STEAM AFTERSCHOOL GUIDE

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SCIENCE

<u>Science!</u>

Throughout the experiments, students will learn more about science and how it can relate to their everyday lives. Students will be exposed to different fields of science such as chemistry, astronomy and earth science. Students will get to do fun interactive activities to promote careers in the science field. By the end of our time together, students will get to have a general knowledge of different aspects of science.

OREO MOON PHASES ⚛

Oreo Cookie Moon Phases

NEW MOON • WAXING CRESCENT • WAXING HALF (FIRST QUARTER) • WAXING GIBBOUS

FULL MOON • WANING GIBBOUS • WANING HALF (LAST QUARTER) • WANING CRESCENT

www.sciencebob.com
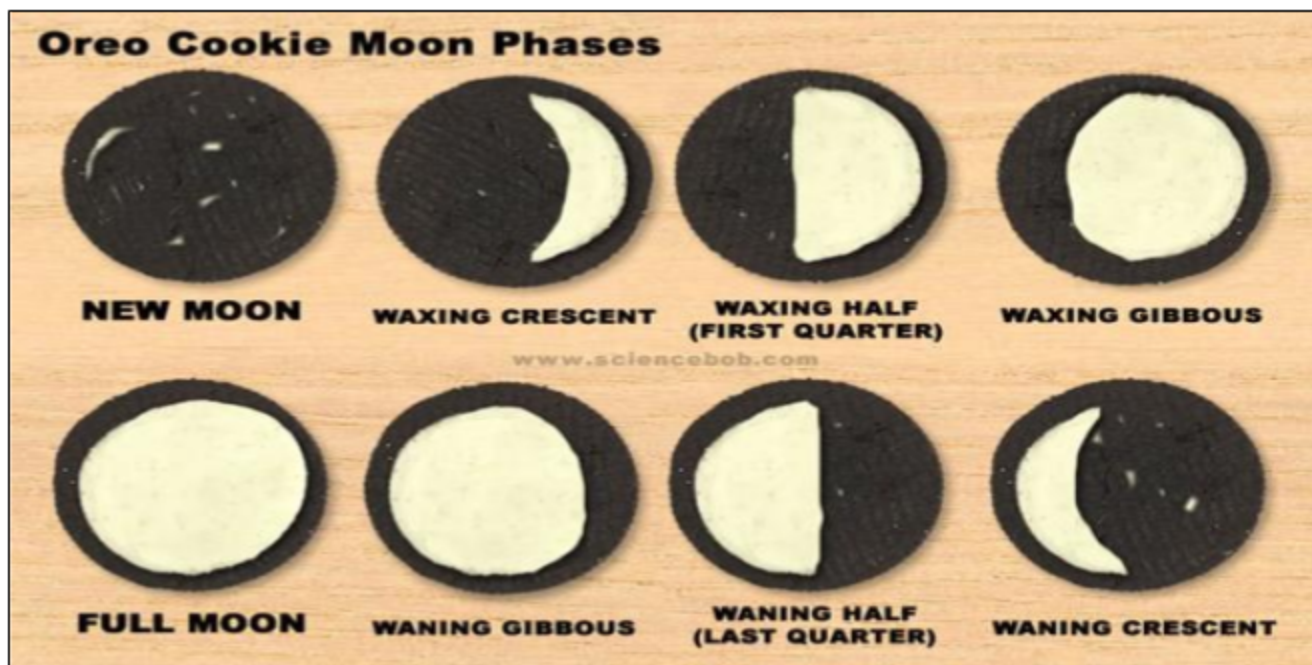
Materials

- Oreos
- Plastic Plates
- Plastic Knife

Learning Objectives

Students will learn …
- Accurately model the shape of the Moon's phases using Oreo cookies
- Place the phases in order

Est. Duration: 20 minutes   Est. Cost: $8.81   Age Range: 8-12

OREO MOON PHASES ⚛

Description

This experiment will explain the different phases of the moon in correlation to the sun. Participants will be able to identify different phases of the moon by using Oreos to recreate each phase of the moon. Participants will discuss the different phases, showing understanding of the curriculum.

Phases

1. New moon: beginning of moon phases
2. Waxing Crescent: small part of right side is seen
3. First Quarter: "quarter" since it's ¼ way through the cycle
4. Waxing Gibbous: half the moon is lit up as its growing
5. Full moon: the moon is now fully lit up
6. Waning Gibbous: half the moon is lit as it is shrinking
7. Last Quarter: ¼ of the moon is lit up again, but it's becoming smaller
8. Waning Crescent: the moon is now a crescent, it will soon be a new moon

OREO MOON PHASES ⚛

Instructions

1. Give each group 8 oreos.
2. Carefully remove the top cookie without separating the cream.
3. Then slowly start to cut the cream in a moon phase.
4. Continue with the rest of the phases.
5. Choose a phase and give a brief explanation of the moon.

MOON PHASE WORKSHEET
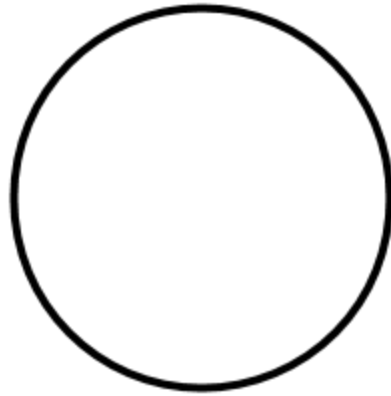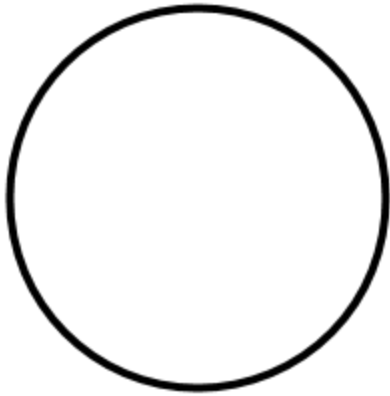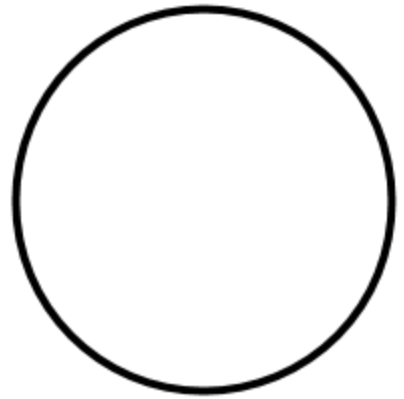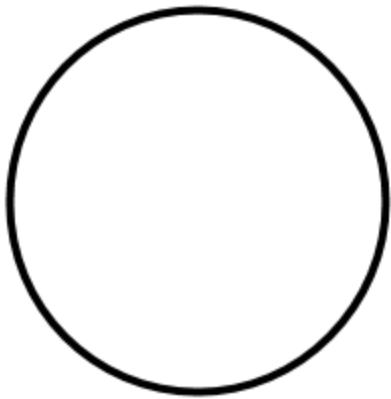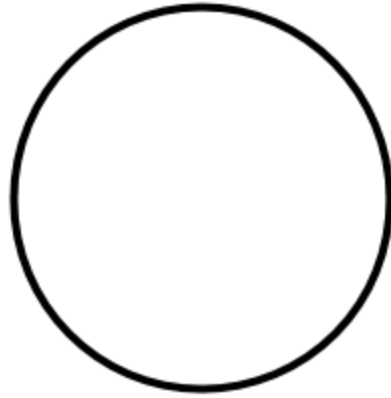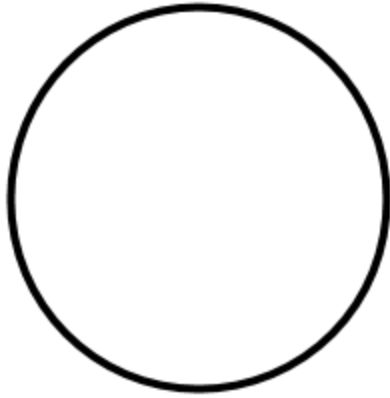
MILK MADNESS

Materials

- Milk
- Water based food coloring
- Tide detergent
- Washcloth
- Plastic plates (Dixie brand)

Learning Objectives

Students will learn...
- What is chemistry?
- What is polar and nonpolar?
- The effect of two polar substances mixing together
- Molecules and how they bond together

Est. Duration: 30 minutes   Est. Cost: $25.90   Age Range: 8-12

MILK MADNESS

Description

 In this activity, students will be able to learn more about chemistry by creating a eye catching chemical reaction. Students will learn about the basics of polarity. Through this students will use milk, food coloring and detergent to create a fun milk masterpiece.

Instructions

1. Pour Milk in the plate.
2. Add some drops of food coloring on the milk. You can use a variety of colors, just be sure to add 3-4 drops of each color.
3. Add a drop of the detergent.
4. Observe what happens and discuss in a group.

UV BRACELET
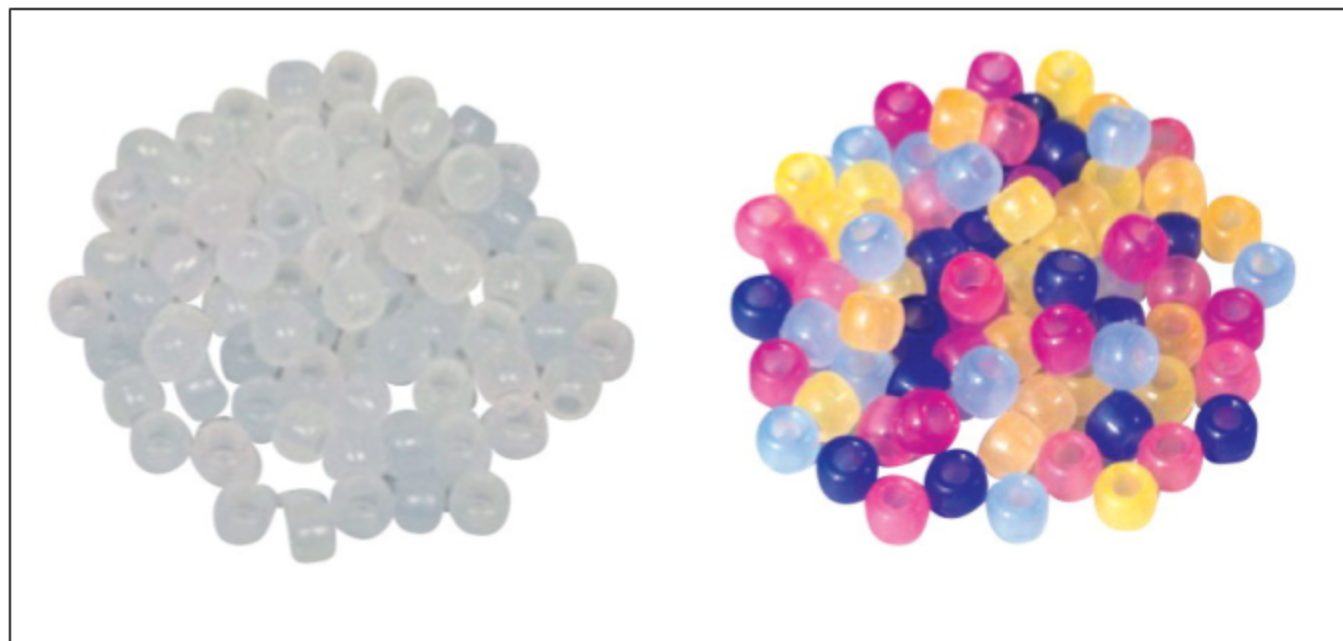
Materials

- UV beads
- Elastic string
- Scissors
- Regular beads

Learning Objectives

Students will learn...
- The sun and how it emits UV rays.
- The Ozone layer and what is its purpose.
- The effect UV rays can have on a person and how it affects society today.

