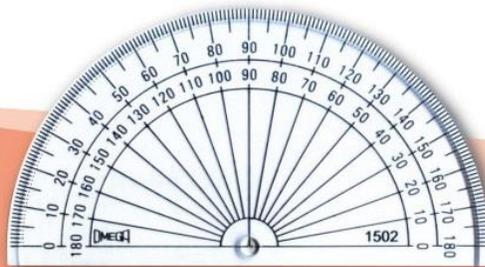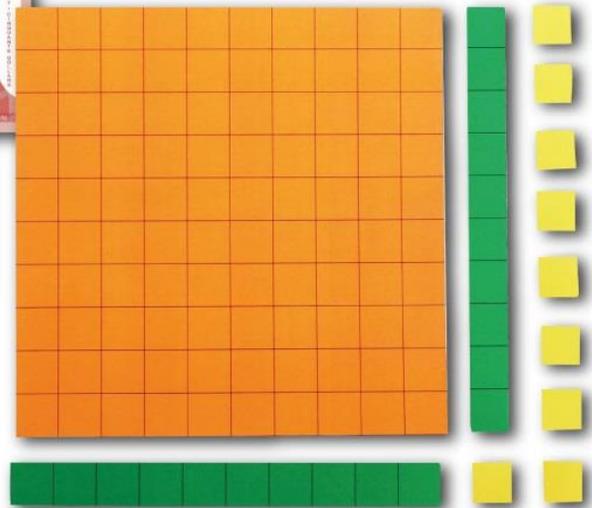# Learn at Home
JUNIOR

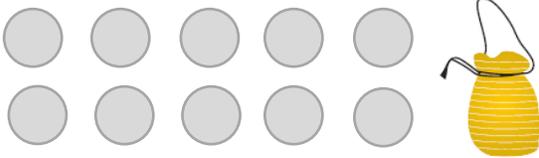# Math Kit
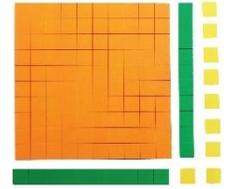
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Junior Tasks	Money (Bills and Coins) $5, $10, $20, $50, $100 (Total 25 pcs) and Coins (120 pcs)
1 **Coins in Your Bag**	You have 10 coins in the bag, what value could you have in your bag?
2 **Quarters**	How many quarters make $100? How would this information help you know other dollar amounts in quarters?
3 **Coin Story**	I had 15 coins and traded some coins in for coins of equal value and ended up with 11 coins. Can you create a story where this could happen? Can you create another story? Story A Story B:
4 **Constant Rate**	Decide on a price for 24 doughnuts. At that price, what will 6 donuts cost?
5 **Would You Rather?**	Would you rather have a stack of quarters as tall as you or $100? Why?
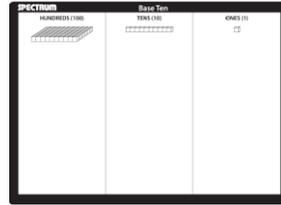
Junior Tasks	Base Ten & Mat
1 **Represent a Number**	Use base ten blocks to represent a number that has half as many hundreds blocks as tens blocks. What could your number be?
2 **Matching Models**	Using 22 base ten blocks - what different numbers could you represent? Can you represent these numbers any other way?
3 **Number Wonder**	A number with lots of 8's in it is less than a number with lots of 2's in it. How is this possible? Use base ten blocks to justify your thinking?
4 **Bug Home**	Build 2 different homes for a bug with the base ten blocks. Estimate the value of each home, then count the value of home. Which one has a greater value? How much greater?
5 **Less is More or Is it?**	Explain a situation where it would take fewer base ten blocks to represent a greater number.
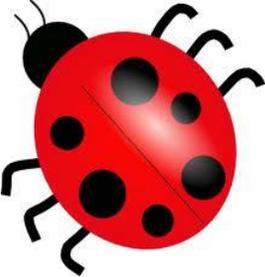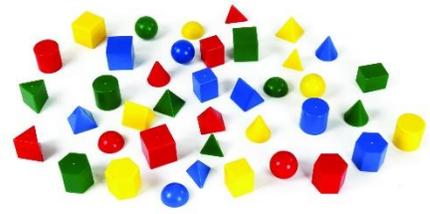
Junior Tasks	Geometric Solids (10 pcs per set) Assorted Colour- No colour choice
1 **Making Nets**	Choose one 3D figure. Trace one side of the figure and use that to help you create a net for it. Can you create another net for the same figure that looks different?
