

# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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Math Festival: Geometry K, 1, 2, 3, 4, 5, 6, 7, 8

### Build It!

Grade Span

#### Materials used with this activity:

Task Cards in Sheet Protectors

MultiLink Cubes

#### Comments:

Creating 3-D buildings from 2-D pictures takes visual and spatial reasoning and planning. While the easiest tasks are suitable for Kinders, the hardest, using the traditional drafting 2-D views, will challenge even adults. There are several companies that manufacture cubes that link together on multiple sides—all of these should work for this activity.

#### Standard(s) for Mathematical Practice

- 1) Make sense of problems & persevere in solving them.
- 2) Reason abstractly and quantitatively.
- 4) Model with mathematics.
- 5) Use appropriate tools strategically.
- 7) Look for and make use of structure.

#### Related K, 1, 2, 3, 4, 5, 6, 7, or 8th grade Standards:

CC: Counting & Cardinality    OA: Operations & Algebraic Thinking    NBT: Number & Operations in Base Ten  
MD: Measurement & Data    G: Geometry    NF: Number & Operations—Fractions    NS: The Number System  
EE: Expressions & Equations    SP: Statistics & Probability    RP: Ratio & Proportion Relationships    F: Functions

K.G.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces (sizes are compared directly or visually, not compared by measuring). Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

3.MD.6 Measure areas by counting unit squares (square cm, square m, square in, square ft., and improvised units).

7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

7.G.6 Solve real world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Mathematics  
Festival  
Program

## Build It!



Use the MultiLink Cubes at this table to build the cube buildings that are pictured on each task card. Example:



Top



Bottom



Left Side



Right Side

Makes this:



**For an EXTRA CHALLENGE, build this with the SAME COLORS as pictured above!**

04/30/13

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Page #1

# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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**Math Festival:** Geometry      K, 1, 2, 3, 4, 5, 6, 7, 8

### Building Polyhedra

**Grade Span**

#### Materials used with this activity:

- Task Cards
- Geometry Stix™ (4 tubs)
- commercially available through math supply catalogs

#### Comments:

The hardest part of running this station is getting kids to take what they build apart at the end of the session. This Station benefits from having a parent volunteer helping students. Hardest tasks are REALLY hard!

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K.G.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").

K.G.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

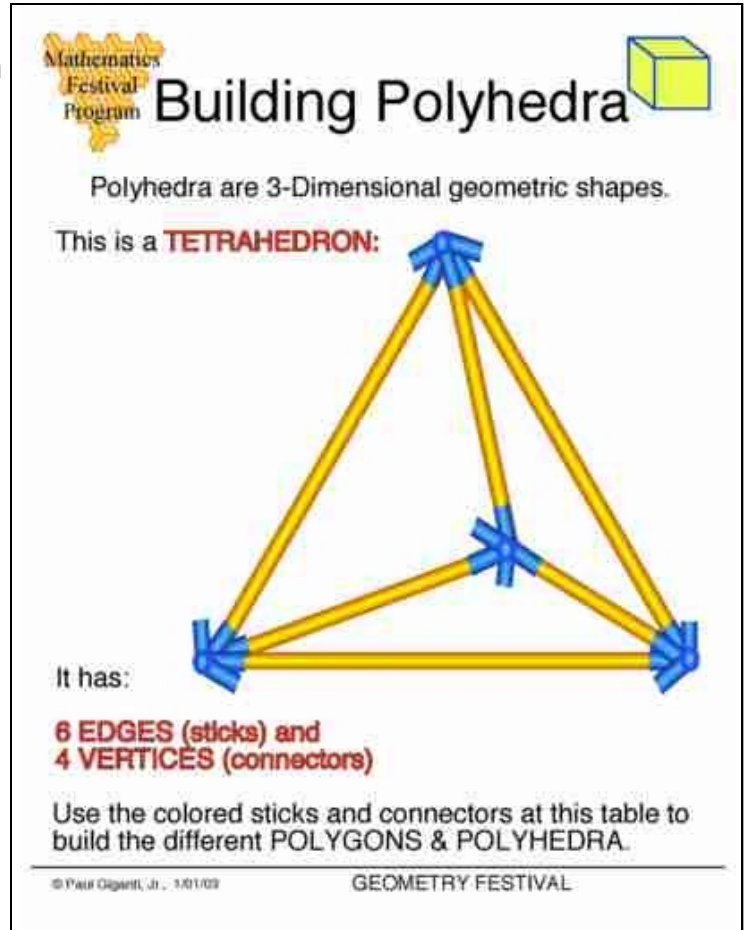
1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.

3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

5.G.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

6.G.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

7.G.6 Solve real world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.



The station card features a logo for the Mathematics Festival Program and a small 3D cube. The title is "Building Polyhedra". Below the title, it states "Polyhedra are 3-Dimensional geometric shapes." and "This is a TETRAHEDRON:". A diagram shows a tetrahedron constructed from yellow sticks and blue connectors. Below the diagram, it lists "It has: 6 EDGES (sticks) and 4 VERTICES (connectors)". At the bottom, it says "Use the colored sticks and connectors at this table to build the different POLYGONS & POLYHEDRA." and includes the copyright "© Paul Giganti, Jr., 1/01/02" and "GEOMETRY FESTIVAL".

# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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**Math Festival:** Geometry

1, 2, 3, 4, 5

### Can You Draw This?

Grade Span

**Materials used with this activity:**

- Task Cards in Sheet Protectors
- Thick White Board Markers
- Cloths or White Board Erasers

#### Comments:

This station is one of the only activities that requires reading because drawing each shape requires following written instructions.

Due to the written instructions, resulting shapes may vary because of differing interpretations. Always ask the question: Why did you draw it that way?

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K.G.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.

K.G.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

K.G.6 Compose simple shapes to form larger shapes.

1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.

2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces (sizes are compared directly or visually, not compared by measuring). Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

4.G.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

7.G.2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

Mathematics Festival Program

## Can You Draw This?

You can turn **WORDS** into a **PICTURE**!

For example:

*I am a large **SQUARE**. Inside me there is a smaller **SQUARE**. Each corner of the the smaller **SQUARE** is touching one of my sides.*

Can help you draw...

At this table, use the **WORD** descriptions to help you draw the pictures. Read carefully!

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# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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**Math Festival:** Geometry      K, 1, 2, 3, 4, 5, 6, 7, 8

**Count How Many**      Grade Span

### Materials used with this activity:

- Task Cards in Sheet Protectors
- Thick White Board Markers
- Cloths or White Board Erasers

### Comments:

While the actual answers are numbers, the task at hand in each problem is to observe and distinguish geometric shapes, both in 2-D drawing and drawings of 3-D objects. This station requires knowledge of geometric shapes and spatial visualization. Younger students may get different answers based upon their more limited spatial visualization skills.

