

Day 1

Practice (Source: <https://openupresources.org/math-curriculum/>)

Tyler orders a meal that costs \$15.

- A. If the tax rate is 6.6%, how much will the sales tax be on Tyler's meal?
- B. Tyler also wants to leave a tip for the server. How much do you think he should pay in all? Explain your reasoning.

Converting a Fraction to a Decimal (Source: <https://www.openmiddle.com/>)

Directions: Using the digits 1 to 9, at most one time each, place a digit in each box to make a true statement.

$$\frac{\boxed{}}{\boxed{}\boxed{}} = 0.\boxed{}$$

Lollipops

Joe bought 7 green lollipops. There are 3 fewer yellow lollipops than green lollipops. There are 2 more red lollipops than yellow lollipops. How many lollipops are there? Show how you got your answer.

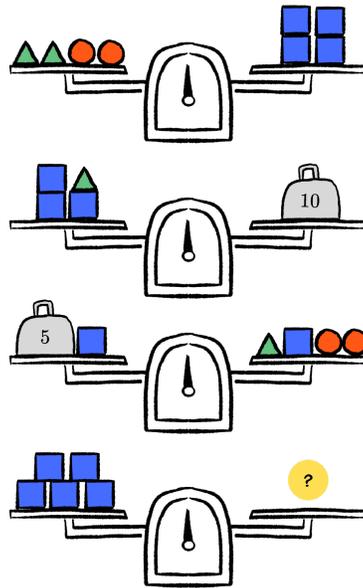
Day 2

Practice (Source: <https://openupresources.org/math-curriculum/>)

- A. How much higher is 500 than 400 m?
- B. How much higher is 500 than -400 m?
- C. What is the change in elevation from 8,500 m to 3,400 m?
- D. What is the change in elevation between 8,500 m and -300 m?
- E. How much higher is -200 m than 450 m?

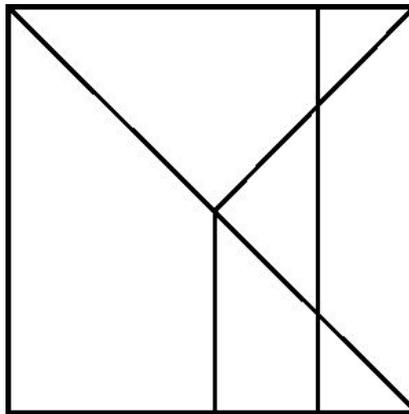
Balancing Scales (Source: brilliant.org)

Given the balance scales below, which combination would balance five squares?



Fraction Talk (Source: <http://fractiontalks.com/>)

Shade in one of the regions in this square. What fraction of the big square did you shade? Explain.



Day 3

Integer Sums and Differences (Source: <https://www.openmiddle.com/>)

Using the integers -3 to 3, at most one time each, fill in the blanks to make each equation true.

$$\square + \square = \square$$

$$\square - \square = \square$$

Which One Doesn't Belong? (Source: wodb.ca)

Choose a number in this picture that you don't think belongs with the rest. Explain why. Can you pick another number and give a different reason?

17	26
44	65

Word Problems (Source: <https://openupresources.org/math-curriculum/>)

The *departure from the average* is the difference between the actual amount of rain and the average amount of rain for a given month.

The historical average for rainfall in Albuquerque, NM for June, July, and August is shown in the table.

June	July	August
0.67	1.5	1.57

- A. Last June only 0.17 inches of rain fell all month. What is the difference between the average rainfall and the actual rainfall for last June?
- B. The departure from the average rainfall last July was -0.36 inches. How much rain fell last July?
- C. How much rain would have to fall in August so that the total amount of rain equals the average rainfall for these three months? What would the departure from the average be in August in that situation?

Day 4

Temperature (Source: <https://openupresources.org/math-curriculum/>)

A weather station on the top of a mountain reports that the temperature is currently 0°C and has been falling at a constant rate of 3°C per hour. Find each temperature. Explain or show your reasoning.

- A. If it continues fall at this rate, what will the temperature be:
 - i. in 2 hours?
 - ii. in 5 hours?
 - iii. in half an hour?
- B. What was the temperature:
 - i. 1 hour ago?
 - ii. 3 hours ago?
 - iii. 4.5 hours ago?

Mobius Strip (Source: *Critical Thinking Puzzles*, Michael A. DiSpezio, 1996)

Here is one of the strangest loops you'll ever see. It's called a Mobius strip in honor of the German mathematician who first investigated its properties.



