Math 7 -8 Activities- Menu J

Upper Canada District School Board

Curriculum Connections

Creating Futures, Leading and Learning for All

Instructions: Each day, choose from the options below. Choose as many or as few as you have time for.

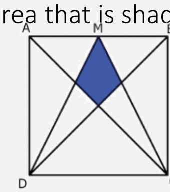
Estimation

A — How many cheeseballs come in the container?

B — Not The Starburst®!

C — Kite in a Square

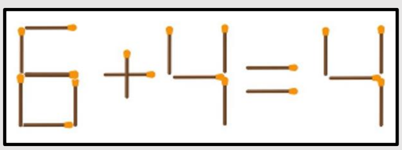
Estimate the fraction of the total area that is shaded.



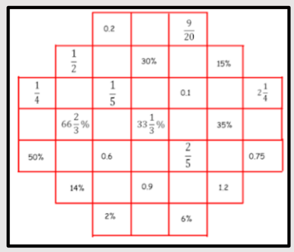
Working with Numbers

A — Matchstick Math

How can you make this equation true by moving **ONLY ONE** matchstick? There are at least 3 ways to do this!



B — Fractions, Decimals and Percentages



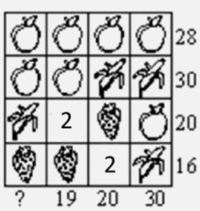
C — Between 2 Numbers

How many ants must work together to carry one dung beetle? How many ants can one dung beetle pull?

Activities / Puzzles

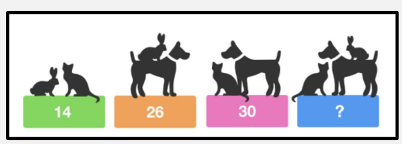
A — Puzzling Fruit

What should replace the question mark?



B — How Much Do They Weigh?

What will be the weight on the scale with the question mark? How do you know?

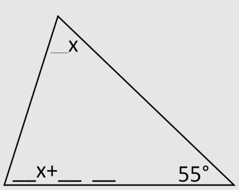


C — Card Equations

Problems

A — Triangle Sum Theorem

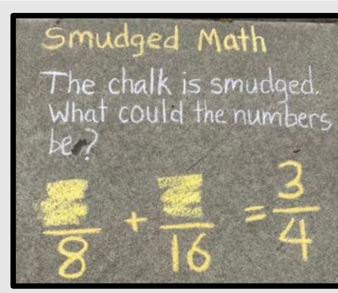
Fill in the blanks so that when you solve for x, it is a whole number.



B — Doritos® Roulette: Hot or Not?

How many chips are hot?

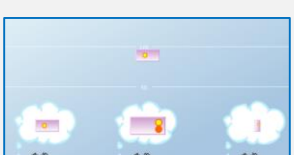
C



See sample solutions here.

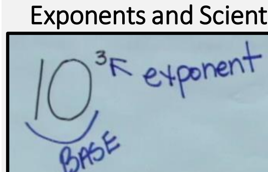
Technology

A — Exploring Dilations



LearnAlberta.ca

B — Exponents and Scientific Notation

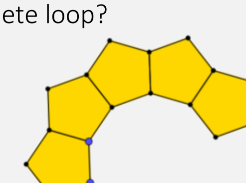


tvo 50

Watch the video lesson and answer the questions found here.

C — Polygon Rings

If the pattern continues will form a complete loop?



Please click on this Icon, wherever you see it, to access Indigenous content.

Explanatory Notes: LEARN AT HOME CHOICE BOARDS FOR PARENTS AND EDUCATORS

Creating Futures, Leading and Learning for All

Choice Board Background Information:

- ✓ Choice boards were created to provide flexibility in learning at home;
- ✓ Boards were planned for divisions: K-3, 4-6, 7-8 for open, individualized learning;
- ✓ Planned with recognition that parents may currently hold various roles at home;
- ✓ Designed to enhance the materials provided by the Ministry;
- ✓ Experiential learning focus with accessible materials at home;
- ✓ Low/No tech options;
- ✓ Accessible on mobile devices.

Choice Boards - Parents Can:

- ✓ Choose as many or as few learning opportunities as desired;
- ✓ Follow the days of the week or be flexible in using the choice boards;
- ✓ Be confident that the learning is based in curriculum;
- ✓ Engage other children in the home in common experiential learning (i.e., baking, reading, playing math games, being active together);
  - ✓ Click on the links provided for further learning and sample questions to ask;
    - ✓ Have fun!

Choice Board Activities Provide:

- ✓ Clear connections to curriculum expectations and process skills;
- ✓ Open activities with options to individualize learning;
- ✓ Accessibility (many require little to no technology);
- ✓ Math – focus on numeracy skills;
- ✓ Literacy – focus on reading, writing, oral language and media literacy;
- ✓ French learning opportunities;
- ✓ Health and Physical Well-Being;
- ✓ Opportunities to foster connections within the household;
- ✓ Focus on conversation and thinking.

Choice Boards - Teachers Can:

- ✓ Create classroom-based choice boards for students while they are learning at home;
- ✓ Incorporate ideas from the choice boards into teaching practices, daily and weekly planning;
- ✓ Explore and incorporate new resources into classroom learning;
- ✓ Engage students and families in virtually sharing learning with one another;
- ✓ Expand on activities in order to provide individualized learning opportunities;
- ✓ Incorporate other UCDSB resources (i.e., Math Tool, VLC, links) to extend student learning.

How many cheeseballs come *in the container*?

Source: http://www.estimation180.com/day-209.html

Use the picture below to help determine your estimate.

	Too Low	Too High	Just Right
Estimate			
Reasoning			

The reveal:
There are 910 cheeseballs in the container.
Click here to watch the video answer.

Not The Starburst®!

Source: http://getmadmath.weebly.com/starburst-gate.html

Task 1 – Estimate!

How many mini Starburst® are in the ¼ cup below? Make an estimate!

Task 1 – Solution!

How close was your estimate?

Note- The cup is overflowing so an estimate between 30-37 is accurate!

Click here to try Task 2!

Not The Starburst®!