Est. Duration: 20 minutes   Est. Cost: $25.60 Age Range: 8-12

UV BRACELETS

Description

Through this activity students will make their own bracelet using both UV reactive beads and regular non reactive beads. Students will be prompted to custom make the bracelet to their liking, and take it outside. Once outside, students will see how the UV beads react. Using these observations, students will learn about the sun and the ozone layer and how it can affect them today.

Instructions

1. Give each student 5 UV beads and 5 regular beads and a precut elastic string.
2. Put all the beads on a string.
3. Tie the string around your wrist.
4. Go outside and observe what happens when in the light.

EDIBLE EARTH LAYERS

Materials

- Pudding (Vanilla)
- Marshmallows
- M&M's
- Sprinkles
- Food Coloring

Learning Objectives

Students will learn...

- Layers of the earth
- Why are the layers important?
- The specific characteristics of each layer

Est. Duration: 35 minutes   Est. Cost: $26.46 Age Range: 8-12

EDIBLE EARTH LAYERS ⚛

Description

Through this activity, students will be able to identify the different layers of the earth's soil. Earth science is crucial for students to learn and experience, so they will learn about the crust, mantle, outer core, and inner core throughout the experiment. By the end of our time together, the students will know the general meanings and descriptions of every layer they learned, and how it relates to their daily activities.

Instructions

1. Give one cup to each student.
2. Each group will share 3 bowls of vanilla pudding that have been colored red, orange, and yellow. They will also share one bowl of chocolate pudding, sprinkles, and marshmallows.
3. 4-5 Marshmallows will be placed at the bottom of the cup, representing the inner core.
4. A semi-thin layer of the yellow pudding will be placed on top of the marshmallows, representing the outer core.

EDIBLE EARTH LAYERS

5. A second semi-thin layer of pudding will be added, but this time it will be orange. This represents the lower mantle.

6. A third layer of red pudding will be added, representing the upper mantle.

7. Finally, a layer of sprinkles will be added on top, representing the crust.

COKE GEYSER

Materials

- Coke (6-Pack Bottles)
- Mentos

Learning Objectives

Students will learn...
- Basic chemistry
- The difference between physical and chemical reactions
- What is carbon dioxide?
- Some of the carbon dioxide reaction

Est. Duration: 15 minutes   Est. Cost: $8.34   Age Range: 8-12

COKE GEYSER

Description

Through the use of coke and mentos, students will learn the chemical reactions between the two and how exactly it explodes and why. As the Mentos candy sinks in the bottle, the candy causes the production of more and more carbon dioxide bubbles, and the rising bubbles react with carbon dioxide that is still dissolved in the soda to cause more carbon dioxide to be freed and create even more bubbles, resulting in the eruption. By the end of the experiment they have learned the ins and outs of the chemical relationship between the candy and the soda.

Instructions

1. Give each student one bottle of coke and 2 mentos.
2. Unscrew the bottle cap and place the bottle on the ground.
3. A countdown will be given and students will place their mentos into the coke bottles.
4. Students will run to a safe distance away from the bottle.
5. Observe what happens and discuss in a group.

KEY TERMS

Mixture - two or more substances mixed together in any proportion but not chemically combined

Outer Core - lies above Earth's solid inner core and below its mantle

Inner Core - The innermost part of the Earth

Crust - the crust is the outermost solid shell of a planet

Mantle - The 2nd layer of the 3. Very hot and is under the crust.

Volume - the amount of space an object takes up

TECHNOLOGY

<u>Technology!</u>

The purpose of these activities is to expose the kids to the various forms of technology. This is important because technology is the future. The kids will work on coding by first using blocks to understand how coding and logic works, then applying it to online coding activities. They will also learn about electrical circuits and technology. They will use Snap-Circuits to make circuits and complete tasks. They will also use Music Makey Makey to understand how electricity flows and to make music in a fun and educational manner.

TYNKER

With Code
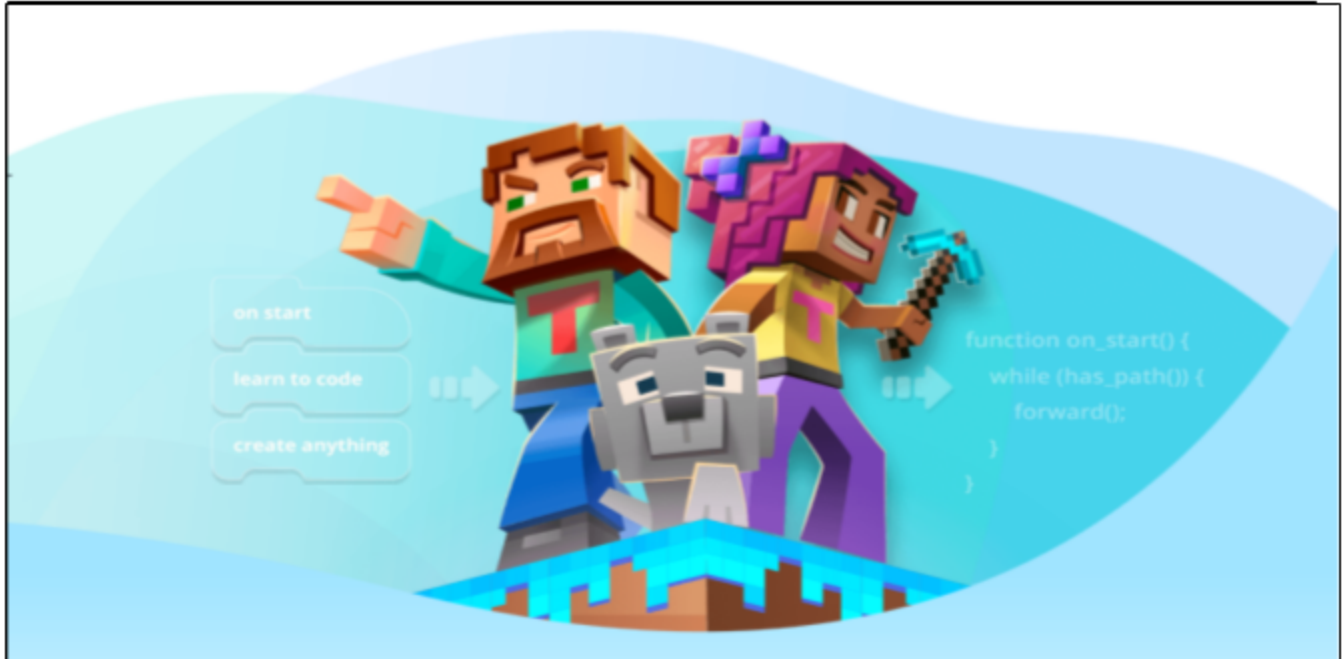
Materials

- Computer with internet access

Description

- Tynker is a online interactive coding website.

Learning Objectives

Students will learn...

- Basic coding via tynker using JavaScript
- Use and function of code
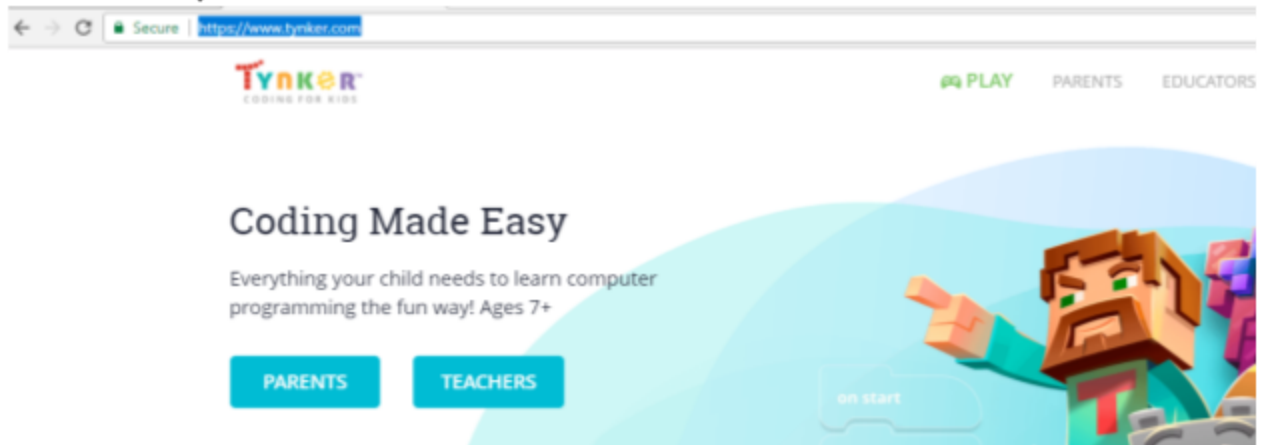- Structure and function of code

Est. Duration: 25 minutes   Est. Cost: $0.00   Age Range: 9-12

TYNKER

Instructions
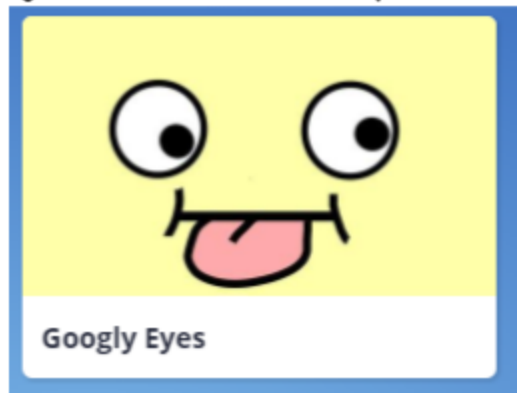
1. Go to tynker.com

2. Sign in as a student. The username is RDCStudent and the password is digitalconnectors.

Student
Create anything you imagine by learning to build with code.

3. Choose "create a project" in the top bar. Then select "googly eyes"

Googly Eyes

TYNKER

4. This is your interface, where all your code will be. Let's start a simple program, Click on the "right eye" in the bottom right corner. In the left panel, select the "blocks" option near the top.

