

Teach the triangle

When preschoolers learn geometric shapes, they gain a basic and powerful tool for organizing their world. The ability to recognize and differentiate between shapes prepares them to recognize letters and numbers. It helps them to identify, sort, and classify—basic skills they will need in math and science.

A curriculum unit on shapes usually includes the circle, square, rectangle, and triangle. Focusing on one shape at a time can help children establish a particular shape in their minds, identify the shape in the environment, and begin to compare it to other shapes.

This article focuses on the **triangle**, with learning activities you can offer throughout the classroom. (For focusing on the circle, refer to “Go round: Teach the circle shape” in the Spring 2015 issue www.childcarequarterly.com/backissu_spring15.php).

What is a triangle?

By definition, a triangle is a two-dimensional figure with three straight sides and three corners or angles. The sides can be of equal or different lengths, which affect the size of the angles. A triangle with sides of equal lengths is an **equilateral** triangle, one with two sides equal is an **isosceles** triangle, and one with sides of differ-

ent lengths is a **scalene** triangle.

Triangles are as old as the ancient civilizations of Egypt and Babylonia. As mathematics developed, triangles formed the basis of a separate branch, trigonometry, that astronomers used to study the stars and planets. Trigonometry principles, particularly the measurement of angles, also proved useful to the navigators of ships, and later airplanes, in determining their position and

course as well as to surveyors determining land boundaries.

Architects and engineers incorporate the triangle shape in designing buildings and bridges. Unlike squares and rectangles, triangles can bear heavy loads for longer periods without collapsing. Actually, engineers often add a diagonal bar through a square truss to make two triangles and thus achieve greater structural strength.



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Children will recognize the triangle as one of the instruments in the rhythm band set. This metal percussion instrument is used by wind ensembles, symphonic bands, and symphony orchestras to play everything from marches to symphonies. It is also used in folk, rock, Cajun, and Brazilian music. A cast-iron version, hung from a porch or chuck wagon, may be used to call people to eat.

Introduce the triangle shape

Introduce children to the triangle shape and help them appreciate its importance in daily life with the activities below. Inform parents that you're teaching the triangle, and encourage them to help their children identify the shape in their home and elsewhere--plastic container for deli sandwiches and

danger sign on slow-moving vehicles, for example.

Circle time. Cut out an assortment of triangles from construction paper or poster board. Name the shape, and ask what the triangle cut-outs have in common--three straight sides and three corners or **angles**. Note that the sides of a triangle may not be the same length, but all three sides are straight. In addition, the corners may not be sharp but may be rounded, as in a coat hanger.

Invite children to find the triangle shape in the room. Write down the name of the object and photograph it. (You may need to prepare the room ahead of time by placing triangle shapes in clear view, such as in the block and library centers. You might also display a college pennant and drawings or photos, such as a

boat with a triangular sail.)

Outdoor walk. Take a walk around the playground or the neighborhood. Again write down the name of each triangular object and photograph it. For example: Does the playground climber have a roof or tent top in a triangular shape? Is there a triangle in the sidewalk where it turns to go around a tree or building? Do you see triangular windows in a house? What about gables and rooftops on houses? Do you see a yield sign at an intersection? (You may need to scout a route in advance.)

Place the photos of triangular objects in the library center where children can look at them on their own.

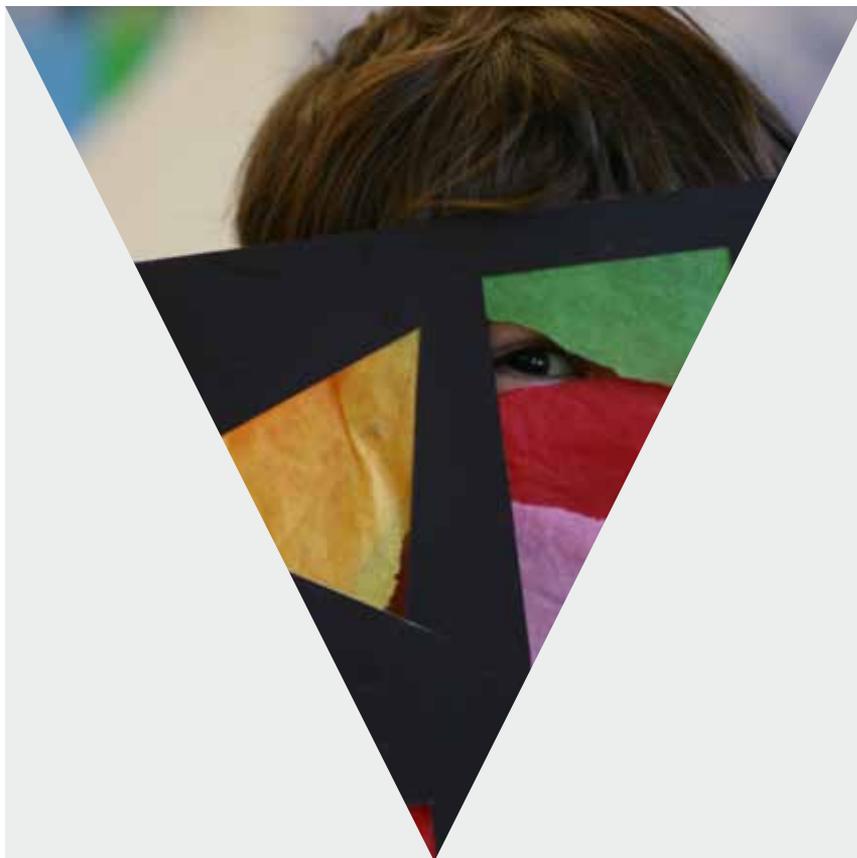
Art center. Invite children to make triangles using various materials. Examples:

- Bend pipe cleaners into a triangle shape.
- Glue craft sticks in a triangle shape onto construction paper.
- Dip triangle-shaped sponges into paint and press on paper.
- Cut paper or fabric scraps into triangles and glue on paper to make a collage.
- Glue various items (yarn, ribbon, leaves, used stamps, stickers) on triangle shapes.
- Roll clay into a rope and shape it into a triangle.

Sand/water table. Invite children to use fingers or sticks to draw triangles in sand or dirt (wet or dry). Bury plastic or foam geometric shapes in the sand and have children look for the triangle treasure. Offer boats with triangular sails to float in water.

Dramatic play. Set up the dramatic play center for a sailing excursion. Make the boat out of a

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large appliance box or several boxes, each large enough for a child to sit in. Attach a large paper triangle to a wooden rod to serve as the sail, and insert the rod into a sturdy container of clay or sand next to the boat. Provide props such as map, telescope (paper towel roll), cut-out paper fish, seashells, paddles, sunglasses, water bottles, and sailor hats. Add photos of the sea and sailing vessels to walls.

Sailor hat

Invite children to make their own sailor hats, following these instructions:

Remove a two-page spread from a newspaper, such as front and back page. Place on a surface and turn so that the vertical fold is horizontal. Bring the two short sides together and crease. Fold

down the right-hand and left-hand corners so they meet in the crease, making two triangles, and crease. This leaves a band at the bottom edge of the paper. Fold up one thickness of the band along the base of the triangles. Turn the hat over and do the same with the other band. Place your fingers between the two bands and open the hat. Voila!

Block center. Ask children to identify triangle shapes in wooden blocks, magnetic tiles, and other construction sets that you may have. Invite children to use the triangles for building (house roof, for example). Display photos of Disney's Epcot ball (surface of triangles), the Flatiron Buildings in Fort Worth and New York, and the Great Pyramid of Giza in Egypt.

Math and Manipulatives.

Cut pairs of triangles in different measurements—two equal sided, two short and wide, two tall and narrow, for example. Paste one of each pair on poster board. Invite children to match the triangles in hand to those on the poster board.

Draw a pair of large five-pointed stars on poster board. On one star, cut off the five triangular (point) sections, leaving a pentagon shape in the middle. Mix up the pieces in a basket. Invite children to put the pieces together to make a star, using the uncut star as a guide.

Music. Demonstrate how to play the triangle. Hold it by the ball or loop with the non-dominant hand. Position the instrument so that the loop is at the top and the open (or missing) corner is by the non-dominant hand. Hold the beater (slender mallet) in the dominant hand and strike the bottom bar or the bar opposite the open corner. Listen for the shimmering sound from the single strike. For a roll, move the beater quickly back and forth in one of the closed corners. In a rhythm band performance, the player can strike the triangle in time with the rhythm. The roll is great for the end.

Library center. Add books about triangles, such as those below for preschoolers. Choose a book for circle time and invite children to point to the triangles in the pictures.

Circles, Triangles and Squares by Tana Hoban

Award-winning photographer and author, Tana Hoban teaches shapes and other concepts with picture books, including this 1974 book of black-and-white photos

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that stand alone with no text.

I Spy Shapes in Art, by Lucy Micklethwait

This book invites children to find squares, circles, triangles, and other shapes in works of museum art—triangles in Wassily Kandinsky’s “Soft Hard” and Winslow Homer’s “Blackboard,” for example.