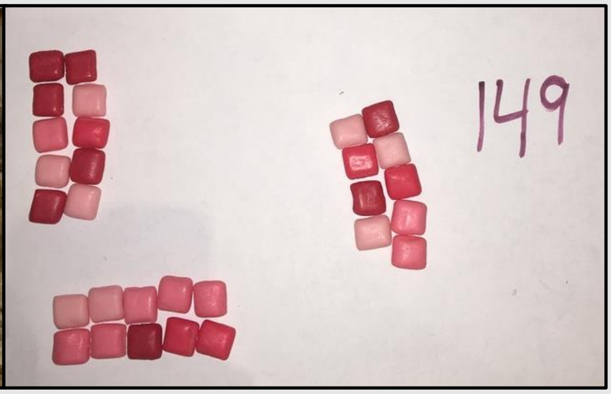
Source: http://getmadmath.weebly.com/starburst-gate.html

Task 2 – Estimate the Bag!

There were 30 - 37 Starburst® in a ¼ cup. How many are in this bag?

Task 2 – Solution!

How close was your estimate?



Click here to try Task 3!

Not The Starburst®!

Source: http://getmadmath.weebly.com/starburst-gate.html

Task 3 – Analyzing Our Answers and the Bag!

Look at the Starburst® label below:

What do you notice?
What do you wonder?

Are you surprised?

Is the difference a lot or a little? What is the percentage of error?

How many would be per serving if there truly are 6 servings???

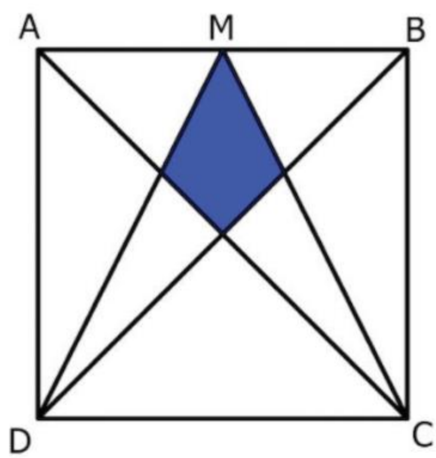
Possible Solutions:

If there are 30-37 Starburst® in 1 serving, it would be expected that there should be 180 – 222 in the 6 serving bag! The percentage of error is as follows: 149/180 x 100% = 83%; the bag contains 83% of the product and is missing 17%.
If there are truly 6 servings, there would be ~ 25 Starburst®/serving (149/6 = 24.83).

Kite in a Square

ABCD is a square. M is the midpoint of the side AB. By constructing the lines AC, MC, BD and MD, the blue shaded quadrilateral is formed.

Estimate the fraction of the total area that is shaded.



Hint: How many kites will fit in the square?

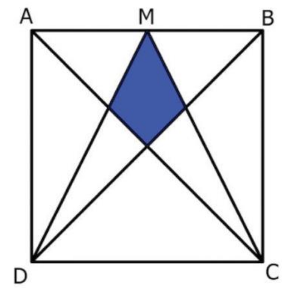
	Too Low	Too High	Just Right
Estimate			
Reasoning			

Click here to see the solution to this problem.

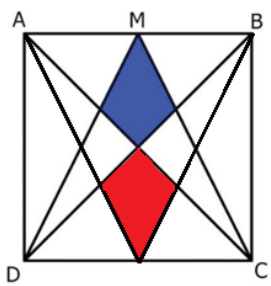
Source: https://nrich.maths.org/kiteinasquare AND https://www.youcubed.org/tasks/kite-in-a-square/

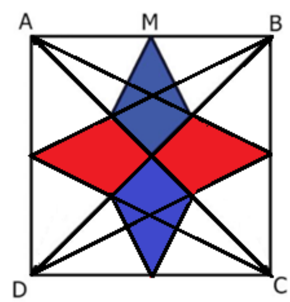
Kite in a Square - Solution

The shaded area covers $\frac{1}{12}$ of the total area.

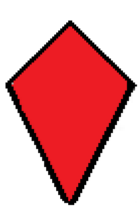


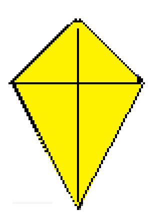
Reasoning: We can start to draw congruent kites in the square.

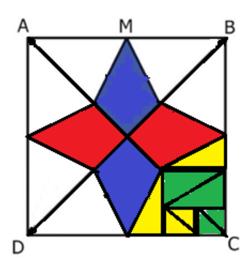




There are four full kites that fit. The remaining corners can be filled by cutting a kite into triangles and filling in the space. We can see that two more kites fit in each corner. This gives a total of 12 kites that fit inside the total area.







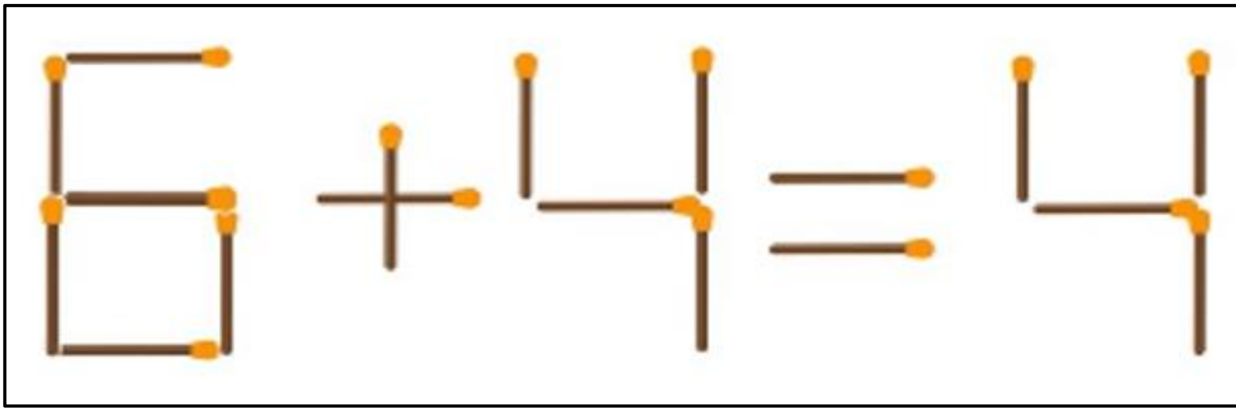
Click here to see several other ways to solve this problem.

