

SCHOOL AGE

Week

13

Smart Activities

Sunrise and Sunset

Materials: watercolors, brushes, colored pencils

Instructions:

Have you stopped to watch the sunrise or sunset lately? Have you noticed how the colors in the sky continually change as the sun comes up in the east, arcs over the sky, and then sets in the west? As the light changes, so does bird activity, the smell of the earth and air, wind velocity, temperature, and even the direction the flowers face.

The light from the sun is composed of all the colors of the rainbow, all traveling through the atmosphere at varying wavelengths. The light waves usually appear white because they blend so closely together. Because of the low angle of the sun during sunrise and sunset, the longer wavelengths of red, orange, and yellow become visible at these times of day. These colors can vary greatly in intensity due to pollutants and water vapor in the air.

Try This:

1. Note the colors of the sky at sunrise or sunset over the course of a week or two.
2. Use colored pencils or watercolors to depict the light.
3. Keep a journal of the two times, recording colors, dates, and times of the events.



Fantastic Fractals

Materials: paper, ruler, markers

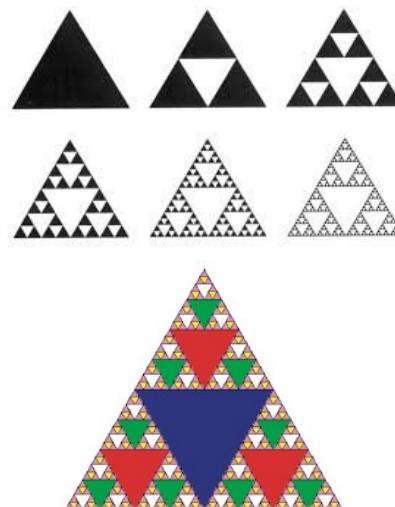
Instructions:

A fractal is a shape that is similar to itself no matter how far you zoom in on one or more of its particular parts.

Frequently fractals occur in nature, such as ice crystals that freeze on a windowpane. The ice crystal pattern is repeated exactly the same throughout the entire ice formation. A wood fern plant is another great example of a fractal. Notice how just one branch of the plant looks like a smaller copy of the entire stalk.

Scientists, mathematicians, and astronomers all use the principles of fractals in their applied research projects. Fractals are also interesting to artists simply because they are beautiful.

1. Draw a large equilateral triangle with six-inch sides.
2. Use a ruler to measure the length of each edge of the triangle and put a dot in the center of each edge.
3. Connect each midpoint to create a new triangle, pointing down, inside the first triangle. The original triangle is now divided into four smaller triangles.



The Mandarin Language

Materials: paper, black marker

Instructions:

There are thousands of languages in the world. More people speak Mandarin than any other. Mandarin is a form of Chinese.

The Chinese language does not use letters. It uses characters, or symbols. Each symbol has its own meaning.

Chinese characters can be a form of art. Calligraphers use ink and brushes to make the writing look beautiful.

Chinese has been around for thousands of years. This artifact shows early Chinese writing.

All around the world, children are learning Mandarin. Do you want to learn a new language? It is helpful to practice by speaking, reading, and writing in that language.



Want to practice Chinese? Here are some Chinese characters, how to say them, and what they mean. Try saying these words aloud. Then practice writing the characters.

| Characters | Chinese | How You Say It | English |
|------------|----------|-------------------|---------|
| 你好 | ni hao | nee how | hello |
| 家 | jia | jee-ah | home |
| 朋友 | peng you | pung yo | friend |
| 学校 | xue xiao | shueh shee-yow | school |

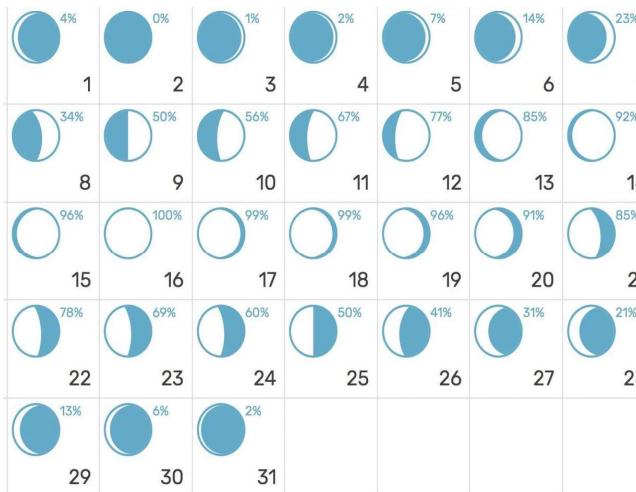
The Moon's Phases

Materials: paper, markers, stapler

Instructions:

Even easier to track than the changing constellations are the changing phases of the moon, which completes a cycle every 29th day. The moon does not generate its own light (only stars do this), so we only see the portion of the moon that is lit by the sun. When there is a full moon, the sun is shining directly on the moon. At other times our earth gets in the way, shadowing the moon so that only part of it is visible.