If You Were a Triangle, by Marcie Aboff

Color illustrations show examples of triangle shapes in such things as a yield sign, wallpaper, and a quilt. It also introduces children to different types of triangles—isosceles, equilateral, and right triangle.

Shapes, Shapes, Shapes, by Tana Hoban

Color photos from everyday life challenge children to find 11 different shapes, from circles and

hearts to triangles and stars.

Triangles, by Jennifer S. Burke

This small book (6-inches by 7-inches, 24 pages) contains full-color photos of triangles found in fences and buildings of New York City, with simple, large-print text.

Triángulos: Triángulos a Nuestro Alrededor/Triangles: Seeing Triangles All Around Us, by Sarah Schuette

True to its title, this Spanish/English book contains photos of triangles in such common objects as tortilla chips, sandwiches, arrow signs, and buttons.

Triangles, by Yusuke Yonezu

The triangle shape is cut out on alternate pages of this board book, revealing—when the page is turned—a roof, hat, flag and other objects.

Invite each child to cut a large triangle shape, 10-12 inches on a side, out of construction paper.

Children may write their name on a triangle, paste their picture on it, and decorate it with markers. Fold and staple one edge of each triangle to a cord and hang in the room.

On a desktop or tablet computer, search for company and organization logos that use a triangle in their design. Some examples: Caterpillar construction machinery, Citgo gasoline, Delta Airlines, HGTV, YMCA (Young Men’s Christian Association), and YWCA (Young Women’s Christian Association). Note that the three sides of the World YWCA logo represent “body, mind and spirit.” Invite children to make a logo for themselves using the triangle shape. You might divide children into pairs and have each child assign a positive quality for each side to the other child—for example, “kind, respectful, and smart” or “strong, friendly, and patient.”

With a small group of children, write the word *triangle*. Note the two parts of the word—TRI (three) and ANGLE (the space between two lines close to where they meet). Ask: “What other words start with TRI?” Examples are *tricycle* (three wheels), *triceratops* (three horns), *triathlon* (three sports—swimming, biking, and running), and *tripod* (three-legged stand). Ask: “What other words end with ANGLE?” *Rectangle* and *quadrangle* are geometric figures with a related meaning. Other words, such as *bangle*, *dangle*, *jangle*, *tangle*, and *wangle*, simply rhyme with triangle. Write the words on cards and leave in the library center.

Cooking. Before handling food and cooking tools, have children wash their hands well with soap and water. Put out pieces of whole wheat toast on snack plates

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with plastic serrated knives. Ask: "What is the shape of a piece of toast?" (square) Ask: "How can you cut the toast in one straight line to make triangles?" (diagonally) Invite children to spread the toast (or triangle crackers) with peanut or almond butter or with hummus. While children enjoy the snack, show photos of pie wedges and watermelon slices. Ask: "Do these look like triangles?" (except that one side is slightly curved).

Science center. Ask children to observe how a seesaw works. Note that a seesaw consists of basically two parts: a straight board that sits atop a **fulcrum**. The fulcrum can be a cylinder or a triangle. Invite children to make a model seesaw, using a wooden ruler or craft stick for the board. They can make a triangular fulcrum by folding a 4x5-inch index card on the short side into four equal panels and gluing the two ends, one on top of the other. Invite children to predict what will happen in the following experiments. What happens when you place a rock on one end of the board? Can you make the board balance using two rocks, one on either end? What happens if you move the fulcrum slightly away from the middle of the board? Encourage children to observe each experiment and draw a line diagram to explain what happens.

Outdoor play. It's often possible to modify traditional games to include the triangle shape. Here are three examples:

Hopscotch. Using chalk, draw a hopscotch grid on a sidewalk. A traditional grid has three squares lined up in a column, two rectangles side by side, a single square,

two rectangles side by side, and a final semicircle at the top. Each figure has a number, one through nine. Try drawing triangles instead of squares, for example. The first player tosses a rock into triangle No. 1 and hops over it with one foot to triangle No. 2. The player then hops on one foot to triangle No. 3, then on both feet to the rectangles, and so on. At semicircle No. 9, the player turns around and heads back. If the player's rock or foot lands on a line or outside a figure, the next player takes a turn. To win, a player must successfully complete eight trips up and back on the grid, moving the rock to the next figure on each turn.

Kick the can. In this variation of hide and seek, a metal can is placed in the middle of a holding pen, drawn as a triangle in the dirt. While it hides her eyes, the other children run and hide. It then tries to find everyone. When it tags a player, the player goes into the holding pen. If one of the untagged players kicks the can, the tagged players go free. The game ends when it gets all the players into the holding pen.

Bean Bag Toss. Children toss triangular-shaped bean bags into a triangular shape on the bean bag board.

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