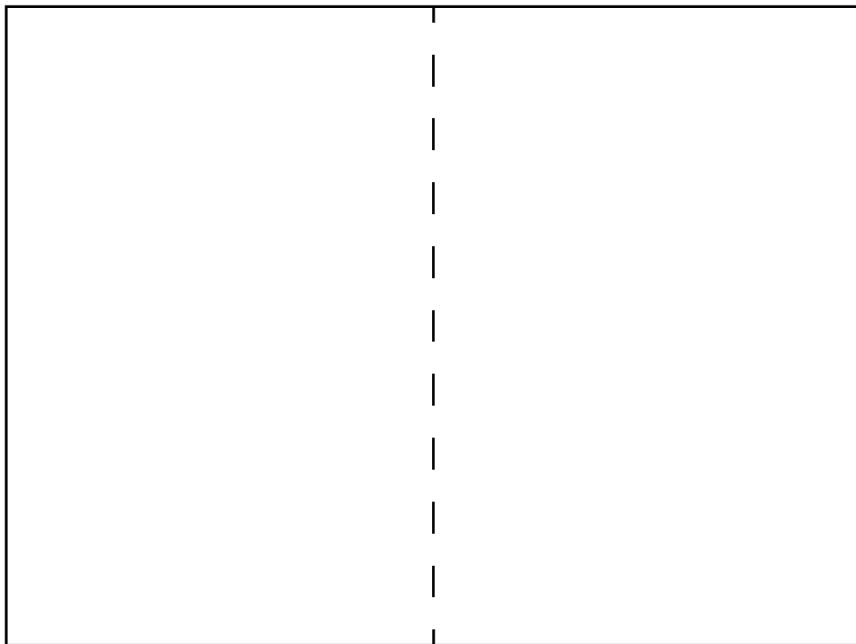
**WATERCOLOR  
HOUSE TEMPLATE  
(PAGE 1)**

# WATERCOLOR HOUSE TEMPLATE (PAGE 2)

**BASE**



**ROOF**



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# WORD SEARCH

FIND THE WORDS HIDING  
IN THIS PUZZLE!

I J R U U N P U X D Q K G D W B L O H O  
C A M O U F L A G E F I C V D H U X U T  
P J W F A W F G O Z B C N L C G X G D D  
Y C B B N I X K L R F O X Y D E E R V N  
V S K G I A N Y K E G P G R Y L X A Y P  
U O D F M K J A K P C R W B V R R U N R  
D R S U A I A W Q T S C O Y B H D Z Q H  
H X J S L N F E G I N X S P E C I E S C  
I X L C U G E Z U L W F L A T C K I Z B  
B G E G D D Q X Y E F U Q R X L X R D Q  
E O K Y O O P N G K J A U F B K P B F E  
R Q L P S M L R K V P F Y W K D O G Z E  
N X O C A T L Q S B H P G K P X S S X K  
A K X I K O J T T T T L L D A M F O W L  
T H H A B I T A T R X A I J N A N C X F  
E P N R L R C C B A J T Z H D M S D K B  
R E S F S Q R O C O B Y A Z A M M Z S N  
R T S J K B V E B I U P R F I A M A L N  
P T K J V Y Q Z B O W U D K H L H A P K  
A A L W Y K S P V W P S P F I S H C U M