Image from: <https://mathcraft.wonderhowto.com/>

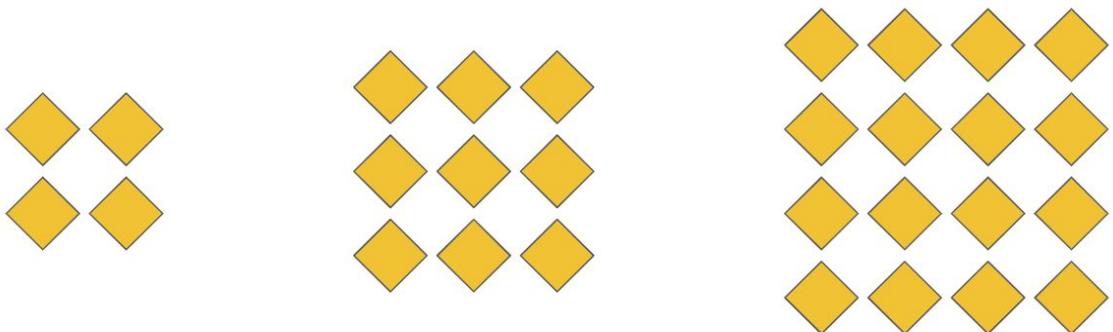
To build a Mobius strip, you need a strip of paper about 1 inch wide and 10 inches long. Coil the paper into a simple loop. Then put a single twist in the loop before securing the ends together with a piece of tape. Use a marker to color one side of the strip red and the other side blue.

Suppose you divide right down the middle of the Mobius strip. What shape would you get? Make a guess; then use a pair of scissors to carefully divide the strip.

Visual Pattern (Source: visualpatterns.org)

Below is a pattern of trees in stages 1-3 below.

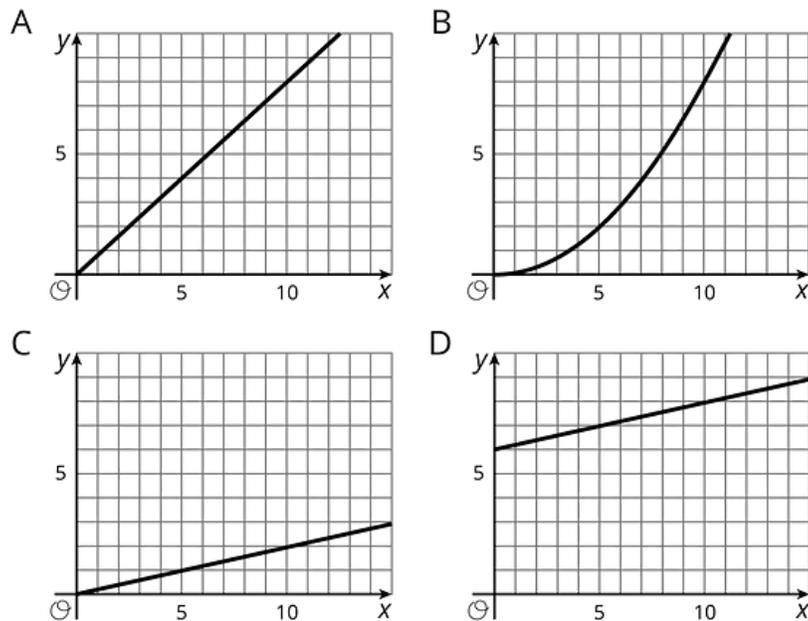
- A. Draw what you think stage 4 might look like.
- B. Draw or describe what you think stage 10 might look like.
- C. Label how many trees are in each stage.
- D. Try to write an equation to describe the relationship between the stage number n and the number of trees T .



Day 5

Graphs (Source: <https://openupresources.org/math-curriculum/>)

Which graphs could not represent a proportional relationship? Explain how you decided.



Shopping (Source: <https://openupresources.org/math-curriculum/>)

A shopper bought a watermelon, a pack of napkins, and some paper plates. In his state, there is no tax on food. The tax rate on non-food items is 5%. The total for the three items he bought was \$8.25 before tax, and he paid \$0.19 in tax. How much did the watermelon cost?

Would You Rather (Source: <https://www.wouldyourathermath.com/>)

Whichever option you choose, justify your reasoning with mathematics.

Share equal slices of cake from pan A with 8 friends OR share equal slices of cake from pan B with 6 friends?

Cake A



Cake B

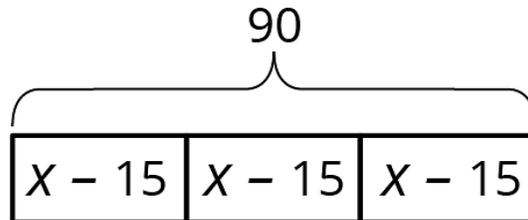


Day 1

Drawing a Diagram (Source: <https://openupresources.org/math-curriculum/>)

A school ordered 3 large boxes of board markers. After giving 15 markers to each of 3 teachers, there were 90 markers left. The diagram represents the situation.

How many markers were originally in each box?



Puzzle (Source: <https://www.solveemoji.com/>)

What is the value of the last row?

$$\begin{array}{rcl}
 \text{🦄} & + & \text{🦄} = 24 \\
 \text{🦄} & + & \text{🦊} = 18 \\
 \text{🦊} & - & \text{🦉} = 3 \\
 \text{🦉} & + & \text{🦄} = ?
 \end{array}$$

Putting It Together (Source: *Critical Thinking Puzzles*, Michael A. DiSpezio, 1996)

Suppose you have a list of numbers from one to one hundred. How quickly can you add them all up without using a calculator?

