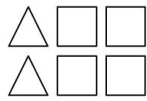**Ratios & Proportions (~ 36 min)**

1. Find the ratio of to squares in the diagram below.

Unsimplified ratio of triangles to squares:

⬜ : ⬜

For every 1 triangle there are _____ squares, therefore the simplified ratio of triangles to squares is _____ : _____.

2. Find the ratio of to squares in the diagram below.
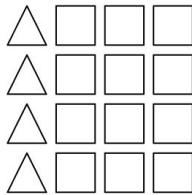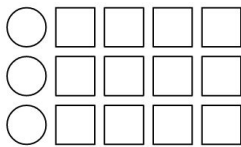

Unsimplified ratio of triangles to squares:

⬜ : ⬜

For every 1 triangle there are _____ squares, therefore the simplified ratio of triangles to squares is _____ : _____.

3. Find the ratio of circles to squares in the diagram below.
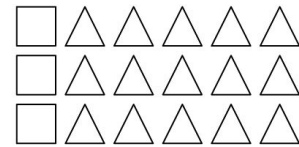

Unsimplified ratio of circles to squares:

⬜ : ⬜

For every 1 circle there are _____ squares, therefore the simplified ratio of circles to squares is _____ : _____.

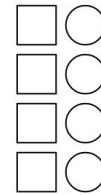**4.** Find the ratio of squares to in the diagram below.

Unsimplified ratio of squares to triangles:

⬜ : ⬜

For every 1 square there are _____ triangles, therefore the simplified ratio of squares to triangles is _____ : _____.

5. Find the ratio of squares to circles in the diagram below.

Unsimplified ratio of squares to circles:

⬜ : ⬜

For every 1 square there are _____ circles, therefore the simplified ratio of squares to circles is _____ : _____.

6. There are 20 triangles and 4 squares. What is the simplest ratio of squares to triangles?

7. There are 6 circles and 9 triangles. What is the simplest ratio of circles to total shapes?

Ratios & Proportions (~ 36 min)

8. There are 20 circles and 8 triangles. What is the simplest ratio of triangles to total shapes?

9. There are 3 squares and 6 circles. What is the simplest ratio of squares to circles?

10. There are 10 squares and 6 circles. What is the simplest ratio of circles to squares?

11. Fill in the blanks to express the quantities given in ratio language. Ratios must be expressed in *simplest form.*

Number of Books Read in a Year:

Person	Books
Keshawn	66
Avery	11
Julian	55

For every _____ book(s) Keshawn read, Avery read _____ book(s).

12. Fill in the blanks to express the quantities given in ratio language. Ratios must be expressed in *simplest form.*

Distribution of Student Quiz Scores:

Quiz Score	Students
60s	35
70s	30
80s	5
90s	25

For every _____ student(s) scoring in the 90s, there was/were _____ student(s) scoring in the 60s.

13. Fill in the blanks to express the quantities given in ratio language. Ratios must be expressed in *simplest form.*

Number of Twitter Followers:

Person	Followers
Kehlani	14
Shaquana	35
Hannah	21
Leah	49

For every _____ follower(s) Shaquana has, Kehlani has _____ follower(s).

14. Fill in the blanks to express the quantities given in ratio language. Ratios must be expressed in *simplest form.*

Number of Boys and Girls in a Class:

Gender	Students
Boys	30
Girls	40

For every _____ boy(s) in the class, there is/are _____ girl(s) in the class.

Ratios & Proportions (~ 36 min)

15. Fill in the blanks to express the quantities given in ratio language. Ratios must be expressed in *simplest form.*

Number of Students in Each Grade:

Grade	Students
9th Grade	36
10th Grade	27
11th Grade	63
12th Grade	9

For every _____ student(s) in 11th Grade, there is/are

_____ student(s) in 10th Grade.

16. Yusuf and Dianelys are adding chocolate chips to a batch of pre-made cookie dough to make chocolate chip cookies. Yusuf mixes 2 cups of dough with 5 quarter-cups of chocolate chips and Dianelys mixes 4 cups of dough with 5 quarter-cups of chocolate chips. Whose cookies will be more chocolaty?

A. Yusuf's cookies will be more chocolaty.

B. Dianelys's cookies will be more chocolaty.

C. The two sets of cookies will be equally chocolaty.

17. Students are making lemonade from a powdered lemon drink mix. Meena mixes 4 cups of water and 5 teaspoons of powdered lemon mix. Nolan mixes 4 cups of water and 3 teaspoons of powdered lemon mix. Whose mix will be more lemony?

A. Meena's mix will be more lemony.

B. Nolan's mix will be more lemony.

C. The two mixes will be equally lemony.

18. Yusuf and Nora are making fruit salads for a picnic. Yusuf mixes 5 cups of melon and 4 cups of apple and Nora mixes 3 cups of melon and 4 cups of apple. Whose fruit salad will taste more melony?
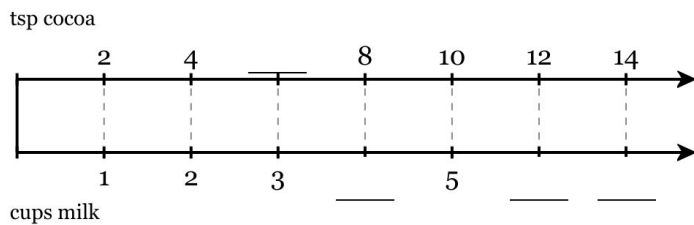
A. Yusuf's fruit salad will be more melony.

B. Nora's fruit salad will be more melony.

C. The two fruit salads will be equally melony.
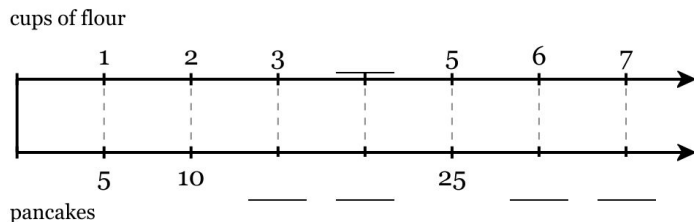
Ratios & Proportions (~ 36 min)

19. In art class students are mixing blue and red paint to make purple paint. Jeriel mixes 3 cups of blue paint and 2 cups of red paint. Fawzia mixes 3 cups of blue paint and 2 cups of red paint. Whose purple paint will be bluer?

A. Jeriel's purple paint will be bluer.

B. Fawzia's purple paint will be bluer.
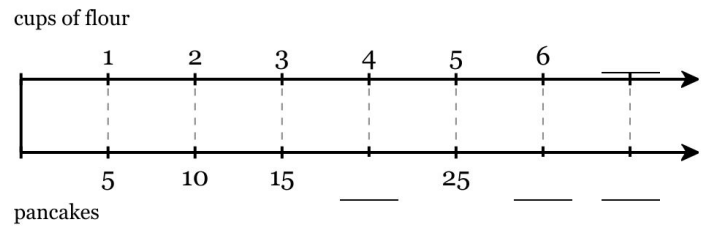
C. The two purple paints will be equally blue.

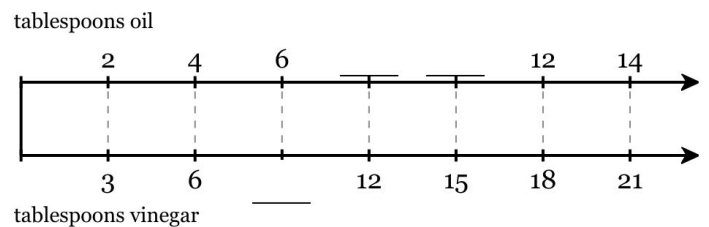**20.** A hot chocolate recipe calls for two teaspoons of cocoa for every cup of milk.

tsp cocoa

cups milk

21. A recipe calls for one cup of flour to make five pancakes. Fill in the blanks in the double number-line below.

cups of flour
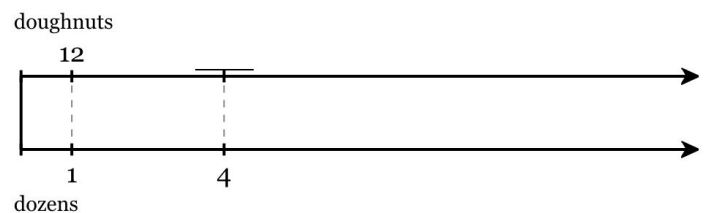

pancakes

22. A recipe calls for one cup of flour to make five pancakes. Fill in the blanks in the double number-line below.
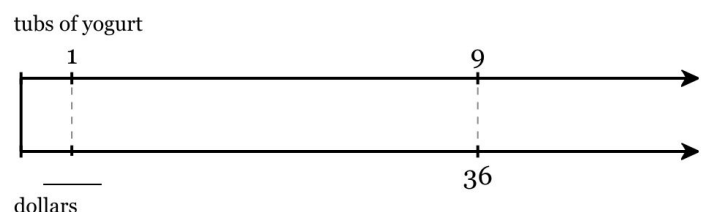
cups of flour

pancakes

23. To make salad dressing, combine two tablespoons of oil for every three tablespoons of vinegar. Fill in the blanks in the double number-line below.

tablespoons oil

tablespoons vinegar

24. There are twelve doughnuts in a dozen. How many doughnuts are there in four dozen?

doughnuts

dozens

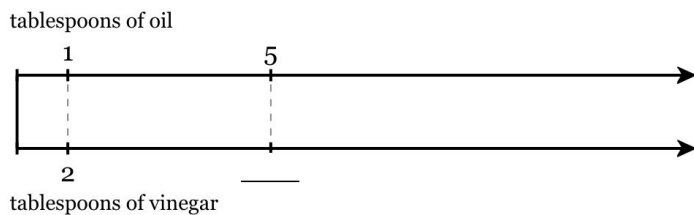**25.** Nine tubs of yogurt cost $36. How much does one tub of yogurt cost?

tubs of yogurt

dollars

Ratios & Proportions (~ 36 min)

26. A tub of yogurt costs $4. How much do five tubs of yogurt cost?

tubs of yogurt

```
      1           5
```

```
      4         ____
  dollars
```

27. To make salad dressing, combine one tablespoon of oil for every two tablespoons of vinegar. If a batch of salad dressing has five tablespoons of oil, how many tablespoons of vinegar does it have?

tablespoons of oil

```
      1           5
```

```
      2         ____
tablespoons of vinegar
```

28. A grocery store sells a bag of 3 oranges for $1.17. What is the unit cost? On the double number line below, fill in the given values, then use multiplication or division to find the missing value.

dollars

```
  0
```

```
  0      ____        ____
oranges
```

29. Kehlani read 12 books in 2 months. If she reads at a constant rate, how many books did she read each month? Give your answer as a whole number or a FRACTION in simplest form.