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K.G.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.

K.G.2 Correctly name shapes regardless of their orientations or overall size.

1.G.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.



2.G.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.

3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

4.G.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles. (Two-dimensional shapes should include special triangles, e.g., equilateral, isosceles, scalene, and special quadrilaterals, e.g., rhombus, square, rectangle, parallelogram, trapezoid.) CA

5.G.4 Classify two-dimensional figures in a hierarchy based on properties.

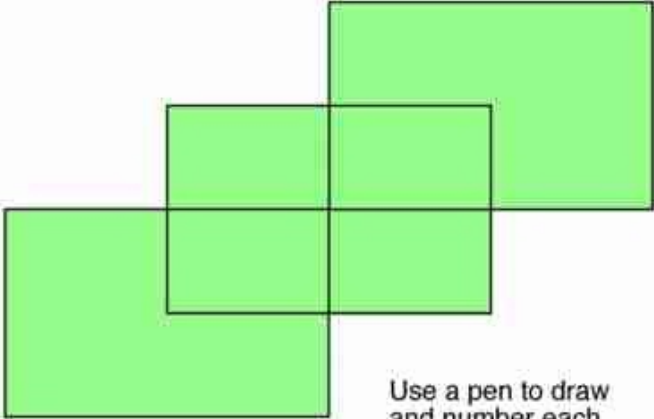
6.G.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.



## Count How Many...

Many shapes can be hidden inside one design. Find and count all of a certain shape inside each design.

For example: How many **RECTANGLES** can you count in this design?



Use a pen to draw and number each shape as you find it.

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# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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Math Festival: Geometry K, 1, 2, 3, 4, 5, 6, 7, 8

### Cube Nets

Grade Span

#### Materials used with this activity:

- Task Cards in Sheet Protectors
- Wooden Cubes
- 26 different Hexomino Pieces (6 squares) sized to fit cube
- Tally Sheets in Sheet Protectors
- Thin White Board Markers and erasers

#### Comments:

The PDF for this station includes reproducible Hexomino Pieces that can be cut out and used with 2cm wooden cubes, and 2cm graph paper students can cut out/record the Cube Nets as they find them.

Some students may persevere in finding all 11 possible Cube Nets; others may find just a few—both are OK.

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K.G.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/æcornersæ) and other attributes (e.g., having sides of equal length).

2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces (sizes are compared directly or visually, not compared by measuring). Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.


5.G.4 Classify two-dimensional figures in a hierarchy based on properties.

6.G.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

7.G.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

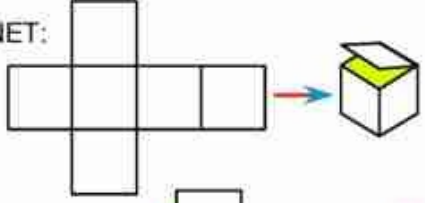


## Cube Nets

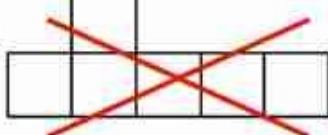


A CUBE NET is **SIX SQUARES** together when folded, completely cover all 6 faces of a cube.

This **IS** a CUBE NET:



This is **NOT** a CUBE NET:



A CUBE NET MUST...

- ✓ have **SIX AND ONLY SIX** squares
- ✓ **COVER ALL SIX** faces of a cube

Wrap each pattern around a real cube to test if it is a CUBE NET. **Some are CUBE NETS; some are not.**

There are **26** patterns at this table, but only **11 are Cube Nets!** Can you find them all?

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# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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**Math Festival:** Geometry

K, 1, 2, 3, 4

### Fill This Space

Grade Span

**Materials used with this activity:**

Task Cards in Sheet Protectors

Cuisenaire Rods (multiple sets)

#### Comments:

Though Cuisenaire Rods™ were originally designed to help primary students understand the base-ten system, when combined with a geometric shape, creates a multi-grades problem solving situation that combines number and spatial skills. Many tasks at this station have multiple answers. Creativity is encouraged.

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K.CC.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects. Compare numbers.

K.OA.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g.,  $5 = 2 + 3$  and  $5 = 4 + 1$ ).



K.OA.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

1.MD.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.

2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces (sizes are compared directly or visually, not compared by measuring). Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

2.NBT.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.


3.G.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.



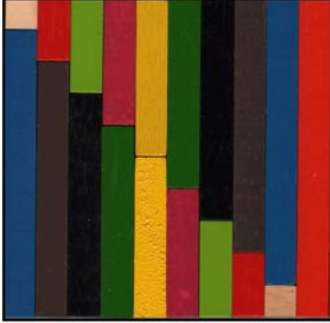
### Fill This Shape

Fill in the shapes using the **COLORED RODS**.  
Use **ONLY** the **NUMBER** of rods asked for.  
For example:

Fill this shape with **EXACTLY 19 rods**.



Here is **ONE** way you can fill this shape with **EXACTLY 19 rods**.



There is often more than one correct way to fill the shape!

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# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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Math Festival: Geometry

K, 1, 2, 3, 4, 5, 6

### Finish-Me Symmetry

Grade Span

Materials used with this activity:

- Task Cards in Sheet Protectors
- Thick White Board Markers
- Cloths or White Board Erasers

#### Comments:

Each of the tasks in this station are based upon one or two lines of reflective symmetry. Students must use a grid overlaying half or a quarter of a recognizable shape, in order to use symmetry to draw the other half or three-quarters of that shape. Simplified coordinate mapping and freehand drawing skills are required.

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K.G.6 Compose simple shapes to form larger shapes.


2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces (sizes are compared directly or visually, not compared by measuring). Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

4.G.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

4.G.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

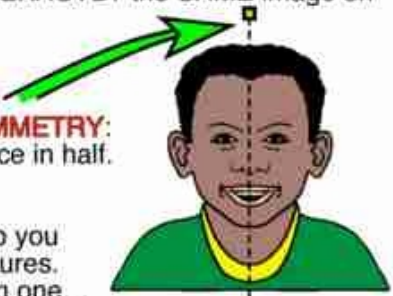
7.G.2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

8.G.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.




### Finish-Me Symmetry

SYMMETRY reflects EXACTLY the SAME image on both sides of a LINE, like a MIRROR.



This is a **LINE of SYMMETRY**: It divides the boy's face in half.

SYMMETRY can help you draw shapes and pictures. If you know what is on one side of a line of SYMMETRY then you can draw in what is on the other side!



At this table, there are Finish-Me Symmetry drawings such as this one:

How many of these Symmetry tasks can you "finish"?

Some of the unfinished drawings have more than one line of SYMMETRY!