Source: https://nrich.maths.org/kiteinasquare AND https://www.youcubed.org/tasks/kite-in-a-square/

Matchstick Math

Source: https://www.littlethings.com/matchstick-math-problem-puzzle/3

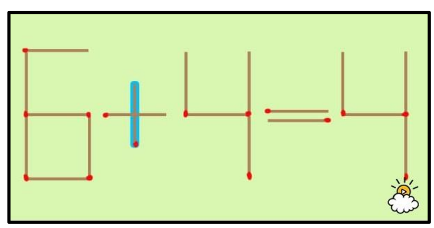
How can you make this equation true by moving **ONLY ONE** matchstick? There are at least **3 ways** to do this!



Hints!

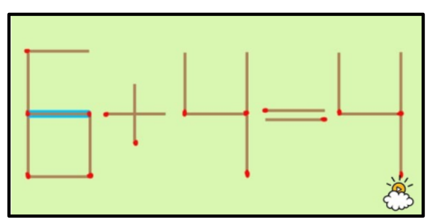
Hint #1

The matchstick highlighted in blue is the one you want to move to make the **first** solution.



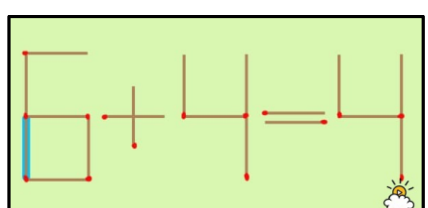
Hint #2

The matchstick highlighted in blue is the one you want to move to make the **second** solution.



Hint #3

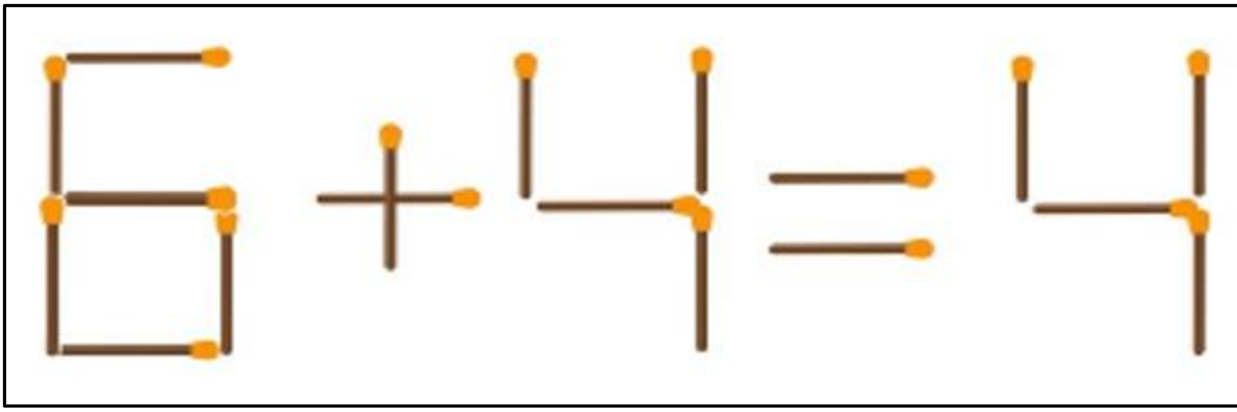
The matchstick highlighted in blue is the one you want to move to make the **third** solution.



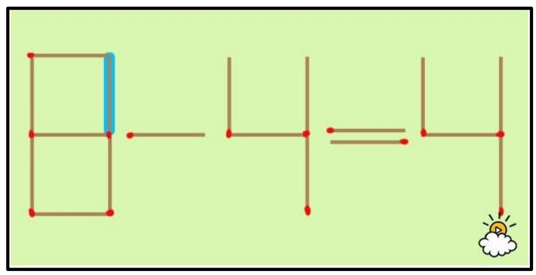
Click here for solutions!

Matchstick Math-Solutions

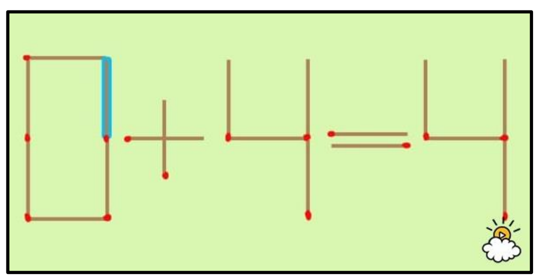
Source: https://www.littlethings.com/matchstick-math-problem-puzzle/3



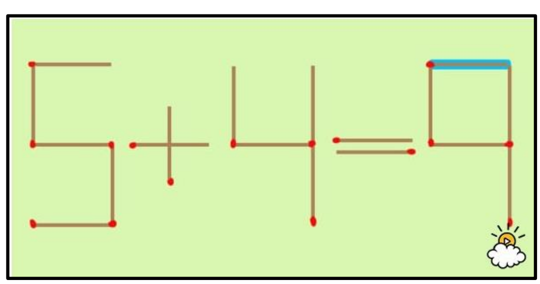
Solution #1



Solution #2



Solution #3



Fractions, Decimals and Percentages

Calculate the numbers in the empty boxes by adding the boxes surrounding it. An example is done below in blue:

$0.2 + 0.5 + 0.3 + 0.2$
$= 1.2$ or 120% or $1\frac{1}{5}$

$\frac{2}{10} + \frac{3}{10} + \frac{9}{20}$
$= \frac{2}{10} + \frac{3}{10} + \frac{4.5}{10}$
$= \frac{9.5}{10}$ or 0.95 or 95%

$45\% + 30\% + 15\% + 10\%$
$= 100\%$ or 1.0 or $\frac{1}{1}$

		0.2	$\frac{9.5}{10}$	$\frac{9}{20}$		
	$\frac{1}{2}$	1.2	30%	100%	15%	
$\frac{1}{4}$		$\frac{1}{5}$		0.1		$2\frac{1}{4}$
	$66\frac{2}{3}\%$		$33\frac{1}{3}\%$		35%	
50%		0.6		$\frac{2}{5}$		0.75
	14%		0.9		1.2	
		2%		6%		

Try to use different strategies to calculate the answers in each of the boxes! What about trying it without a calculator? What mental math strategies can you use to add your answers together?

Click here to check your answers!

Source: https://www.startingpointsmaths.com/2018/05/fractions-decimals-and-percentages.html

Fractions, Decimals and Percentages- Solutions

Calculate the numbers in the empty boxes by adding the boxes surrounding it.