KINGDOM

CAT

DOG

OWL

HIBERNATE

ANIMAL

HABITAT

CAMOUFLAGE

FOX

LIZARD

MAMMAL

PET

DEER

PLATYPUS

REPTILE

FISH

PANDA

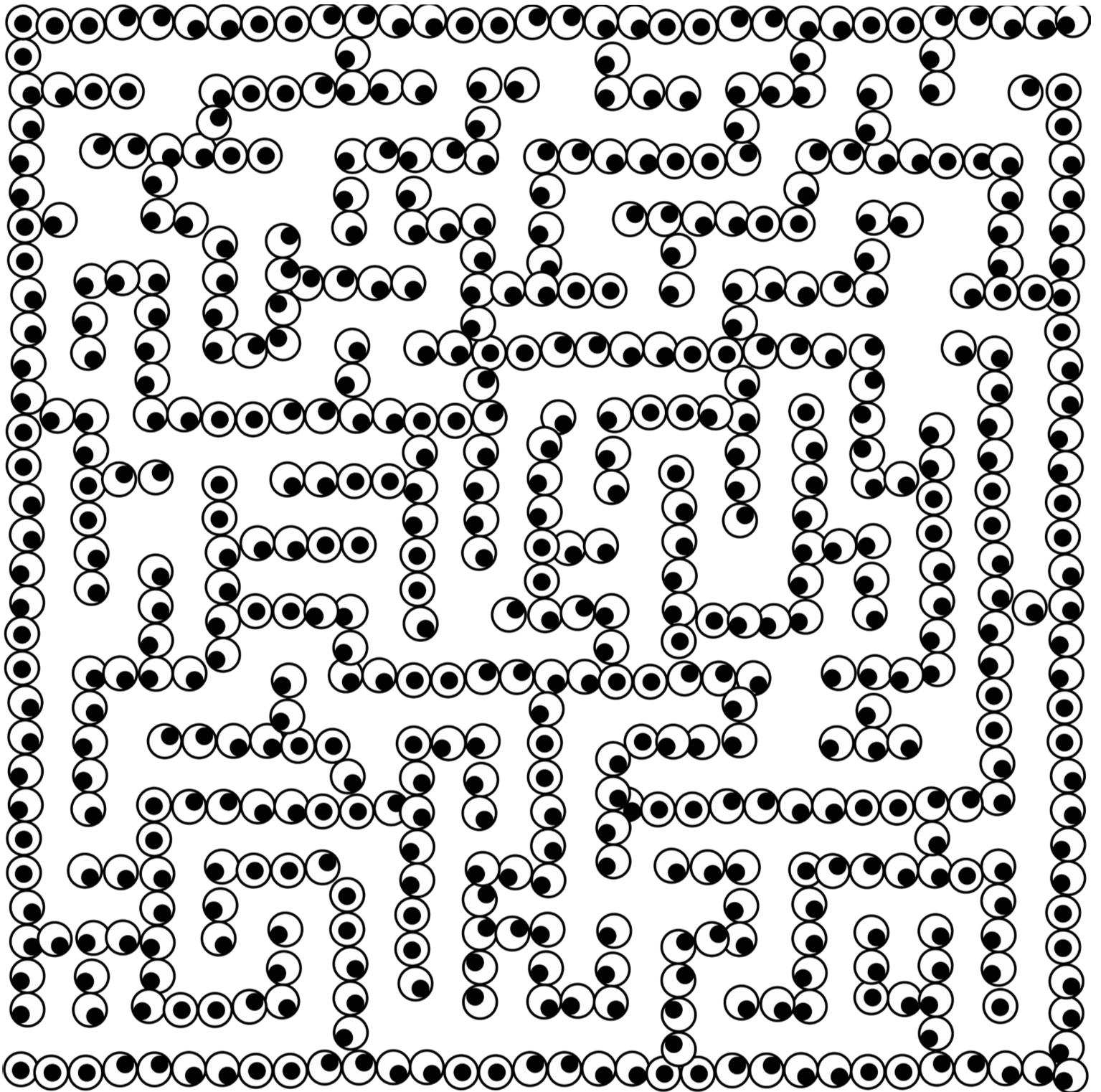
SPECIES

NAME: \_\_\_\_\_

# GOOGLY EYE MAZE

FIND YOUR WAY FROM START TO FINISH THROUGH  
THIS LABYRINTH OF GOOGLY EYES.

START







FINISH

NAME: \_\_\_\_\_

# WEATHER SUDOKU

COLOR AND CUT OUT THE PICTURE ON THE NEXT PAGE AND PLACE OR GLUE TO THE SUDOKU BOARD USING THE FOLLOWING RULES:

- EACH ROW CONTAINS EACH PICTURE 1 TIME.
- EACH COLUMN CONTAINS EACH PICTURE 1 TIME.
- EACH 2 X 2 SQUARE BOX CONTAINS EACH PICTURE 1 TIME.