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# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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Math Festival: Geometry

K, 1, 2, 3, 4

### Geo-Wrapping Paper

Grade Span

Materials used with this activity:

8-fold Paper Napkins

Baskets of Rubber Stamps with Geometric Shapes

Ink Pads of Different Colors

#### Comments:

This station is predominantly a math-and-art activity. It involves repetitive stamping to make geometric patterns—stamping the same stamp, in the same color, in the same place and position, in each of the 8 rectangles formed by the napkin's folds. It may seem trivial, but it can be quite a challenge for young students while still affording great creative opportunities for older students.

#### Standard(s) for Mathematical Practice

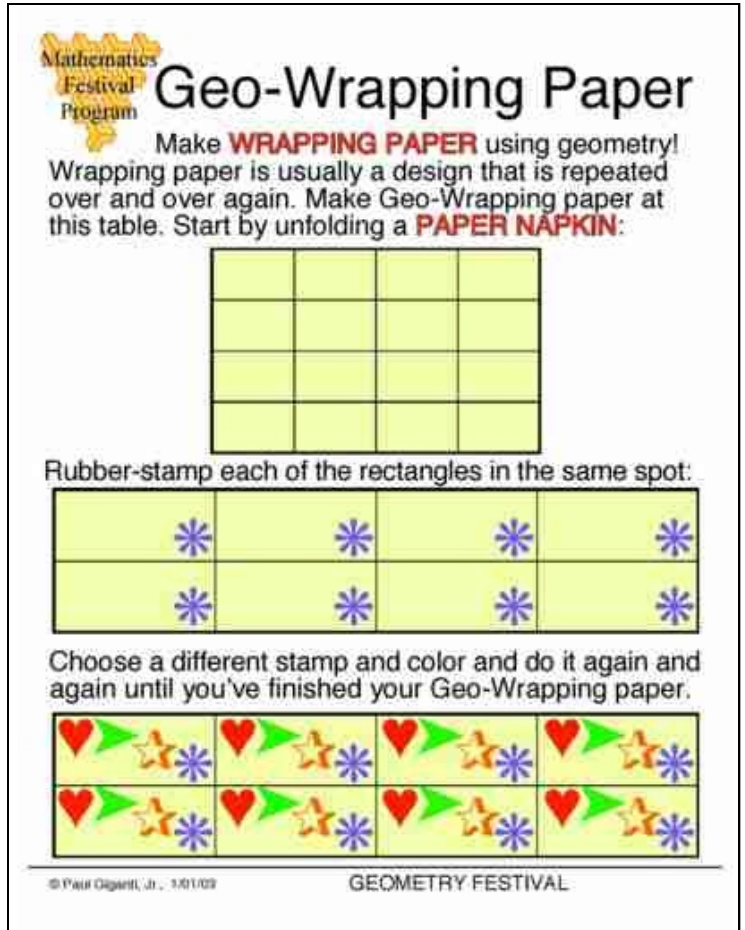
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4.OA.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.

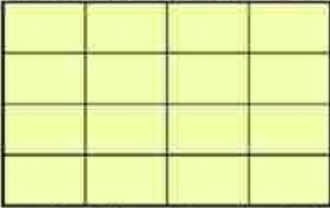
While there are few Common Core grade-level standards correlated to this activity, it is a wonderful cross-curricular activity for young students that blends mathematics and art.



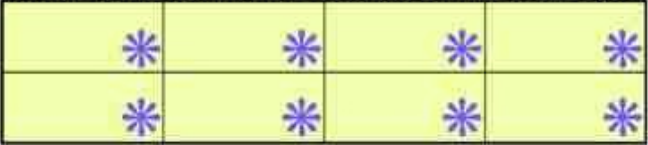
**Mathematics Festival Program**

### Geo-Wrapping Paper


Make **WRAPPING PAPER** using geometry! Wrapping paper is usually a design that is repeated over and over again. Make Geo-Wrapping paper at this table. Start by unfolding a **PAPER NAPKIN**:



Rubber-stamp each of the rectangles in the same spot:



Choose a different stamp and color and do it again and again until you've finished your Geo-Wrapping paper.



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# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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Math Festival: Geometry K, 1, 2, 3, 4, 5, 6, 7, 8

### HEX, the Game

Grade Span

#### Materials used with this activity:

- Game Cards in Sheet Protectors
- Task Cards in Sheet Protectors
- Cloths or White Board Erasers

#### Comments:

HEX is similar to Tic-Tac-Toe, but involving a much more sophisticated strategy. It is a two-player game for all ages, simple to play but requiring strategic blocking and planning ahead more than one move.

John Nash, a Nobel Laureate, proved that no matter how you play, there will ALWAYS be a winner—no ties!

#### Standard(s) for Mathematical Practice

- 1) Make sense of problems & persevere in solving them.
- 2) Reason abstractly and quantitatively.
- 3) Construct viable arguments and critique the reasoning of others.
- 7) Look for and make use of structure.

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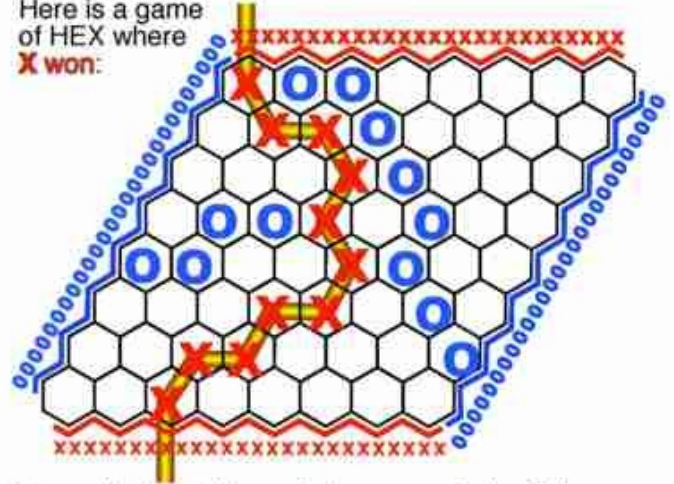
There are no Common Core grade level standards that specifically address either logic or strategic planning, so HEX is best addressed by the Common Core Mathematical Practices above.



### The Game of HEX

In HEX one person is **X**, and the other is **O**. Take turns putting your mark inside ANY empty HEXAGON on the board. The person who makes a **continuous PATH** from their side to their other side is the **WINNER!**

Here is a game of HEX where **X** won:



Your path doesn't have to be connected until the very end. You can place your mark **ANYWHERE** each time.