30. Jayden bought 3 chicken wings for $3.00. What's the unit cost of one wing?

31. Nakeisha read 2 books in 3 months. If she reads at a constant rate, how many books did she read each month? Give your answer as a whole number or a FRACTION in simplest form. On the double number line below, fill in the given values, then use multiplication or division to find the missing value.

books

```
  0
```

```
  0      ____        ____
months
```
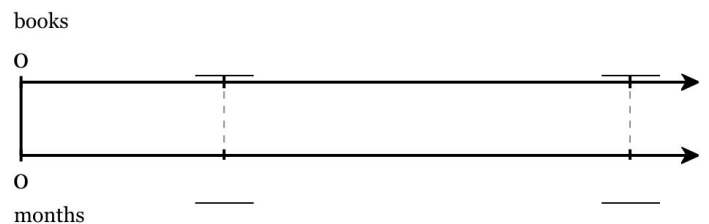
Ratios & Proportions (~ 36 min)

32. The ratio of students to adults on a field trip is 22 to 2. Which table correctly represents this ratio?

A

Students	Adults
11	1
12	2
13	3

B

Students	Adults
22	2
24	4
26	6

C

Students	Adults
11	1
22	12
33	23

D

Students	Adults
22	2
33	3
44	4

33. A pump fills a pool at a constant rate. At the end of 5 minutes it has filled 2 gallons of water. Which table represents the relationship between the number of minutes and the number of gallons of water in the pool?

A

Time (minutes)	Water (gallons)
5	2
10	4
20	8

B

Time (minutes)	Water (gallons)
5	2
10	6
20	10

C

Time (minutes)	Water (gallons)
10	4
12	6
14	8

D

Time (minutes)	Water (gallons)
5	2
10	7
20	17

34. The diagram below represents the rate of making copies on a copy machine. Which table represents this rate?

A

Time (seconds)	Copies
1	6
2	12
3	18

B

Time (seconds)	Copies
1	2
2	4
3	6

C

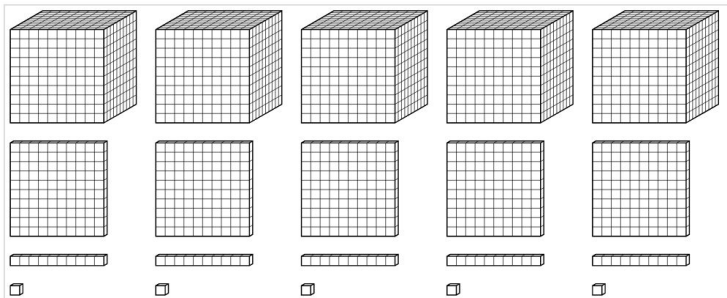| Time (seconds)	Copies
6	1
12	2
18	3

D

Time (seconds)	Copies
2	1
4	2
6	3

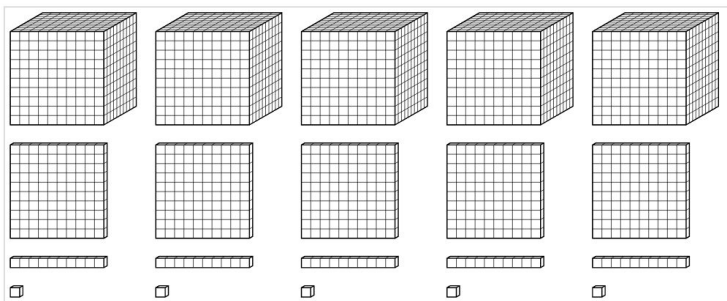# Base 10 Number Sense (~37 min)

1. Circle the blocks you would need to create a representation of 3553. The shapes represent 1000s, 100s, 10s, and 1s, respectively.
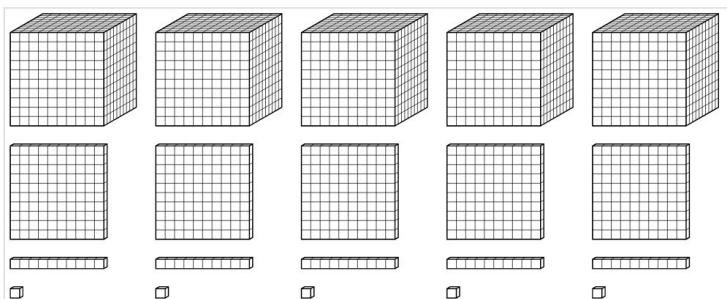
2. Circle the blocks you would need to create a representation of 4151. The shapes represent 1000s, 100s, 10s, and 1s, respectively.
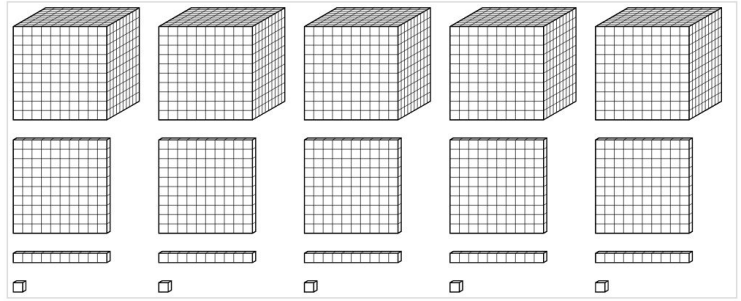
3. Circle the blocks you would need to create a representation of 3031. The shapes represent 1000s, 100s, 10s, and 1s, respectively.
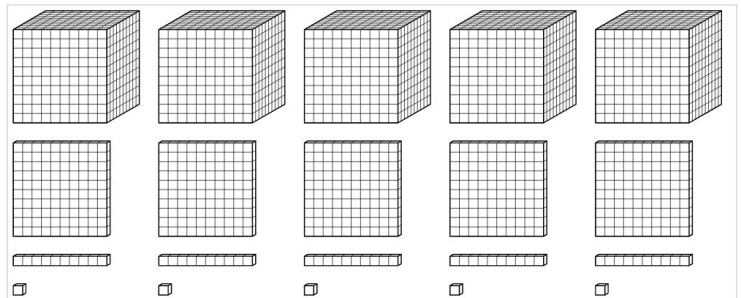
4. Circle the blocks you would need to create a representation of 333. The shapes represent 1000s, 100s, 10s, and 1s, respectively.
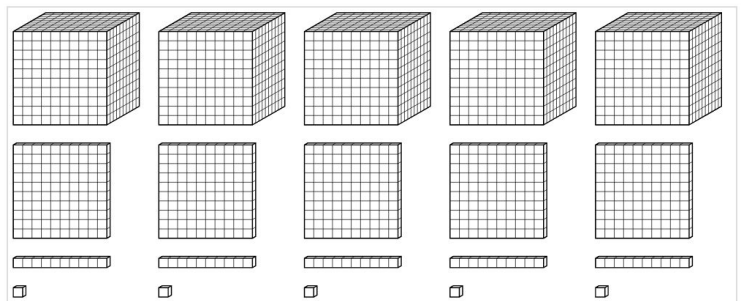
5. Circle the blocks you would need to create a representation of 3133. The shapes represent 1000s, 100s, 10s, and 1s, respectively.
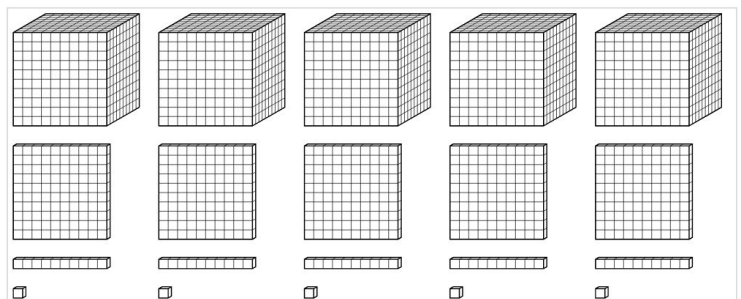
6. Circle the blocks you would need to create a representation of 5.401. The shapes represent 1s, .1s, .01s, and .001s, respectively.

7. Circle the blocks you would need to create a representation of 3.232. The shapes represent 1s, .1s, .01s, and .001s, respectively.

8. Circle the blocks you would need to create a representation of 2.133. The shapes represent 1s, .1s, .01s, and .001s, respectively.