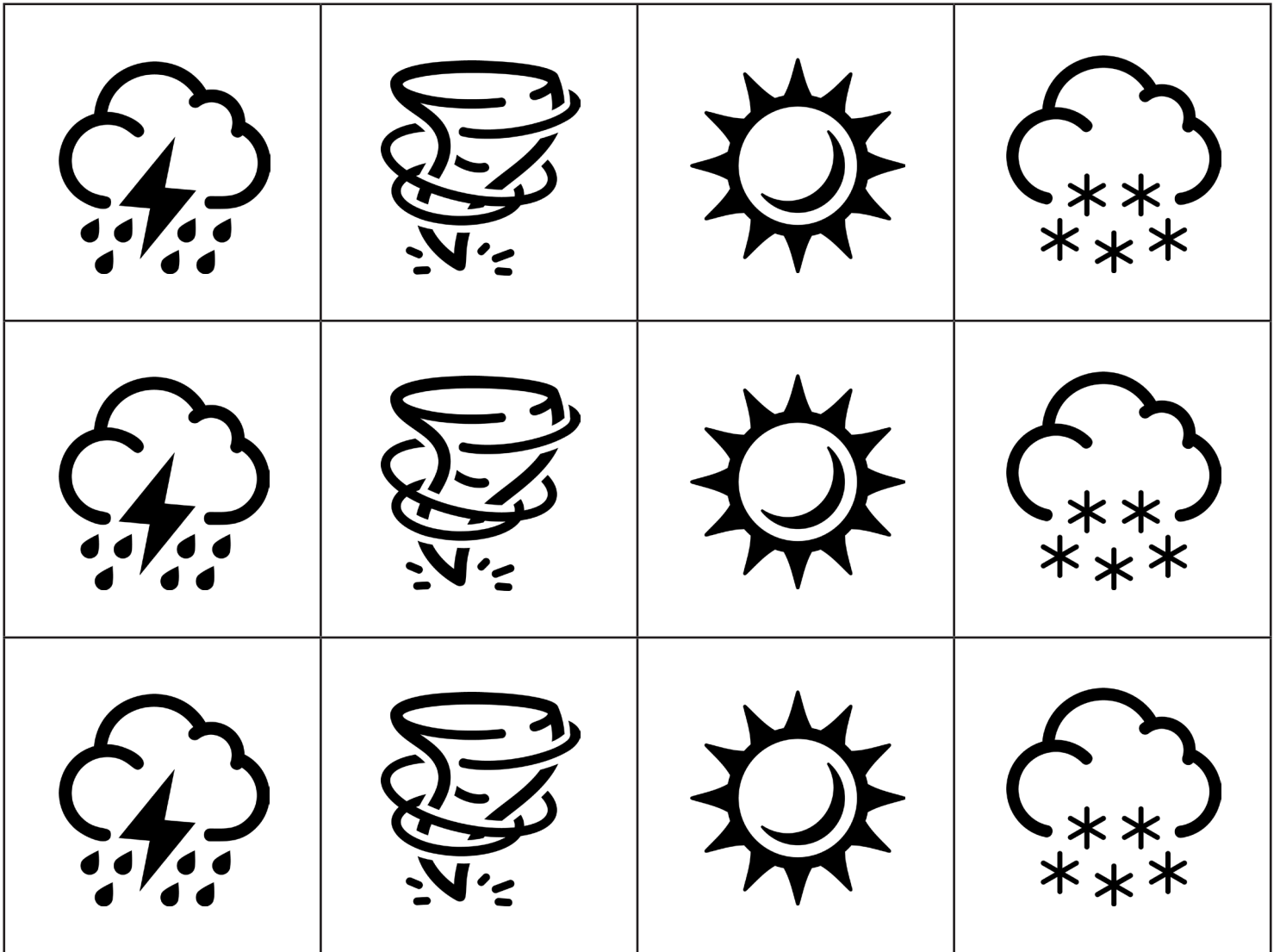
			
			
			
			



NAME: \_\_\_\_\_

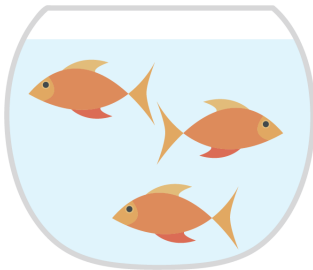
# WEATHER SUDOKU PICTURES

COLOR AND CUT OUT THESE IMAGES TO PLAY WEATHER SUDOKU.