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GEOMETRY FESTIVAL

# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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**Math Festival: Geometry**

4, 5, 6, 7, 8

### Investigating Diagonals Grade Span

**Materials used with this activity:**

- Task Cards in Sheet Protectors
- Thick White Board Markers
- Cloths or White Board Erasers
- Rulers

**Comments:**

Investigating the diagonals of polygons reveals an interesting spacial pattern that is true of all polygons. The number pattern that is generated in the T-table can be discovered by a systematic investigation and careful observation. Younger students can simply draw the lines and fill in the table; older students can deduce the algebraic generalization for all polygons' diagonals.

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4.G.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.


4.OA.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.

5.OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.

5.G.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category.

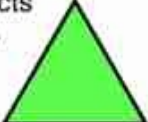
6.EE.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

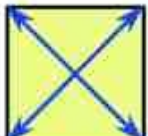
8.F.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.



## Investigating Diagonals

A **DIAGONAL** is a straight line that connects any two **OPPOSITE** corners of a polygon.


A **TRIANGLE** has **NO** DIAGONALS: 

A **SQUARE** has **TWO** DIAGONALS: 

Draw and count the **DIAGONALS** of the shapes at this table, then fill in the chart. There's a pattern; can you find it?

Name of Polygon	Number of Sides	Number of Diagonals
TRIANGLE	3	0
SQUARE	4	2
PENTAGON	5	?
HEXAGON	6	?
HEPTAGON	7	?
OCTAGON	8	?
NONAGON	⋮	?
DECAGON	⋮	?
...	⋮	...
N-GON	N	?

HINT: Use a ruler and draw your diagonals in a systematic way so you don't miss any or count any diagonal twice!



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# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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**Math Festival: Geometry** 3, 4, 5, 6, 7, 8

### Let's Tessellate!

Grade Span

#### Materials used with this activity:

Commercial Plastic Tessellation Tiles (a variety)

White Paper

Sharp Pencils

Crayons

(students can make their own original tessellating tiles out of card-stock, but that requires a lesson in tessellation.)

#### Comments:

M.C. Escher made tessellations famous with his artwork. Using commercially available tiles, even primary students can create original, artistic tessellation art work. Students select ONE tile, tracing it with pencil in the middle of the page. Moving outward from there, the tile is traced where it fits snug without gaps. When done, the student color the drawing in a creative way.

#### Standard(s) for Mathematical Practice

- 4) Model with mathematics.
- 5) Use appropriate tools strategically.
- 6) Attend to precision.

#### Related K, 1, 2, 3, 4, 5, 6, 7, or 8th grade Standards:

CC: Counting & Cardinality    OA: Operations & Algebraic Thinking    NBT: Number & Operations in Base Ten  
MD: Measurement & Data    G: Geometry    NF: Number & Operations—Fractions    NS: The Number System  
EE: Expressions & Equations    SP: Statistics & Probability    RP: Ratio & Proportion Relationships    F: Functions

While there are few Common Core K–8 standards correlated to this activity, it is a wonderful cross-curricular activity for students which blends mathematics and art.

8.G.1 Verify experimentally the properties of rotations, reflections, and translations: lines are taken to lines, and line segments to line segments of the same length. b. Angles are taken to angles of the same measure; parallel lines are taken to parallel lines.

High school geometry students will study transformational geometry, which is the basis for all art based upon tessellations.

Mathematics Festival Program **Let's Tessellate!**

A TESSELLATION is a geometric shape or design that can be "TILED" to COMPLETELY fill up a flat space.

This is a Tessellating Tile:

Here is how this Tile makes a TESSELLATION:

Try tracing some of the Tessellating Tiles onto paper. Be CREATIVE; add color and details to your drawing.

Watch out! Some shapes tessellate and some DON'T!

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# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

© Paul Giganti, Jr., 2001

**Math Festival:** Geometry

1, 2, 3, 4, 5

### Make a Square/Triangle Grade Span

**Materials used with this activity:**

- Scissors
- Glue Sticks
- Photocopies of puzzle pieces
- Photocopies of triangle and square frames

**Comments:**

Make a Square/Triangle is what's called a transformation in geometry: the same puzzle shapes can make EITHER a square or a triangle by being arranged in different ways. If color and abstract designs are added before cutting out the pieces, once the students solve the two puzzles, these can be glued to the frame of their choice to make a piece of math art!

**Standard(s) for Mathematical Practice**

- 1) Make sense of problems & persevere in solving them.
- 2) Reason abstractly and quantitatively.
- 7) Look for and make use of structure.

**Related K, 1, 2, 3, 4, 5, 6, 7, or 8th grade Standards:**

CC: Counting & Cardinality    OA: Operations & Algebraic Thinking    NBT: Number & Operations in Base Ten  
MD: Measurement & Data    G: Geometry    NF: Number & Operations—Fractions    NS: The Number System  
EE: Expressions & Equations    SP: Statistics & Probability    RP: Ratio & Proportion Relationships    F: Functions

**Mathematics Festival Program** **Make a Square-Triangle**

This puzzle makes TWO DIFFERENT shapes.

These four pieces:

can make a ...

... or a

**Color all 4 pieces with two or more colors, then cut the pieces out carefully around the black line. Make BOTH the SQUARE and the TRIANGLE inside their frames. Choose the one you like best. Then GLUE the pieces.**

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K.G.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.

8.G.1 Verify experimentally the properties of rotations, reflections, and translations: lines are taken to lines, and line segments to line segments of the same length. b. Angles are taken to angles of the same measure; parallel lines are taken to parallel lines.

# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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**Math Festival: Geometry**

K, 1, 2, 3, 4, 5, 6

### Making Polygons

Grade Span

**Materials used with this activity:**

Task Cards in Sheet Protectors

Six Sets of Wooden Linked-Craft Sticks (six sticks each)

**Comments:**

Linked sticks are made by drilling 3/16 holes in both ends of each craft stick (tongue depressor), then joining SIX of these craft sticks together with five brass brads through the holes.


Hint: How many sticks would you need to build the last task on the sheet?

**Standard(s) for Mathematical Practice**

- 1) Make sense of problems & persevere in solving them.
- 2) Reason abstractly and quantitatively.
- 4) Model with mathematics.
- 5) Use appropriate tools strategically.

**Related K, 1, 2, 3, 4, 5, 6, 7, or 8th grade Standards:**


CC: Counting & Cardinality    OA: Operations & Algebraic Thinking    NBT: Number & Operations in Base Ten  
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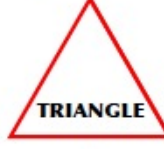










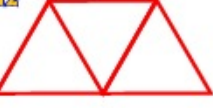


Mathematics  
Festival  
Program

## Making Polygons

With your partner, make the following POLYGONS:



<p>1</p>  <p>TRIANGLE</p>	<p>2</p>  <p>SQUARE</p>	<p>3</p>  <p>HOUR GLASS</p>
<p>4</p>  <p>PENTAGON</p>	<p>5</p>  <p>HEXAGON</p>	<p>6</p>  <p>RHOMBUS</p>
<p>7</p>  <p>LONG RECTANGLE</p>	<p>8</p>  <p>PARALLOGRAM</p>	<p>9</p>  <p>TRAPEZOID</p>
<p>10</p>  <p>TRIANGLE inside a SQUARE</p>	<p>11</p> <p>THE LETTER</p> 	<p>12</p>  <p>CAN YOU MAKE THIS?</p>
<p>© Paul Giganti, Jr., 1/01/03</p>		

K.G.2 Correctly name shapes regardless of their orientations or overall size.