9. Circle the blocks you would need to create a representation of 1.215. The shapes represent 1s, .1s, .01s, and .001s, respectively.
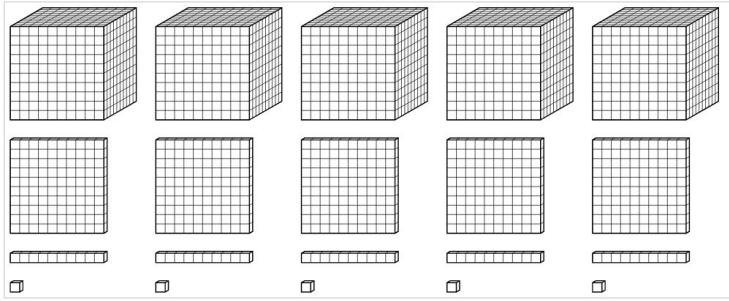

10. Circle the blocks you would need to create a representation of 3.105. The shapes represent 1s, .1s, .01s, and .001s, respectively.
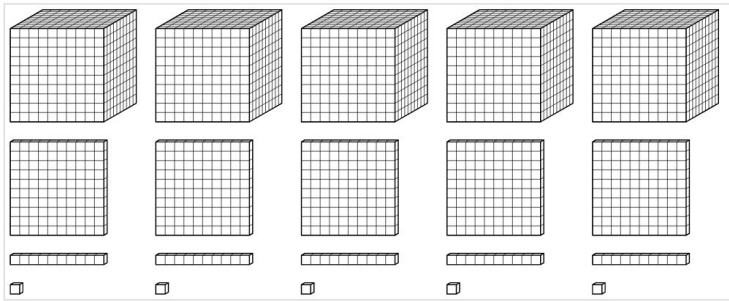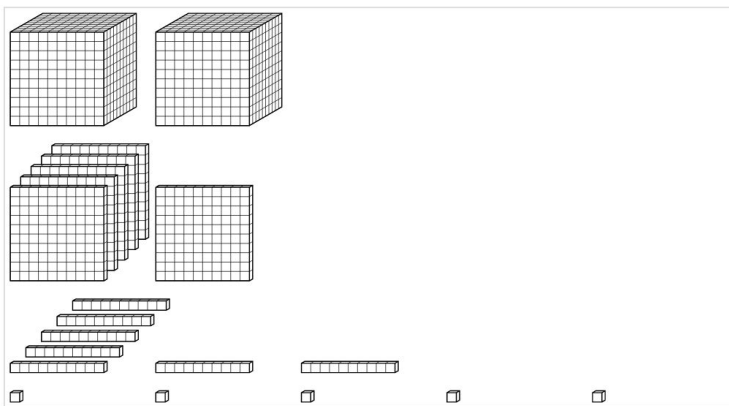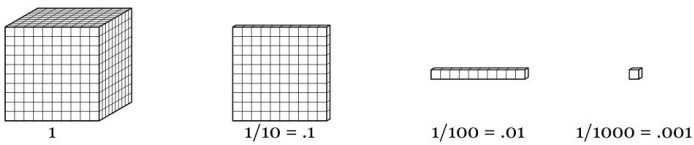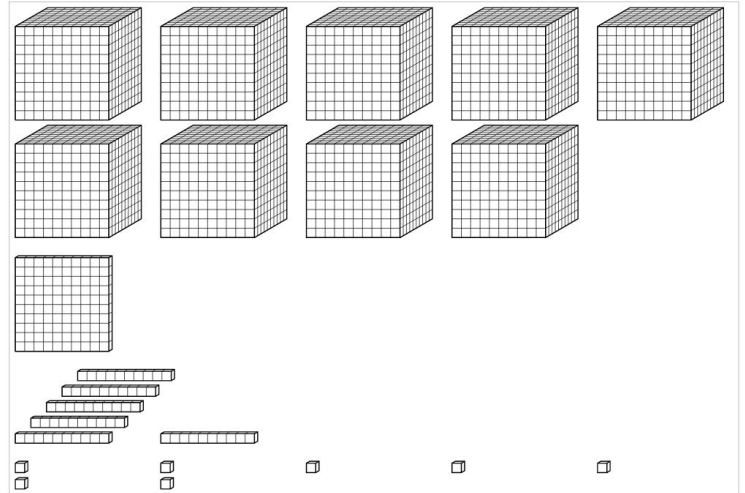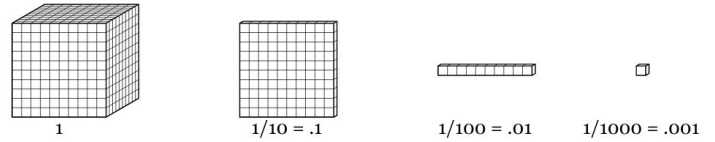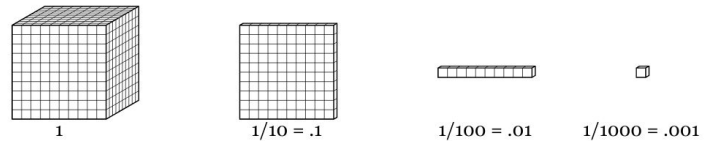

11. What number is represented by the base ten blocks shown below?

12. What number is represented by the base ten blocks shown below?

13. What number is represented by the base ten blocks shown below?

Base 10 Number Sense (~37 min)
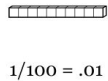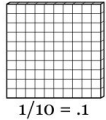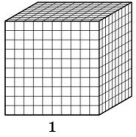
14. What number is represented by the base ten blocks shown below?

1   1/10 = .1   1/100 = .01   1/1000 = .001
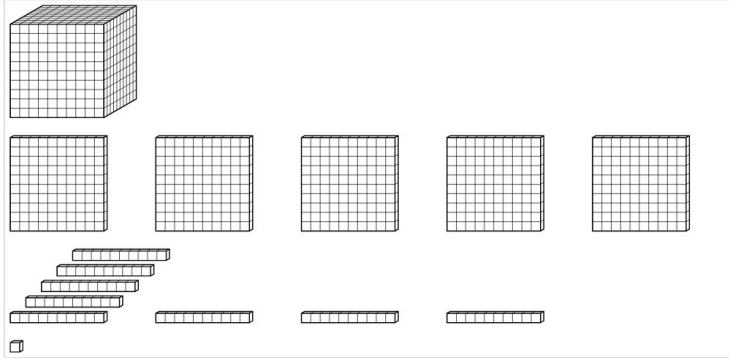
15. What number is represented by the base ten blocks shown below?

1   1/10 = .1   1/100 = .01   1/1000 = .001
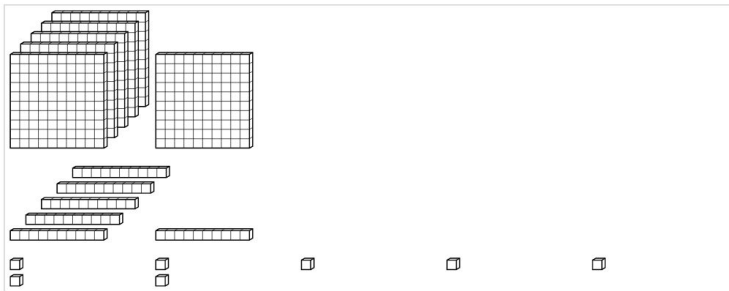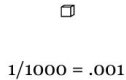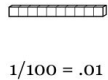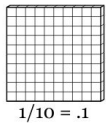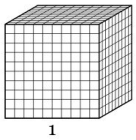
16. Write the numbers below in order from least to greatest. Use commas to separate.

| 3.6 | 4.3 | 3.9 | 2.3 | 1.7 | 1.5 |

17. Write the numbers below in order from least to greatest. Use commas to separate.

| 1.1 | 1.3 | 4.4 | 3.6 | 0.8 | 4.6 |

18. Write the numbers below in order from least to greatest. Use commas to separate.

| 2.6 | 7.1 | 2.2 | 6.8 | 6.4 | 1.6 |

19. Write the numbers below in order from least to greatest. Use commas to separate.

| 2.3 | 3.6 | 3.2 | 2.9 | 3.1 | 3.8 |

20. Write the numbers below in order from least to greatest. Use commas to separate.

| 3.4 | 2.6 | 5.4 | 2.8 | 5.6 | 4.9 |

21. Evaluate: 140.9×10

22. Evaluate: $525.8 \div 10$

23. Evaluate: $88.28 \div 10$

24. Evaluate: 104.995×10

3

25. Evaluate: 17.617×10

26. Compute. Express your answer as a whole number or decimal.

$$17 \times 10$$

27. Compute. Express your answer as a whole number or decimal.

$$71.9 \div 10^3$$

28. Compute. Express your answer as a whole number or decimal.

$$87.9 \times 10$$

29. Compute. Express your answer as a whole number or decimal.

$$6824 \div 10$$

30. Compute. Express your answer as a whole number or decimal.

$$39000 \div 10$$

31. $89,700$ is how many times greater than 8.97? 8.97 is what fractional part of $89,700$?

$89,700$ is _____ times greater than 8.97
<u>word bank 1</u>

8.97 is _____ of $89,700$
<u>word bank 2</u>

This word bank also applies to questions 32 - 35.

Word bank 1: **(a)** 10, **(b)** 100, **(c)** 1000, **(d)** 10000

Word bank 2: **(a)** 1/10, **(b)** 1/100, **(c)** 1/1000, **(d)** 1/10000

32. 8910 is how many times greater than 8.91? 8.91 is what fractional part of 8910?

8910 is _____ times greater than 8.91
<u>word bank 1</u>

8.91 is _____ of 8910
<u>word bank 2</u>

33. 5370 is how many times greater than 53.7? 53.7 is what fractional part of 5370?

5370 is _____ times greater than 53.7
<u>word bank 1</u>

53.7 is _____ of 5370
<u>word bank 2</u>

34. 7040 is how many times greater than 70.4? 70.4 is what fractional part of 7040?

7040 is _____ times greater than 70.4
<u>word bank 1</u>

70.4 is _____ of 7040
<u>word bank 2</u>

35. 3.2 is how many times greater than $.32$? $.32$ is what fractional part of 3.2?

3.2 is _____ times greater than $.32$
<u>word bank 1</u>

$.32$ is _____ of 3.2
<u>word bank 2</u>

36. Fill in the guided sentence below to explain how 8×10 relates to 2×10.

8 is _____ 2, so 8×10 is _____ 2×10.
<u>word bank 1</u>   <u>word bank 2</u>

$2 \times 10 =$ ____ $8 \times 10 =$ ____

This word bank also applies to questions 37 - 40.