1. Make a flip book of the moon's phases by copying the pictures below by hand.
2. Arrange the phases in order starting with the full moon at the top left-hand corner and moving through the phases across from left to right until you're at the end of the flip book with another full moon.
3. Check your flip book by doing some moon observations at night from your home. Select one observation site and use that particular site for your viewings.
4. Start your observations on the flip book page that matches the moon configuration on the first night you start observing.



I See the Moon and the Moon Sees Me

Materials: paper, pencil, internet access

Instructions:

There are eight major phases of the Moon: new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning gibbous, third quarter, waning crescent.

Phases of the Moon - Understanding Moon Phases - Video for Kids

<https://youtu.be/RPvL7yeWBQM>

1. Listen to this video. It's an animated pictorial explaining the different phases of our moon.
2. See if you can guess what country the narrator is from by his accent!
3. Become an educated observer of the sky.
4. Try writing an original folktale about the "Man in the Moon" and how he got there or a poem about the images of the moon.



Puzzle Palooza

Materials: toothpicks or craft sticks

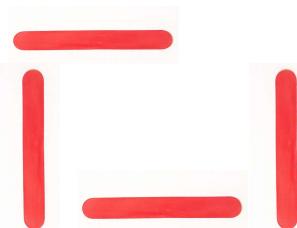
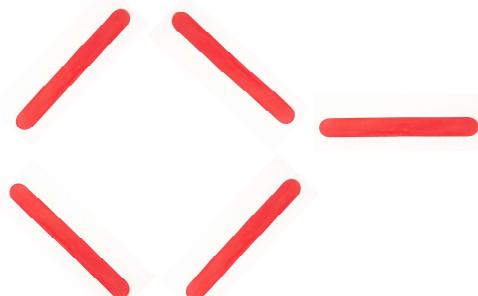
Instructions:

Lay the toothpicks/craft sticks in the configuration below. Follow the directions to see if you can complete the puzzle.

1. This is two puzzles in one.

Move two sticks to get three equal squares.

Move two more sticks to make two rectangles.



2. Invent Your Own Craft Stick Puzzle

Stump your friends and family

Make an arrangement of toothpicks/craft sticks.

Remove, add, or move sticks to make a second shape.

If you aren't happy with new arrangement, go back to the original and start over.

Puzzle makers try lots of configurations to invent interesting puzzles of varying difficulties. When you've found an arrangement you like, draw the starting placement for the sticks and write the instructions for making the new design. You might want to make an answer sheet on an extra sheet of paper.

<https://mathsticks.com/my/2016/08/stick-puzzles-ice-breakers/>

Stick Puzzles

One square here. Move **one stick** to make three squares.

The initial arrangement consists of four vertical sticks and four horizontal sticks forming a single large square. To solve the puzzle, one stick must be moved to create three smaller squares.

Stick Puzzles

Three triangles. Move **two sticks** to make four triangles.

The initial arrangement consists of six sticks forming three triangles. To solve the puzzle, two sticks must be moved to create four triangles.

Stick Puzzles

Move **five sticks** to leave three squares.

The initial arrangement consists of ten sticks forming five squares. To solve the puzzle, five sticks must be moved to leave three squares.

MATHSTICKS

Which is Fizzier? Drinkable Science Experiment

*Adult supervision required. Wash hands before and after activity.

Materials: limes, oranges, baking soda, sugar, ice water, two matching glasses, two knives & basic kitchen supplies (measuring spoons, chopping board, juicer, teaspoons, straws), optional: ruler. *Note - baking soda is found in the baking aisle of the grocery store.