5. In the left panel, locate the "On start" block. Click on it and drag it to the center the area (the designer).
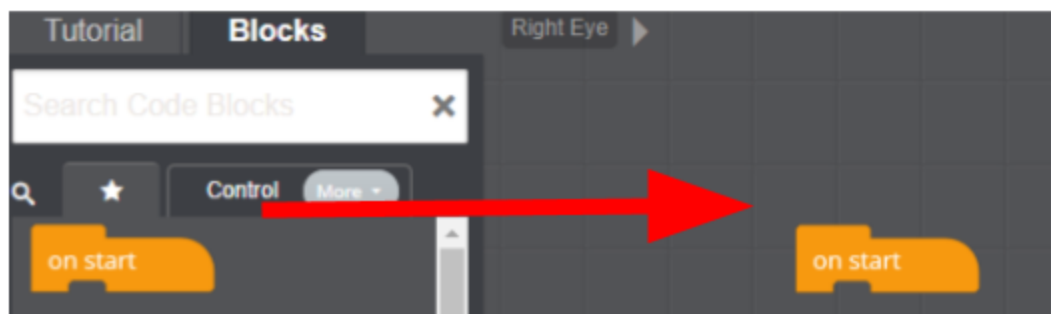
6. Type forever into the search bar in the left panel. Drag it and place it under the "on start" block, it should automatically connect the 2. Now search for "Turn". Drag the block and place it inside the "forever" loop. Now search for "wait". Drag it and place it under the "turn" block and inside the "forever block". Your code should now look like this:

7. In the wait block, change the time from 1 second to .05 seconds.

8. Click on the play button to run the code.
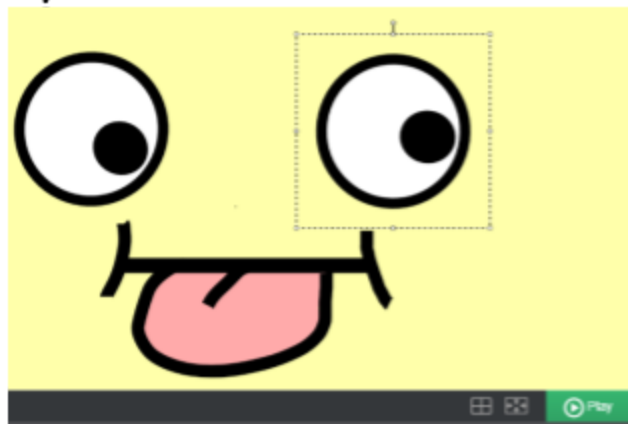
9. Congrats you made your first program! Go ahead and explore other programs that you could make and have fun!

MUSIC MAKEY MAKEY
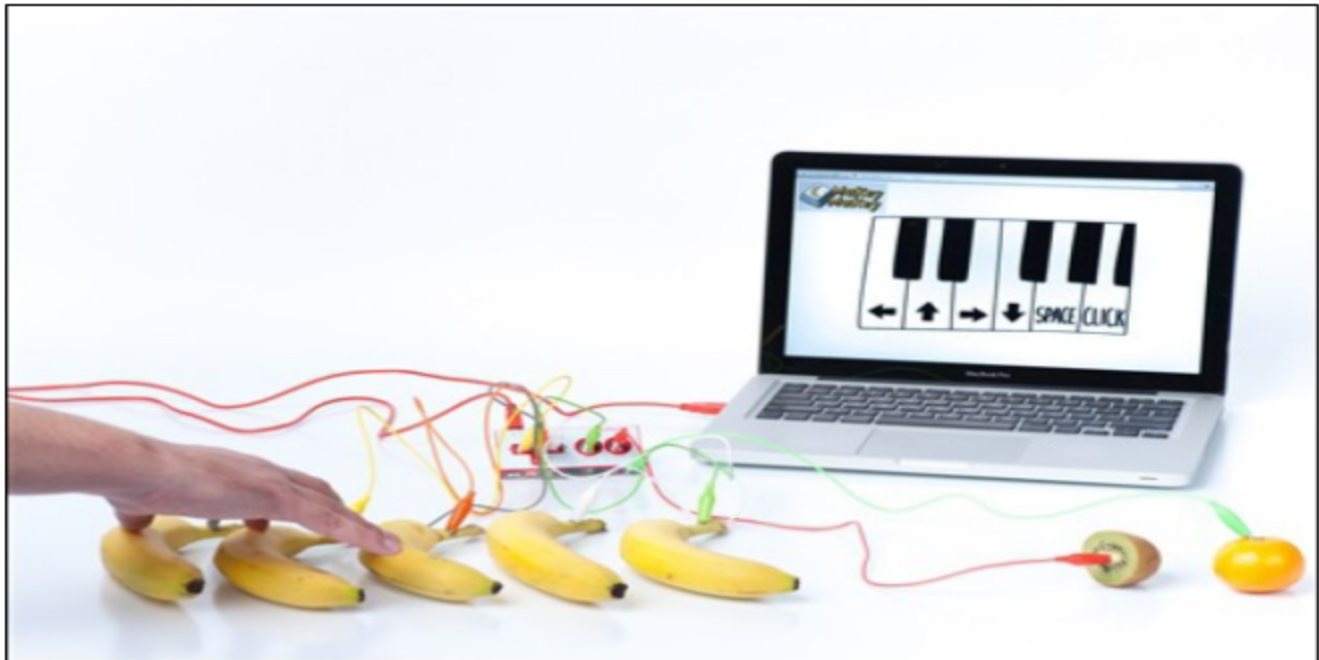
Materials

- Computer with internet access
- Music Makey Makey™ Kit
- Playdoh or coins

Learning Objectives

- After participating in this activity students will have a firm grasp on the many ways you could manipulate a physical connection with the internet.

Est. Duration: 35 minutes   Est. Cost: $30-50   Age Range: 7-12

MUSIC MAKEY MAKEY 💻

Description

Music makey makey will allow the kids to make music while learning how electricity works.

Instructions

1. Take out the makey panel and a few wires.
2. Connect the power cable to a USB port on your computer
3. Snap one clip onto of piece of your clothing that is close to your skin
4. Connect the other side of this same wire to one of the ports labeled "Earth"
5. Connect one side of each remaining wires to a space of each of the remaining spots (Space, Up, Down , Left and Right)
6. Take each of the open ended wires and attach a quarter sized piece of play doh (other options: cardboard, tin foil, fruit etc.)
7. Tap each piece of play doh to activate a key and have fun!

SNAP CIRCUITS
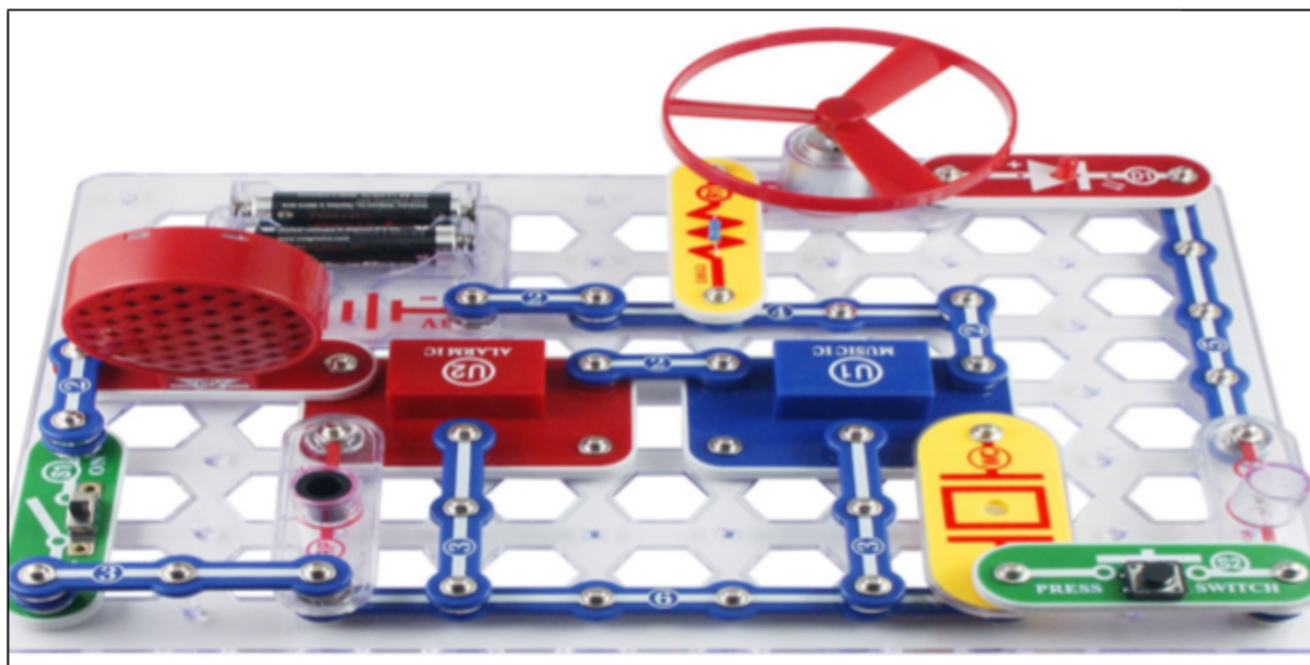
Materials

- 3 Snap Circuits Jr. Sets
- Each set requires 2 AA batteries
- A Table

Description

- Snap circuits will show the kids how electricity and circuits work.

Learning Objectives

Students will learn...
- How basic principles of technology works, such as circuitry, motion and electricity as well as logic
- How technology works

Est. Duration: 30 minutes   Est. Cost: $64.25   Age Range: 8-12

SNAP CIRCUITS

Instructions

1. Place the grid on a flat surface. Place the battery holder, motor, fan, the 2-snap wires, 3-snap wires, and 4-snap wires on the table next to the grid. The snap wires are indicated on the second page of the manual.
2. Explain briefly to the kids how electricity flow and circuits work. Then help the kids to make a small closed circuit using the battery holder, the motor and the wires. **BEWARE OF MOVING PARTS!**
3. Observe how the motor immediately starts spinning. Optional: stop the motor by removing a wire and then place the fan on the motor and restart the circuit and watch the fan fly up.
4. Now take out the sliding switch from the box and insert into the circuit (replacing a wire with the switch). Make sure the switch is off. Now place the fan on the motor and make sure the circuit is closed. Observe how the motor isn't spinning. Now turn the switch on and watch the fan fly up in a bit.
5. Wonderful! You made a circuit! Now you can mess around with the other parts in the box, but be careful of the moving parts.

CODE BLOCKS

Programing in Action

Materials

- Code Blocks
- A flat surface and lot of free space

Learning Objectives

- Understand the way code works in a fun manner
- Learn how code works and how order can impact it

Est. Duration: 30 minutes   Est. Cost: $0.00   Age Range: 8-12

CODE BLOCKS

Description

Code blocks will allow for the kids to learn how code, order and logic works.

Instructions

1. Choose one kid to be the "Robot"
2. Randomly place the blocks on a surface and tell the kids that they each get to take turns to place one of the blocks as part of the code
3. Let one kid go and choose a block and place it on the table where is is clearly visible to everyone
4. The next kid will go and do the same.
5. The third kid (and all the kids after him/her) will have 2 options: either place another block of code or change a previous block of code
6. Once all the kids have gone, let the program run: tell the "robot" to follow the instructions in order
7. Once that is done, let the kids, using the same blocks in the code already, change the order of them to see how the order of the code can impact the outcome.

CODE COMBAT

Materials

- Computer with internet access

Description

- The kids will program a character in the game to find the gem while avoiding traps. The program will teach them how to do it.