Word bank 1: **(a)** 2 times, **(b)** 3 times, **(c)** 4 times, **(d)** 5 times, **(e)** 10 times

Word bank 2: **(a)** 2 times, **(b)** 3 times, **(c)** 4 times, **(d)** 5 times, **(e)** 10 times

37. Fill in the guided sentence below to explain how 28×3 relates to 7×3.

28 is _____ 7, so 28×3 is _____ 7×3.
<u>word bank 1</u>   <u>word bank 2</u>

$7 \times 3 =$ ____ $28 \times 3 =$ ____

Base 10 Number Sense (~37 min)

38. Fill in the guided sentence below to explain how 18×2 relates to 6×2.

18 is _____ 6, so 18×2 is _____ 6×2.
_{word bank 1}   _{word bank 2}

$6 \times 2 = $ _____ $18 \times 2 = $ _____

39. Fill in the guided sentence below to explain how 60×7 relates to 6×7.

60 is _____ 6, so 60×7 is _____ 6×7.
_{word bank 1}   _{word bank 2}

$6 \times 7 = $ _____ $60 \times 7 = $ _____

40. Fill in the guided sentence below to explain how 40×8 relates to 10×8.

40 is _____ 10, so 40×8 is _____ 10×8.
_{word bank 1}   _{word bank 2}

$10 \times 8 = $ _____ $40 \times 8 = $ _____

41. Fill in the guided sentence below to explain how $.06 \times 5$ relates to 6×5.

$.06$ is _____ of 6, so
_{word bank 1}

$.06 \times 5$ is _____ of 6×5.
_{word bank 2}

$6 \times 5 = $ _____ $.06 \times 5 = $ _____

This word bank also applies to questions 42 - 45.

Word bank 1: **(a)** one tenth, **(b)** one hundredth, **(c)** one thousandth

Word bank 2: **(a)** one tenth, **(b)** one hundredth, **(c)** one thousandth

42. Fill in the guided sentence below to explain how $.07 \times 5$ relates to 7×5.

$.07$ is _____ of 7, so
_{word bank 1}

$.07 \times 5$ is _____ of 7×5.
_{word bank 2}

$7 \times 5 = $ _____ $.07 \times 5 = $ _____

43. Fill in the guided sentence below to explain how $.04 \times 9$ relates to 4×9.

$.04$ is _____ of 4, so
_{word bank 1}

$.04 \times 9$ is _____ of 4×9.
_{word bank 2}

$4 \times 9 = $ _____ $.04 \times 9 = $ _____

44. Fill in the guided sentence below to explain how $.003 \times 2$ relates to 3×2.

$.003$ is _____ of 3, so
_{word bank 1}

$.003 \times 2$ is _____ of 3×2.
_{word bank 2}

$3 \times 2 = $ _____ $.003 \times 2 = $ _____

45. Fill in the guided sentence below to explain how $.004 \times 7$ relates to 4×7.
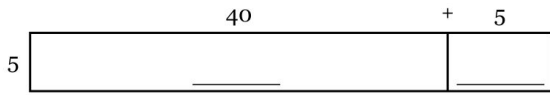
$.004$ is _____ of 4, so
_{word bank 1}

$.004 \times 7$ is _____ of 4×7.
_{word bank 2}

$4 \times 7 = $ _____ $.004 \times 7 = $ _____

Mathematical Models for Operations (~35 min)

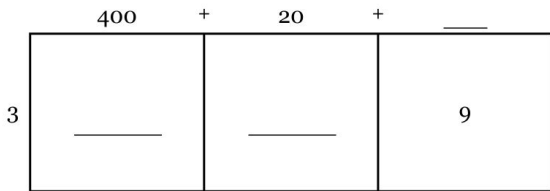**1.** Write the missing values in the area model for multiplication below.

$$5 \times 45$$

40	+	5

5 | _____ | _____ |

According to the model above, $5 \times 45 =$ _____

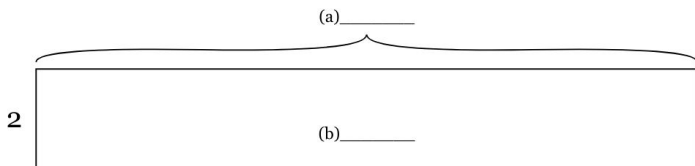**2.** Write the missing values in the area model for multiplication below.

$$3 \times 423$$

| 400 | + | 20 | + | ____ |

3 | _____ | _____ | 9 |

According to the model above, $3 \times 423 =$ _____

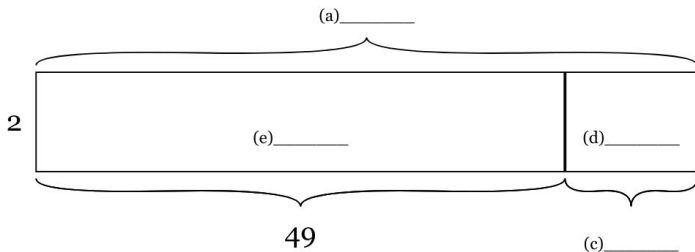**3.** Find 2×49 using an area model and subtraction.

Which multiple of 10 is closest to 49? (a)_____

Fill in the blanks marked (a) with the number found above. Then, find (b), the total area of the rectangle.

(a)_____

2 | (b)_____ |

Find (c) and (d) below, then use (b) from above and (d) to find (e).

(a)_____

2 | (e)_____ | (d)_____ |

49   (c)_____

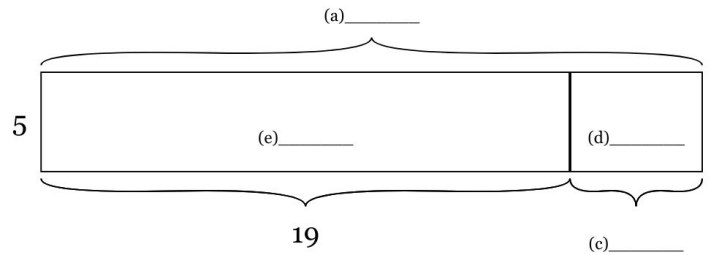According to the model above, $2 \times 49 =$ _____

4. Find 5×19 using an area model and subtraction.

Which multiple of 10 is closest to 19? (a)_____

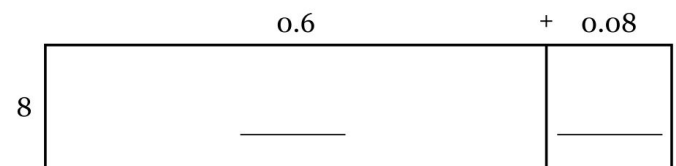Fill in the blanks marked (a) with the number found above. Then, find (b), the total area of the rectangle.

(a)_____

5 | (b)_____ |

Find (c) and (d) below, then use (b) from above and (d) to find (e).

(a)_____

5 | (e)_____ | (d)_____ |

19   (c)_____
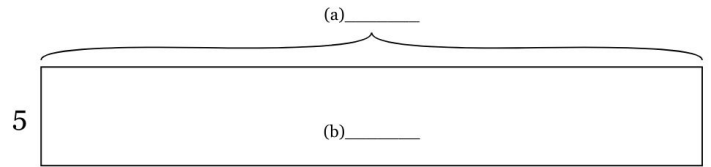
According to the model above, $5 \times 19 =$ _____

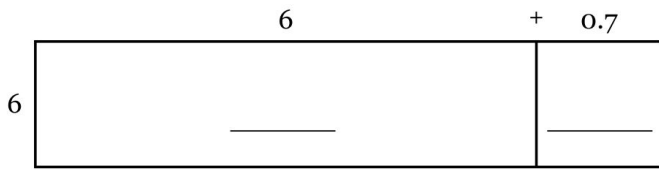**5.** Enter the missing values in the area model for multiplication below.

$$8 \times 0.68$$

| 0.6 | + | 0.08 |

8 | _____ | _____ |

According to the model above, $8 \times 0.68 =$ _____

Mathematical Models for Operations (~35 min)

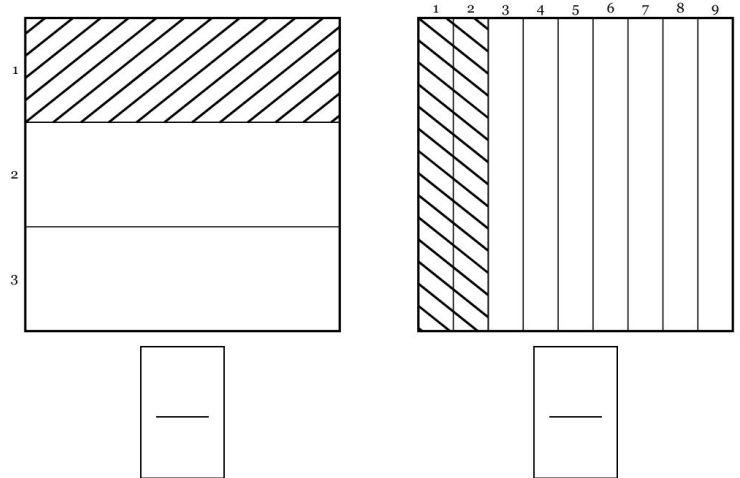**6.** Enter the missing values in the area model for multiplication below.

$$6 \times 6.7$$

	6	+	0.7
6	_____		_____

According to the model above, $6 \times 6.7 =$ _____

7. The squares below each represent a unit or a whole.

$$\underbrace{\frac{1}{3}}_{\text{Fraction 1}} \times \underbrace{\frac{2}{9}}_{\text{Fraction 2}}$$

For each, write in the box below the fraction represented by the shaded area.

The two diagrams above have been overlapped in the diagram below:

How many little rectangles are in the overlapping shaded region?

How many little rectangles are there altogether?

Fill in the blanks below to create the multiplication problem represented by the diagrams above. Write the product in unsimplified form.

$$\boxed{\quad} \times \boxed{\quad} = \boxed{\quad}$$
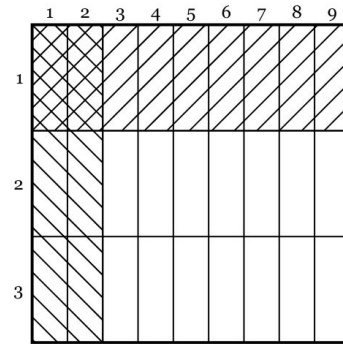
Mathematical Models for Operations (~35 min)

8. The squares below each represent a unit or a whole.

$$\underbrace{\frac{1}{5}}_{\text{Fraction 1}} \times \underbrace{\frac{2}{3}}_{\text{Fraction 2}}$$

For each, write in the box below the fraction represented by the shaded area.

The two diagrams above have been overlapped in the diagram below:

How many little rectangles are in the overlapping shaded region?

