



Seasonal STEM Challenges for Fall

The Magic of Autumn

In the season of pumpkin carving, corn mazes and crunchy leaves, it's easy to get swept away with the magic of fall — just don't forget that STEM is the magic that makes a lot of it possible. Chemistry powers the remarkable change of colors displayed on every tree. Farmers plan corn mazes with graphs and diagrams, then use GPS, drones or precise stakes to carve out their creation. Even baking the perfect pie requires precise measurement, balanced proportions and food science for the combination of a flaky crust and moist filling.

Combine these autumn themes with useful STEM skills and get ready to bring your learners memorable and seasonal STEM challenges!



HANDS-ON STEM EDUCATION

For over 30 years, PCS Edventures has inspired students to develop a passion for Science, Technology, Engineering and Mathematics (STEM), focusing our efforts on making learning and discovery a fun and interactive process for grades K-12.

- Classroom
- After-School
- Home Learning

1. BUILD A BRICK CORN MAZE

One of the most quintessential autumn activities is a visit to the corn maze. Over the last 30 years, the number of corn mazes in the United States and throughout the world has skyrocketed. One reason for this is the advent of new technologies allowing farmers to strategically plan intricate designs. GPS-enabled planters and tractors help farmers execute their plan and aerial footage from drones helps them see the big picture, trimming any areas that need additional definition. In this activity, learners get to plan and build their own corn mazes, then challenge others to complete them.

MATERIALS

- Paper and Pencil
- BrickLAB Bricks (or other construction blocks)
- Marble



INSTRUCTIONS

1. Start by drawing a map for your corn maze on a piece of paper.

Think about the size of your foundation. Make sure the path is wide enough for the marble to go through. Consider how many dead ends to include. Make sure there is an entrance and exit.

2. Create a base from large brick baseplates.
3. Add longer bricks to construct the walls of your maze.
4. Test the maze by sending the marble through from beginning to end.
5. Once you have completed your maze, swap with a friend or challenge someone to see how fast they can complete it.

DISCUSSION QUESTIONS

1. How long did it take your friend to complete the maze?
2. How could you improve your maze design?
3. If you were to create a real corn maze, what design would you create?



2. FALLING LEAF ZENTANGLE

You know it's Autumn when the leaves start changing colors, but do you know why the leaves change colors? As days get shorter and temperatures get colder, trees stop making chlorophyll, the green pigment that absorbs light and enables photosynthesis, the process by which plants get their fuel. As the chlorophyll breaks down, the green color resides leaving vibrant yellow, orange and red hues in its place. In this activity, learners explore changing patterns in a colorful leaf zentangle.

MATERIALS

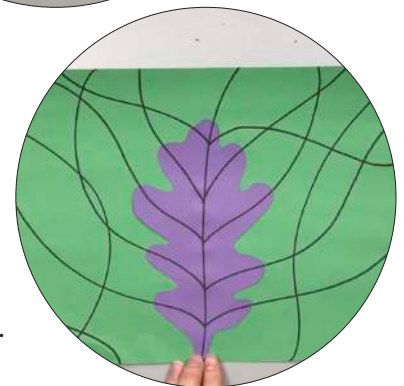
- Large Leaf
- Construction Paper (2 sheets per person, assorted colors)
- Glue Stick
- Pencil
- Permanent Marker
- Scissors

INSTRUCTIONS

1. Gather a large leaf from outside, or draw and cut one out from a piece of paper. Using a pencil, trace the leaf onto a sheet of construction paper.
2. Cut out the leaf from the construction paper. Using a glue stick, glue the construction paper leaf to a second color of paper.
3. Draw one line up the center of the leaf, extending off the leaf to the edge of the paper. Then, draw other lines radiating out from the center like veins, also extending off the leaf to the edge of the paper. Add additional lines to create an artistic grid.
4. Fill in each section with a different pattern.

DISCUSSION QUESTIONS

1. Describe the patterns you created. What was your inspiration?
2. Did you plan out your design or freestyle? Why?



3. CANDY CORN CONSTRUCTION

Candy corn has been a fall tradition since the 1880's when it was invented by the Wunderlee Candy Company. The process has evolved over time as machinery replaced the time-intensive process of layering each color by hand in a candy mold. Today, candy manufacturers produce over 35 million pounds of the candy each year. This team-building challenge allows learners to use candy corn in a new way — as a construction material.

CHALLENGE: Build the tallest freestanding structure using the materials provided.