Learning Objectives

- Learn more about how code can be used to complete actions and tasks
- Learning and applying algorithms

CODE COMBAT 💻

Instructions

1. Go to codecombat.com and select "try the game." Then select the "play button on the "Kithgard Dungeon." Follow the instructions on the screen (indicated by the yellow arrows)
2. When starting the level, it is helpful to read, understand, and plan out how the task will be accomplished
3. Click on "start level." If you look at the code, it should read **hero.moveRight().** This will make the character move right. Next, type in **hero.moveDown()** under the previous line of code. This will make the character move down. Click on run and see what the code does. Now the final step is to move left, so type in **hero.moveRight().** Your code should look like:

```
5   hero.moveRight()

6   hero.moveDown()

7   hero.moveRight()
```

4. Now hit "Run."
5. Congrats, you got the jewel! You can move onto the next levels and continue learning. The website will tell you the proper steps to take.
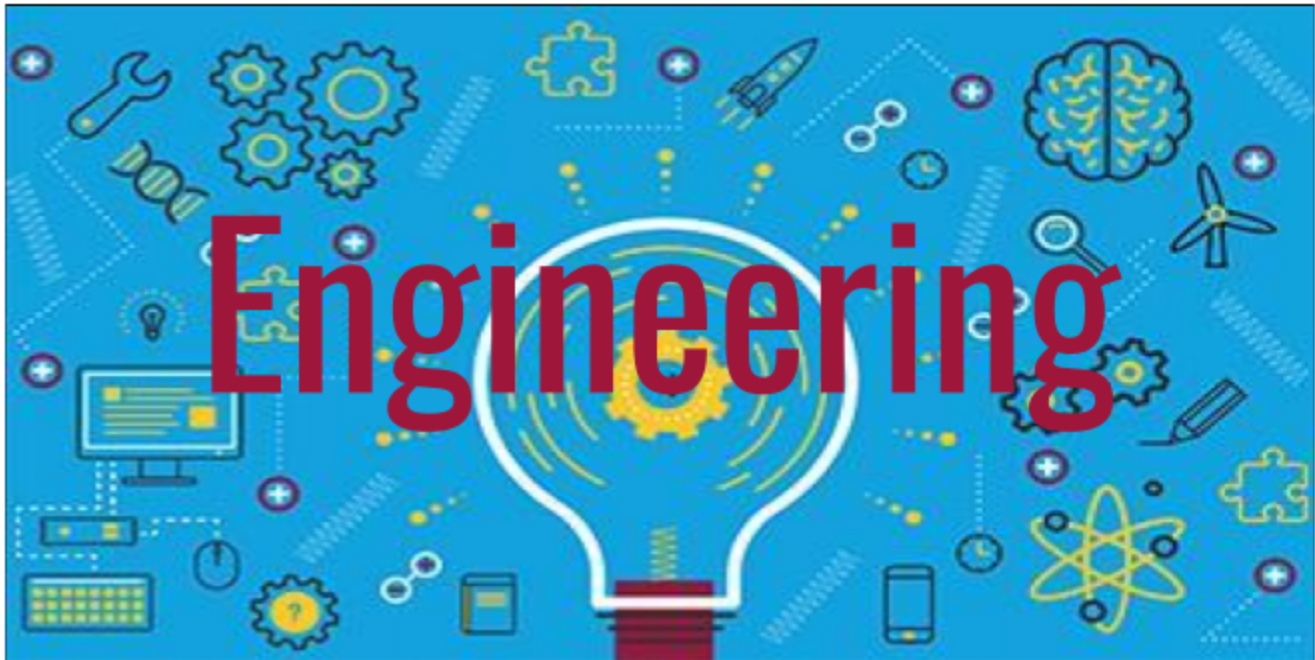
ENGINEERING

Engineering!

In today's world engineering is becoming a foundation for the future. Engineers solve problems and create designs to benefit humanity using innovative thinking, and the information, models, and methods provided by science. Through these activities, students will be exposed to various applications of engineering, such as construction, architecture and design, as well as coding and robotics. At the end of the activities, students will have a better understanding of how engineering can impact them and why it is important.

OZOBOT BIT

Maze Maniac

Students will be draw mazes on paper and attempt to travel through them with an ozobot. The goal is to get from start to finish on the maze by using pre-coded stickers and an ozobot. When deciding what stickers will be best to move the ozobot, the students should use a process of trial and error to come up with innovative and creative solutions.

Materials

- White paper
- Ozobot Bit + Kit
  - Markers
  - Stickers
  - Calibration sheet

Learning Objectives

- Problem-solving skills through trial and error
- Critical thinking
- Creativity through the creation of the maze
- Strategic analysis of problems

Est. Duration: 30 minutes   Est. Cost: $60.00   Age Range: 5-8

MAZE MANIAC

Instructions

1. Make your own maze!
    a. Use a piece of white paper and any color marker besides black. Use that marker to draw the boundaries of the maze.
    b. Include a start and a finish.
    c. Feel free to include turns and dead ends!
2. You can use your maze or you can trade mazes with other students. Remember, the goal is to get through the maze using the Ozobot Bit.
3. Press the power button to turn the Ozobot Bit on and off.

4. To use the Ozobot properly, you need to calibrate it. In the kit, see the calibration sheet and calibrate the bot.

5. To get through the maze, you will use the stickers. In the **kit**, there are sheets of stickers made of black lines and various colored stripes.
   a. Each pattern of stripes causes the bot to move differently.
   b. Some stickers tell the bot to rotate, change direction, turn, pause, or change speed. Black lines fill empty space.
   c. Carefully read the different stickers on the sheets.
6. Place the stickers on the maze to move through it. Connect each sticker (see the Quick Start Guide below on how to connect)

Static codes work on tablets (using the Ozobot app) and on paper

Place static codes on BLACK path. Flash codes work on paths of any color

OK
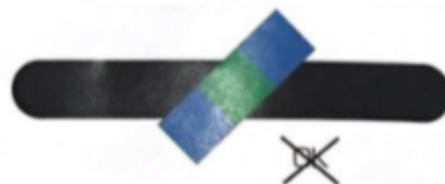
Don't place code too close to intersections or curves

OK

OK
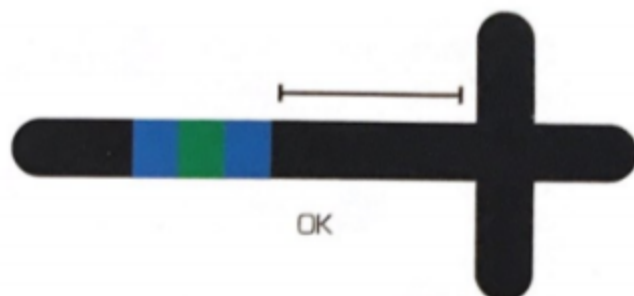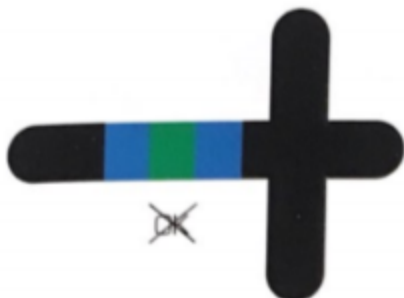
Two color static codes are used on the end of lines only:

U-turn

Exit / Win (play again)

Exit / Win (game over)

All other static codes need a black line before and after

Orientation matters for some static codes

f.e.

Nitro Boost

←

Snail Dose

→

7. After placing all of your stickers down, look at the sheets again and put a "START" and "END" sticker at the start and end of your maze.
8. Place your bot on the "START" sticker and turn it on.
9. If your bot doesn't get to the end or moves the wrong distance, go back and change your stickers and reset the bot. Have fun!

OZOBOT BIT

Maze Maniac

Students will be draw mazes on paper and attempt to travel through them with an ozobot. The goal is to get from the start to the finish on the maze by programming an ozobot with directions to move. When programming, the students should use a process of trial and error to come up with innovative and creative solutions.

Materials

- White paper
- Ozobot Bit + Kit
  - Markers
- Computer

Learning Objectives

- Programming skills
- Digital literacy
- Problem-solving skills
- Critical thinking
- Creativity
- Strategic analysis of problems

Est. Duration: 60 minutes   Est. Cost: $60.00   Age Range: 9-12

MAZE MANIAC

Instructions

1. Make your own maze! Use a piece of white paper and a black marker. Include a start and a finish. Feel free to include turns and dead ends!

2. You can use your maze or you can trade mazes with other students. Remember, the goal is to get through the maze using the Ozobot Bit.

3. Press the power button to turn the Ozobot Bit on and off.

4. <u>To start coding, go to ozoblockly.com (if you look through the tutorial, skip to the next step)</u>
   <u>Tutorial:</u>

   a. <u>Click the FLASHING bar in the lower left corner</u>

   LOAD YOUR bit

   FLASHING
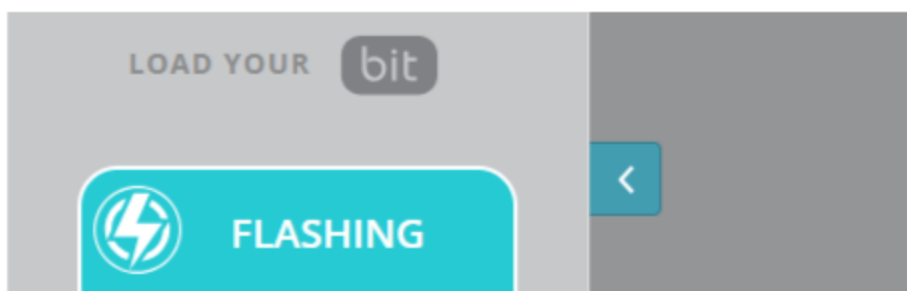
b. To calibrate your bot, tilt your computer screen, place the bot in the circle and double click the power button. It will flash <mark>green</mark> if it works.
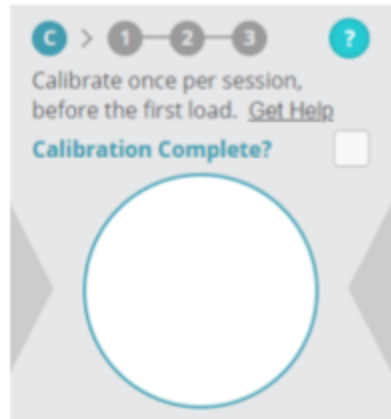
c. Build your code (see the step 5)
d. To load your code onto the bot, tilt your computer screen, place the bot in the white area and click Load Bit.
   i. It will flash <mark>green</mark> if it works.
   ii. If it flashes <mark>red</mark>, restart the loading process.
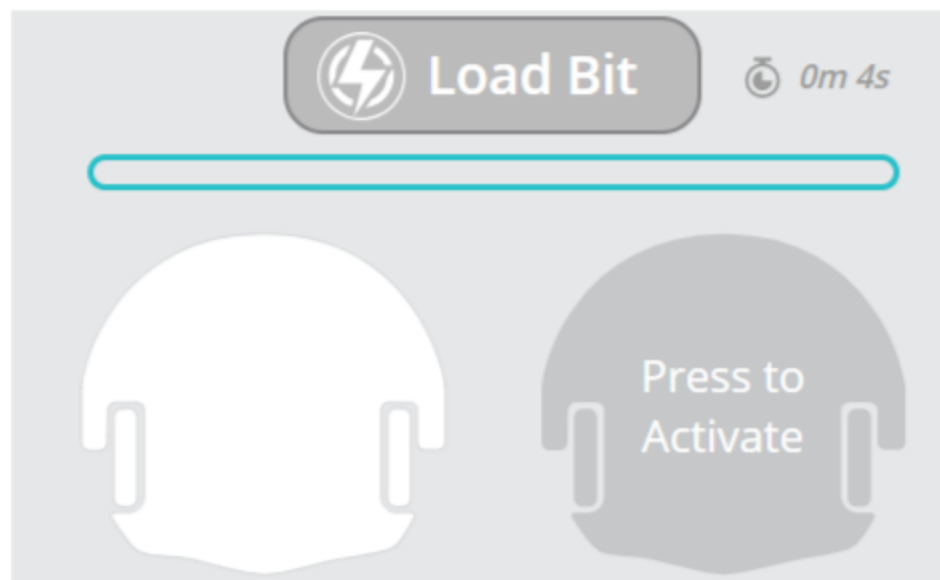
5. <u>To build the code, use the block categories on the left side of the website.</u>

   a. <u>The ==yellow== section allows you to move</u>

   b. <u>The ==pink== section allows you to light up the bot</u>

   c. <u>The ==dark blue== section is for time</u>

   d. <u>The ==light blue== section is for looping actions and activities</u>

6. To get through the maze you will need to know how to go straight, turn left, turn right, turn around, and do a victory dance!

   a. These will be your main code blocks, by changing the direction, distance, and speed, you will be able to move.