How many little rectangles are there altogether?

Fill in the blanks below to create the multiplication problem represented by the diagrams above. Write the product in unsimplified form.
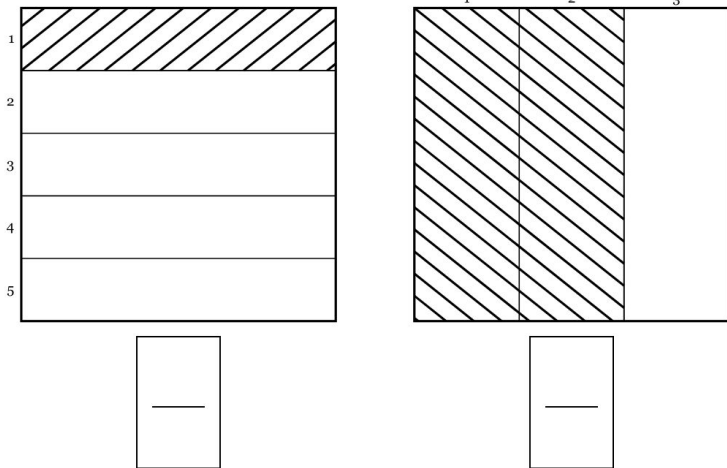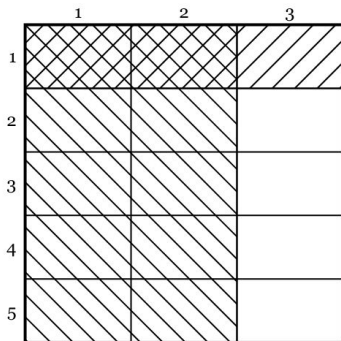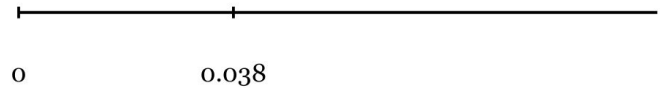
$$\boxed{\quad} \times \boxed{\quad} = \boxed{\quad}$$

9. Solve $0.038 + 0.017$ with the open number line. Add or take back thousandths or hundredths until you've added 0.017. Draw arcs on the number line to keep track of the jumps you make. Label each arc with the jump's distance and the numbers you land on.

0   0.038

10. Solve $0.64 + 0.17$ with the open number line. Add or take back hundredths or tenths until you've added 0.17. Draw arcs on the number line to keep track of the jumps you make. Label each arc with the jump's distance and the numbers you land on.

0   0.64

Mathematical Models for Operations (~35 min)

11. Solve $0.095 - 0.067$ by removal. Remove or add back thousandths or hundredths until you've removed 0.067. Draw arcs on the number line to keep track of the jumps you make. Label each arc with the jump's distance and the numbers you land on.
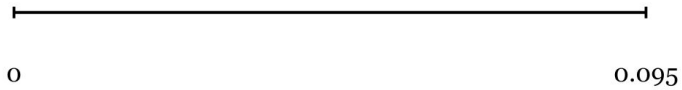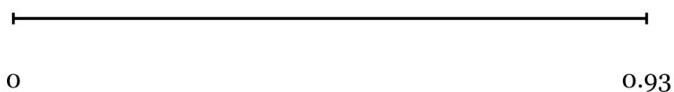
```
|————————————————————————————————————|
0                                  0.095
```

12. Solve $0.93 - 0.68$ by removal. Remove or add back hundredths or tenths until you've removed 0.68. Draw arcs on the number line to keep track of the jumps you make. Label each arc with the jump's distance and the numbers you land on.

```
|————————————————————————————————————|
0                                   0.93
```

13. Complete the standard algorithm for $347 + 447$, including any "carried," or regrouped digits, if necessary.

14. Complete the standard algorithm for $378 + 190$, including any "carried," or regrouped digits, if necessary.

15. Complete the standard algorithm for $21.2 + 98.7$, including any "carried," or regrouped digits, if necessary.

Note: you may have some boxes "left over." You can leave them empty or fill in "missing" 0's and/or decimal points.

Mathematical Models for Operations (~35 min)

16. Complete the standard algorithm for $24.7 + 2.63$, including any "carried," or regrouped digits, if necessary.

Note: you may have some boxes "left over." You can leave them empty or fill in "missing" 0's and/or decimal points.

$$
\begin{array}{c}
\square\ \square\ \square\ \square\ \square\ \square \\
\square\ \square\ \square\ \square\ \square\ \square \\
+\ \square\ \square\ \square\ \square\ \square \\
\hline
\square\ \square\ \square\ \square\ \square\ \square
\end{array}
$$

17. Complete the standard algorithm for $713 - 549$, including any "borrowed" digits, if necessary.

$$
\begin{array}{c}
\square\ \square\ \square \\
-\ \square\ \square\ \square \\
\hline
\square\ \square\ \square
\end{array}
$$

18. Complete the standard algorithm for $202 - 93$, including any "borrowed" digits, if necessary.

$$
\begin{array}{c}
\square\ \square\ \square \\
-\ \square\ \square\ \square \\
\hline
\square\ \square\ \square
\end{array}
$$

Order of Operations (~33 min)

1. Without dividing, determine if $59,310$ is divisible by 9 and explain how you know.

2. Without dividing, determine if $26,912$ is divisible by 3 and explain how you know.

3. Without dividing, determine if $18,704$ is divisible by 4 and explain how you know.

4. Without dividing, determine if $75,376$ is divisible by 6 and explain how you know.

5. Use multiplication to expand the expression below. Then compute.

$$6^2$$

6. Use an exponent to condense the expression below. Then compute.

$$4 \times 4 \times 4 \times 4$$

7. Use multiplication to expand the expression below. Then compute.

$$0^3$$

8. Use an exponent to condense the expression below. Then compute.

$$6 \times 6 \times 6 \times 6$$

9. What is the value of the expression $2 \cdot 4^2 + 8 + 9 \cdot 2$?

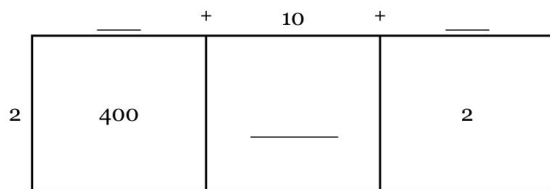**10.** What is the value of the expression $3 \times 6 + 9^2$?

11. What is the value of the expression $\frac{(9^2-65)}{4^2}$?

12. What is the value of the expression
$6 \times 2^2 + 6 + 6 \times 2$?

13. Write the missing values in the area model for multiplication below.
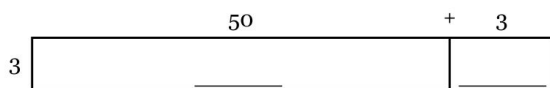
$$2 \times 211$$

According to the model above, $2 \times 211 =$ _____

14. Write the missing values in the area model for multiplication below.
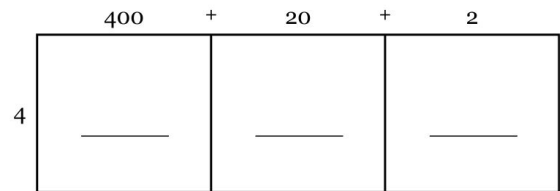
$$3 \times 53$$

According to the model above, $3 \times 53 =$ _____

15. Write the missing values in the area model for multiplication below.
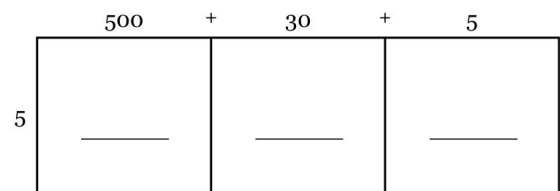
$$4 \times 422$$

According to the model above, $4 \times 422 =$ _____

16. Write the missing values in the area model for multiplication below.

$$5 \times 535$$

According to the model above, $5 \times 535 =$ _____

17. Which expression is NOT equivalent to $24 + 18$?

A. $3(8+5)$ B. $3(8+6)$

C. $6(4+3)$ D. $2(12+9)$

18. Which expression is equivalent to $90 + 20$?

A. $2(45+9)$ B. $3(30+20)$

C. $10(9+2)$ D. $5(85+4)$

Order of Operations (~33 min)

19. Which expression is NOT equivalent to $60 + 12$?

A. $6(10 + 2)$ B. $3(20 + 4)$

C. $2(30 + 5)$ D. $2(30 + 6)$

25. What is the value of the expression $9z + 3$ when $z = 9$?

20. Which expression is NOT equivalent to $100 + 20$?

A. $10(10 + 2)$ B. $4(96 + 5)$

C. $2(50 + 10)$ D. $5(20 + 4)$

26. What is the value of the expression $5x^2 - 3x - 10$ when $x = 3$?

21. Represent the following sentence as an algebraic expression, where "a number" is the letter x.

9 is multiplied by a number.

27. What is the value of the expression $x + 4y$ when $x = 9$ and $y = 3$?

22. Represent the following sentence as an algebraic expression, where "a number" is the letter x.

The difference of 5 and a number.

23. Represent the following sentence as an algebraic expression, where "a number" is the letter x.

The quotient of a number and 9.

28. What is the value of the expression $5w^2 - 3w + 8$ when $w = 2$?

24. Represent the following sentence as an algebraic expression, where "a number" is the letter x.

8 less than a number.

Order of Operations (~33 min)

29. What value of x makes the equation below true?

$$6x - 8 = 46$$

A. 6   B. 7   C. 8   D. 9

30. Which equation has the solution $x = 7$?

A. $6x - 5 = -37$ B. $5x + 1 = 33$

C. $6x + 7 = 49$ D. $3x + 6 = 51$

31. Which equation has the solution $x = 7$?

A. $4x + 5 = 57$ B. $5x + 7 = 41$

C. $3x - 1 = 20$ D. $9x - 1 = -62$

32. What value of x makes the equation below true?

$$9x + 10 = 28$$

A. 2   B. 8   C. 10   D. 20

GCF, LCM & Fraction Sense (~60 min)

1. What is the greatest common factor of 9 and 21?

2. What is the greatest common factor of 4, 44, and 20?

3. What is the greatest common factor of 44, 40, and 20?

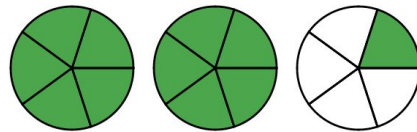**4.** What is the greatest common factor of 48, 42, and 12?