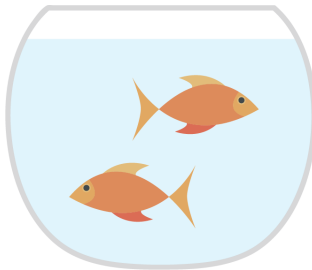


# FISHBOWL BRAIN TEASERS

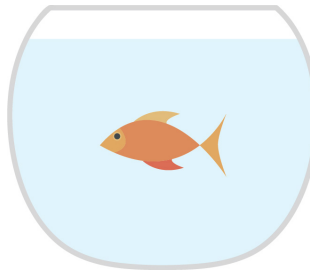
## 1. WHICH FISHBOWL HAS THE MOST WATER?



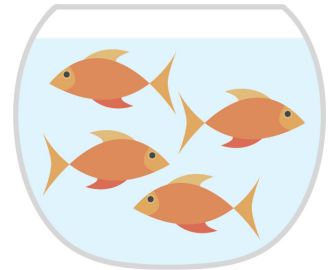
A



B



C



D

## 2. FISHBOWL FILLING

Your fish needs a fishbowl with exactly 6 cups of water to stay healthy but you don't have a measuring cup. But you do have 2 empty fishbowls, 1 that holds 2 cups of water and 1 that holds 5 cups of water. You also have 1 fishbowl that holds 7 cups of water and is full of water.

How can you get exactly 6 cups of water in fishbowl C without throwing any water out?



## 3. FISHBOWL MATH

You want to buy one fish of each kind.  
How many dollars do you need?

$$\text{Red fish} + \text{Red fish} + \text{Red fish} = \$30$$

$$\text{Red fish} + \text{Blue fish} + \text{Blue fish} = \$20$$

$$\text{Blue fish} + \text{Yellow fish} + \text{Yellow fish} = \$9$$

$$\text{Red fish} + \text{Blue fish} + \text{Yellow fish} = ?$$

# COLOR BY CODING

## INSTRUCTIONS

Figure out the colors in this coloring page by finding the matching letters on the ASCII code sheet. Then color the picture with the numbers noted on the picture. There are two different code options, BINARY and DECIMAL. The binary coloring page is harder, so pick which one is best for you.

## WHAT'S THE STEAM BEHIND IT?

There's a lot of talk today about coding being the language of the future. But what exactly is it and why is it important? Coding makes it possible for us to tell computers how to do stuff, like run our phone, play a video game, and make a website. Any app you use on your phone or computer is possible because of code.