2 **Finding Volume**	Choose 2 shapes. Which has a larger volume? Prove it.
3 **Surface Area**	Choose 3 shapes. Which has the largest surface area? Prove it.
4 **Prisms vs. Pyramids**	How are prisms like pyramids? How are they different? Fill in the chart

Prisms   Pyramids
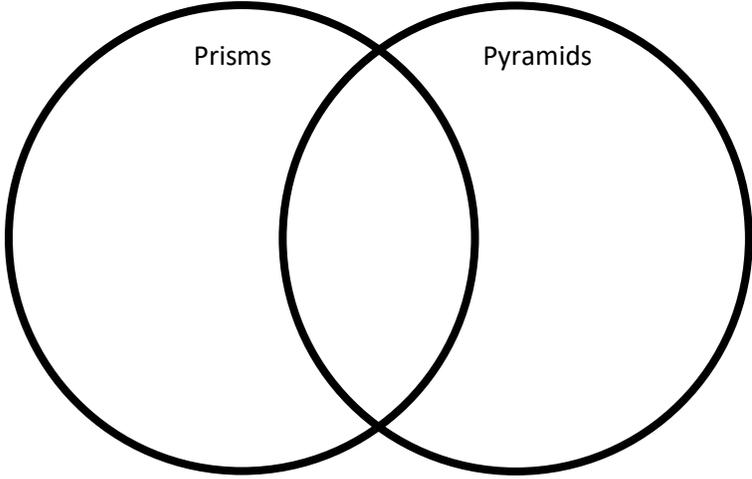
| 5 **Properties of Figures** | Fill in the chart |

Shape	Rectangular Prism	Triangular Prism
# of faces		
# of vertices		
# of edges		

What do you notice about the two shapes?

Junior Tasks	Venn Diagram Mat
1 **Sorting Tangrams**	Sort your tangrams into the Venn Diagram. Describe how you sorted the shapes.
2 **Sorting 3D Figures**	Choose some geometric solids. How could you organize them in the Venn diagram? Could you do it another way?
3 **Sorting Numbers**	Use the numbers 1-10, and sort them into a Venn Diagram. Describe how you sorted the numbers.
4 **Using Venn Diagrams to Solve Problems**	Put the following information into a Venn Diagram to help answer some questions. Out of forty students, 14 want chocolate ice cream and 29 want vanilla. a.　　　If five students want both, how many students don't want ice cream? b.　　　How many want either flavour? What are the chances that you randomly choose someone who wants vanilla? *(impossible, unlikely, likely, certain)*
5 **Notice/Wonder**	 What questions could you answer by looking at this Venn diagram. Create your own Venn Diagram with some questions for a peer to solve.
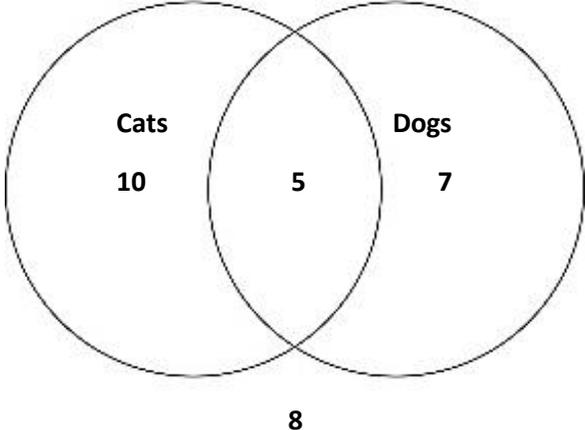
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Junior Tasks	Deci-rods (Relational Rods) 80 pcs
1 **Fraction Match**	Choose a fraction. (e.g. 1/2= Using the rods, model the fraction in as many ways as you can. Justify your work. Is there always more than one way to model a fraction? Why or why not?
