Math & Science ALL YEAR LONG

Fall, winter, spring, summer—each season offers fun learning opportunities for your youngster. Here are games and activities that will help him enjoy math and science year-round.

FALL

Math hunt

A fall scavenger hunt will let your child practice math as your family enjoys nature. Together, list items to find and activities to try. Here are a few ideas:

- Collect acorns and put them in piles that equal prime numbers. (*Note:* A prime number is a number that can only be divided by 1 and itself. The first few prime numbers are: 2, 3, 5, 7, 11, 13, and 17.)
- Find a leaf that looks symmetrical. To check symmetry, lay the leaf on a piece of paper, and trace around it with a pencil. Cut out the outline, and fold it in half. If the edges match up, it is symmetrical. The fold is the line of symmetry, and one side will be a mirror image of the other.
- Gather four twigs. Arrange one pair so they're *parallel* and another pair so they're *perpendicular* to each other.

Changing colors

Does your youngster know why leaves change color in the fall? This activity will help her understand.

Have her find a large green leaf on the ground. She should tear it into very small pieces and put them in a small, clear jar. Help her carefully add rubbing alcohol and mash the leaf parts in the alcohol with a spoon. Ask her to cover the jar loosely with foil, and place it in a shallow pan with an inch of hot water. When the alcohol turns color, she can remove the foil. Then, have her cut a long, thin strip from a coffee filter and put the strip in the jar so one end sticks out. Let it sit for at least 30 minutes. Your child will observe red, orange, or other colors traveling up the paper!

Tell her that those colors—which are seen in fall leaves—were in the leaf all along. They were covered up by *chlorophyll*, a green substance that works with sunlight to make food for trees in spring and summer. In the fall, leaves stop making chlorophyll, so the other colors become visible.

WINTER

Snowman fractions

Be the first to build a snowman in this two-player game that teaches your youngster about fractional parts.

First, each player draws and cuts out a set of snowman parts: three round "snowballs" for the body (each 6 inches across), one carrot nose, one mouth, two eyes, three buttons, one hat, and one scarf.

Then, each person should draw lines dividing one snowball into halves, another into fourths, and the other into eighths. Label the fractions ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$), and cut along the lines.

Mix up all the parts in one bag, and give each person a sheet of paper. Take turns pulling out one part and gluing it to your paper. But wait! A snowball must be complete before you may add decorations. So if a snowman's head has a $\frac{1}{2}$ part and two $\frac{1}{8}$ parts, the player would need to add $\frac{1}{2} + \frac{1}{8} + \frac{1}{8}$ and see that he needs $\frac{1}{4}$ to finish the circle. If you get a part you can't use, return it to the bag, and your turn ends. Finish your snowman first to win.

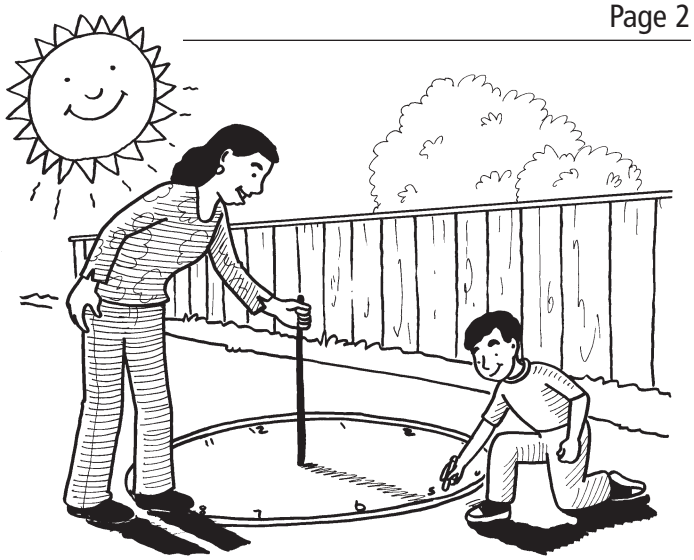
continued

Cold as ice

Why do ponds freeze and oceans usually don't? Your child can find out with this project.

Have her pour 1 cup of water into each of four paper cups. She should leave the first cup alone and slowly stir different amounts of salt (1 tbsp., 2 tbsp., 3 tbsp.) into the others. Make sure she labels each cup with the amount of salt added. Then, let her place the cups outside (if it's 32º or colder) or in the freezer.

Suggest that she check the cups regularly and note when each one freezes. She'll learn that the more salt there is, the longer it takes—since salt lowers the freezing point of water. You can explain that ponds freeze because they are made of freshwater. Oceans are about 3.5 percent salt and freeze only in extreme polar regions.



SPRING

Weather forecaster

What's the chance it will rain? Let your youngster build a barometer and make a prediction.

Have him cut a balloon in half and then stretch the half without the neck tightly over the mouth of a glass jar. Help him secure it with a rubber band. Then, he should tape the end of a straw to the center of the balloon, leaving the rest of the straw suspended over the edge of the jar.

Let him tape a sheet of paper to the wall and place his "barometer" against it with the straw touching the paper. With a pencil, he can mark where the straw touches the paper. To measure air pressure, have him mark the straw's position each day. When air pressure falls, the balloon will expand and tilt the straw down—this indicates rain. When air pressure rises, the balloon sinks, and the straw points up—this usually means dry weather.

Flower power

Your youngster can stop to smell the flowers while she practices multiplication and division.

Find a patch of flowers in your neighborhood or at a park, and have your child make up a math problem. For instance, if there are 12 tulips and each has 6 petals, she could say, "12 tulips x 6 petals = 72 petals."

Then, take turns giving each other multiplication and division problems using flowers, leaves, or other springtime objects. To help your youngster practice division, you might say, "Each flower has 4 petals, and there are 60 petals altogether. How many flowers are there?" *Answer:* 15 (60 ÷ 4 = 15).

SUMMER

Shadow clock

Before watches, clocks, and cell phones, people used the sun to tell time. Create a sundial to help your child learn about the Earth's rotation.

Ask him to make a circle with sidewalk chalk or rocks in a sunny spot outside (sidewalk, yard, driveway). Once an hour, hold a stick pointing straight up in the center of the circle, and let him mark the stick's shadow with a line of chalk or rocks. He should use chalk to write the hour on the sidewalk or rocks. After several hours, he will notice that his marks are spaced like the numbers on a clock.

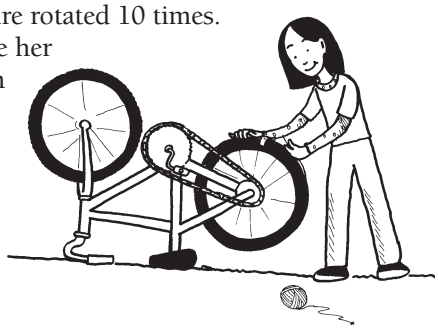
Your youngster probably knows that the Earth rotates once every 24 hours. As it turns, positions of shadows cast by the sun change. That is how a sundial works.

Round and round

Bike riding is not only good exercise—it's a way for your child to practice math skills.

She can find the circumference of her bike's tire by wrapping string around it once and then laying the string down and measuring its length. Then, have her pick a short distance to ride (mailbox to fire hydrant) and estimate how many times her wheels rotate as she goes.

To check her estimate, she can measure the distance she traveled (50 feet) and divide it by the tire's circumference (60 inches). First, she'll need to convert the feet to inches (50 feet x 12 inches = 600 inches). Then, she can calculate: 600 ÷ 60 = 10, so her tire rotated 10 times. For more practice, have her repeat this activity with different routes, or let her measure and estimate when her siblings ride their bikes.



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