## WHAT IS ASCII?

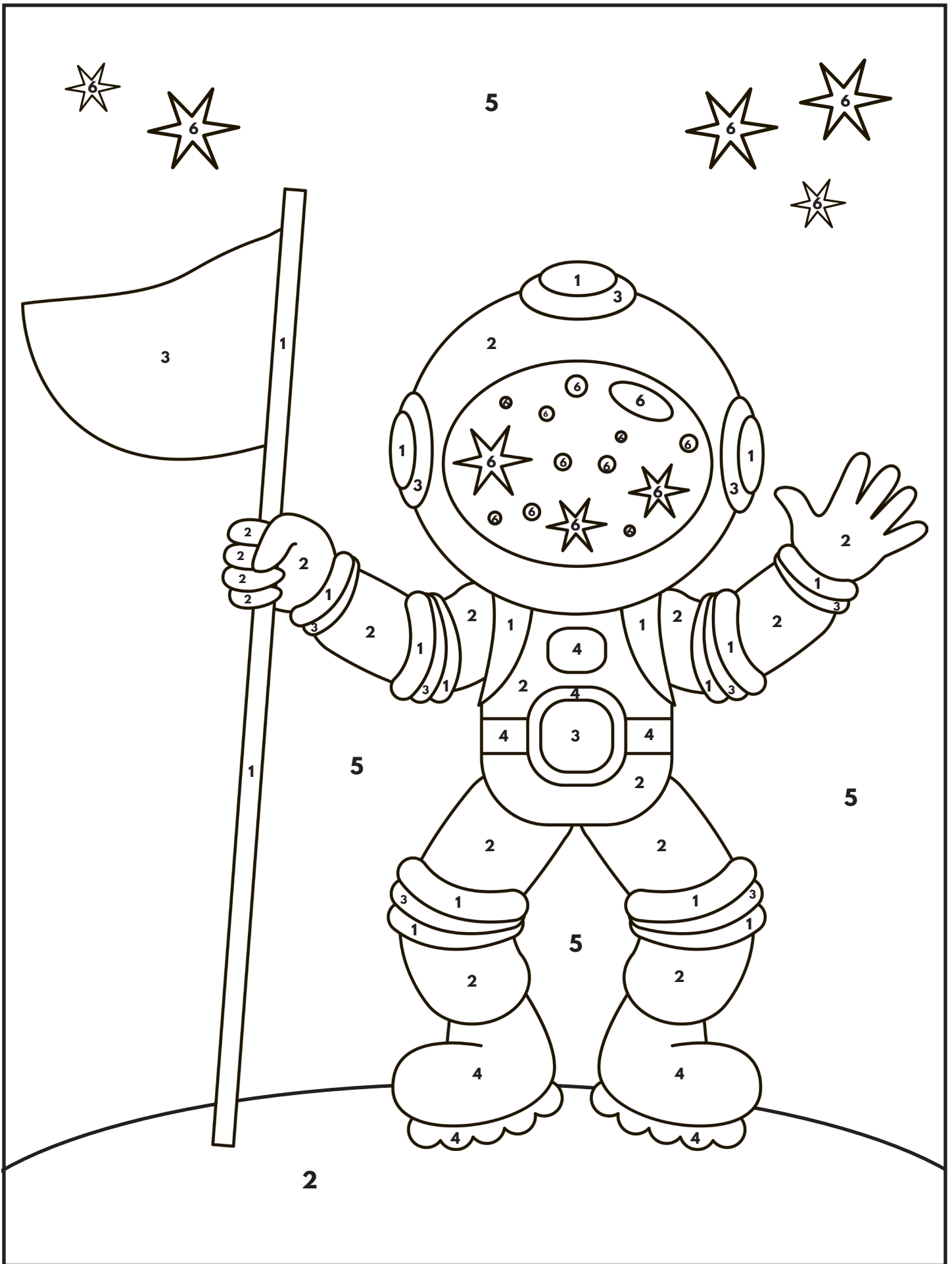
Computers speak the languages of zeroes and ones, essentially on and off signals to computer parts called transistors. These zeroes and ones have been translated into codes called the ASCII Binary code where every letter, number and character has an 8 digit combination of zeroes and ones. ASCII is the most common format for text files for computers and the internet. It stands for American Standard Code for Information Interchange and uses numbers to represent letters and special characters. The binary version uses only zeros and ones in an 8 bit (or digit) pattern.

But it would take too long to do anything if we had to code in just zeroes and ones, so computers use other languages now, that are all based upon binary.



# ASCII

<b>CHARACTER</b>	<b>BINARY</b>	<b>CHARACTER</b>	<b>DECIMAL</b>
A	01000001	A	65
B	01000010	B	66
C	01000011	C	67
D	01000100	D	68
E	01000101	E	69
F	01000110	F	70
G	01000111	G	71
H	01001000	H	72
I	01001001	I	73
J	01001010	J	74
K	01001011	K	75
L	01001100	L	76
M	01001101	M	77
N	01001110	N	78
O	01001111	O	79
P	01010000	P	80
Q	01010001	Q	81
R	01010010	R	82
S	01010011	S	83
T	01010100	T	84
U	01010101	U	85
V	01010110	V	86
W	01010111	W	87
X	01011000	X	88
Y	01011001	Y	89
Z	01011010	Z	90



NAME: \_\_\_\_\_

# COLOR BY CODING

## WHAT IS ASCII?

ASCII is the most common format for text files for computers and the internet. It stands for American Standard Code for Information Interchange and uses numbers to represent letters and special characters. The binary version uses only zeros and ones in a 8 bit (or digit) pattern. The decimal version uses two digit numbers.

## INSTRUCTIONS

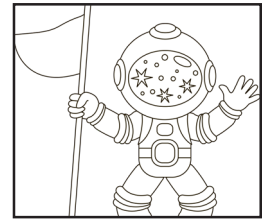
Figure out the colors in this color by number coloring page by finding the matching letters on the ASCII code sheet **BINARY** column. Then color the picture with the numbers noted on the picture.