2 **Measuring Matters**	Use the length of the yellow rod as a non-standard unit of measure. Estimate the width of the page. Measure the width of this page. Measure the width of this page using the red rod. Were you able to determine the answer without actually measuring?
3 **Puzzle Challenge**	Use five different rods and a piece of paper. Place the rods to create a shape that can be cut from the paper. Challenge someone else to determine how you created the shape. Can other shapes be created using the same rods so that the shapes have the same perimeter? Same area? Which shape has the greatest perimeter?
4 **Making Patterns**	Create a pattern. Draw a reflection of the pattern
5 **Fractions with Rods**	What does one dark green rod represent if one red rod represents one-half?
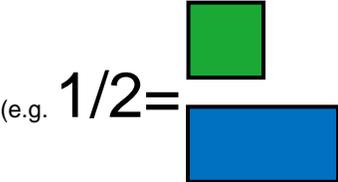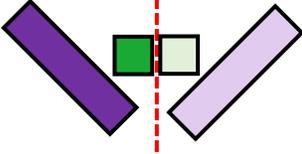
Junior Tasks	Tangrams (7 pcs per set) Assorted Colour- No colour choice
1 **Tangrams**	Use a minimum of two of the tangram pieces to build two designs that have similar areas. Describe how you know they have similar areas.
2 **House Measurements**	Use the tangrams to build the following image. Use a ruler to help find the perimeter and area of this shape.
3 **Symmetry Design**	On a piece of paper draw a line of symmetry. Use the tangram pieces to help draw symmetrical image designs.
4 **Quilt Design**	Create a design with 3 tangram pieces to make a small square. Replicate the pattern onto a paper square and then rotate each square ½ turns, ¼ turns to create a quilt pattern. Describe the translations required to make your quilt pattern.
5 **Puzzle Challenge**	Arrange the tangrams such that they make 1 large square all together.
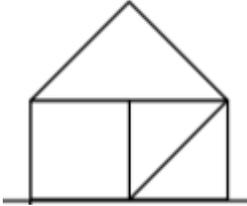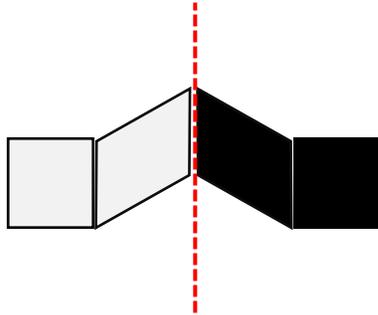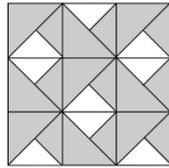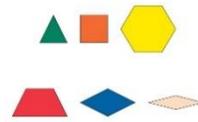
Junior Tasks	Wooden Pattern Blocks (25 pcs)
1 **Fraction Design**	Using pattern blocks, create a design that is ½ yellow, ¼ green and includes at least two other colours. What fractions do the other colours represent? How do you know?
2 **Fraction Models**	What fractions can you model with pattern blocks? Are some easier to model than others? Why?
3 **Fraction Debate**	Someone described the red pattern block is a ½ and their friend described it as 1 ½. The teacher said they are both right. How is this possible?
4 **Larger Than One**	Create a design using at least 6 pattern blocks (they can be the same or different shapes). Look at your design - what improper or mixed fractions do you see? Explain.
5 **Pattern Block Symmetry Design**	Use your pattern blocks and a ruler/piece of string/line on a piece of paper to create an intricate design that is symmetrical.
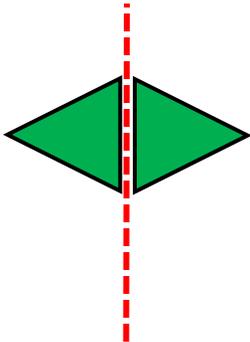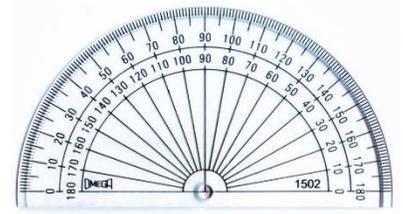
Junior Tasks	Protractor
1 **Angle Search**	Find 3 things that are smaller than a right angle in your home. Find 3 things that are larger than a right angle in your home.