   > move | forward | distance | 1 step | speed | medium
   >
   > rotate | slight left
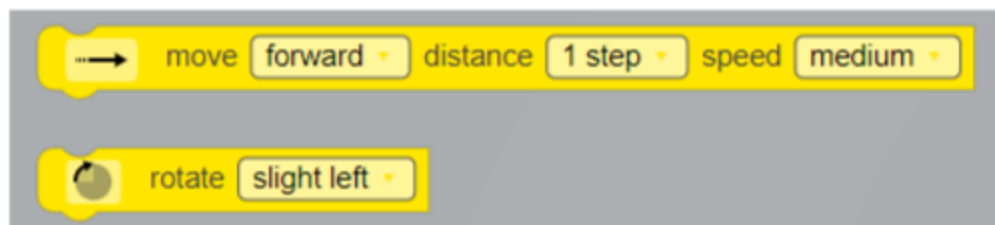
   b. For example, to move in a square, the code would look like this. Move forward and turn right 4 times.

move	forward ▾	distance	5 steps ▾	speed	medium ▾
rotate	right ▾				
move	forward ▾	distance	5 steps ▾	speed	medium ▾
rotate	right ▾				
move	forward ▾	distance	5 steps ▾	speed	medium ▾
rotate	right ▾				
move	forward ▾	distance	5 steps ▾	speed	medium ▾
rotate	right ▾				
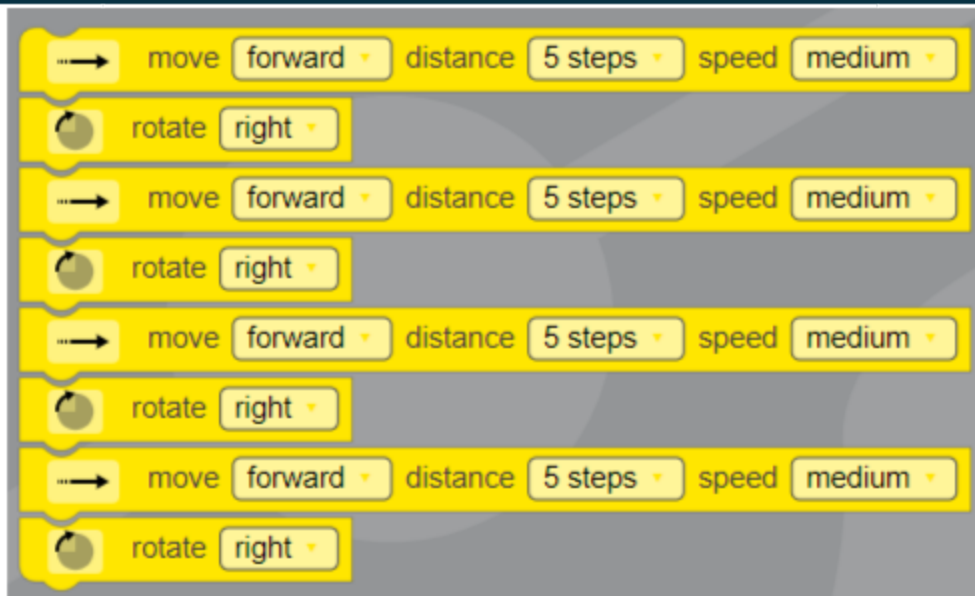
b. To make a victory dance, change the color of the bot and make it spin around. Example - Set the top color to green and the bot will spin once to the left and once to the right. **Make your own victory dance!**

set top light color	🟩
spin	left ▾
spin	right ▾

c. Once you create your code, load it to the bot (see step 4d).

7. Finally, to run the code, turn on the bot, place it in the maze, and click the **power button twice**.

8. If your bot does not get to the end or moves the wrong distance, go back and edit your code and reload it to the bot.

9. Have Fun!

COOL CARS
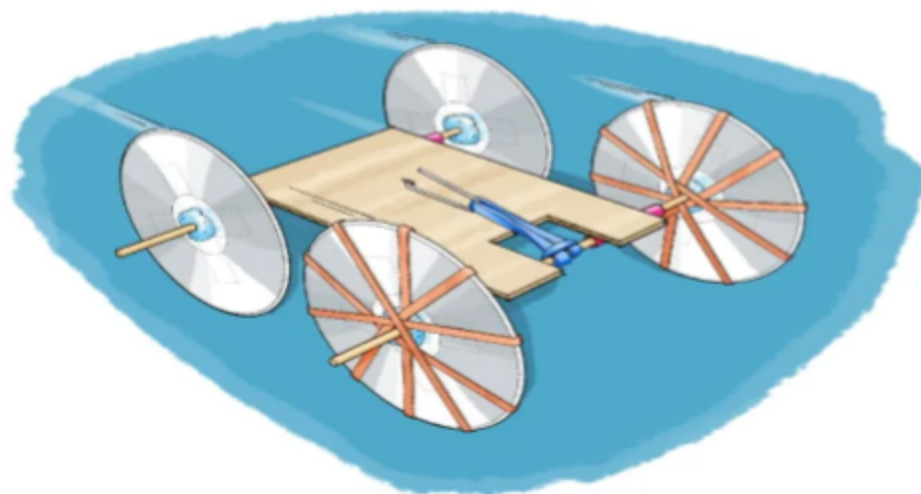
Students will be build their own popsicle stick cars powered by a twisted rubber band. The goal is to get the car to move as far as possible straight forward. The students will learn experimentation through the building and testing of their rubber band powered popsicle stick cars.

Materials

- 7 popsicle sticks
- 2 skewers
- 2 straws
- 1 rubber band
- Cardboard
- Wood glue
- Tape
- Ruler
- Scissors

Learning Objectives

- Technical skills through hands-on construction
- Comprehension of step by step processes
- The ability to follow directions
- Experimentation skills through testing

Est. Duration: 30 minutes   Est. Cost: $25.00 Age Range: 9-12

COOL CARS
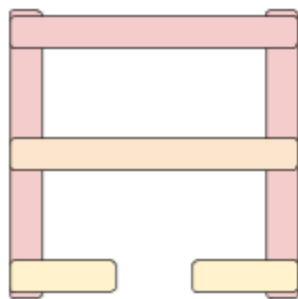
1. Make your own car! Grab 3 popsicle sticks. Lay out two popsicle sticks parallel to each other and connect the top with a popsicle stick. Glue the ends together.
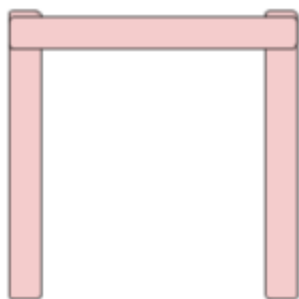
2. Glue 1 popsicle stick across the middle.

3. Take 2 popsicle sticks. Cut each into 3 pieces so that you have 6 pieces.

4. Glue 2 of those pieces to the bottom ends of the popsicle sticks.

COOL CARS

5.   Glue 2 more pieces to each side of the middle of the top stick. So that there is a space between them. This will be called the "latch".

6.   Glue the last 2 pieces to either side of the "latch".
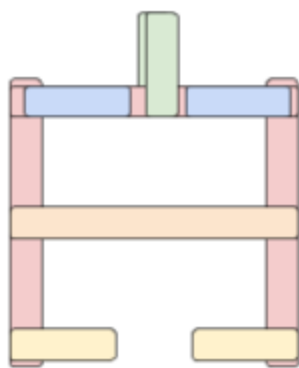
7.   Take 1 straw, tape it across the leftover pieces and "latch". Take another straw, cut two pieces, about an inch each, and tape them to the bottom sticks.
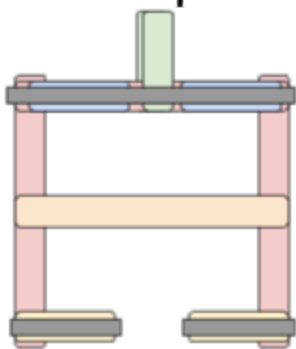
8.   Take the cardboard, cut out 4 similar size circles. These will be the wheels

COOL CARS
Instructions

9. **Wheels:**
   a. Stick 1 skewer through a wheel.
   b. Stick another skewer through another wheel.
   c. Feed these skewers through the straws.
   d. At the end of each skewer, put the other wheels.
   e. Move the wheels closer to the car
   f. Glue the wheels to the skewers
   g. Cut off excess wood, save for later.
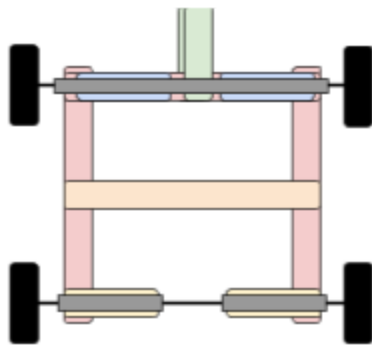
10. Take one piece of the excess skewer, about 1 inch long. Glue to the middle of the bottom skewer. This will be called the "twister"

11. **IMPORTANT!** Make sure everything is dry and secure before continuing.

COOL CARS

12.   Time to power your car! Take your rubber band, put one end into the "latch", put the other end onto the "twister".

13. Finally, twist the "twister" around to wind up the rubber band.

14. Release! Try to go as far as you can in as straight a line as possible.

TOWER TRAGEDY
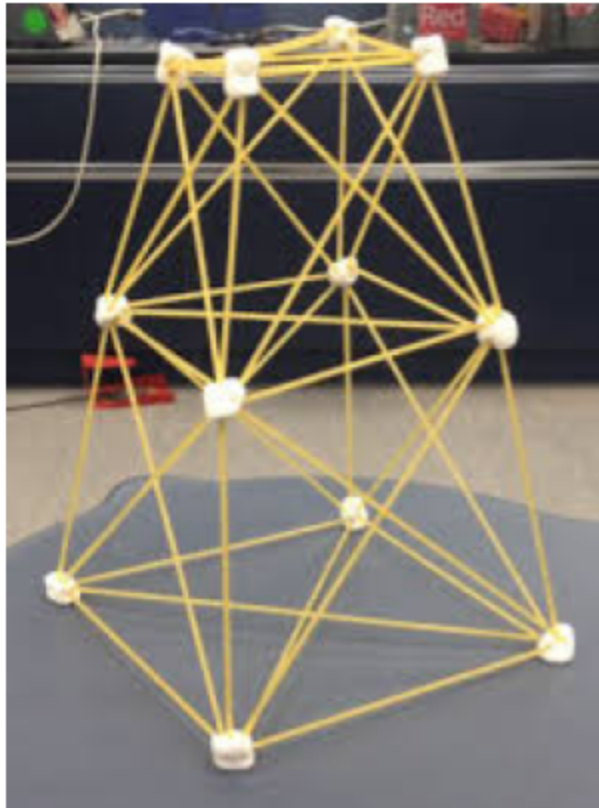
Description

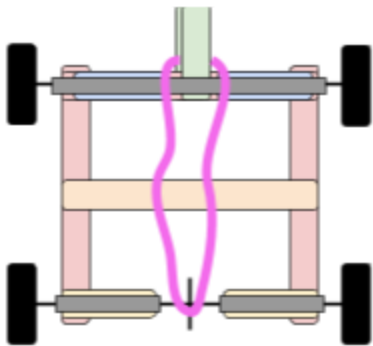Students will be use uncooked spaghetti straws and marshmallows to make a tower. The goal is to use the spaghetti straws in conjunction with the marshmallows to create the tallest tower possible. When designing, the students should use their creative skills to engineer the best possible solution.