1

=  
\_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_  
01010111    01001000    01001001    01010100    01000101

2

=  
\_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_  
01000111    01010010    01000101    01011001



3

=  
\_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_  
01001111    01010010    01000001    01001110    01000111    01000101

4

=  
\_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_  
01000010    01001100    01000001    01000011    01001011

5

=  
\_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_  
01000010    01001100    01010101    01000101

6

=  
\_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_    \_\_\_\_\_  
01011001    01000101    01001100    01001100    01001111    01010111

# COLOR BY CODING

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## INSTRUCTIONS

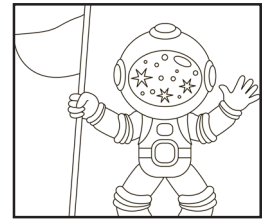
Figure out the colors in this color by number coloring page by finding the matching letters on the ASCII code sheet **DECIMAL** column. Then color the picture with the numbers noted on the picture.

1

= \_\_\_\_\_  
           **87**      **72**      **73**      **84**      **69**

2

= \_\_\_\_\_  
           **71**      **82**      **69**      **89**



3

= \_\_\_\_\_  
           **79**      **82**      **65**      **78**      **71**      **69**

4

= \_\_\_\_\_  
           **66**      **76**      **65**      **67**      **75**

5

= \_\_\_\_\_  
           **66**      **76**      **85**      **69**

6

= \_\_\_\_\_  
           **89**      **69**      **76**      **76**      **79**      **87**

# WORD SEARCH

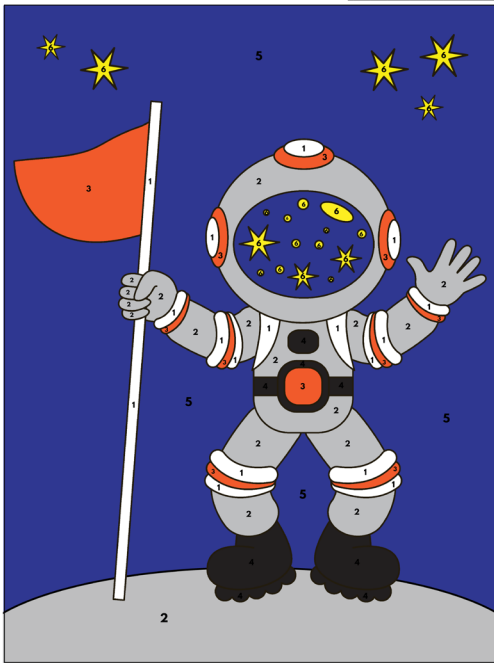
FIND THE WORDS HIDING IN THIS PUZZLE!

PLAY



CAT DOG CAMOUFLAGE FOX PLATYPUS REPTILE


NAME: \_\_\_\_\_



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files for computers and the internet. It stands for American Standard Code for Information Interchange and uses numbers to represent letters and special characters. The binary version uses only zeros and ones in a 8 bit (or digit) pattern. The decimal version uses two digit numbers.

Figure out the colors in this color by number coloring page by finding the matching letters on the ASCII code sheet BINARY column. Then color the picture with the numbers noted on the picture.

1	=	W	H	I	T	E	
		01010111	01001000	01001001	01010100	01000101	
2	=	G	R	E	Y		
		01000111	01010010	01000101	01011001		
3	=	O	R	A	N	G	E
		01001111	01010010	01000001	01001110	01000111	01000101
4	=	B	L	A	C	K	
		01000010	01001100	01000001	01000011	01001011	
5	=	B	L	U	E		
		01000010	01001100	01010101	01000101		
6	=	Y	E	L	L	O	W
		01011001	01000101	01001100	01001100	01001111	01010111