5. What is the least common multiple of 2 and 10?

6. What is the least common multiple of 2, 3, and 9?

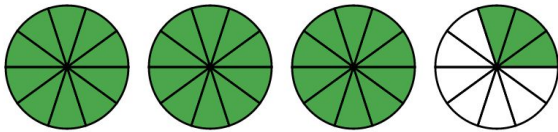**7.** What is the least common multiple of 2, 6, and 8?

8. What is the least common multiple of 6 and 8?

9. Assume that each circle shown below represents one unit. Express the shaded amount as a single fraction and as a mixed number.
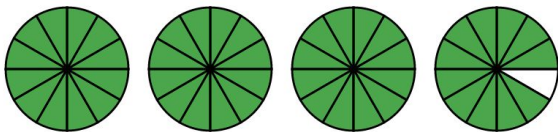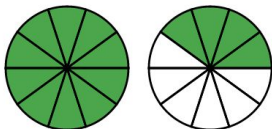
10. Assume that each circle shown below represents one unit. Express the shaded amount as a single fraction and as a mixed number.

11. Assume that each circle shown below represents one unit. Express the shaded amount as a single fraction and as a mixed number.

12. Assume that each circle shown below represents one unit. Express the shaded amount as a single fraction and as a mixed number.
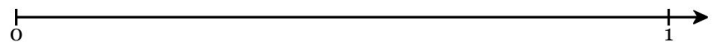

13. Use the number line to determine which fraction is larger: $\frac{5}{8}$ or $\frac{4}{8}$. (a) Draw evenly spaced lines to *partition*, or break, the segment from 0 to 1 into the appropriate number of pieces. (b) Plot $\frac{5}{8}$ on the number line. (c) Plot $\frac{4}{8}$ on the number line. (d) Complete the sentence below.

$\frac{5}{8}$ is (greater / less) than $\frac{4}{8}$ because 5 is (greater / less) than 4, and the two fractions have (the same / different) denominators.

14. Use the number line to determine which fraction is larger: $\frac{1}{8}$ or $\frac{3}{8}$. (a) Draw evenly spaced lines to *partition*, or break, the segment from 0 to 1 into the appropriate number of pieces. (b) Plot $\frac{1}{8}$ on the number line. (c) Plot $\frac{3}{8}$ on the number line. (d) Complete the sentence below.
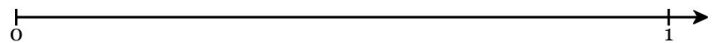

$\frac{1}{8}$ is (greater / less) than $\frac{3}{8}$ because 1 is (greater / less) than 3, and the two fractions have (the same / different) denominators.
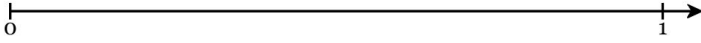
15. Use the number line to determine which fraction is larger: $\frac{1}{8}$ or $\frac{4}{8}$. (a) Draw evenly spaced lines to *partition*, or break, the segment from 0 to 1 into the appropriate number of pieces. (b) Plot $\frac{1}{8}$ on the number line. (c) Plot $\frac{4}{8}$ on the number line. (d) Complete the sentence below.

$\frac{1}{8}$ is (greater / less) than $\frac{4}{8}$ because 1 is (greater / less) than 4, and the two fractions have (the same / different) denominators.

16. Use the number line to determine which fraction is larger: $\frac{5}{8}$ or $\frac{2}{8}$. (a) Draw evenly spaced lines to *partition*, or break, the segment from 0 to 1 into the appropriate number of pieces. (b) Plot $\frac{5}{8}$ on the number line. (c) Plot $\frac{2}{8}$ on the number line. (d) Complete the sentence below.

$\frac{5}{8}$ is (greater / less) than $\frac{2}{8}$ because 5 is (greater / less) than 2, and the two fractions have (the same / different) denominators.
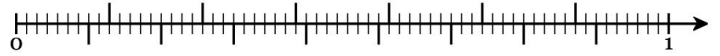
17. Simplify: $\frac{70}{88}$

18. Simplify: $\frac{18}{30}$

19. Simplify: $\frac{22}{90}$

20. Simplify: $\frac{45}{66}$

21. Use the number line to determine which fraction is larger: $\frac{5}{7}$ or $\frac{7}{9}$. The segment from 0 to 1 has been partitioned into 63 pieces, the smallest number needed to plot both fractions. (a) Plot a fraction equivalent to $\frac{5}{7}$. (b) Plot a fraction equivalent to $\frac{7}{9}$. (c) Complete the sentence below.

$\frac{5}{7}$ is $\left(\begin{array}{c}\text{greater}\\\text{less}\end{array}\right)$ than $\frac{7}{9}$ because $\frac{5}{7} = \frac{\square}{63}$ and $\frac{7}{9} = \frac{\square}{63}$
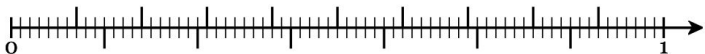
22. Use the number line to determine which fraction is larger: $\frac{8}{9}$ or $\frac{5}{7}$. The segment from 0 to 1 has been partitioned into 63 pieces, the smallest number needed to plot both fractions. (a) Plot a fraction equivalent to $\frac{8}{9}$. (b) Plot a fraction equivalent to $\frac{5}{7}$. (c) Complete the sentence below.

$\frac{8}{9}$ is $\left(\begin{array}{c}\text{greater}\\\text{less}\end{array}\right)$ than $\frac{5}{7}$ because $\frac{8}{9} = \frac{\square}{63}$ and $\frac{5}{7} = \frac{\square}{63}$

**23.** Use the number line to determine which fraction is larger: $\frac{9}{10}$ or $\frac{6}{7}$. The segment from 0 to 1 has been partitioned into 70 pieces, the smallest number needed to plot both fractions. (a) Plot a fraction equivalent to $\frac{9}{10}$. (b) Plot a fraction equivalent to $\frac{6}{7}$. (c) Complete the sentence below.

$\frac{9}{10}$ is $\left(\begin{array}{c}\text{greater}\\\text{less}\end{array}\right)$ than $\frac{6}{7}$ because $\frac{9}{10} = \frac{\square}{70}$ and

$\frac{6}{7} = \frac{\square}{70}$

24. Use the number line to determine which fraction is larger: $\frac{4}{9}$ or $\frac{1}{4}$. The segment from 0 to 1 has been partitioned into 36 pieces, the smallest number needed to plot both fractions. (a) Plot a fraction equivalent to $\frac{4}{9}$. (b) Plot a fraction equivalent to $\frac{1}{4}$. (c) Complete the sentence below.
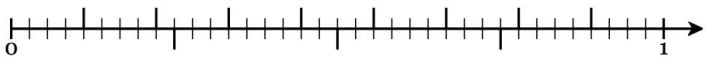
$\frac{4}{9}$ is $\left(\begin{array}{c}\text{greater}\\\text{less}\end{array}\right)$ than $\frac{1}{4}$ because $\frac{4}{9} = \frac{\square}{36}$ and

$\frac{1}{4} = \frac{\square}{36}$

25. Round 7.473 to the nearest tenth.

26. Round 1.5 to the nearest whole number.

27. Round 2.1486 to the nearest hundredth.
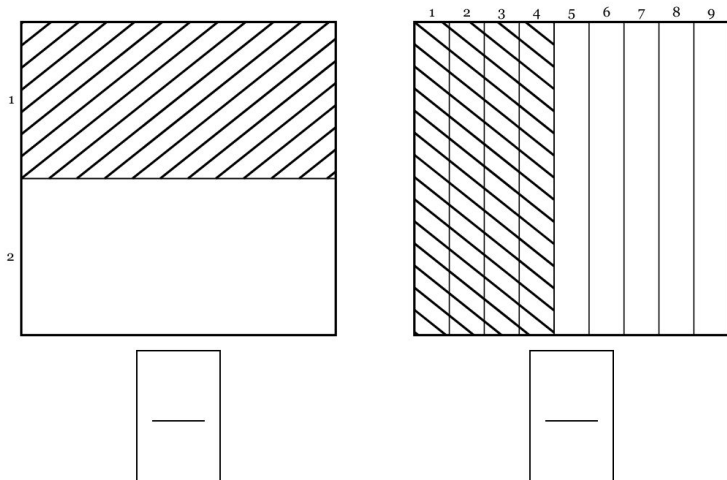
28. Round 3.4 to the nearest whole number.
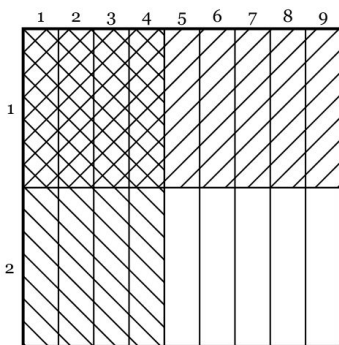
GCF, LCM & Fraction Sense (~60 min)

29. The squares below each represent a unit or a whole.

$$\underbrace{\frac{1}{2}}_{\text{Fraction 1}} \times \underbrace{\frac{4}{9}}_{\text{Fraction 2}}$$

For each, write in the box below the fraction represented by the shaded area.

The two diagrams above have been overlapped in the diagram below:

How many little rectangles are in the overlapping shaded region?

How many little rectangles are there altogether?

Fill in the blanks below to create the multiplication problem represented by the diagrams above. Write the product in unsimplified form.

$$\boxed{} \times \boxed{} = \boxed{}$$

30. The squares below each represent a unit or a whole.

$$\underbrace{\frac{5}{6}}_{\text{Fraction 1}} \times \underbrace{\frac{7}{10}}_{\text{Fraction 2}}$$

For each, write in the box below the fraction represented by the shaded area.

The two diagrams above have been overlapped in the diagram below:

How many little rectangles are in the overlapping shaded region?