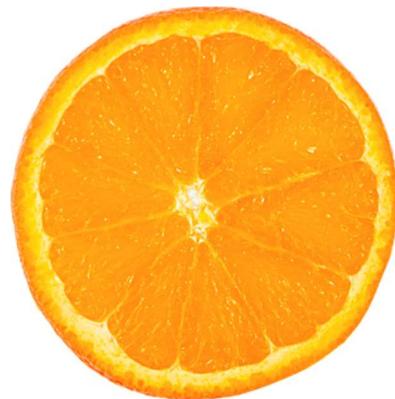
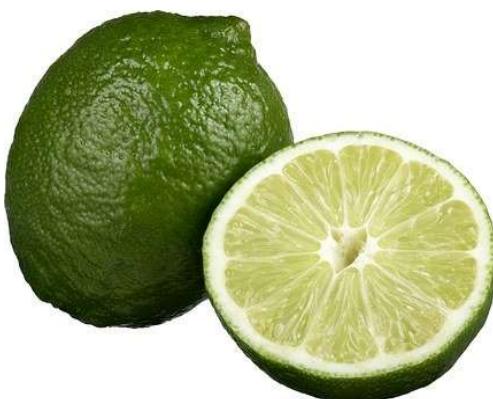
Preparation: This is a test to see which juice makes fizzier bubbles - lime or orange? Create a chemical reaction by adding bicarbonate soda (baking soda) to each citrus juice and see if one makes more bubbles than the other.

Fair test definition: conducting a test that keeps all the conditions the same while changing only one variable.

Instructions:

1. Before starting, make some predictions about what you think will happen.
2. Use 2 different knives to cut the lime and orange in half (2 knives to avoid cross-contamination). Set aside half of each fruit to use later.
3. Juice the lime and pour into one glass. Take a small sip to try it. Can you describe the taste?
4. Wash the juicer before using it with the orange to avoid cross-contamination. Juice the orange and pour the juice into the second glass. The volume of the liquid in both glasses should be equal. Take a small sip to compare the taste to the lime juice. How do you describe the taste?
5. Use the $\frac{1}{4}$ tsp. or $\frac{1}{8}$ tsp. to add baking soda to each glass.
6. Things to look for:
 - Does one fizz higher than the other?
 - Does one fizz longer than the other?
 - How does the size of the fizzy bubbles differ?
7. Take a small taste of each. How has the taste changed? Try adding water and sugar to see if it can be made to taste better.

More information about the pH scale: <https://kids.kiddle.co/PH>



The Science of Colors - Complementary Colors

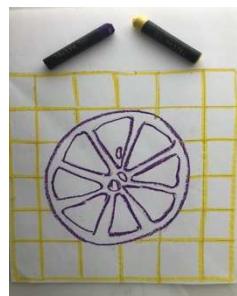
Materials: half lime or orange from the fizzy science experiment, oil-pastels or crayons, white paper, pencil, watercolors, newspaper, color wheel (included), internet access, website:

https://kids.kiddle.co/Complementary_color

Preparation: Use the website to become familiar with the color theory of complementary colors. Look at the color wheel below. Primary colors are in the center triangle: red, yellow, blue. Secondary colors, made by mixing two primary colors are: green, orange, purple. The outer ring of colors includes the full spectrum of primary, secondary, and intermediate colors (primary + secondary: yellow-orange, orange-red, red purple, etc.). Complementary colors are opposite each other on the color wheel and make each other seem more vibrant. See the real-world examples on the website above.

Instructions:

1. Choose a complementary color scheme for the painting: red and green, yellow and purple, or blue and orange. It does not have to match the color of the fruit. Be creative!
2. Hold the half fruit with the sliced end facing you. Count the segments. Are there any seeds? Include those.
3. Trim a piece of paper so it is square. Use the extra piece of scrap paper to test paint colors.
4. Draw the fruit lightly in pencil by making a large circle in the center of the paper. Do not worry about making the shapes look perfect. They look more realistic if they are not perfect! Use rounded triangle shapes for the segments. Be sure to include the shapes for seeds, if any.
5. Use a straight edge to make a grid of squares for the background. Trace the pencil lines of the fruit with one of the primary colors and trace the grid lines with its complementary color. For example, trace the fruit lines with purple and the background lines with yellow.
6. Then, fill in each shape of the fruit with the complementary color paint. If you outlined it with purple, the paint color will be yellow. Paint each shape separately. Make each segment of color a variation of the shade.
7. Fill in the background sections with different shades of the complementary color.



Lemon-Scented Slime

Materials: 1/2 cup clear school glue, 1/2 cup water, 1 teaspoon baking soda, 3-4 tablespoon contact solution (must contain boric acid), 1 squirt yellow gel food coloring, 1 tablespoon lemon gelatin mix, lemon essential oil (optional), mixing bowl, fork, measuring cups, measuring spoons

Instructions:

1. Pour glue into bowl.
2. Add 1/2 cup water and gelatin mix and stir until mix is dissolved.
3. Add 1 teaspoon baking soda and stir until dissolved.
4. Add yellow food coloring and stir until blended.
5. Add 3 tablespoons contact solution and stir into mixture.
6. When the mixture starts sticking to the fork, blend with hands by pulling and kneading the slime to reduce the stickiness.
7. If it is too sticky, add another tablespoon of contact solution.