		0.2	$\frac{9.5}{10}$	$\frac{9}{20}$		
	$\frac{1}{2}$	1.2	30%	100%	15%	
$\frac{1}{4}$	$161\frac{2}{3}\%$	$\frac{1}{5}$	$93\frac{1}{3}\%$	0.1	2.85	$2\frac{1}{4}$
$141\frac{2}{3}\%$	$66\frac{2}{3}\%$	1.8	$33\frac{1}{3}\%$	$118\frac{1}{3}\%$	35%	$3\frac{7}{20}$
50%	$190\frac{2}{3}\%$	0.6	2.23	$\frac{2}{5}$	2.7	0.75
	14%	1.66	0.9	2.56	1.2	
		2%	98%	6%		

Source: https://www.startingpointsmaths.com/2018/05/fractions-decimals-and-percentages.html

Between 2 Numbers

Source: http://www.between2numbers.com/

An ant can carry 50 times its own weight. But a certain species of dung beetle can pull 1,141 times its own body weight.

An ant weighs about 0.004 g, and a dung beetle weighs about 20 g.

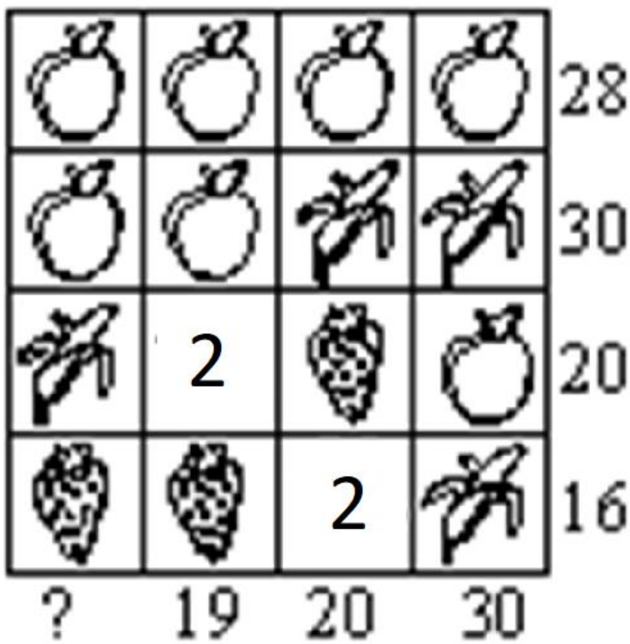
How many ants must work together to carry one dung beetle? How many ants can one dung beetle pull?

Solution:

Ant (0.004 g)	Dung Beetle (20 g)
One ant can carry 50 times its own weight: 0.004 g x 50 = 0.2 g 20 g ÷ 0.2 g = 100 (The weight of 1 dung beetle) Therefore, it will take 100 ants to carry 1 dung beetle!	One dung beetle can pull 1141 times its own weight: 20 g x 1141 = 22 820 g or 22 kg! 22 820 g ÷ 0.004 g = 5.7 million (The weight of 1 ant) Therefore, the dung beetle can pull 5.7 million ants!

Puzzling Fruit

In the puzzle below, the numbers alongside each column and row are the total of the values of the symbols within each column and row. What should replace the question mark? Make sure you provide a full and detailed solution.



Hint:

Determine the value of each piece of fruit.

Can you write an equation to represent the different sums.

Make sure you provide a full and detailed solution.

Click here to see the solutions to this question.

Puzzling Fruit

Solution:

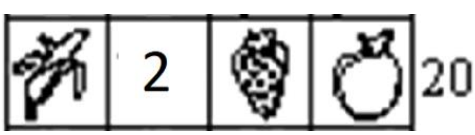
Let *a* represent the apple:

$$\begin{aligned} a + a + a + a &= 28 \\ 4a &= 28 \\ a &= 28 \div 4 \\ a &= 7 \end{aligned}$$

Let *b* represent the banana:

$$\begin{aligned} 2a + 2b &= 30 \\ 2(7) + 2b &= 30 \\ 14 + 2b &= 30 \\ 2b &= 30 - 14 \\ 2b &= 16 \\ b &= 16 \div 2 \\ b &= 8 \end{aligned}$$

Let *s* represent the strawberry:



$$\begin{aligned} b + 2 + s + a &= 20 \\ 8 + 2 + s + 7 &= 20 \\ 17 + s &= 20 \\ s &= 20 - 17 \\ s &= 3 \end{aligned}$$

Now that we know the value of each fruit we can sub in and solve for the question mark:

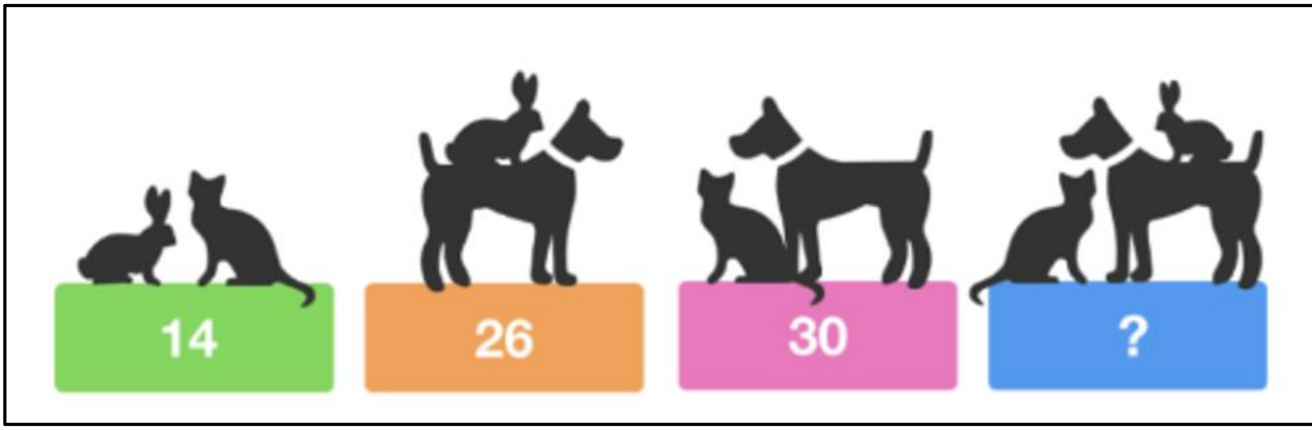
$$\begin{aligned} 2a + b + s &= ? \\ 2(7) + 8 + 3 &= ? \\ 14 + 8 + 3 &= ? \\ 25 &= ? \end{aligned}$$

Therefore, the question mark should be replaced with 25.