MATERIALS

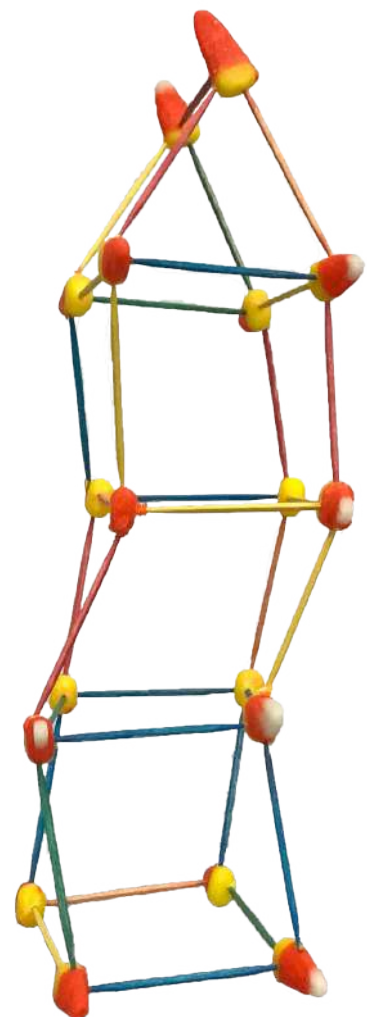
- Candy corn or candy pumpkins
- Round Toothpicks

INSTRUCTIONS

3. Take a few minutes to plan your candy corn skyscraper.
4. Start a timer for 15 minutes and build your candy structure as tall as it will go.

DISCUSSION QUESTIONS

1. What was your strategy for creating the tallest structure?
2. Did you follow the plan you initially laid out?
3. If you were to do the challenge again, what would you do differently?



4. GRAPH YOUR HALLOWEEN HAUL

MATERIALS

- Halloween Candy
- Paper and Pencil

INSTRUCTIONS

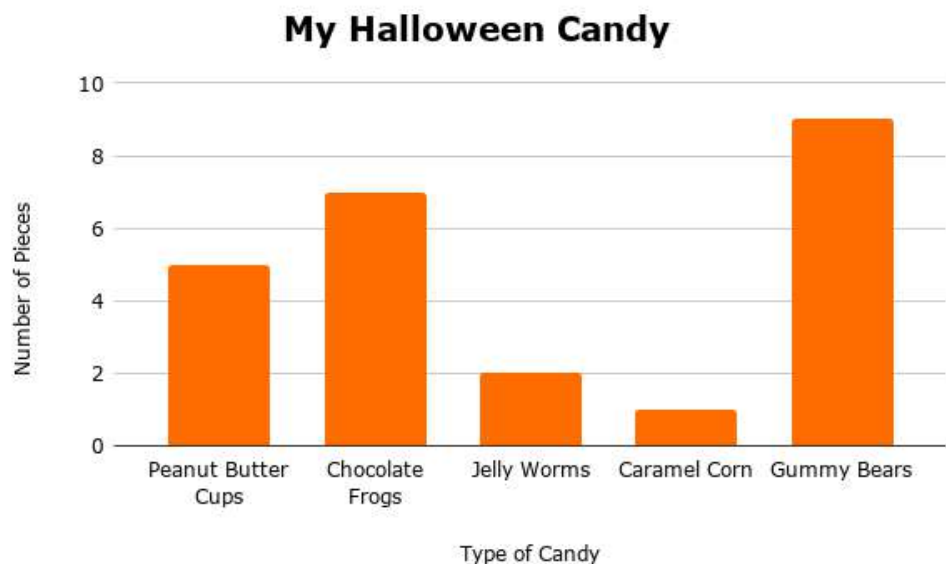
1. Dump out your sweet loot and sort by candy type.
2. Write down the name of each type of candy in your collection.
3. Add a tally mark for each piece next to its name.
4. Make a bar graph representing how much of each type of candy you scored!

To create a bar graph, label the horizontal axis with the names of each candy. Label the vertical access with numbers from 0 to 10 (or your maximum number). Next, draw bars above the candy names whose height reaches to the number of pieces for that type of candy. An example bar graph is below.

DISCUSSION QUESTIONS

1. What is your favorite kind of candy?
2. Which candy did you have the most of? Least of?
3. How could you use this graph to negotiate candy trades?

Type of Candy	# of Pieces
Peanut Butter Cups	5
Chocolate Frogs	7
Jelly Worms	2
Caramel Corn	1
Gummy Bears	9



References:

Griggs, B., & Maxouris, C. (2016, October 10). Ick or treat? 7 strange facts about candy corn. Retrieved from <https://www.cnn.com/2016/10/10/health/strange-facts-about-candy-corn/index.html>.

Palm, C. E. (n.d.). Why Leaves Change Color. Retrieved from <https://www.esf.edu/pubprog/brochure/leaves/leaves.htm>.

Skelly, S. (2013, December). Corn Maze Visit Tips. Retrieved from <https://www.cornmazesamerica.com/media.php>.

Watson, S. (2006, September 29). What is candy corn and how is it made? Retrieved from [https:// recipes.howstuffworks.com/menus/candy-corn.htm](https://recipes.howstuffworks.com/menus/candy-corn.htm).



For more information, visit: <https://edventures.com/collections>
or contact a STEM Program Specialist at (800) 429-3110

PCS edventures!TM
Experts in Hands-On **STEM** Education