Day 2

Equations (Source: <https://openupresources.org/math-curriculum/>)

Elena walked 20 minutes more than Lin. Jada walked twice as long as Elena. Jada walked for 90 minutes. The equation $2(x + 20) = 90$ describes this situation. Match each amount in the story with the expression that represents it.

- | | |
|----------------|--|
| A. x | 1. The number of minutes that Jada walked |
| B. $x + 20$ | 2. The number of minutes that Elena walked |
| C. $2(x + 20)$ | 3. The number of minutes that Lin walked. |
| D. 90 | |

Jar of Honey (Source: brilliant.org)

A full jar of honey weighs 750 grams, and the same jar two-thirds full weighs 550 grams. What is the weight of the empty jar in grams?

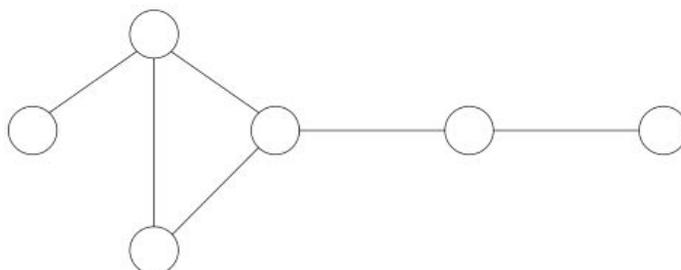


Who's Who? (Source: <https://wild.maths.org/>)

We can represent a group of friends by drawing a graph.

- Each node represents a person.
- An edge joins two nodes if and only if those two people are friends.

Here is a graph showing a group of friends. Can you work out who's who using the clues below?



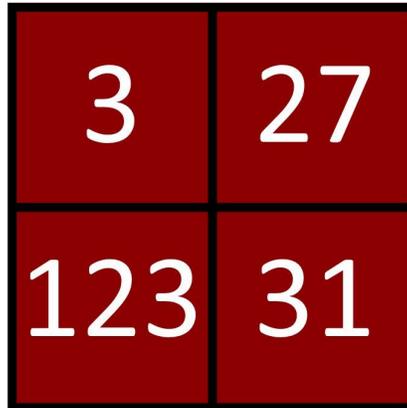
1. Alan has 3 friends, Barney, Charlie, and Daniel.
2. Barney and Ed are both friends with Charlie.

3. Ed is Frank's only friend.

Day 3

Which One Doesn't Belong? (Source: wodb.ca)

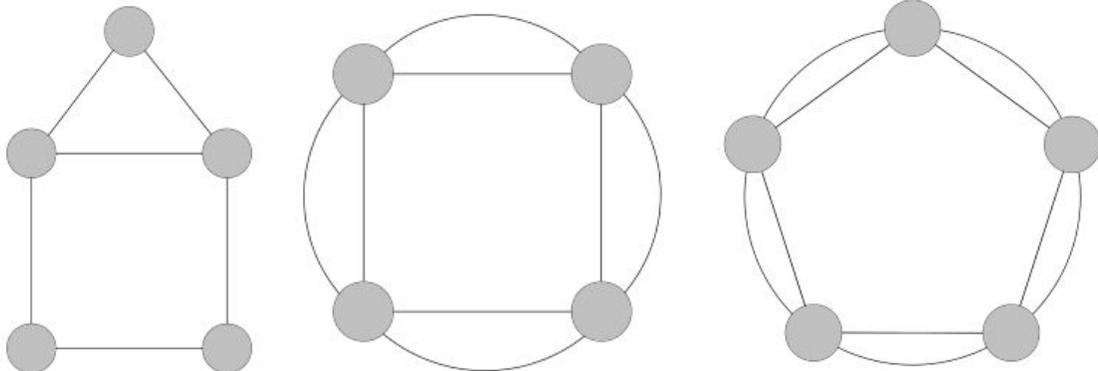
Choose a number in this picture that you don't think belongs with the rest. Explain why. Can you pick another number and give a different reason?

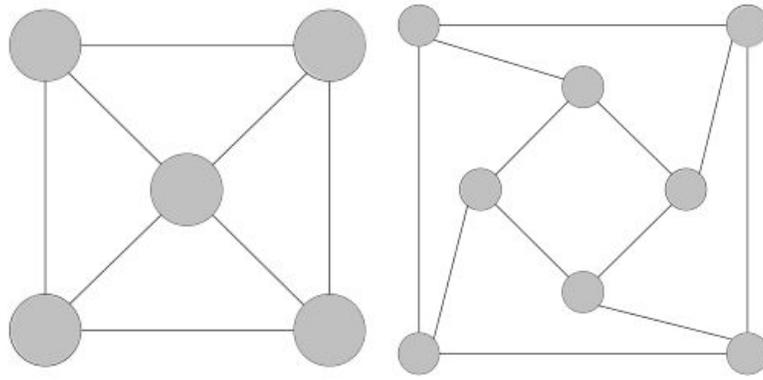


Graphs (Source: <https://wild.maths.org/>)

A traversable graph is one you can draw without taking your pen off the paper, and without going over any edge twice.