From: <https://www.simpleeverydaymom.com/lemon-jello-slime-recipe/>

Socks-ketball Challenge

Materials: balled-up pair of clean socks, basket or bin per player

Preparation: More than one player is needed.

Instructions:

1. Stand 3-4 feet back (adjust as needed, if too difficult).
2. Before throwing the socks into the basket, each player must do 10 squats. If anyone misses the shot, the player must do another 10 squats before trying again. If a player makes a shot, he/she must take an extra step back, so the distance is more difficult each time.
3. Substitute any exercise as needed.



Paper Plate Solar System

Materials: paper plate, paint (various colors), sponge paintbrush or a paper towel, scissors, cardstock or thick paper, glue, a piece of string or yarn

Instructions:

Paper Plate:

Begin by painting your paper plate with various colors using a sponge paintbrush or a paper towel. We recommend using black, dark blues, and grey to represent space. You can add these colors in layers. You may want to let the layer dry some before adding other colors of paint to the plate. Once you have finished painting, allow time for your paper plate to dry before you continue. In the meantime, you can create your planets for your solar system.

Planets:

Cut various size circles from the cardstock or other thick paper that you have available. Cut one circle for each planet and the sun. Use a bigger circle for larger planets like Jupiter and smaller circles for planets like Mars. Using your sponge brush or paper towel, paint the planets using colors that are similar to each planet's real-life color. Allow time for your painted planets to dry.

Once your plate is dry, you are going to cut it into a spiral starting on the edge of the plate and making your way in a spiral towards the middle of the plate. Now, glue your dry planets to the spiral in order. Start with the sun in the middle of your plate. Glue the remaining pieces to the plate in order one by one making your way to the other end of the spiral. With tape or glue, attach the piece of string/yarn to the center of the plate by the sun. Find a special place to hang your artwork!

The Order:

The Sun
Mercury
Venus
Earth
Mars
Jupiter
Saturn
Uranus
Neptune



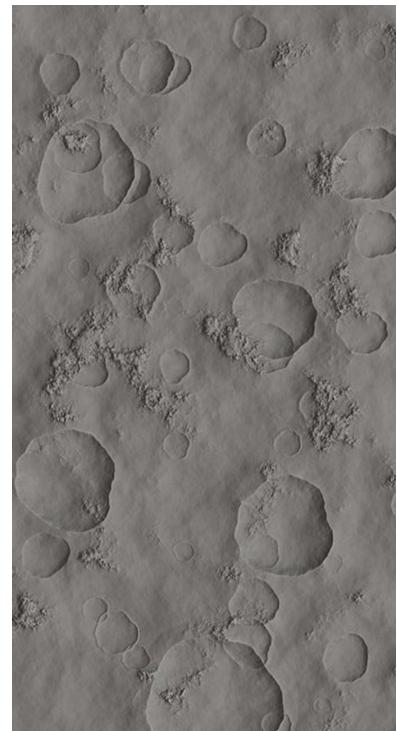
STEAM: Moon Craters

Materials: 4 cups of flour, ½ cup baby oil, small rocks, round baking pan

Instructions:

Have you ever been looking at the moon and noticed the round details on its surface? These are called craters. A crater occurs when a meteorite impacts the moon's surface leaving behind a large cavity. Try this with the activity below:

1. You can complete this activity outside if you have available space. If you choose to do this experiment indoors, place a towel under the pan to catch the flour that may fly out of the pan.
2. Mix the flour and oil and place it in an even layer in the round baking pan.
3. Place the pan on the floor.
4. Standing over the pan drop small rocks onto the flour/oil mixture.
5. Remove the rock after you dropped it and observe how it impacted the surface. Did it leave an indent? Did it shift the surface?
6. Try multiple times with various small rocks and observe the impact of each one.



Cooking: Space Constellations

*CAUTION: Wash hands for 20 seconds before and after this activity.

Materials: pretzel sticks, mini marshmallows, internet access

Preparation: You can watch more about constellations here:

<https://www.youtube.com/watch?v=1sZ15SUeS9w>

Instructions:

A space constellation is a group of visible stars that form a pattern that can be viewed from earth. Some of these patterns may take form in the shape of an animal, a person, or an object. If you watched the video linked above, you saw some examples of constellations. You can also search for images of star constellations.

Using pretzel sticks and mini marshmallows, make space constellations! Try making multiple different ones. Which ones were easy to make? Which ones were challenging to make? Have you seen any of these constellations at night in the sky?

Enjoy these constellation snacks with family while talking about constellations!