How Much Do They Weigh?

Source: https://twitter.com/DanShuster/status/1259948144101429248

What will be the weight on the scale with the question mark? How do you know?



Solution #1 – Guess and Check

26 – 14 = 12
Therefore, the dog weighs 12 more units than the cat (since the rabbit is the constant in each of these situations).

30 – 26 = 4
Therefore, the cat weighs 4 more units than the rabbit (since the dog is the constant in each of these situations).

The weight of the cat plus the rabbit is equal to 14. The cat weighs 4 more units than the rabbit. To determine the weights of both animals two numbers are needed that add up to 14 and have a difference of 4. Using guess and check it can be determined that these two numbers are 9 and 5. Therefore the **weight of the cat is 9 and the weight of the rabbit is 5.**

Using this information, it can be determined that the **weight of the dog is 26 – 5 = 21.** This answer can be checked by adding the weights of the cat and the dog to see that they add up to 30 (21 + 9 = 30).

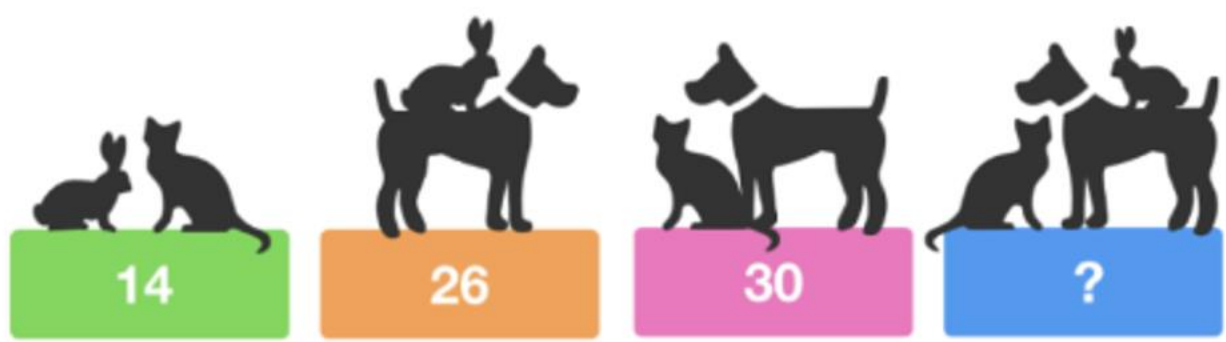
The final scale reading will be **9 + 5 + 21 = 35**

Click here to see how to solve this problem using algebra!

How Much Do They Weigh?

Source: https://twitter.com/DanShuster/status/1259948144101429248

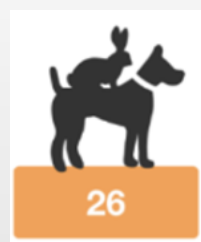
What will be the weight on the scale with the question mark? How do you know?



Solution #2 – Algebra

Let **R** represent the **rabbit**
Let **C** represent the **cat**
Let **D** represent the **dog**

R + C = 14



R + D = 26

C + D = 30

How much more does the cat weigh than the rabbit?

30 – 26 = 4

$C + D - (R + D) = 4$

$C + \cancel{D} - (R + \cancel{D}) = 4$

C – R = 4

Therefore, the cat weighs 4 more units than the rabbit.

R + C = 14
C – R = 4
14- 4 = 10

$C + R - (C - R) = 10$

$\cancel{C} + R - (\cancel{C} - R) = 10$

$\frac{2R}{2} = \frac{10}{2}$

R = 5

Therefore, the rabbit weighs 5 units.

If one of the unknowns is determined, it can now be substituted into the other equations:

R + C = 14
5 + C = 14
C = 14 – 5
C = 9

Therefore, the cat weighs 9 units.

R + D = 26
5 + D = 26
D = 26 - 5
D = 21

Therefore, the dog weighs 21 units.

Card Equations

Materials Required: A standard deck of playing cards with the Jacks, Queens, and Kings removed.

Goal: Create an equation and solve.

Task: Turn up three cards and use them to create your equation then solve for the unknown. Red cards are negative and black cards are positive. Record your equation and solution.

Sample Hand:

Numbers: -7, 1, -4

Expression:

$$(-4)a + 1 = -7$$
$$-4a = -7 - 1$$
$$-4a = -8$$
$$a = \frac{-8}{-4}$$
$$a = 2$$

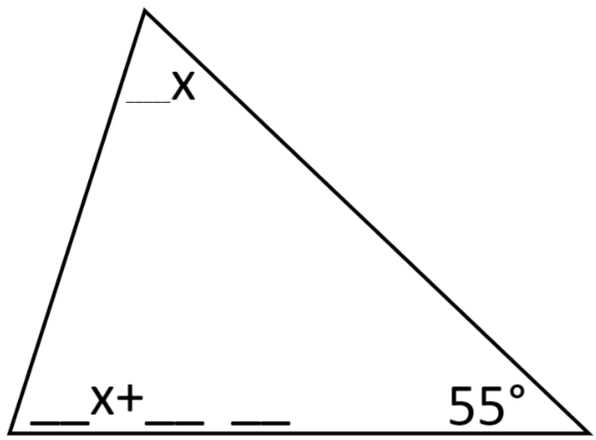
Which number combination was the most difficult to make an equation for? Why?

Which number combination was the easiest to make an equation for? Why?

TIPS4RM: Grade 8:

Triangle Sum Theorem

Directions: Using the digits 1-9 at most one time each, fill in the blanks so that when you solve for x, it is a whole number.



Hint:

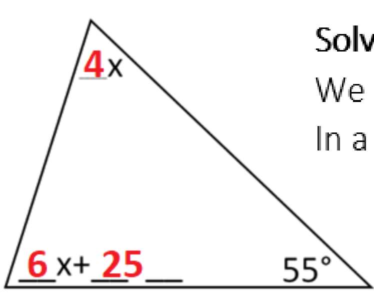
How many degrees must the two unknown angles sum to? Can you write an equation to represent the sum of the two unknown angles?