Materials

- White paper
- (Mini) Marshmallows
- (Dry) Spaghetti

Learning Objectives

- Creativity through the creation of the tower
- Building and construction skills
- An understanding of balance
- Problem-solving skills
- Trial and error skills

Est. Duration: 20 minutes   Est. Cost: $6.00   Age Range: 5-8

TOWER TRAGEDY

Instructions

1. Build your own tower! Get a white piece of paper to use as the base of your amazing Tower!
2. Grab 20 sticks of the dry spaghetti. (Remember you can break and use as many of the 20 to build your tower).
3. Grab 20 mini marshmallows.
4. Use the spaghetti as foundations and corners and the marshmallows as joints.
5. Use your creative minds to combine the 2 and build the biggest tower you can with your resources. Try to find the best shapes to make a stronger, taller tower. Ex. square and triangles are a good start!
6. Finally, at the top of your tower, place one marshmallow. This will be the top of the tower. Measure the height from the bottom to the top marshmallow.

CATAPULT CRAZY

Students will be use art supplies to attempt to create a catapult and shoot it through a designated target. The goal is to use all the supplies together to create the most ideal catapult to use.

Materials

- Popsicle sticks
- Rubber bands
- Plastic spoons
- (Colored) Cotton balls

Learning Objectives

- Technical skills through hands-on construction
- Comprehension of step by step processes
- The ability to follow directions
- Experimentation skills through testing

Est. Duration: 25 minutes   Est. Cost: $14.00   Age Range: 5-12

CATAPULT CRAZY

Instructions

1. Make your own catapult! Grab any color of popsicle stick and rubber bands.
2. Stack 3 popsicle sticks and rubber band them together.
3. Then get 1 popsicle stick, place it between the stack, perpendicular, like a "t". Rubber band those together.
4. Put the plastic spoon, in the same direction as the base popsicle stick, and rubber band the handle of the spoon to it.
5. Finally, put the cotton ball in the spoon, pull it back, and shoot it as far as you can!
6. To make a better catapult, experiment with different amounts of popsicle sticks and different positions!

Bonus - For an extra challenge, make a square out of popsicle sticks, place it on a table, try to shoot the cotton ball into the target.

KEY TERMS

<u>Programming</u> - The process of developing and implementing various sets of instructions to enable a computer to do a certain task

<u>Innovative</u> - introducing new ideas; original and creative in thinking.

<u>Experimentation</u> - The action or process of trying out new ideas, methods, or activities.

<u>Building/Testing</u> - The process or business of constructing something/ take measures to check the quality, performance, or reliability of (something), especially before putting it into widespread use or practice.

<u>Designing</u> - Do or plan (something) with a specific purpose or intention in mind.

KEY TERMS

<u>Technical</u> - Relating to a particular subject, art, or craft, or its techniques.

<u>Strategic/Analysis</u> - Carefully designed or planned to serve a particular purpose or advantage./ detailed examination of the elements or structure of something.

ART

Art!

The best way to display creativity is through art! Art is visually appealing to the eyes and it helps everyone express themselves in a way that isn't always possible through words. Everybody has a unique art style which showcases their personality. Art can be painted, performed, and sometimes even spoken aloud such as poetry. After the activities, the students will have a general understanding of different types of artforms and how to use their creativity.

KEYBOARD ART
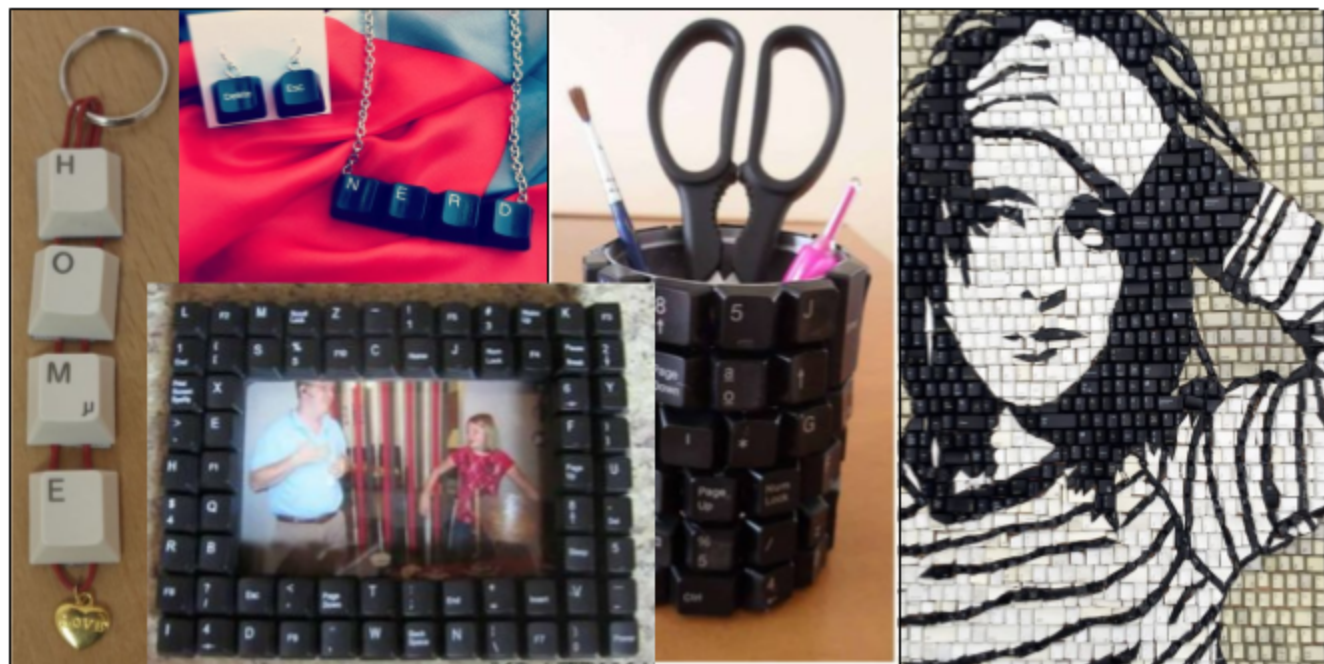
Materials

- Old Keyboards
- Glue (Hot glue is preferred)
- Cardboard
- Chains
- Other materials depending on if you want to create
  - Jewelry
  - Pencil Holder
  - Picture Frame
  - Keychains
  - Mural

Learning Objectives

- In this activity students will be using used and old keyboards to create their very own art such as jewelry, keychains, murals, pictures,even pencil holders, etc. It's up to their creativity and imagination on what they will create.

KEYBOARD ART

Instructions

1. Gather materials
2. Use cardboard as a base to create the picture frame or pencil holder.
3. For jewelry and keychains, glue keys to claps and key rings.
4. BE CREATIVE!

MELTED CRAYONS

Materials

- Art canvas or paper
- Crayons
- Hot glue
- Blow dryer

Learning Objectives

- Students will learn how to make different art pieces with silhouettes and images
- Students will see how different colors blend together
- Students will learn how liquid art is formed from beginning to end

MELTED CRAYONS

Instructions

1. Gather materials
2. Sort out crayons
3. Method 1:
   a. Hot glue crayons to the top of the canvas or paper
   b. Slant it so the crayons would be able to drip
   c. Blow dry the crayons so it melts down the canvas
   d. Let it dry and clean it up
4. Method 2:
   a. Put the crayon into the hot glue gun
   b. Color the canvas into any image, design, or pattern you want
   c. Let it dry and enjoy!
5. Optional:
   a. Cut out certain images and place it onto the canvas
   b. Melt the crayons over it
   c. Remove once dry

KEY TERMS

<u>Art</u> - the application of human creative skill and imagination, typically in a visual form, producing works to be appreciated for their beauty or emotional power

<u>Abstract</u> - art that does not attempt to represent reality, but seeks to achieve its effect using shapes, forms, colors, and textures

<u>Aesthetic</u> - concerned with beauty or the appreciation of beauty

<u>Mural</u> - painting or other work of art executed directly on a wall

<u>Silhouette</u> - the dark shape and outline of someone or something visible against a lighter background, especially in dim light.

MATH

<u>Math!</u>

Math is an essential part to everything in life because we use it daily. From these activities, students will practice the basic operations that will strengthen their learning for the future. Some of the activities focus on learning while being physically active. Others showcase the creativity of the students by creating shapes. Each represents different objectives in math that the students learn and will need in the future.

RELAY MATH

math
relay race

Materials

- Operation Flashcards (Addition, Subtraction, Multiplication, Division)
- Tape
- Folding Table
- Crates/Bins
- Pool Noodles - 3
- Soccer Cones - 6 to 9
- Black Cloth
- Plank

Learning Objectives

- Improve math skills in basic operation problems
- Learn fluency in basic operations
- Use objects to solve elementary mathematical problems

Est. Duration: 30 minutes   Est. Cost: $68.52   Age Range: 5-10

RELAY MATH

Description

Students will display their physical strength by completing our obstacle course and creating items while also testing their mental capabilities by completing and understanding math equations with other math obstacles.

Instructions

1. Students will start of by creating teams (if possible).
2. Set up the relay race with different obstacles.
3. They will play as though it is a normal relay
4. After each obstacle, they will continue by answering a math question. If they get the question wrong, the student will have to go back to the beginning of the line and start the course over again.

MATH BINGO

Materials

- Bingo Sheets (with different difficulty levels)
- Pencils/Pens
- Bingo Beads and Cage

Learning Objectives

- Demonstrate fluency in basic operation problems
- Students will develop the concept of quantity
- Use objects to solve mathematical problems

Est. Duration: 30 minutes   Est. Cost: $31.56   Age Range: 5+

MATH BINGO

Description

Students will showcase their basic knowledge on math operations through solving problems while trying to achieve filling in five blocks in a row (BINGO).

Instructions

1. Print off as many BINGO boards as needed.
2. Students will get bingo boards with basic operation problems.
3. Bingo will be played as normal.
4. The number called has to be the answer of the operation on the students board.
5. Five in a row is BINGO!
6. Refer to the next page for a variety of bingo pieces.

BINGO

B	I	N	G	O
5 - 4	6 + 3	4 + 2	8 - 4	7 - 2
1 + 1	7 + 1	9 + 2	9 - 6	3 + 4
3 + 12	20 - 0	★	16 - 2	5 + 13
8 - 7	9 + 4	19 - 2	8 + 11	9 + 7
18 - 8	4 - 2	8 + 6	14 + 3	8 - 5

B I N G O

9 + 6	20 - 3	4 + 2	8 - 4	7 - 2
10 + 5	12 + 4	9 + 2	9 - 6	3 + 4
18 - 2	6 + 2	★	16 - 2	5 + 13
3 + 7	8 - 7	19 - 2	8 + 11	9 + 7
2 + 11	9 - 5	8 + 6	14 + 3	8 - 5

B I N G O

B	I	N	G	O
9 + 6	6 + 3	4 + 2	8 - 4	7 - 2
10 + 5	7 + 1	9 + 2	9 - 6	3 + 4
18 - 2	20 - 0	★	16 - 2	5 + 13
3 + 7	9 + 4	19 - 2	8 + 11	9 + 7
18 - 8	4 - 2	8 + 6	14 + 3	8 - 5

MATH SKIPS

Materials

- Chalk/Duct Tape
- Stones

Learning Objectives

- Demonstrate the ability to create basic operations using given answers
- Learn to fluently answer and solve basic operations

Est. Duration: 15 minutes   Est. Cost: $1.59   Age Range: 6+

MATH SKIPS

Description

Students will demonstrate their quick math skills while showcasing their physical strength. They must display their mental capabilities while having fun with this childhood game.