2 **Draw and Classify**	 Use your protractor to draw the following angles: 1. a 45° angle 2. a 170° angle 3. a 120° angle 4. a 5° angle Classify which types of angles each of these are?
3 **How to draw/measure and angle?**	If you had to describe to someone how to use a protractor to draw an angle and measure, what might you tell them?
4 **Parallel Properties**	Draw an interesting design with intersecting lines. Find 5 different angles within your design, and measure them!
5 **Measure Me**	Measure and label all the different angles you can find in the image!
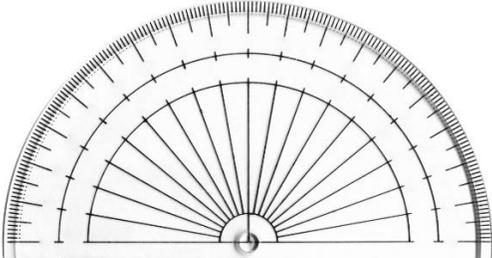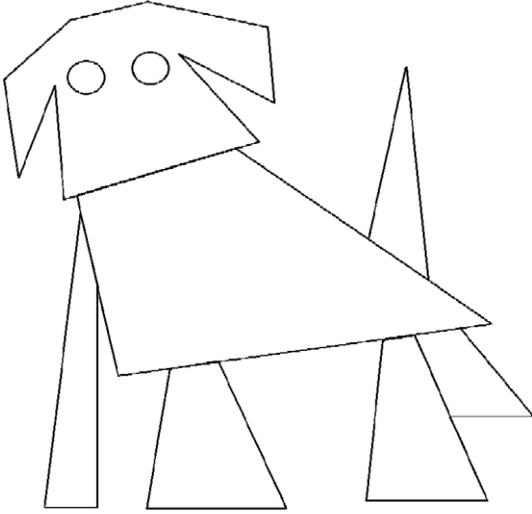
Junior Tasks	Two-Colour Counters (50 pcs)
1 **Multiplication Model**	Use the counters to represent 7 x 8 and 8 x 7. *Hint:* **7 groups of 8**
2 **Ratio Model**	Use the 2 coloured counters to model the ratio 3:5 in a variety of ways.
3 **+/- Patterns**	Use your two-colour counters and a ten frame to represent an equation for addition and subtraction.
4 **Fair Share**	 You have 36 counters, what are all the different ways that you could share them equally?
5 **Show me Equivalence**	Use the counters in an array model to represent equivalent fractions. E.g. ¼ = 4/16

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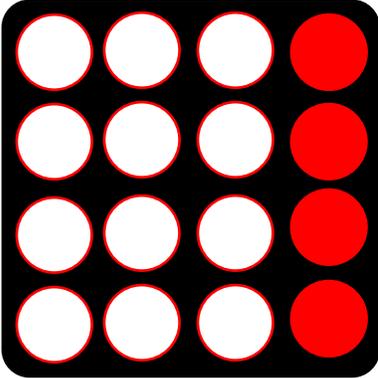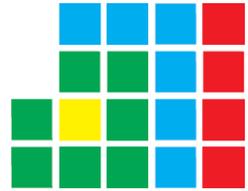
Junior Tasks	Coloured Tiles (40 pcs)
1 **Area Find**	Using 24 tiles - how many rectangles can you make? What is the area of each rectangle? What is the perimeter of each rectangle? What do you notice?
2 **Predicting Patterns**	Make a pattern with the tiles. What would the next position look like? What would the 10th position look like? What would the 100th position look like?
3 **Unique Shapes**	How many unique shapes can you make using 5 tiles? Colour doesn't matter. The sides must be lined up.
4 **Building Nets**	Use the coloured titles to build a visual representation of what different nets could look like for a cube? How many can you build?
5 **Name that Fraction**	Build a rectangle that is ½ yellow, ⅕ green, 1/10 blue and the rest red. What fractional part is red?