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K.G.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

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2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces (sizes are compared directly or visually, not compared by measuring). Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

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4.G.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

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# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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Math Festival: Geometry

K, 1, 2, 3, 4, 5, 6

### Math & Literature

Grade Span

Materials used with this activity:

A Variety of Math-Themed Children's Literature Books

#### Comments:

This Math Festival station includes a list of suggested books for this station, a great starter list for a classroom Math & Literature library. It also includes an article on the best ways parents can draw out the math while reading a math-themed book with their children.

#### Standard(s) for Mathematical Practice

- 1) Make sense of problems & persevere in solving them.
- 2) Reason abstractly and quantitatively.
- 4) Model with mathematics.

#### Related K, 1, 2, 3, 4, 5, 6, 7, or 8th grade Standards:

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There are MANY related CACSSM Standards that go with this Math Festival station, but each depends on the book chosen and the math concepts within.



## Math & Literature

Did you know that MATH is not just found in your math textbook? You can also find math in many children's books!

In *the Greedy Triangle*, you'll learn how a triangle "morphs" into all sorts of new geometric shapes:



In *Alexander, Who Used to Be Rich Last Sunday*, you'll learn how NOT to lose your allowance:



In *Each Orange Had 8 Slices*, you'll see that MULTIPLICATION is every where you look in the real world:



...And many more! Have a seat at this table and discover all the math you can find in the wonderful children's **books with MATH inside**.

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ALGEBRA FESTIVAL

Activity Card # 1

# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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**Math Festival:** Geometry      K, 1, 2, 3, 4, 5, 6, 7, 8

### MIRA Fun!

**Grade Span**

#### Materials used with this activity:

- Task Cards in Sheet Protectors
- MIRA—reflective and translucent plastic frames  
(While commercially available, these can be constructed by cutting colored plexiglass into 8" X 4" rectangles)

#### Comments:

No vast knowledge of symmetry is required here;—only problem solving and intuition—so even young children can figure out complex reflection angles to solve each task. While commercially available, these can be constructed by cutting plexiglass that is of a color that make it BOTH reflective and transparent. Size is approx. 8" X 4". No side frame handles are necessary.

#### Standard(s) for Mathematical Practice

- 1) Make sense of problems & persevere in solving them.
- 2) Reason abstractly and quantitatively.
- 5) Use appropriate tools strategically.
- 8) Look for and express regularity in repeated reasoning.

#### Related K, 1, 2, 3, 4, 5, 6, 7, or 8th grade Standards:

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EE: Expressions & Equations    SP: Statistics & Probability    RP: Ratio & Proportion Relationships    F: Functions

4.G.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

8.G.1 Verify experimentally the properties of rotations, reflections, and translations: lines are taken to lines, and line segments to line segments of the same length. b. Angles are taken to angles of the same measure; parallel lines are taken to parallel lines.

Mathematics Festival Program

## MIRA Fun!

This is a **MIRA**:

It works like a mirror, but **BETTER!**

With it you can perform **MATH MAGIC** with **SYMMETRY**.

For example, here is a car **OUTSIDE** its garage:

With the MIRA, you can put the car **INSIDE** its garage:

Use a **MIRA** for **SYMMETRY MAGIC** at this table.

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# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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Math Festival: Geometry

K, 1, 2, 3, 4, 5, 6

### Pattern Block Recipes

Grade Span

#### Materials used with this activity:

Recipe Task Cards in Sheet Protectors

Pattern Blocks in Baskets

#### Comments:

Each task card is a "recipe" where students first get out the "ingredients" they need, the Pattern Blocks that are required, then build the pictured shape from just those blocks in the recipe.

All pieces must fit within the black outline with nothing pointing out or any holes inside.

#### Standard(s) for Mathematical Practice

- 1) Make sense of problems & persevere in solving them.
- 2) Reason abstractly and quantitatively.
- 4) Model with mathematics.
- 5) Use appropriate tools strategically.
- 6) Attend to precision.

#### Related K, 1, 2, 3, 4, 5, 6, 7, or 8th grade Standards:

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EE: Expressions & Equations    SP: Statistics & Probability    RP: Ratio & Proportion Relationships    F: Functions

K.G.6 Compose simple shapes to form larger shapes.

1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.



6.G.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.


Mathematics Festival Program

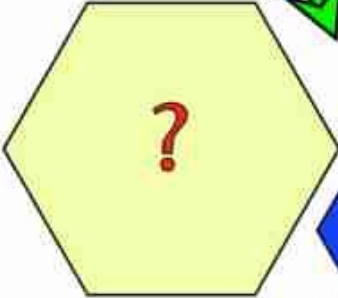
### Pattern Block Recipes

A PATTERN BLOCK RECIPE is a list of INGREDIENTS you NEED to make a certain shape.

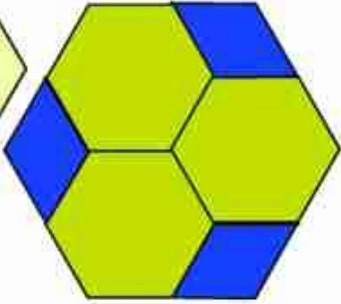
Here is a Recipe: **YOU WILL NEED:**

**3 HEXAGONS**  **3 RHOMBUSES** 

**Use them to MAKE:** 



If you follow the recipe, you will get:



Use **Pattern Blocks** to make the PATTERN BLOCK RECIPES.

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K.G.6 Compose simple shapes to form larger shapes.

1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.

6.G.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.



# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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**Math Festival:** Geometry      K, 1, 2, 3, 4, 5, 6, 7, 8

### Polyhedraville

**Grade Span**

**Materials used with this activity:**

- Task Cards in Sheet Protectors
- ITSPHUN polygon pieces (Amazon)

**Comments:**

Polyhedra are 3D geometric shapes with 2D faces (sides) of regular polygons such as triangles, squares, pentagons, hexagons, etc. Some polyhedra are simple such as a tetrahedron with four triangle faces, some are complex, such as a Truncated Icosahedron, the shape of a soccer ball. At this station students of all ages can make countless polyhedra of their choice and ability.