For each graph below, decide whether or not it is traversable. It might be helpful to keep track of where you started, the route you took, and where you finished.





Matching Equations (Source: <https://openupresources.org/math-curriculum/>)

Match each equation to a story. (Two of the stories match the same equation.)

1. $3(x + 5) = 17$
2. $3x + 5 = 17$
3. $5(x + 3) = 17$
4. $5x + 3 = 17$

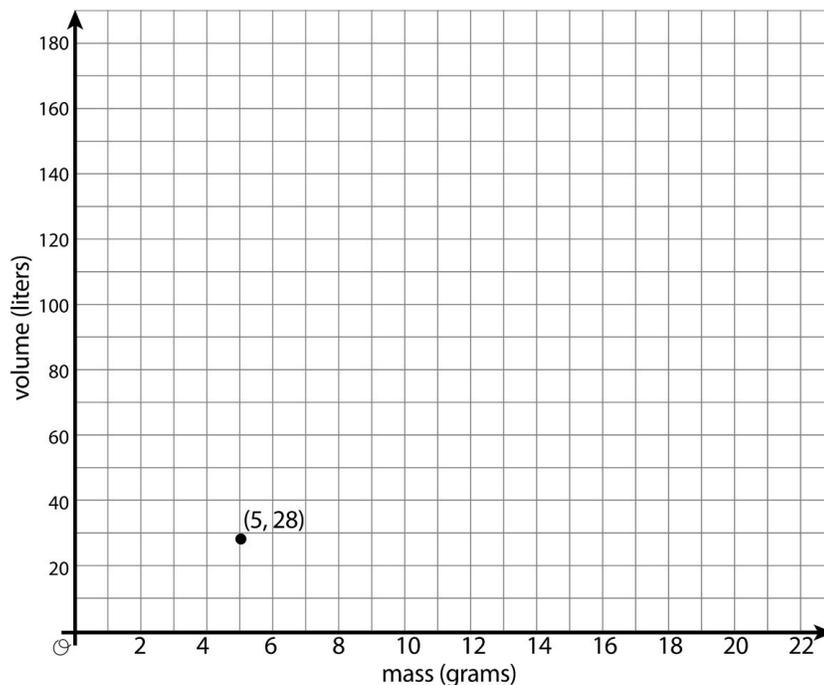
- A. Jada's teacher fills a travel bag with 5 copies of a textbook. The weight of the bag and books is 17 pounds. The empty travel bag weighs 3 pounds. How much does each book weigh?
- B. A piece of scenery for the school play is in the shape of a 5-foot-long rectangle. The designer decides to increase the length. There will be 3 identical rectangles with a total length of 17 feet. By how much did the designer increase the length of each rectangle?
- C. Elena spends \$17 and buys a \$3 book and a bookmark for each of her 5 cousins. How much does each bookmark cost?
- D. Noah packs up bags at the food pantry to deliver to families. He packs 5 bags that weigh a total of 17 pounds. Each bag contains 3 pounds of groceries and a packet of papers with health-related information. How much does each packet of papers weigh?
- E. Andre has 3 times as many pencils as Noah and 5 pens. He has 17 pens and pencils all together. How many pencils does Noah have?

Six out of seven “□”s below contain addition signs, and the remaining “□” contains a subtraction sign. Where should the six + signs and one – sign go to make the equation true?

$$1 \square 2 \square 3 \square 4 \square 5 \square 6 \square 7 \square 8 = 30$$

Graphing (Source: <https://openupresources.org/math-curriculum/>)

There is a proportional relationship between the volume of a sample of helium in liters and the mass of that sample in grams. If the mass of a sample is 5 grams, its volume is 28 liters. (5, 28) is shown on the graph below.

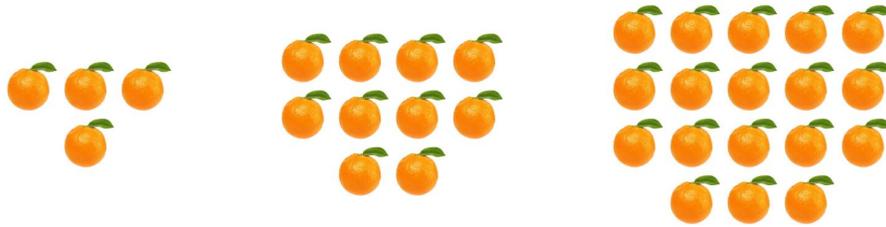


- What is the constant of proportionality in this relationship?
- In this situation, what is the meaning of the number you found in part a?
- Add at least three more points to the graph above, and label with their coordinates.
- Write an equation that shows the relationship between the mass of a sample of helium and its volume. Use m for mass and v for volume.