Instructions

1. Students will set-up a calculator shaped hopscotch area.
2. Students will then toss a stone on a number on the calculator then hop on an equation that equals the number the stone landed on.
3. 1 foot hops for odd numbers and 2 foot hops for even numbers.
4. Their turn will continue until a mistake is made landing on the wrong equation or stepping on a line.

GEO-SHAPES

Materials

- Colored printer paper
- Glue/Tape
- Scissors

Learning Objectives

- Students will use art to create geometric shapes
- Use their knowledge of 3D shapes to create models

Est. Duration: 15 minutes   Est. Cost: $7.76   Age Range: 5+

GEO-SHAPES

Description

Students will create a geo-shape of their choice to hold candy, with creating these students will be practicing creating cone shapes and learning about geo-shapes.
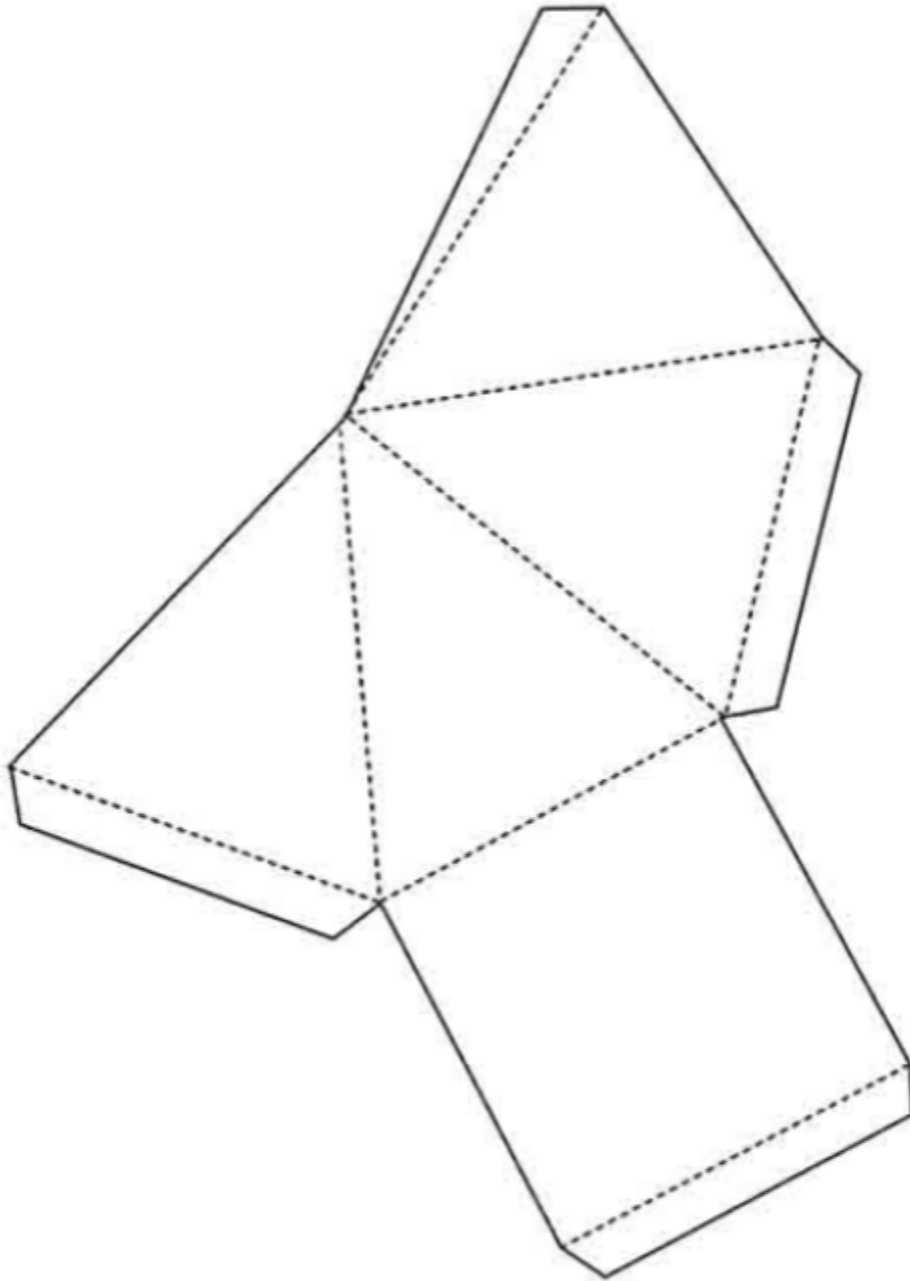
Instructions