**Standard(s) for Mathematical Practice**

- 1) Make sense of problems & persevere in solving them.
- 2) Reason abstractly and quantitatively.
- 5) Use appropriate tools strategically.
- 7) Look for and make use of structure.

**Related K, 1, 2, 3, 4, 5, 6, 7, or 8th grade Standards:**

CC: Counting & Cardinality    OA: Operations & Algebraic Thinking    NBT: Number & Operations in Base Ten  
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EE: Expressions & Equations    SP: Statistics & Probability    RP: Ratio & Proportion Relationships    F: Functions

1.G.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.

1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.

2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces (sizes are compared directly or visually, not compared by measuring). Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

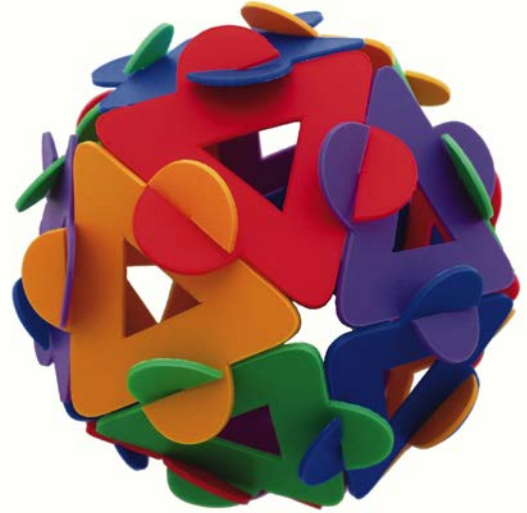
6.G.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.



### Polyhedraville



Use the **ITSPHUN® polygons** at this table to build all kinds of **polyhedra**.



**For an EXTRA CHALLENGE, build these with the SAME COLORS as pictured!**

polygon pieces copyrighted by ITSPHUN LLC, 2012 Visit: itsphun.com

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GEOMETRY FESTIVAL

Activity Page #1

# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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Math Festival: Geometry

4, 5, 6, 7, 8

### Proportional Drawing

Grade Span

Materials used with this activity:

Double-width Task Cards in Sheet Protectors

Thin White Board Markers

Cloths or White Board Erasers

Rulers

#### Comments:

While this is a classic artist's technique for enlarging small drawings into much larger ones, it is also a practical use of two-axis coordinate points and careful measurement. This activity provides students with a simple example of the power of proportional reasoning. If students make their own grids, large and small, there is a TON of measurement and planning involved!

#### Standard(s) for Mathematical Practice

- 1) Make sense of problems & persevere in solving them.
- 2) Reason abstractly and quantitatively.
- 4) Model with mathematics.
- 5) Use appropriate tools strategically.
- 6) Attend to precision.

#### Related K, 1, 2, 3, 4, 5, 6, 7, or 8th grade Standards:

CC: Counting & Cardinality    OA: Operations & Algebraic Thinking    NBT: Number & Operations in Base Ten  
MD: Measurement & Data    G: Geometry    NF: Number & Operations—Fractions    NS: The Number System  
EE: Expressions & Equations    SP: Statistics & Probability    RP: Ratio & Proportion Relationships    F: Functions

5.G.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two

6.G.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

6.RP.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

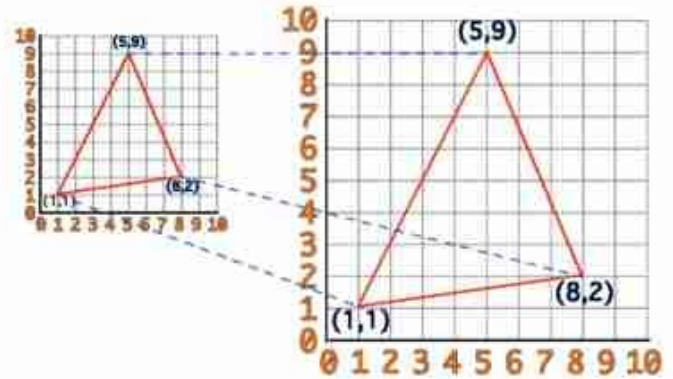
7.RP.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.



### Proportional Drawing

Geometry is useful to artists. They use it to accurately **ENLARGE** a picture and keep its proportions the same.

If you copy a picture from a small grid, line by line, onto a matching but larger grid, you can make an **EXACT** enlargement of the smaller drawing, like this:



Enlarge the pictures at this table. Copy ONE line at a time. **Use the numbers on the grids** to carefully locate the same place on each grid. Keep checking!

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GEOMETRY FESTIVAL

# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

© Paul Giganti, Jr., 2001

Math Festival: Geometry 1, 2, 3, 4, 5, 6, 7, 8

### SPROUTS, the Game

Grade Span

#### Materials used with this activity:

- Task Cards in Sheet Protectors
- Thick White Board Markers
- Cloths or White Board Erasers

#### Comments:

SPROUTS is a two person game that's played with two colored markers on paper. The rules on what each player can and must do on each of their turns are simple and straight-forward. The last player who can take a turn without breaking the rules is the winner. Frequently interesting animals and objects can be seen in the end results, much like a Rorschach test.

#### Standard(s) for Mathematical Practice

- 2) Reason abstractly and quantitatively.
- 3) Construct viable arguments and critique the reasoning of others.
- 7) Look for and make use of structure.

#### Related K, 1, 2, 3, 4, 5, 6, 7, or 8th grade Standards:

CC: Counting & Cardinality    OA: Operations & Algebraic Thinking    NBT: Number & Operations in Base Ten  
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There are no Common Core grade level standards that specifically address either logic or strategic planning, so HEX is best addressed by the Common Core Mathematical Practices above.



### The SPROUTS Game

Here are the rules to the game of SPROUTS:

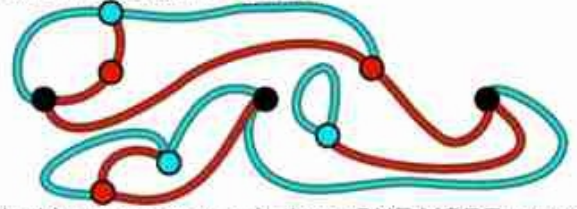
- ★ 2 people take turns playing on one game board,
- ★ For your turn, draw a curved line from any DOT to any DOT, **WITHOUT CROSSING ANY LINE**. Then add a **NEW DOT** somewhere on the line:



- ★ You **MAY NOT** take off, or land on, any dot that already has **THREE PATHS** into it.



- ★ The last person who can draw a line following these rules is the **WINNER!**



Is this game over, or is there ONE MORE move?

