

Skewer Structures

1st Grade to 4th Grade



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Activity By: Babbledabbledo
Website: <https://babbledabbledo.com/engineering-for-kids-skewer-structures/>

**Materials Required:**

1. 12" long bamboo skewers
2. Clay or Playdough
3. Recommended additional materials for second graders: String and spaghetti

Activity Preparation:First Grade:

1. At this age children are learning to count and write numbers up to 100. Have the child count all of the materials and see if they can continue to count them over again until they reach 100. Ask the child to write numbers into the clay using the bamboo skewers.
2. Practice skip counting up to 100 by twos, fives and tens using small clay balls. Alternatively, the child may practice skip counting without using any objects.
3. Use materials to practice addition and subtraction for numbers up to 10. For example place two sticks in front of the child and add two more sticks. Ask the child how many sticks they now have.
4. During the activity, have the child create a square, triangle, and rectangle on their own. Then have the adult create a cube, trapezoid, and hexagon and have the child name the shapes.

Second Grade:

1. At this age children are learning to count and write numbers up to 1,000. Give the child a number from 0 to 1,000 and ask the child to write the number into the clay using the bamboo sticks. Have the child then tell you which numbers are in the ones, tens, and hundreds place.
2. Use materials to practice addition and subtraction. For example place two sticks in front of the child and add two more sticks. Ask the child how many sticks they now have.
3. Add string, spaghetti or other materials to the child's pile. Let the child pick different objects and discuss which materials would be best to build their skewer tower.
4. During the activity, have the child create any shape and describe the shape. Example shapes for this age include triangle, square, hexagon, trapezoids, and rhombi. The child



can also discuss any right angles they observe and point out any angles that are larger or smaller than 90 degrees.

Third Grade:

1. At this age children are learning to count and write numbers up to 100,000. Give the child a number from 0 to 100,000 and ask the child to write the number into the clay using the bamboo sticks. Have the child then tell you which numbers are in the ones, tens, hundreds, thousands, and ten-thousands place.
2. Use materials to practice multiplication problems up to the digit ten. For example, place two groups of five small clay balls in front of the child and ask what is 2 times 5.
3. During the activity, the adult can create three-dimensional objects such as a cube or pyramid and have the child repeat creating the shape. The child can discuss obtuse, acute, and right angles they observe in the objects.
4. During the activity create a cube and discuss the use of braces for lateral loads. Discuss weather related hazards and how braces are a design solution that reduces the impact of building collapse.

Fourth Grade:

1. Use materials to practice multiplication problems up to the digit twelve. For example, place two groups of five small clay balls in front of the child and ask what is 2 times 5.
2. During the activity have the child describe and build quadrilaterals, including squares, rectangles, trapezoids, rhombuses, parallelograms, and kites. Have the child identify points, lines, line segments, angle, endpoints, and parallel and perpendicular lines in various contexts. Have the child use a ruler and measure the sides of the objects to the nearest quarter-inch or whole centimeter.

Standards taught in this activity:

Mathematics:

First Grade:

Number & Operations: Read, write, discuss, and represent whole numbers up to 100. Representations may include numerals, addition and subtraction, pictures, tally marks, number lines and manipulative, such as bundles of sticks and base 10 blocks. Count forward, with and without objects from any given number up to



100 by 1s, 2s, 5s, and 10s. Demonstrate fluency with basic addition facts and related subtraction facts up to 10.

Geometry & Measurement: Compose and decompose larger shapes using smaller two-dimensional shapes. Compose structures with three-dimensional shapes. Recognize three-dimensional shapes such as cubes, cones, cylinders, and spheres.

Second Grade:

Numbers & Operations: Read, write, discuss, and represent whole numbers up to 1,000. Representations may include numerals, words, pictures, tally marks, number lines and manipulatives. Use place value to describe whole numbers between 10 and 1,000 in terms of hundreds, tens and ones. Know that 100 is 10 tens, and 1,000 is 10 hundreds. Demonstrate fluency with basic addition facts and related subtraction facts up to 20.

Geometry & Measurement: Describe, compare, and classify two-dimensional figures according to their geometric attributes. Compose two-dimensional shapes using triangle, squares, hexagons, trapezoids, and rhombi. Recognize right angles and classify angles as smaller or larger than a right angle.

Third Grade:

Numbers & Operations: Read, write, discuss, and represent whole numbers up to 100,000. Representations may include numerals, expressions with operations, words, pictures, number lines, and manipulatives. Use place value to describe whole numbers between 1,000 and 100,000 in terms of ten thousands, thousands, hundreds, tens and ones, including expanded form. Demonstrate fluency of multiplication facts with factors up to 10.

Geometry & Measurement: Build a three-dimensional figure using unit cubes when picture/shape is shown. Classify angles as acute, right, obtuse, and straight.

Fourth Grade:

Geometry & Measurements: Describe, classify, and sketch quadrilaterals, including squares, rectangles, trapezoids, rhombuses, parallelograms, and kites. Recognize quadrilaterals in various contexts. Identify points, lines, line segments, rays, angles, endpoints, and parallel and perpendicular lines in various contexts. Choose an appropriate instrument and measure the length of an object to the nearest whole centimeter or quarter-inch.

Science & Engineering:

Second Grade: Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. Make observations and construct an evidence-based account of how



an object made of a small set of pieces can be disassembled and made into a new object.

Third Grade: Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

Break off chunks of clay and shape them into $\frac{1}{2}$ " to $\frac{3}{4}$ " balls. You can do this either as you work or prior to starting.

Build! Use the clay balls at the joints between the skewers.