OPEN MIDDLE

Source: https://www.openmiddle.com/triangle-sum-theorem/

Solution:

There are many answers to this question. Here is one:



Solving for x:

We know the sum of the angles In a triangle need to add to 180°

$$4x + 6x + 25 + 55 = 180$$
$$10x + 80 = 180$$
$$10x = 180 - 80$$
$$10x = 100$$
$$x = \frac{100}{10}$$
$$\mathbf{x = 10}$$

Extension/extra challenge :

1. Set a value for x and find all the ways to make the problem have that solution.
2. Change the value of the bottom right angle.

Doritos® Roulette: Hot or Not?

Source: https://tapintoteenminds.com/3act-math/doritos-roulette-hot-or-not/

Don't Get Burned By Doritos ® Roulette Spicy Hot Chips!

If you are not familiar with the Doritos ® Roulette Spicy Hot Chips, click here to watch the commercial.

Act 1:

Watch the following video: https://safeYouTube.net/w/Tl3H

What questions come to mind after watching the video?

Act 2:

Look at the pictures of the packaging and try to answer the following questions:

1) How many chips are in the bag?
2) Is the ratio of "hot to not" chips really 1:6 or 1:7?
3) How many hot chips should you expect in a bag?

Act 3:

Watch the answer here! https://safeYouTube.net/w/e53H

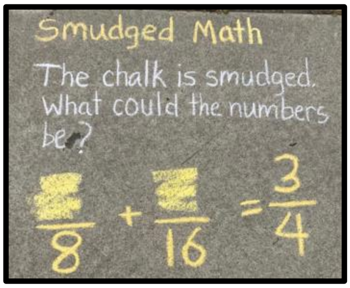
Previously we began to understand the importance of corn to the First Nations Peoples from this area.

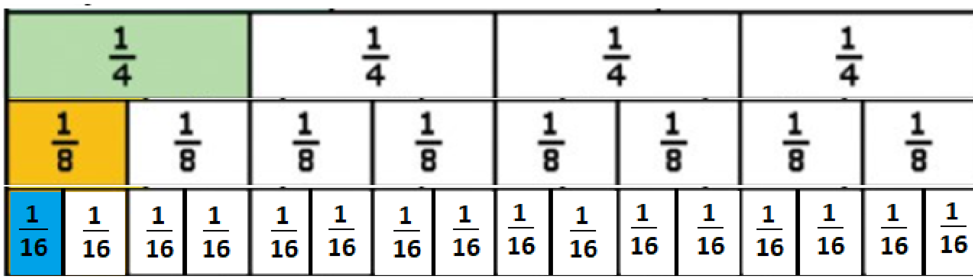
But did you ever wonder where corn (even tortillas) originated?

Watch the attached video to explore this.

[Grain for the People]

Smudged Math- Solution

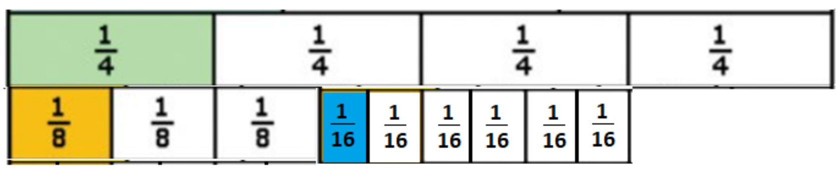




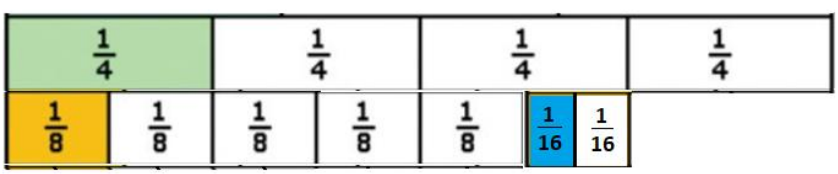
There are many possible solutions to this problem.

- A fraction wall, similar to the one found [here]() and seen above, can be used to help visualize this problem.

One Possible Solution: $\frac{3}{8} + \frac{6}{16} = \frac{3}{4}$



A second Possible Solution: : $\frac{5}{8} + \frac{2}{16} = \frac{3}{4}$



Challenge:

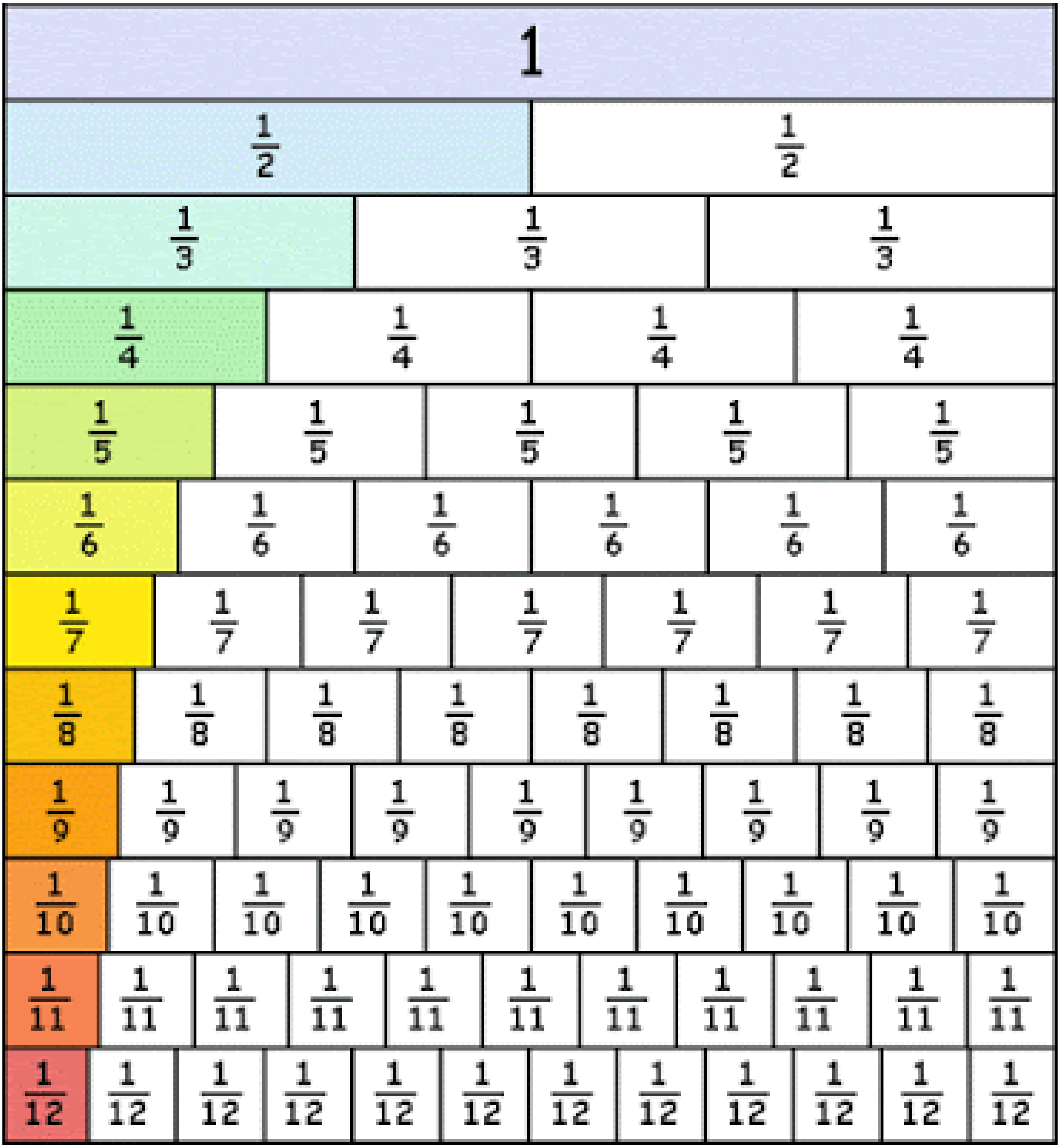
- How many different solutions are there in total? How do you know if you have found them all?
- Create some similar questions of your own and use sidewalk chalk to make smudged math tasks in your neighborhood! Use the fraction wall [here]() to help!