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# ANSWERS

## FISHBOWL BRAIN TEASERS (PG. 32):

#1 = C

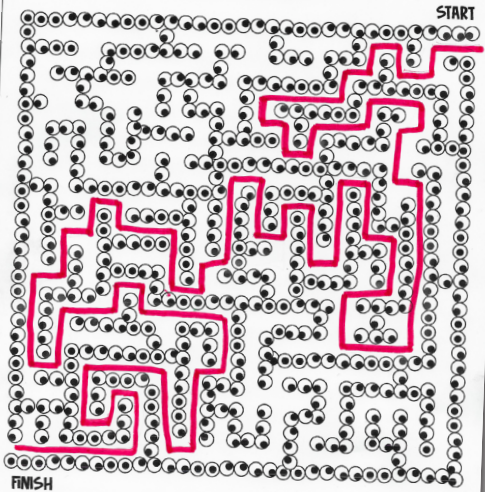
#2 = FOLLOW THESE STEPS

1. POUR FISHBOWL C INTO FISHBOWL B.  
(YOU GET 0 CUPS IN A, 5 CUPS IN B, AND 2 CUPS IN C.)
2. POUR FISHBOWL B INTO FISHBOWL A.  
(YOU GET 2 CUPS IN A, 3 CUPS IN B, AND 2 CUPS IN C.)
3. POUR FISHBOWL A INTO FISHBOWL C.  
(YOU GET 0 CUPS IN A, 3 CUPS IN B, 4 CUPS IN C.)
4. POUR FISHBOWL B INTO FISHBOWL A.  
(YOU GET 2 CUPS IN A, 1 CUP IN B, AND 4 CUPS IN C.)
5. POUR FISHBOWL A INTO FISHBOWL C.  
(YOU GET 0 CUPS IN A, 1 CUP IN B, AND 6 CUPS IN C.)

#3 = \$17

## GOOGLY EYE MAZE

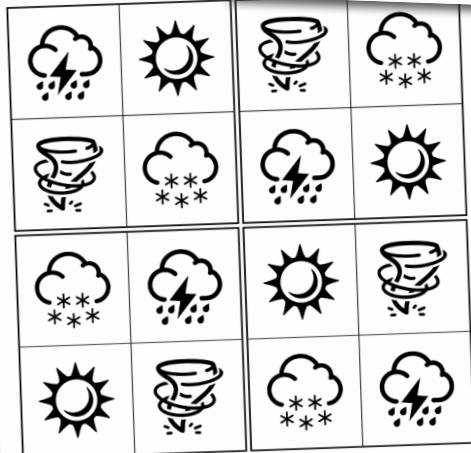
FIND YOUR WAY FROM START TO FINISH THROUGH THIS LABYRINTH OF GOOGLY EYES.



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## WEATHER SUDOKU

GET AND CLIP OR GLUE TO:  
- EACH ROW  
- EACH COLUMN  
- EACH 2x2 BOX



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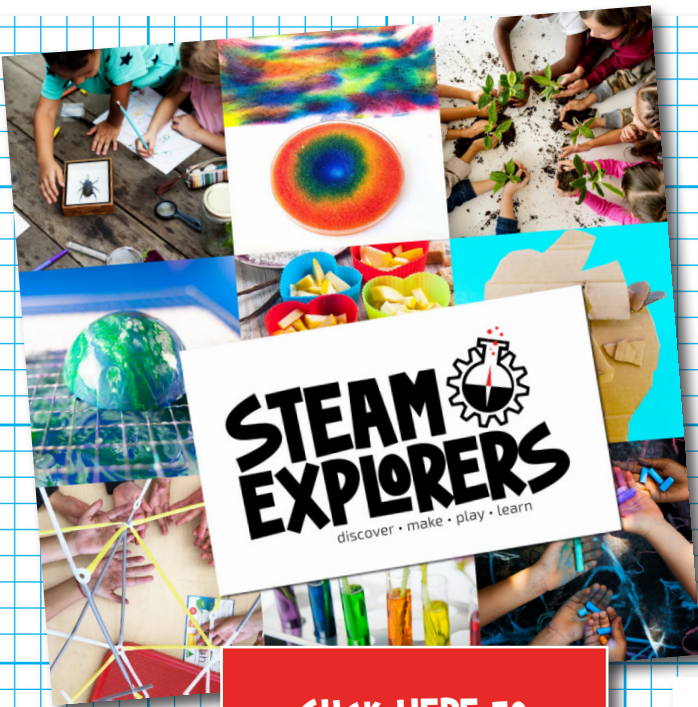
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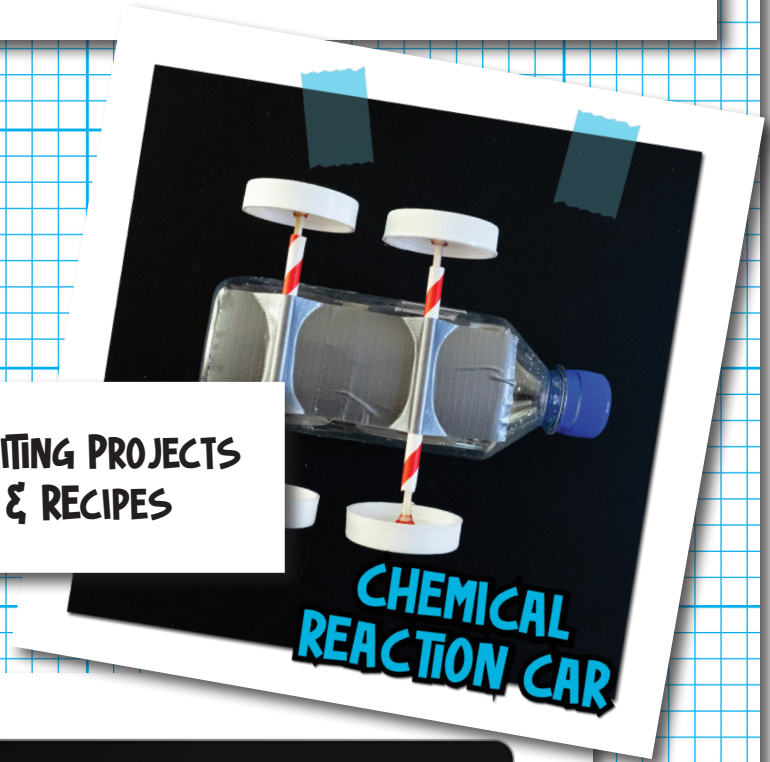
HERE'S A PEEK AT SOME OF THE OTHER AMAZING THINGS YOU'LL FIND INSIDE A STEAM EXPLORERS DIGITAL MAGAZINE AND THE ONLINE PROJECT PORTAL!