Visual Pattern (Source: visualpatterns.org)

Below is a pattern of oranges in stages 1-3 below.

- A. Draw what you think stage 4 might look like.
- B. Draw or describe what you think stage 10 might look like.
- C. Label how many oranges are in each stage.
- D. Try to write an equation to describe the relationship between the stage number n and the number of oranges O .

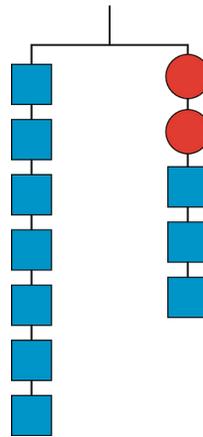


Day 5

Balanced Hanger (Source: <https://openupresources.org/math-curriculum/>)

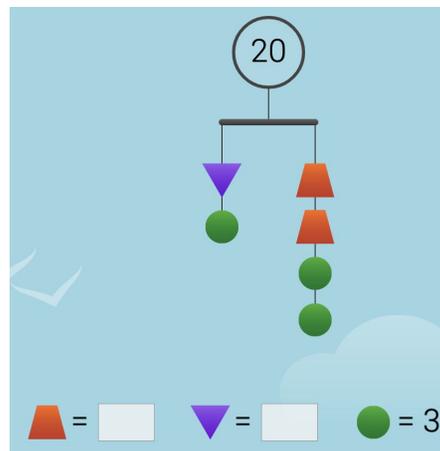
Explain how the parts of the balanced hanger compare to the parts of the equation.

$$7 = 2x + 3$$



Mobile (Source: <https://solveme.edc.org/Mobiles.html>)

What is the value of the trapezoid? The triangle?



Would You Rather (Source: <https://www.wouldyourathermath.com/>)

Whichever option you choose, justify your reasoning with mathematics.

Drive a car at a rate of 40 kilometers per hour
OR
Drive a car at a rate of 15 meters per second?



Mathematics Grade 7
Remote Learning Activities

WEEK 3

Day 1

20% Discount (Source: <https://openupresources.org/math-curriculum/>)

An item costs x dollars and then a 20% discount is applied. Select all the expressions that could represent the price of the item after the discount.

1. $\frac{20}{100}x$
2. $x - \frac{20}{100}x$
3. $(1 - 0.20)x$
4. $\frac{100-20}{100}x$
5. $0.80x$
6. $(100 - 20)x$

Puzzle (Source: <https://www.solvemoji.com/>)

What is the value of the last row?

$$\text{Red Cat} + \text{Red Cat} + \text{Red Cat} = 21$$

$$\text{Brown Owl} + \text{Brown Owl} \times \text{Red Cat} = 120$$

$$\text{Panda} + \text{Brown Owl} \times \text{Brown Owl} = 76$$

$$\text{Red Cat} + \text{Panda} \times \text{Brown Owl} = ?$$

Which One Doesn't Belong? (Source: wodb.ca)

Choose a number in this picture that you don't think belongs with the rest. Explain why. Can you pick another number and give a different reason?

$-\frac{1}{4}$	40%
$\frac{3}{2}$	$\frac{1}{6}$

Day 2

Percent Expressions (Source: <https://openupresources.org/math-curriculum/>)

Select all expressions that show x increased by 35%.

- A. $1.35x$
- B. $\frac{35}{100}x$
- C. $x + \frac{35}{100}x$
- D. $(1 + 0.35)x$
- E. $\frac{100+35}{100}x$
- F. $(100 + 35)x$

Two containers (Source: brilliant.org)

You have two containers, one which can hold 11 liters of water and the other of which can hold 13 liters.



You also have access to a sink with a faucet. You can do any of these three things as many times as you like:

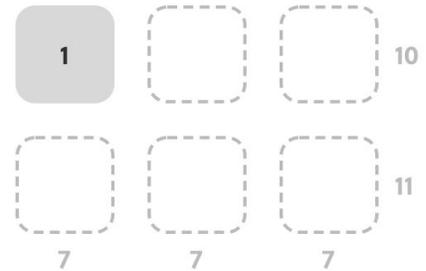
- Fill one of the containers to the top with water.
- Completely empty one of the containers into the sink.
- Pour the contents of one container into another until the second container is full (or until the first container is empty).

Given these conditions, is it possible to measure out exactly 8 liters?

Is It Possible? (Source: brilliant.org)

To solve the problem, put in the number tiles so that every row and column adds up to the target sum beside it.

Is it possible? Show your explanation.