Source: https://sites.google.com/powayusd.com/math-walks/home

Math Walks

Fraction Wall

You can use a fraction wall like this to help answer this question.
Make your own, or print this one if you have access to a printer.



Return to the [Smudged Math](#) task here.

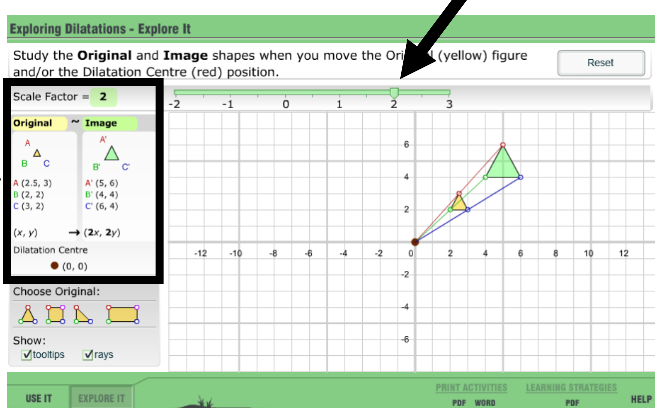
Exploring Dilations

- Click here to access the interactive task from Learn Alberta.

  - Click **Explore It** to see how different scale factors affect the shape (bottom left of the screen).
  - Click **Use It** to answer questions and play a game. You will need to answer 8 questions about dilations correctly to play the game.

As you move the slider see how the coordinate points are affected.

Pull the slider to see how different scale factors affect the shape.

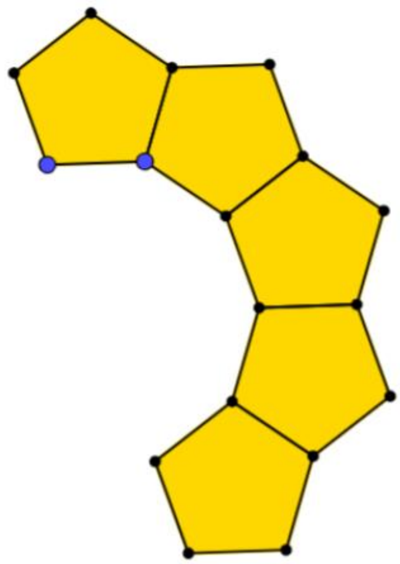


Click **Use It** to answer questions and play the game!

- Watch the video found here to see where transformations are found in the real world! Then, click the **interactive** button to test your knowledge.

Polygon Rings

Here is a pattern made of regular pentagons:



If the pattern continued, do you think it will form a complete loop or will the pentagons overlap?

Try it using the Interactive Tessellation found [here](#).

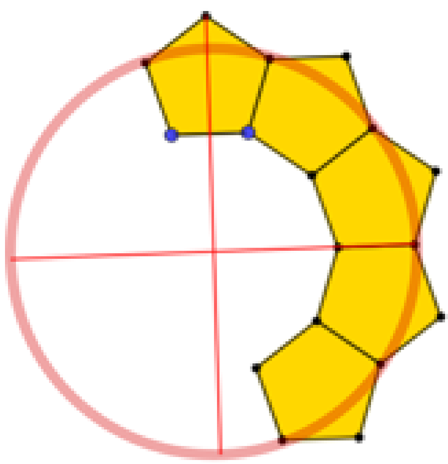
Once you've had a chance to explore, click [here](#) for the solutions as well as some additional questions you might like to consider.

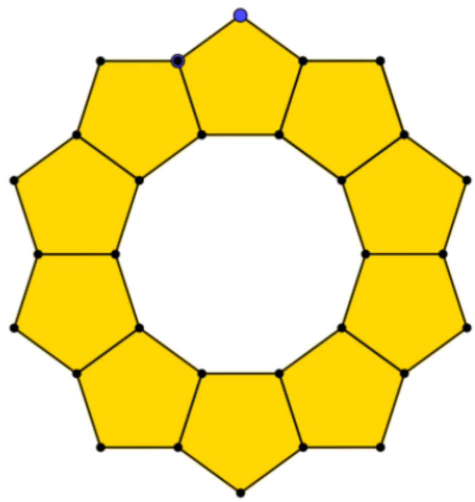
Source:
https://nrich.maths.org/polygonrings

Polygon Rings - Solutions

It will form a complete loop.