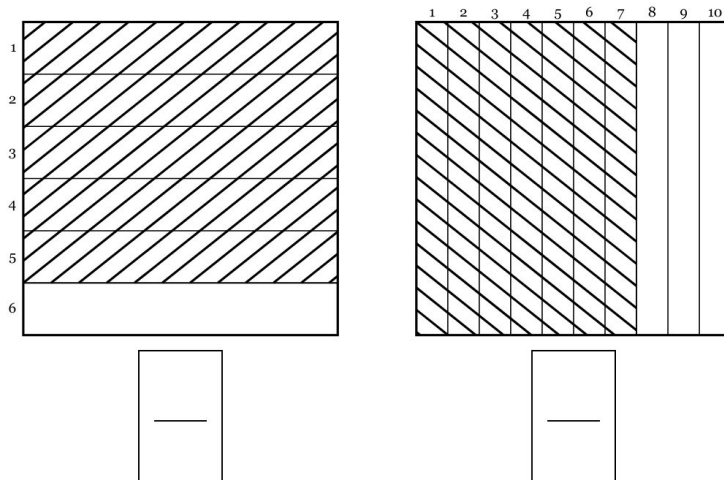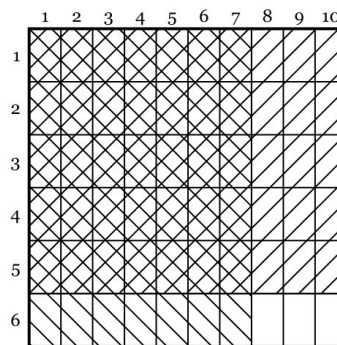How many little rectangles are there altogether?

Fill in the blanks below to create the multiplication problem represented by the diagrams above. Write the product in unsimplified form.

$$\boxed{} \times \boxed{} = \boxed{}$$

GCF, LCM & Fraction Sense (~60 min)

31. The squares below each represent a unit or a whole.

$$\underbrace{\frac{1}{2}}_{\text{Fraction 1}} \times \underbrace{\frac{8}{9}}_{\text{Fraction 2}}$$

For each, write in the box below the fraction represented by the shaded area.

The two diagrams above have been overlapped in the diagram below:

How many little rectangles are in the overlapping shaded region?

How many little rectangles are there altogether?

Fill in the blanks below to create the multiplication problem represented by the diagrams above. Write the product in unsimplified form.
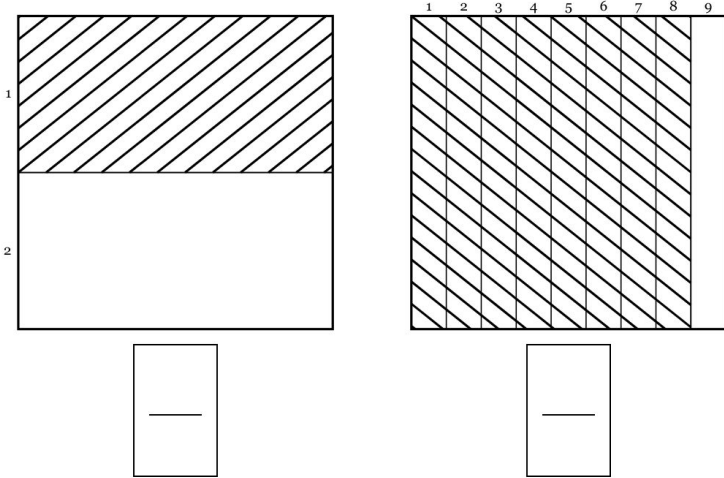
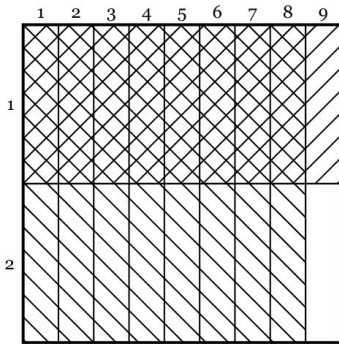$$\boxed{\quad} \times \boxed{\quad} = \boxed{\quad}$$

32. The squares below each represent a unit or a whole.

$$\underbrace{\frac{3}{4}}_{\text{Fraction 1}} \times \underbrace{\frac{3}{10}}_{\text{Fraction 2}}$$

For each, write in the box below the fraction represented by the shaded area.

The two diagrams above have been overlapped in the diagram below:

How many little rectangles are in the overlapping shaded region?

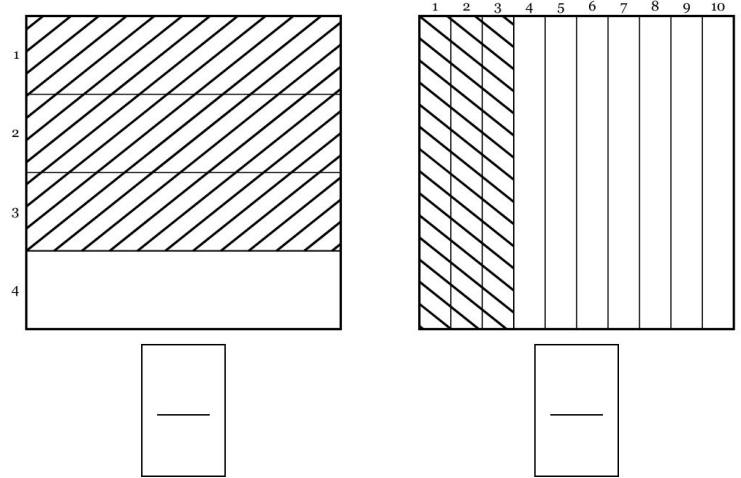How many little rectangles are there altogether?

Fill in the blanks below to create the multiplication problem represented by the diagrams above. Write the product in unsimplified form.
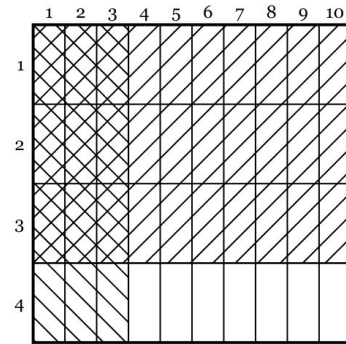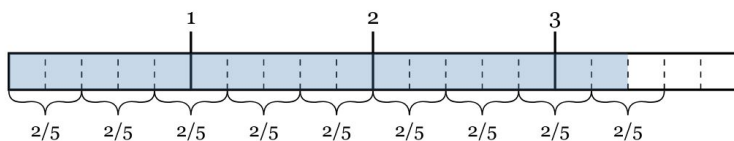
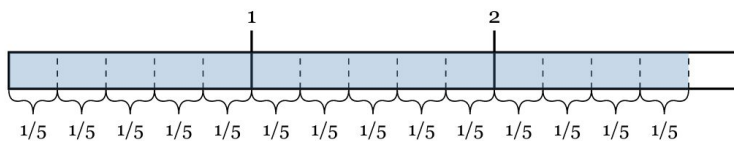$$\boxed{\quad} \times \boxed{\quad} = \boxed{\quad}$$

33. The model below represents a division problem.

Which equation is represented by the model?

A. $3\frac{2}{5} \div \frac{2}{5} = 8\frac{1}{2}$ B. $\frac{2}{5} \div 8\frac{1}{2} = 3\frac{2}{5}$

C. $3\frac{2}{5} \div \frac{2}{5} = 8\frac{1}{5}$ D. $\frac{2}{5} \div 3\frac{2}{5} = 8\frac{1}{2}$
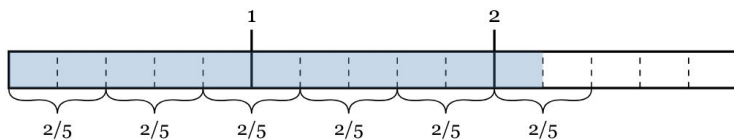
34. The model below represents a division problem.

Which equation is represented by the model?

A. $\frac{1}{5} \div 14 = 2\frac{4}{5}$ B. $14 \div \frac{1}{5} = 2\frac{4}{5}$

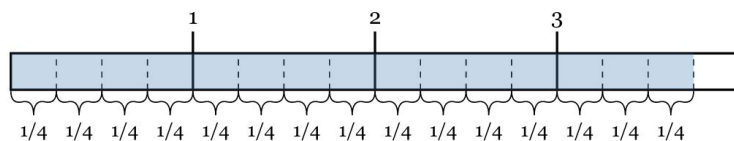C. $2\frac{4}{5} \div \frac{1}{5} = 14$ D. $\frac{1}{5} \div 2\frac{4}{5} = 14$

35. The model below represents a division problem.

Which equation is represented by the model?

A. $11 \div \frac{1}{5} = 2\frac{1}{5}$ B. $\frac{1}{5} \div 11 = 2\frac{1}{5}$

C. $\frac{2}{5} \div 5\frac{1}{2} = 2\frac{1}{5}$ D. $2\frac{1}{5} \div \frac{2}{5} = 5\frac{1}{2}$

36. The model below represents a division problem.

Which equation is represented by the model?