1. Print out as many copies of the shapes as needed.
2. Cut out on dark line on the given piece of paper.
3. Fold on the dotted line.
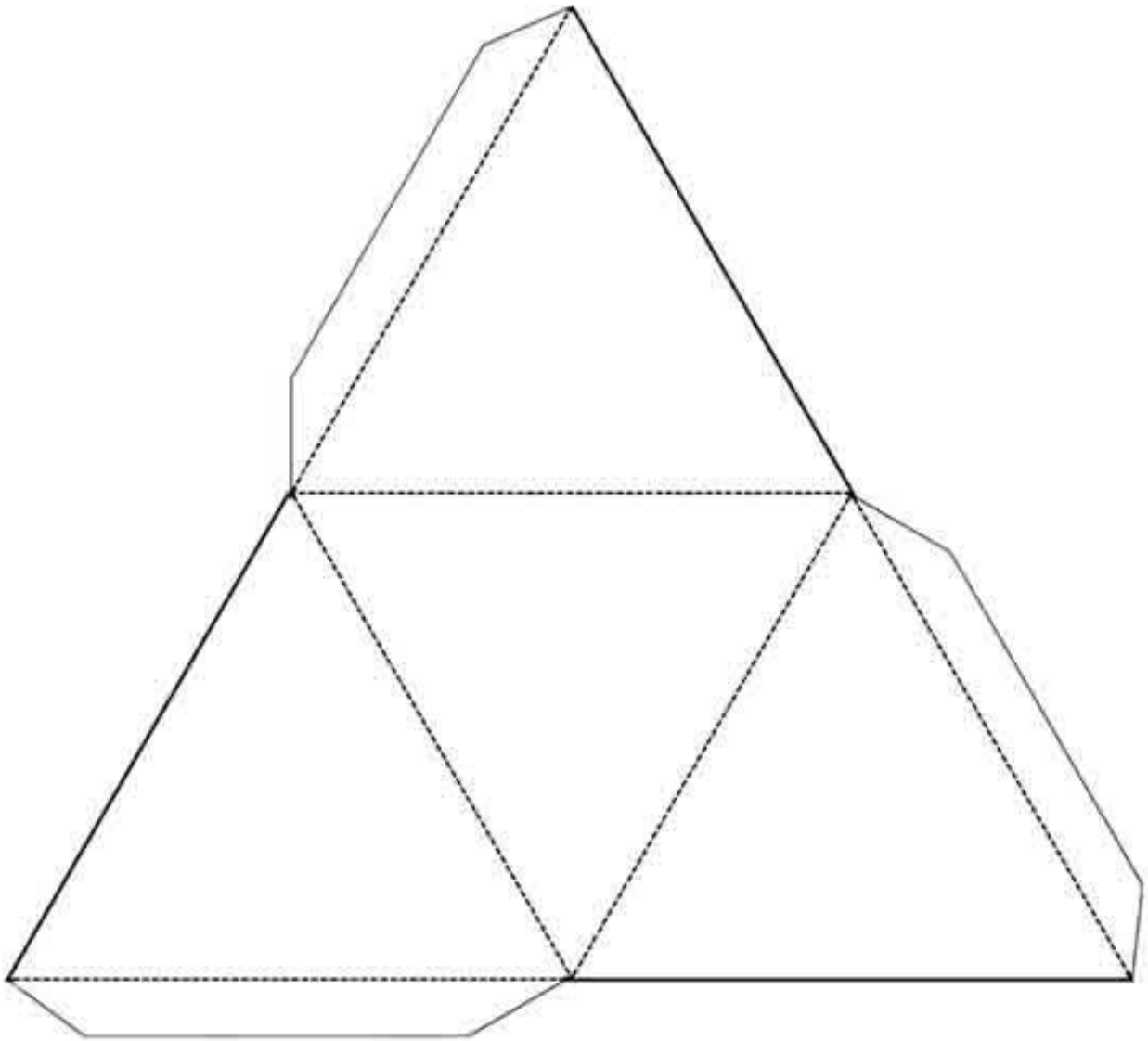4. Use glue/tape to connect sides.
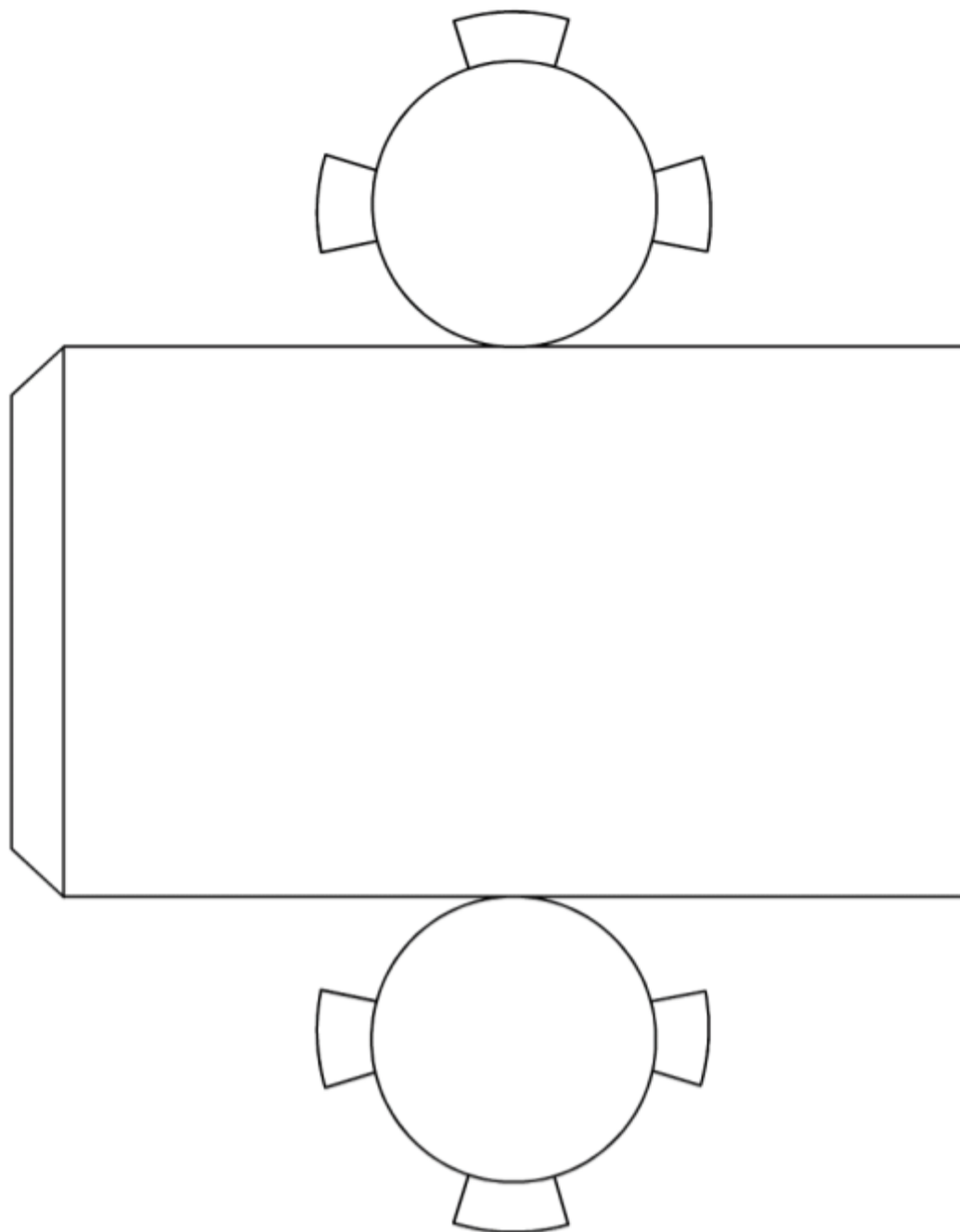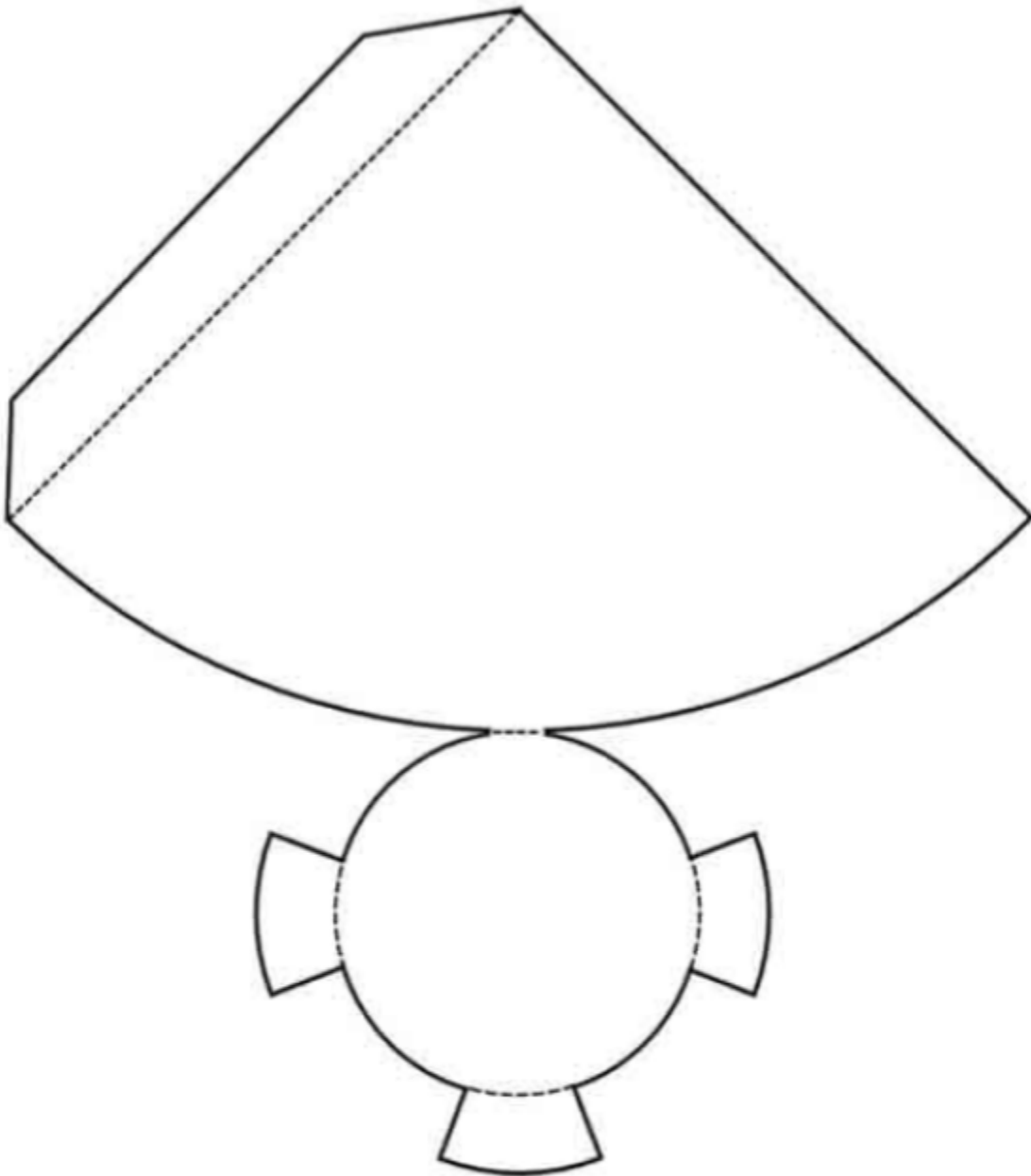
CUBE
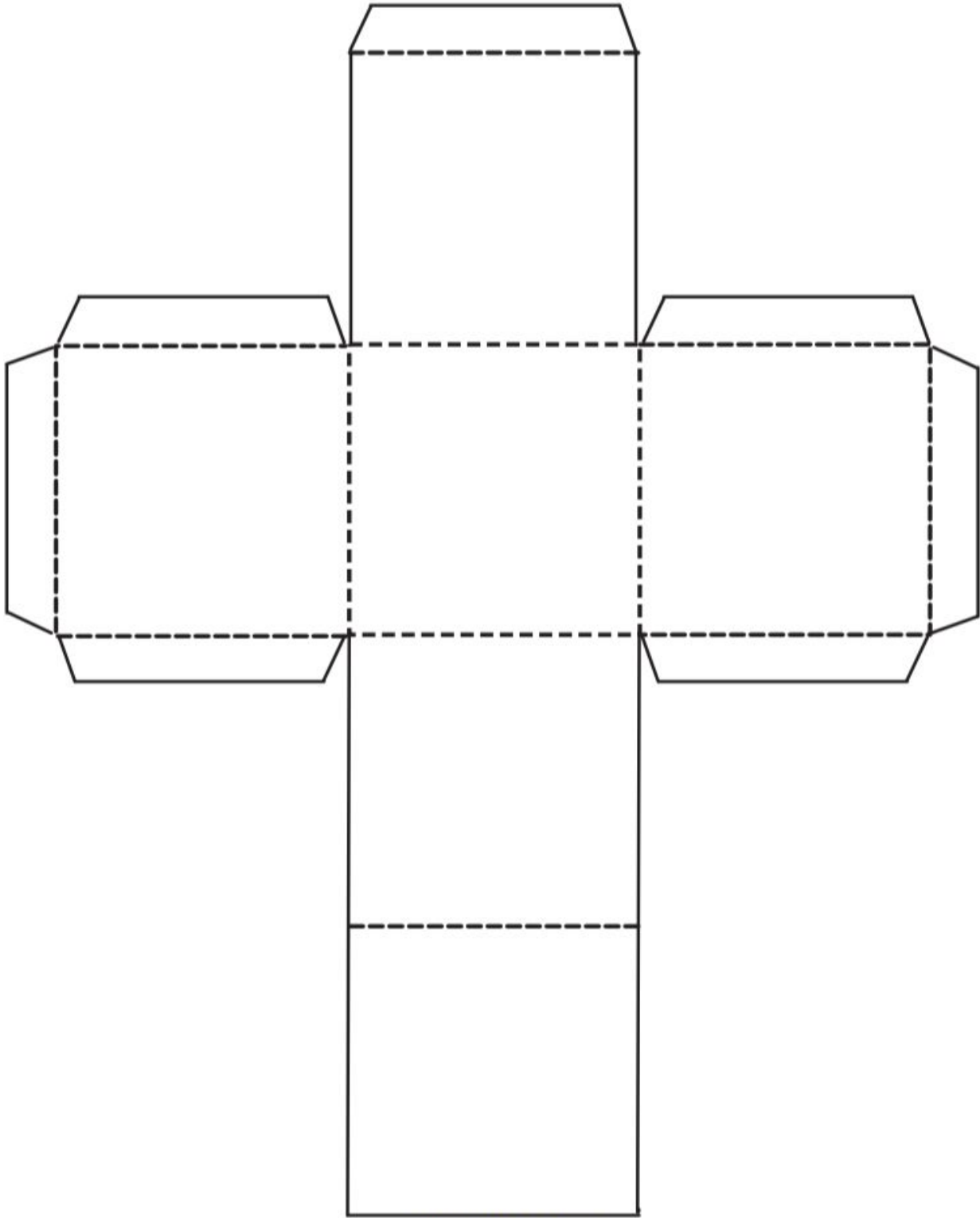
PYRAMID

TRIANGULAR PRISM

CYLINDER

CONE

NUMBER HUNT

Materials

- Index Cards
- Tape

Learning Objectives

- Students will use their senses (especially sight) to find objects in surrounding area
- Demonstrate fluency in basic operations

Est. Duration: 30 minutes   Est. Cost: $5.90   Age Range: 6+

NUMBER HUNT

Description

Students will search and use their basic math skills to answer math questions found around the surrounding area and complete their hunt.

Instructions

1. Setup: Place index card with math problems and answers for different problems around the area where you have the activity to take place.
2. Students will start at any problem they chose and solve the equation.
3. Search for the answer to the problem on another index card.
4. Continue to go through this process until you result back to where they started.

13 + 7	8
40 - 23	20
7 x 9	17
12 / 2	63
8 + 7	6
23 - 9	15
4 x 6	14

27 / 3	24
13 + 10	9
21 - 3	23

7 x 5	18
30 / 3	35
33 + 11	10
45 - 12	44
5 x 5	33
56 / 8	25
7 - 3	7

12 + 7	4
4 x 4	19
40 / 5	16

KEY TERMS

<u>Operation</u> - A math related process; Main four are: adding, subtracting, multiplying, and dividing

<u>Addition</u> - Finding the total, or sum, by combining two or more numbers

<u>Subtraction</u> - Taking one number away from another

<u>Multiplication</u> - Repeated addition

<u>Division</u> - Splitting a value into equal parts or groups → "Fair sharing"

<u>Calculator</u> - A device or app that is used for math calculations

<u>Geometry</u> - A specific type of math that focuses on points, lines, shapes, and space

SCIENCE STAMP CARD

Place Stamp Here	Oreo Moon Phases
Place Stamp Here	Milk Madness
Place Stamp Here	UV Bracelets
Place Stamp Here	Edible Earth Layers
Place Stamp Here	Coke Geysers

TECHNOLOGY STAMP CARD

Place Stamp Here	Tynker
Place Stamp Here	Music Makey Makey
Place Stamp Here	Snap Circuits
Place Stamp Here	Code Blocks
Place Stamp Here	Code Combat

ENGINEERING STAMP CARD

Place Stamp Here	Ozobot 1
Place Stamp Here	Ozobot 2
Place Stamp Here	Cool Cars
Place Stamp Here	Tower Tragedy
Place Stamp Here	Catapult Crazy

ART STAMP CARD

Place Stamp Here	Keyboard Art
Place Stamp Here	Melted Crayons

MATH STAMP CARD

Place Stamp Here	Relay Math
Place Stamp Here	Math Bingo
Place Stamp Here	Math Hopscotch
Place Stamp Here	Geo-Shapes
Place Stamp Here	Number Hunt