Think of a circle divided into 4 equal sizes. Each piece fits two and a half pentagons. 2.5 x 4 = 10 pentagons.





Follow up questions:

How many pentagons form a ring?
How many decagons would form a ring?
Why do they fit together so neatly without overlapping or leaving a gap?

What about other polygons?
Can you always make a ring?
Is there a way to predict how many polygons you need to form a ring?

See additional ways to solve this problem here.

Math 7 -8 Activities Menu J
Curriculum Expectations

	A	B	C
Estimation	How many cheeseballs? Mathematical Process Reasoning and Proving Develop and apply reasoning skills (e.g., recognition of relationships, generalization through inductive reasoning, use of counter-examples) to make mathematical conjectures, assess conjectures and justify conclusions, and plan and construct organized mathematical arguments. Communicating Communicate mathematical thinking orally, visually, and in writing, using mathematical vocabulary and a variety of appropriate representations, and observing mathematical conventions.	**Not The Starburst®!** Number Sense and Numeration Grade 7 *Specific:* use estimation when solving problems involving operations with whole numbers decimals, and percents, to help judge the reasonableness of a solution; solve problems that involve determining whole number percents, using a variety of tools. Grade 8 *Specific:* solve problems involving percents expressed to one decimal place (e.g., 12.5%) and whole-number percents greater than 100 (e.g., 115%); use estimation when solving problems involving operations with whole numbers, decimals, percents, integers, and fractions, to help judge the reasonableness of a solution.	Kite in a Square Mathematical Process Problem Solving Develop, select, apply, and compare a variety of problem-solving strategies as they pose and solve problems and conduct investigations, to help deepen their mathematical understanding; Reasoning and Proving Develop and apply reasoning skills (e.g., recognition of relationships, generalization through inductive reasoning, use of counter-examples) to make mathematical conjectures, assess conjectures and justify conclusions, and plan and construct organized mathematical arguments.
Working with Numbers	**Matchstick Math** Mathematical Process **Problem Solving** **Develop, select, apply, and compare a variety of problem-solving strategies as they pose and solve problems and conduct investigations, to help deepen their mathematical understanding;**	Fractions, Decimals and Percentages Number Sense and Numeration Grade 7 *Specific:* Use a variety of mental strategies to solve problems involving the addition and subtraction of fractions and decimals. *Specific:* Add and subtract fractions with simple like and unlike denominators, using a variety of tools and algorithms. Grade 8 *Specific:* Solve problems involving addition, subtraction, multiplication, and division with simple fractions.	**Between 2 Numbers** Number Sense and Numeration **Grade 7** ***Specific:* demonstrate an understanding of rate as a comparison, or ratio, of two measurements with different units.** **Grade 8** ***Specific*: identify and describe real-life situations involving two quantities that are directly proportional;** **solve problems involving proportions, using concrete materials, drawings, and variables.**
Activities / Puzzles	Puzzling Fruit Patterning and Algebra Grade 7 *Specific*: Solve linear equations of the form ax = c or c = ax and ax + b = c, or variations such as b + ax = c and c = bx + a, by modelling with concrete materials, by inspection, or by guess and check, with and without the aid of a calculator. Grade 8 *Specific*: Translate statements describing mathematical relationships into algebraic expressions and equations. *Specific*: Solve and verify linear equations involving a one-variable term and having solutions that are integers, by using inspection, guess and check, and a "balance" model.	How Much Do They Weigh? Mathematical Process Communicating Communicate mathematical thinking orally, visually, and in writing, using mathematical vocabulary and a variety of appropriate representations, and observing mathematical conventions. Representing Create a variety of representations of mathematical ideas (e.g., numeric, geometric, algebraic, graphical, pictorial; onscreen dynamic representations), connect and compare them, and select and apply the appropriate representations to solve problems.	Card Equations Patterning and Algebra Grade 7 *Specific*: Solve linear equations of the form ax = c or c = ax and ax + b = c, or variations such as b + ax = c and c = bx + a, by modelling with concrete materials, by inspection, or by guess and check, with and without the aid of a calculator. Grade 8 *Specific*: Solve and verify linear equations involving a one-variable term and having solutions that are integers, by using inspection, guess and check, and a "balance" mode
Problems	Triangle Sum Theorem Geometry and Spatial Sense Grade 8 *Specific:* Determine, through investigation using a variety of tools, the angle relationships for intersecting lines and for parallel lines and transversals, and the sum of the angles of a triangle. *Specific*: Solve angle-relationship problems involving triangles (e.g., finding interior angles or complementary angles), intersecting lines (e.g., finding supplementary angles or opposite angles), and parallel lines and transversals (e.g., finding alternate angles or corresponding angles).	**Doritos® Roulette: Hot or Not?** Data Management and Probability **Grade 7** ***Specific:* read, interpret, and draw conclusions from primary data and from secondary data presented in charts, tables, and graphs;** **represent in a variety of ways all the possible outcomes of a probability experiment involving two independent events and determine the theoretical probability of a specific outcome involving two independent events.** **Grade 8** ***Specific:* read, interpret, and draw conclusions from primary data and from secondary data, presented in charts, tables, and graphs.**	Smudged Math Number Sense and Numeration Grade 7 *Specific*: Use a variety of mental strategies to solve problems involving the addition and subtraction of fractions and decimals. *Specific:* Add and subtract fractions with simple like and unlike denominators, using a variety of tools and algorithms. Grade 8 *Specific: S*olve problems involving addition, subtraction, multiplication, and division with simple fractions.
Technology	Exploring Dilations Geometry and Spatial Sense Grade 7 *Specific*: Identify, perform, and describe dilatations (enlargements and reductions) using a variety of tools. Grade 8 *Specific:* Graph the image of a point, or set of points, on the Cartesian coordinate plane after applying a transformation to the original point(s). *Specific:* Identify, through investigation, real-world movements that are translations, reflections, and rotations.	**Exponents and Scientific Notation** Number Sense and Numeration Grade 8 *Overall:* Represent, compare, and order equivalent representations of numbers, including those involving positive exponents. *Specific:* Express repeated multiplication using exponential notation. *Specific:* Represent whole numbers in expanded form using powers of ten.	Polygon Rings Geometry and Spatial Sense Grade 7 *Specific*: Determine, through investigation using a variety of tools polygons or combinations of polygons that tile a plane, and describe the transformation(s) involved.