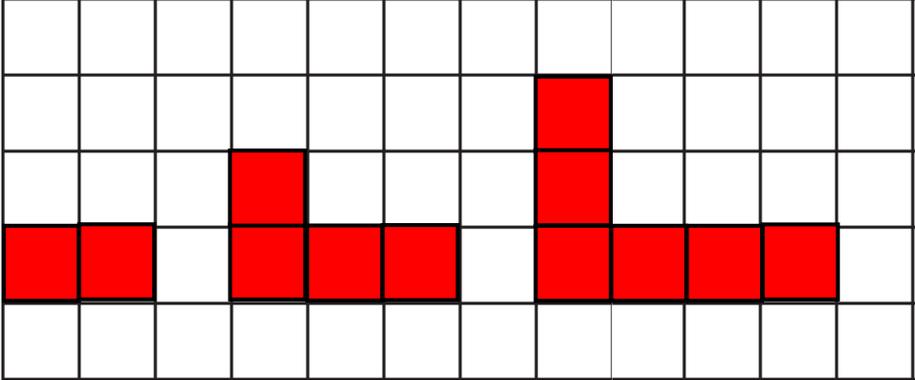
Junior Tasks	Linking Cubes (50 pcs)
1 **Finding Volume**	Build a rectangular prism that has 4 layers with 6 cubes in each layer. What is the volume in cubic centimeters of the rectangular prism if each cube is equal to 1 cubic cm.
2 **Divide it up**	 What are all the different ways that 24 linking cubes can be divided equally?
3 Barrier Game	Play with a partner Build a structure with 10 linking cubes, all cubes must be linked together. Hide your structure behind a large book. Describe your structure to your peer to be able to recreate your structure.
4 **Unique 3D Figures**	Make as many unique 3D shapes with 5 cubes (colour doesn't matter). How many did you find? How do you know you got all of them? **Extensions:** You can repeat with different numbers of cubes. (e.g., 4, 6, 7, etc.)
5 **Building Towers**	Make 10 different sized towers using linking cubes. Choose 6 towers of the 10 to make a set that meets these criteria: - The towers Increase in size. - The towers decrease in size. - That has one tower that is a lot bigger than the other 5 towers.

Junior Tasks	Math Symbol Dice, Dice (1-6 dots), Dice (Numbered 1-6) & Dice (Numbered 1-12) (Total 8 pcs)
1 **Rework the numbers**	 Roll 6 dice. Using all dice - what is the biggest number you can create? What is the smallest number? How do you know?
2 **Can You Land On 100?**	Roll two dice. Multiply the two numbers together. Record. Repeat. Add your new answer to the previous one. Game is over when you get 100 exactly.
3 **More than One Array**	Roll two dice. Multiply the numbers. Draw an array representing the question. Can you draw another array that will give you the same solution?
4 **Build the Biggest**	**Players:** 2-6 **Materials:** 2 dice, scratch paper **Object:** Build the biggest number possible **How to Play:** Players each draw a game board like the one shown. ___ ___ ___ , ___ ___ ___ [throw away] • Each player rolls their dice and decides where to place the digit in their number. • Once placed, a digit cannot be moved. • The throw away box is used to discard a digit that a player doesn't want to use to build their number. • Players continue rolling the dice and placing digits until their game board is filled. • Both players read their numbers out loud and the largest
5 **Pig**	**Players: 2** **Materials: 1 or 2 dice** **Object: Be the first player to reach 100** One Die Version: On a turn, a player can roll repeatedly until one of two things happens (1) the player rolls a 1 or (2) the player chooses to hold (stop rolling). Each number rolled is added to the player's total. If a 1 is rolled, all points for that turn are lost! Scoring examples: 1. Suzy rolls a 4 and decides to continue. She then rolls 5 more times (3, 4, 2, 6, 1). Because she rolled a 1, her turn ends and she receives no points for the numbers rolled. 2. Marcus rolls a 6 and decides to continue. He rolls 3 more times (4, 3, 5) and decides to hold. His score for the round is 18 (6 + 4 + 3 + 5 = 18). Two Dice Version: Two dice are rolled. If a single 1 is rolled on either dice, the turn ends and all points are lost. If two 1s are rolled on a single turn, the player scores 25 points. Doubles, for example a 2 and a 2, are worth double points (4 x 2 = 8).