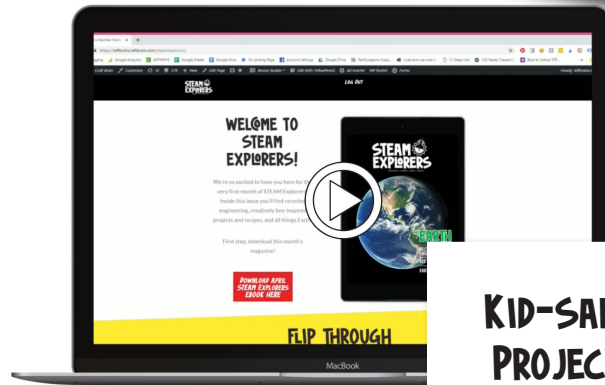
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discover • make • play • learn

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EXCITING PROJECTS & RECIPES



**CHEMICAL REACTION CAR**



KID-SAFE ONLINE PROJECT PORTAL



FUN PRINTABLES & ARTICLES

12 FUN FACTS ABOUT BEES



- 5 Bees can only see ultra-violet rays. They see the world through ultraviolet.
- 6 It takes approximately 1,000 bee stings to be fatal to a healthy adult human.
- 7 Honey bees live in hives called colonies. There are three types of bees in a colony: the Queen, the workers, and the drones.
- 8 Only female bees sting.
- 9 Honey bees communicate with each other via dancing. When they dance, they release pheromones that other bees can smell. When they fly away, they use the Waggle Dance which communicates the direction of the food source.
- 10 Those bees you see flying around your food to them! They are an important part of our food chain because they pollinate approximately 80% of all vegetables, fruit and seed crops in the USA.
- 11 The world's bees are being impacted by Colony Collapse Disorder (CCD), a problem where the worker bees in a colony disappear, up to 90% of bees have disappeared before that crisis, and pesticides are the main culprits. The good news is that CCD is on the decline in recent years.
- 12 There are over 20,000 species of bees in the world.

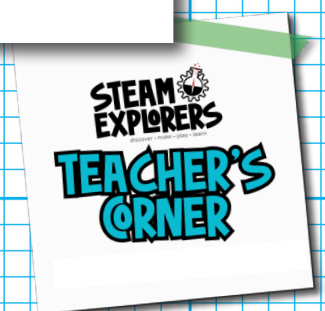
STEAM EXPLORERS APRIL 2019



HELPFUL VIDEOS

**GRAVITY PAINTED EARTH**

BONUS RESOURCES FOR THE ADULTS





**BUSTLE**  
**BORED OM**  
**ACTIVITY PLAN**