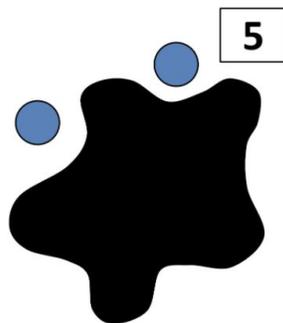
Day 3

Splat (Source:

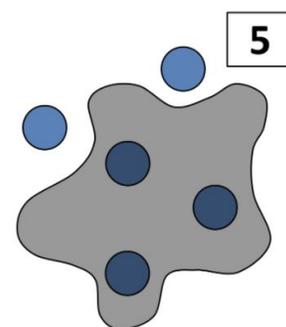
<https://stevevyborne.com/2018/09/splat-for-google-slides-40-lessons/>)

To solve a Splat puzzle, you need to figure out what is covered up by the black splat. For example, this puzzle has a total value of 5, but you only see 2 circles, so what is underneath the splat?

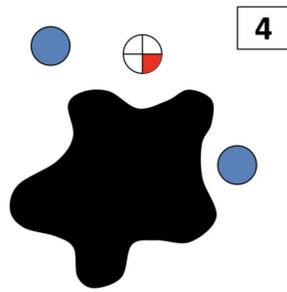
Puzzle



Answer



What is covered up by the splat?



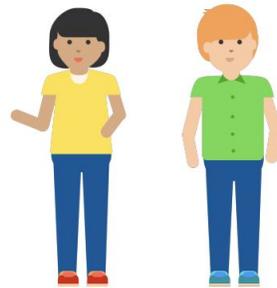
Unit Fraction Proportion (Source: <https://www.openmiddle.com/>)

Fill in the boxes using the digits 1 through 9, at most one time each, to make a true equality statement

$$\frac{\frac{1}{\square}}{\frac{1}{\square}} = \frac{\frac{1}{\square}}{\frac{1}{\square}}$$

Brothers and Sisters (Source: brilliant.org)

A girl has twice as many sisters as brothers. Each of her brothers has five times as many sisters as brothers. All the children have the same parents. Assuming there is at least one brother, how many children are in the family?



Your answer:

Day 4

Story Problems (Source: <https://openupresources.org/math-curriculum/>)

Here are two stories:

- The initial freshman class at a college is 10% smaller than last year's class. But then during the first week of classes, 20 more students enroll. There are then 830 students in the freshman class.
- A store reduces the price of a computer by \$20. Then during a 10% off sale, a customer pays \$830.

Here are two equations:

- $0.9x + 20 = 830$
- $0.9(x - 20) = 830$

- Decide which equation represents each story.
- Explain why one equation has parentheses and the other doesn't.

- C. Solve each equation, and explain what the solution means in the situation.

Practice (Source: <https://openupresources.org/math-curriculum/>)

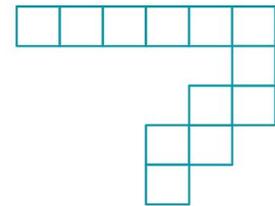
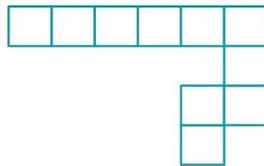
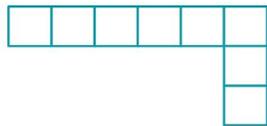
Solve each equation.

- A. $4x = -28$
- B. $x - (-6) = -2$
- C. $-x + 4 = -9$
- D. $-3x + 7 = 1$
- E. $25x + 11 = -86$

Visual Pattern (Source: visualpatterns.org)

Below is a pattern of squares in stages 1-3 below.

- A. Draw what you think stage 4 might look like.
- B. Draw or describe what you think stage 10 might look like.
- C. Label how many squares are in each stage.
- D. Try to write an equation to describe the relationship between the stage number n and the number of squares S .



Day 5

Equations (Source: <https://openupresources.org/math-curriculum/>)

Match each story to an equation.

- A. A stack of nested paper cups is 8 inches tall. The first cup is 4 inches tall and each of the rest of the cups in the stack adds $\frac{1}{4}$ inch to the height of the stack.
- B. A baker uses 4 cups of flour. She uses $\frac{1}{4}$ cup to flour the counters and the rest to make 8 identical muffins.
- C. Elena has an 8-foot piece of ribbon. She cuts off a piece that is $\frac{1}{4}$ of a foot long and cuts the remainder into four pieces of equal length.

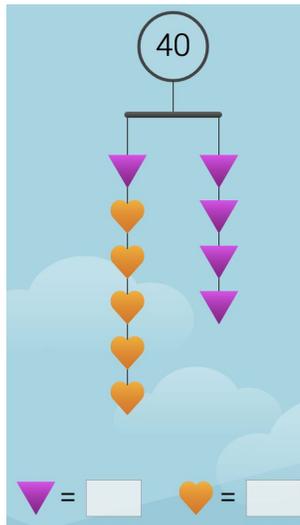
1. $\frac{1}{4} + 4x = 8$

2. $4 + \frac{1}{4}x = 8$

3. $8x + \frac{1}{4} = 4$

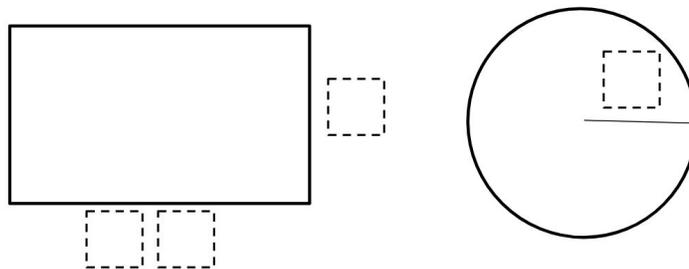
Mobile (Source: <https://solveme.edc.org/Mobiles.html>)

What is the value of the heart? The triangle?