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GEOMETRY FESTIVAL

# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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**Math Festival:** Geometry

4, 5, 6, 7, 8

### Straight Line Designs

Grade Span

**Materials used with this activity:**

- Task Cards in Sheet Protectors
- Thin White Board Markers
- Cloths or White Board Erasers
- Rulers

#### Comments:

By using a ruler and following directions, students produce an interesting math design(s) that, while made entirely of straight lines, appear to produce smooth curves. Not only great practice for repeated measuring and use of a ruler, but the finished projects make a beautiful math & art bulletin board!

#### Standard(s) for Mathematical Practice

- 1) Make sense of problems & persevere in solving them.
- 5) Use appropriate tools strategically.
- 6) Attend to precision.

#### Related K, 1, 2, 3, 4, 5, 6, 7, or 8th grade Standards:

CC: Counting & Cardinality    OA: Operations & Algebraic Thinking    NBT: Number & Operations in Base Ten  
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1.MD.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.

2.MD.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.

2.MD.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

3.MD.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units: whole numbers, halves, or quarters.

4.MD.5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through  $\frac{1}{360}$  of a circle is called a "one-degree angle." and can be used to measure angles. And an angle that turns through  $n$

4.G.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Mathematics Festival Program

### Straight Line Designs

Did you know that you can make **STRAIGHT LINES** look just like a **CURVE**? Use this idea to make designs.

Start with any **ANGLE**. Divide and number its **RAYs** in equal units, such as this:

These are the **RAYs** of this angle:

If you connect the first point on one ray with the last point on the other ray, and so on, and so on ...

... you "**stitch a curve!**" Now try it with the other Angle Frames at this table.

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# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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Math Festival: Geometry 1, 2, 3, 4, 5, 6, 7, 8

### Tangram Investigations Grade Span

Materials used with this activity:

Tangram Investigation Tables in Sheet Protectors

Sets of Tangram Puzzles

#### Comments:

Unlike the Tangram puzzles that make recognizable figures, the Investigations chart outlines five common triangle and quadrilaterals that can be made with one, two, three, four, five, six, or all seven traditional Tangram puzzle pieces. Most, but not all, the shapes can be made with each number of the pieces. Note: the more the pieces the harder it is to make the polygon!

#### Standard(s) for Mathematical Practice

- 1) Make sense of problems & persevere in solving them.
- 2) Reason abstractly and quantitatively.
- 4) Model with mathematics.
- 7) Look for and make use of structure.

#### Related K, 1, 2, 3, 4, 5, 6, 7, or 8th grade Standards:


CC: Counting & Cardinality    OA: Operations & Algebraic Thinking    NBT: Number & Operations in Base Ten  
 MD: Measurement & Data    G: Geometry    NF: Number & Operations—Fractions    NS: The Number System  
 EE: Expressions & Equations    SP: Statistics & Probability    RP: Ratio & Proportion Relationships    F: Functions

K.G.6 Compose simple shapes to form larger shapes.


1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.

2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces (sizes are compared directly or visually, not compared by measuring). Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

5.G.4 Classify two-dimensional figures in a hierarchy based on properties.








**Tangram Investigation**

TANGRAMS are geometry pieces that can make 1000's of DIFFERENT puzzles. Here they are:



Use the **GIANT TANGRAM** pieces at this table to make the shapes listed in the chart below. Use **ONLY** the number of pieces listed at the top of the chart!

Number of Tangram pieces needed...

		1	2	3	4	5	6	7
...to make these shapes		POSSIBLE						
								
		NOT POSSIBLE						
								
								

*Some of the puzzles in the chart are **IMPOSSIBLE!***

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# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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**Math Festival:** Geometry      K, 1, 2, 3, 4, 5, 6, 7, 8

### TANGRAM Puzzles

**Grade Span**

**Materials used with this activity:**

- Tangram Puzzles (six sets)
- Task Cards in Sheet Protectors

**Comments:**

A Classic ancient Chinese geometry puzzle that is both simple and extremely versatile. The seven geometric pieces can make THOUSANDS of recognizable animals and figures such as the whale on the poster. The more Tangram pieces a puzzles requires, the harder it is to figure out, yet there are Tangram puzzles to challenge all ages from Kinder through adult!

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Mathematics Festival Program

## TANGRAM Puzzles

TANGRAMS are **7 geometry pieces** that can be made into **1000's** of **DIFFERENT shapes**. Here they are:

- small Triangle
- small Triangle
- parallelogram
- square
- medium Triangle
- large Triangle
- large Triangle

With these 7 pieces, you can make puzzles such as this:

**What am I?**

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K.G.6 Compose simple shapes to form larger shapes.

1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.

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# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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Math Festival: Geometry 1, 2, 3, 4, 5, 6, 7, 8

### Tracing Networks

Grade Span

#### Materials used with this activity:

- Task Cards in Sheet Protectors
- Thick White Board Markers
- Cloths or White Board Erasers

#### Comments:

Network theory is a branch of mathematics used by airlines to plot the most efficient routes between cities. Tracing Networks require that students "trace" a network without tracing over a path (line) more than once. The dots could be thought of as the cities and the lines the air routes. Students must find the most efficient path between the "cities;" harder than it looks!

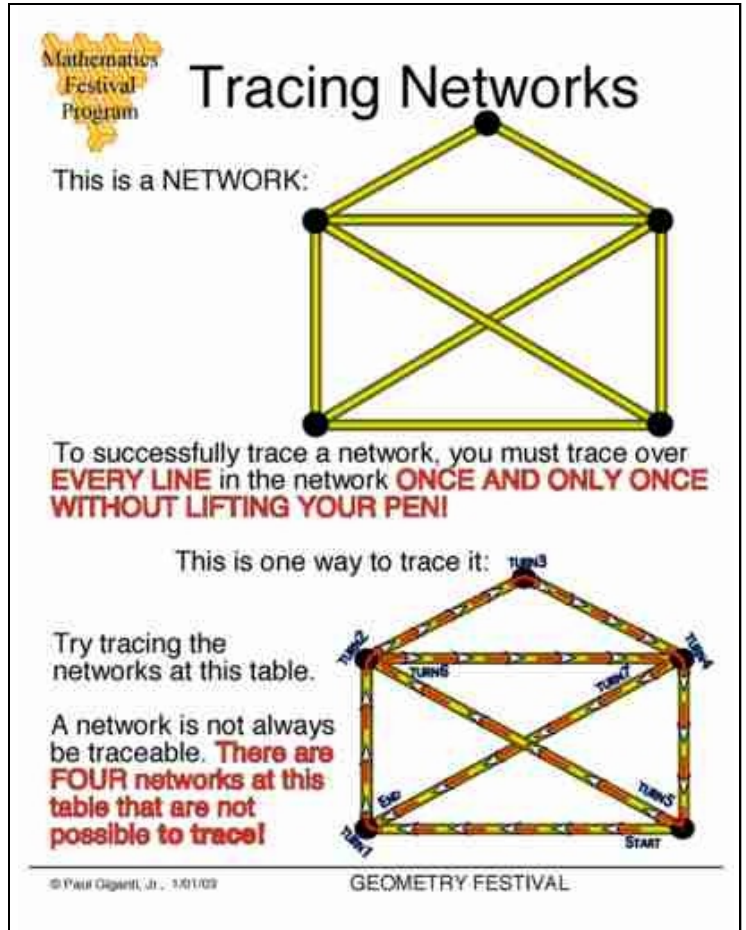
#### Standard(s) for Mathematical Practice

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There are no Common Core grade level geometry standards that specifically address the study of networks, but the study of networks based upon rules have many practical uses, such as finding the best routes for airlines and buses.