Perimeter and Circumference (Source: <https://www.openmiddle.com/>)

Using the digits 1-6, at most one time each, fill in the boxes to create the largest and smallest combined perimeter/circumference for the rectangle and circle.



Day 1

Solving Equations (Source: <https://openupresources.org/math-curriculum/>)

Three students each attempted to solve the equation $2(x - 9) = 10$, but got different solutions. Here are their methods. Do you agree with any of their methods, and why?

Noah's method:

$$\begin{aligned}2(x - 9) &= 10 \\2(x - 9) + 9 &= 10 + 9 && \text{add 9 to each side} \\2x &= 19 \\2x \div 2 &= 19 \div 2 && \text{divide each side by 2} \\x &= \frac{19}{2}\end{aligned}$$

Elena's method:

$$\begin{aligned}2(x - 9) &= 10 \\2x - 18 &= 10 && \text{apply the distributive property} \\2x - 18 - 18 &= 10 - 18 && \text{subtract 18 from each side} \\2x &= -8 \\2x \div 2 &= -8 \div 2 && \text{divide each side by 2} \\x &= -4\end{aligned}$$

Andre's method:

$$\begin{aligned}2(x - 9) &= 10 \\2x - 18 &= 10 && \text{apply the distributive property} \\2x - 18 + 18 &= 10 + 18 && \text{add 18 to each side} \\2x &= 28 \\2x \div 2 &= 28 \div 2 && \text{divide each side by 2} \\x &= 14\end{aligned}$$

Puzzle (Source: <https://www.solvemoji.com/>)

What is the value of the last row?

$$\text{Panda} + \text{Panda} + \text{Panda} = 30$$

$$\text{Panda} + \text{Panda} \times \text{Robot} = 130$$

$$\text{Robot} \times \text{Robot} + \text{Monkey} = 43$$

$$\text{Monkey} + \text{Panda} \times \text{Robot} = ?$$

Which One Doesn't Belong? (Source: wodb.ca)

Choose a number in this picture that you don't think belongs with the rest. Explain why. Can you pick another number and give a different reason?

33%	$\frac{1}{3}$
$\frac{5}{3}$	$\overline{.6}$

Day 2

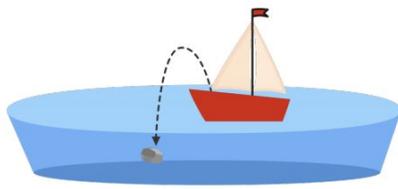
Story Problems (Source: <https://openupresources.org/math-curriculum/>)

- Andre wants to buy a backpack. The normal price of the backpack is \$40. He notices that a store that sells the backpack is having a 30% off sale. What is the sale price of the backpack?
- On the first math exam, 16 students received an A grade. On the second math exam, 12 students received an A grade. What percentage decrease is that?

Water Level (Source: brilliant.org)

A man stuck in a small sailboat on a perfectly calm lake throws a stone overboard. It sinks to the bottom of the lake. When the water again settles to a perfect calm, is

the water level in the lake higher, lower, or in the same place compared to where it was before the stone was cast in?



- The water level is lower.
- The water level rises.
- The water level stays the same.

Is It Possible? (Source: brilliant.org)

To solve the problem, put in the number tiles so that every row and column adds up to the target sum beside it.

			14
			7
7	7	7	

1 2 3 4 5 6

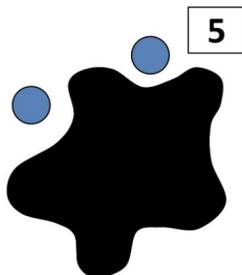
Day 3

Splat (Source:

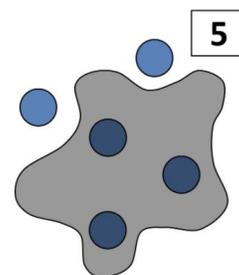
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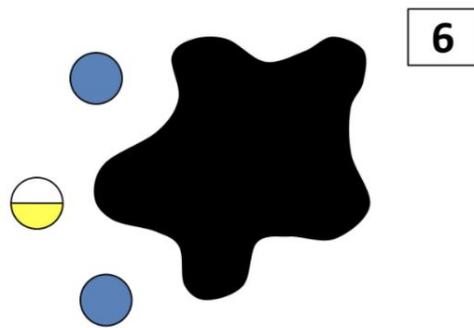
Puzzle



Answer



What is covered up by the splat?



Adding and Subtracting Integers (Source: <https://www.openmiddle.com/>)

Using the digits 1 to 6, at most one time each, fill in the boxes so that top two equations are equal and the bottom equation has the greatest value.

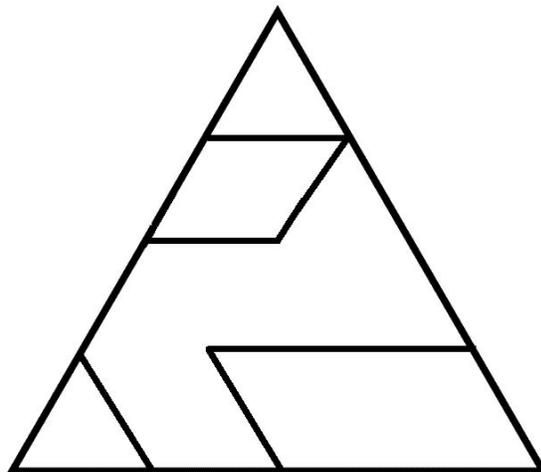
$$-\square + \square =$$

$$-\square - \square =$$

$$-\square - \square =$$

Fraction Talk (Source: <http://fractiontalks.com/>)

What fraction of the large triangle is represented by each region? (Do all your fractions add up to one whole?)



Select all expressions that represent a correct solution to the equation $6(x + 4) = 20$.

A. $(20 - 4) \div 6$

B. $\frac{1}{6}(20 - 4)$

C. $20 - 6 - 4$

D. $20 \div 6 - 4$

E. $\frac{1}{6}(20 - 24)$

F. $(20 - 24) \div 6$

Matching Equations to Stories (Source: <https://openupresources.org/math-curriculum/>)

Match each equation to its solution and to the story it describes.

Equations:

A. $5x - 7 = 3$

B. $7 = 3(5 + x)$

C. $3x + 5 = -7$

D. $\frac{1}{3}(x + 7) = 5$

Solutions:

1. -4

2. $-\frac{8}{3}$

3. 2

4. 8

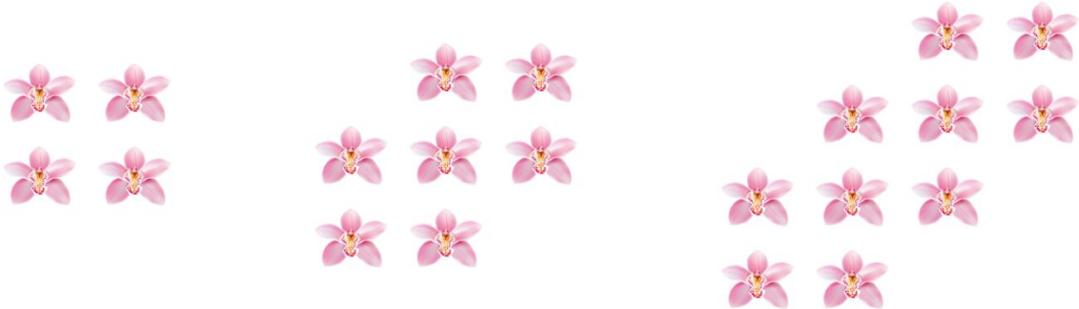
Stories:

- The temperature is -7 . Since midnight the temperature tripled and then rose 5 degrees. What was the temperature at midnight?
- Jada has 7 pink roses and some white roses. She gives all of them away: 5 roses to each of her 3 favorite teachers. How many white roses did she give away?
- A musical instrument company reduced the time it takes for a worker to build a guitar. Before the reduction it took 5 hours. Now in 7 hours they can build 3 guitars. By how much did they reduce the time it takes to build each guitar?
- A club puts its members into 5 groups for an activity. After 7 students have to leave early, there are only 3 students left to finish the activity. How many students were in each group?

Visual Pattern (Source: visualpatterns.org)

Below is a pattern of orchids in stages 1-3 below.

- A. Draw what you think stage 4 might look like.
- B. Draw or describe what you think stage 10 might look like.
- C. Label how many orchids are in each stage.
- D. Try to write an equation to describe the relationship between the stage number n and the number of orchids O .



Day 5

Story Problems (Source: <https://openupresources.org/math-urriculum/>)

- A. The baby giraffe weighed 132 pounds at birth. He gained weight at a steady rate for the first 7 months until his weight reached 538 pounds. How much did he gain each month?
- B. Six teams are out on the field playing soccer. The teams all have the same number of players. The head coach asks for 2 players from each team to come help him move some equipment. Now there are 78 players on the field. Write and solve an equation whose solution is the number of players on each team.

Mobile (Source:

<https://solveme.edc.org/Mobiles.html>)

What is the value of the triangle? The crescent?



Sides of a Triangle (Source: <https://www.openmiddle.com/>)

The perimeter of a triangle is 20 units. Using whole numbers, how many sets of side lengths can you find for this triangle?