The poster is titled "Tracing Networks" and features a logo for the "Mathematics Festival Program" in the top left corner. The main title "Tracing Networks" is in a large, bold font. Below the title, it says "This is a NETWORK:" followed by a diagram of a network with six vertices and nine edges. The edges are arranged in a square with both diagonals, and a horizontal line connecting the two top vertices. Below the diagram, it says "To successfully trace a network, you must trace over EVERY LINE in the network ONCE AND ONLY ONCE WITHOUT LIFTING YOUR PEN!".

Below this, it says "This is one way to trace it:" followed by a diagram of the same network where each edge is colored with a different pattern. The vertices are labeled "START" at the bottom right and "END" at the bottom left. The edges are labeled with "TURNS" at various points along the path.

Below the second diagram, it says "Try tracing the networks at this table." and "A network is not always be traceable. There are FOUR networks at this table that are not possible to trace!".

At the bottom of the poster, it says "© Paul Giganti, Jr., 1/01/02" and "GEOMETRY FESTIVAL".

# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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Math Festival: Geometry 2, 3, 4, 5, 6, 7, 8

### Transformations!

Grade Span

#### Materials used with this activity:

Transformation Puzzle sets (6)

Task Cards in Sheet Protectors

#### Comments:

A very versatile five piece puzzle by Sam Loyd, perhaps America's greatest ever puzzle maker. The same five pieces when rearranged and make a dozen different geometric shapes. This is another transformational geometry puzzle. If you're smart enough, you can move and rotate one piece to make a completely different shape!

#### Standard(s) for Mathematical Practice

- 1) Make sense of problems & persevere in solving them.
- 2) Reason abstractly and quantitatively.
- 6) Attend to precision.
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1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.

Mathematics Festival Program

## Transformations!

Sam Loyd, the great puzzlemaker, invented a TRANSFORMATION PUZZLE. With these 5 pieces you can make SEVEN DIFFERENT shapes!

The **SAME** 5 pieces make each of these shapes. Can you make all SEVEN?

SQUARE    RECTANGLE    RIGHT TRIANGLE    CROSS    QUADRILATERAL    TRAPEZOID    PARALLELOGRAM

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# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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**Math Festival:** Geometry      K, 1, 2, 3, 4, 5, 6, 7, 8

### What's My Area?

Grade Span

#### Materials used with this activity:

- Task Cards in Sheet Protectors
- Thin White Board Markers
- Cloths or White Board Erasers

#### Comments:

A graphic way to see and practice the concept of area from the simple counting of square units to the use of formulas. Some non-standard geometry shapes even require estimation. This station is an investigation of area from simple to complex.

#### Standard(s) for Mathematical Practice

- 1) Make sense of problems & persevere in solving them.
- 2) Reason abstractly and quantitatively.
- 4) Model with mathematics.
- 6) Attend to precision.
- 7) Look for and make use of structure.

#### Related K, 1, 2, 3, 4, 5, 6, 7, or 8th grade Standards:

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3.G.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.

---

3.MD.5 Recognize area as an attribute of plane figures and understand concepts of area measurement.

---

3.MD.6 Measure areas by counting unit squares (square cm, square m, square in, square ft., and improvised units).

---

3.MD.7 Relate area to the operations of multiplication and addition.

---

4.MD.3 Apply the area and perimeter formulas for rectangles in real-world and mathematical problems.

---

6.G.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.


---

7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

---


7.G.4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

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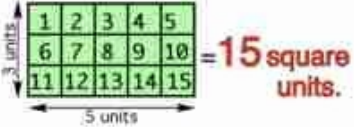


Mathematics  
Festival  
Program

## What's My Area?

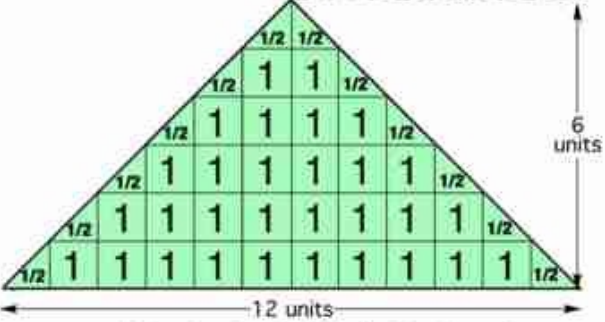


The AREA of a shape is the **TOTAL NUMBER of SQUARE UNITS** that it takes to cover that shape.



The AREA of this shape = **15 square units.**

Find the area of each of the shapes at this table.  
**Count every square unit inside** a shape including parts of a square unit. Check it twice to be sure!



What is the AREA of this shape?

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3.G.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.

---

3.MD.5 Recognize area as an attribute of plane figures and understand concepts of area measurement.

---

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---

# Math Festival Stations Correlation

## to the COMMON CORE Standards in Mathematics

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Math Festival: Geometry K, 1, 2, 3, 4, 5, 6, 7, 8

### What's My Perimeter? Grade Span

#### Materials used with this activity:

- Task Cards in Sheet Protectors
- Thin White Board Markers
- Cloths or White Board Erasers

#### Comments:

A graphic way to see and practice the concept of perimeter from the simple counting of sides of square units to the use of formulas, both standard and invented. Some of the shapes even require estimation. This station is an investigation of perimeter from simple to complex.

#### Standard(s) for Mathematical Practice

- 1) Make sense of problems & persevere in solving them.
- 2) Reason abstractly and quantitatively..
- 4) Model with mathematics.
- 6) Attend to precision.
- 7) Look for and make use of structure.

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K.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.

3.MD.8 Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

4.MD.3 Apply the area and perimeter formulas for rectangles in real-world and mathematical problems.

K.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.

Mathematics Festival Program

### What's My Perimeter?

The PERIMETER of a shape is the distance in **UNITS AROUND the shape ONCE.**

This shape's PERIMETER = 16 units.

Find the PERIMETER of the shapes at this table. Count every unit-side around the **OUTSIDE** of a shape.

What is the PERIMETER of this shape?

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