A. $\frac{1}{4} \div 15 = 3\frac{3}{4}$ B. $15 \div \frac{1}{4} = 3\frac{3}{4}$

C. $3\frac{3}{4} \div \frac{1}{4} = 15$ D. $\frac{1}{4} \div 3\frac{3}{4} = 15$

37. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.
$$\frac{5}{16} - \frac{1}{12}$$

38. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.
$$\frac{5}{7} - \frac{1}{6}$$

39. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.
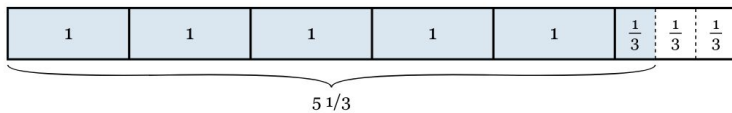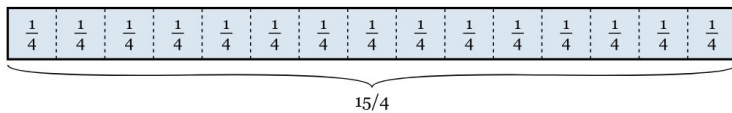$$\frac{4}{9} + \frac{1}{63}$$

40. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{2}{7} - \frac{1}{7}$$

44. Convert $\frac{11}{3}$ into a mixed number.

| $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ |

11/3

41. Convert $5\frac{1}{3}$ into an improper fraction.

| 1 | 1 | 1 | 1 | 1 | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ |

5 1/3

42. Convert $\frac{15}{4}$ into a mixed number.

| $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ |

15/4

43. Convert $\frac{35}{6}$ into a mixed number.

35/6

Percents Review (~33 min)

1. Fill in the following values on the double number line below: (a) 0% of 180 (b) 100% of 180 (c) 50% of 180 (d) 25% of 180 (e) 75% of 180

(a)_____ (d)_____ (c)_____ (e)_____ (b)_____

number

percent

0%   25%   50%   75%   100%

2. Fill in the following values on the double number line below: (a) 0% of 156 (b) 100% of 156 (c) 50% of 156 (d) 25% of 156 (e) 75% of 156
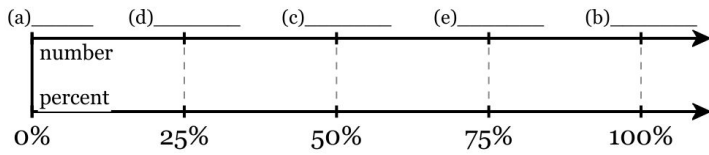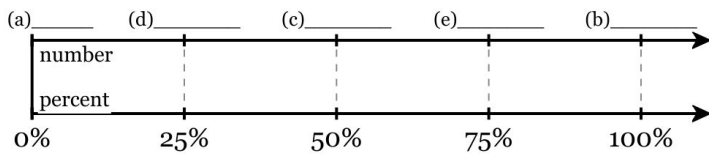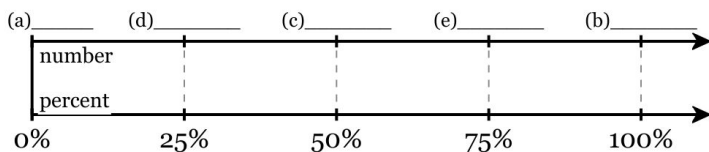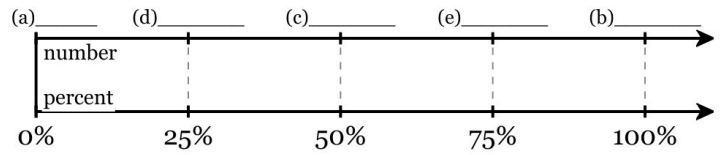
(a)_____ (d)_____ (c)_____ (e)_____ (b)_____

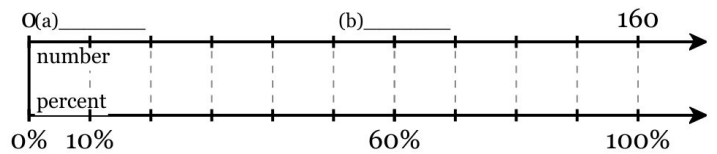number

percent

0%   25%   50%   75%   100%

3. Fill in the following values on the double number line below: (a) 0% of 144 (b) 100% of 144 (c) 50% of 144 (d) 25% of 144 (e) 75% of 144

(a)_____ (d)_____ (c)_____ (e)_____ (b)_____

number
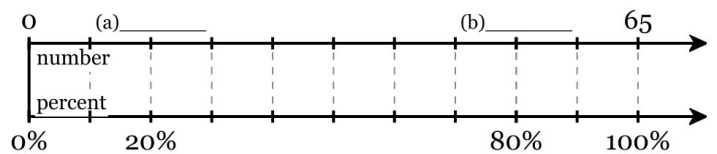
percent

0%   25%   50%   75%   100%

4. Fill in the following values on the double number line below: (a) 0% of 116 (b) 100% of 116 (c) 50% of 116 (d) 25% of 116 (e) 75% of 116

(a)_____ (d)_____ (c)_____ (e)_____ (b)_____

number

percent

0%   25%   50%   75%   100%

5. (a) Find 10% of 160. (b) Use 10% to find 60% of 160. Write your answers on the double number line below.

0(a)_____   (b)_____   160

number

percent

0% 10%   60%   100%

6. (a) Find 20% of 65. (b) Use 20% to find 80% of 65. Write your answers on the double number line below.

0   (a)_____   (b)_____   65

number

percent

0%   20%   80%   100%

7. (a) Find 10% of 40. (b) Use 10% to find 70% of 40. Write your answers on the double number line below.

0(a)_____   (b)_____   40

number

percent

0% 10%   70%   100%

Percents Review (~33 min)

8. (a) Find 10% of 85. (b) Use 10% to find 70% of 85. Write your answers on the double number line below.

0(a)_____ (b)_____ 85
number
percent
0% 10%   70%   100%

9. If 80% of a number is 64 and 15% of the same number is 12, find 95% of that number.
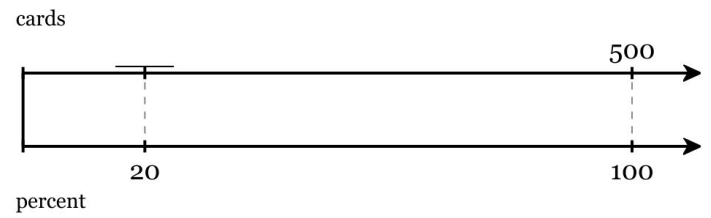
10. If 45% of a number is 60, find 15% of that number.

11. If 5% of a number equals 9, find 50% of that number.

**12.** If 25% of a number is 65 and 85% of the same number is 221, find 60% of that number.

13. Bob's Gift Shop sold 500 cards for Mother's Day. One salesman, Jonathan, sold 20% of the cards sold for Mother's Day. How many cards did Jonathan sell?

Divide/scale down to solve for the missing percent.

cards
                                    500
                20   100
percent

14. Violet has a coin collection. She keeps 10 of the coins in her box, which is 5% of the collection. How many total coins are in her collection?

Multiply/scale up to solve.
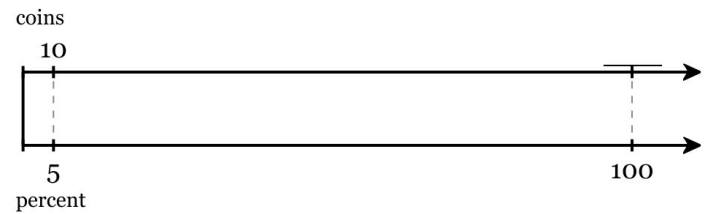
coins
10
                                    100
  5
percent

15. The 12 students in the Environmental Club represent 4% of the students in the seventh grade. How many students are in the seventh grade?

Multiply/scale up to solve.
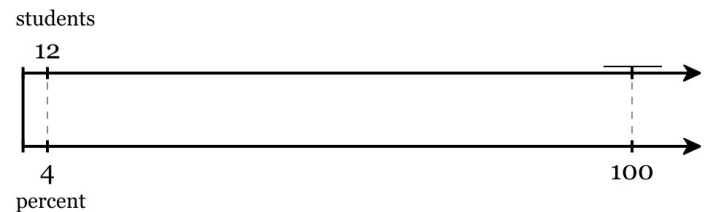
students
12
                                    100
  4
percent

Percents Review (~33 min)

16. At a football stadium, 4% of the fans in attendance were teenagers. If there were 380 teenagers at the football stadium, what was the total number of people at the stadium?

Multiply/scale up to solve.

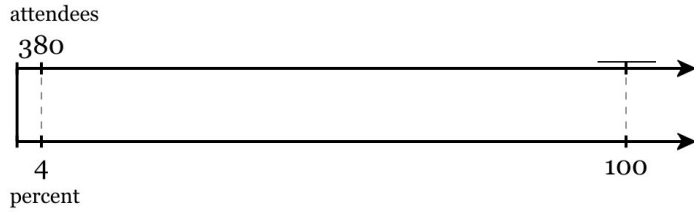attendees

380

4

100

percent

17. 7 is what percent of 20?

18. What is 88% of 350?

19. 252 is what percent of 700?

20. What is 77% of 700?

21. A university's freshman class has 1900 students. 61% of those students are majoring in Engineering. How many students in the freshman class are Engineering majors?

22. A bakery sold 9 vanilla cupcakes in a day, which was 3% of the total number of cupcakes sold that day. How many total cupcakes did the bakery sell that day?

23. A bakery sold a total of 180 cupcakes in a day, and 63 of them were mocha flavored. What percentage of cupcakes sold that day were mocha flavored?

Integers (Signed Numbers) (~39 min)

1. The list below shows the temperature Nathaniel recorded at 11:00 p.m. for four days last January.

Monday: 15°F

Tuesday: -21°F

Wednesday: -12°F

Thursday: -8°F

On which of the days did Nathaniel record the lowest (coldest) temperature?

A. Monday   B. Tuesday

C. Wednesday   D. Thursday

2. The table below shows the elevation at which different artifacts were found in an archeological dig.

Artifact	Elevation
arrow head	858 feet
bone	−1153 feet
necklace	0 feet
clay bowl	−803 feet
woven blanket	473 feet

Which of these artifacts was discovered at the highest elevation?

A. necklace   B. woven blanket

C. bone   D. arrow head

3. The stock market gained and lost value over the first four days of the week.

STOCK MARKET VALUE

Day	Change
Monday	−15.03
Tuesday	−31.34
Wednesday	+48.16
Thursday	−48.34

On which day did the stock market lose the most value?

A. Monday   B. Tuesday

C. Wednesday   D. Thursday

4. The stock market gained and lost value over the first four days of the week.

STOCK MARKET VALUE

Day	Change
Monday	−95.25
Tuesday	−70.19
Wednesday	+3.92
Thursday	+54.96

If the stock market lost value on Friday, which value could represent this change?

A. -9.01 B. 0

C. $+3.68$ D. $+100.58$

Integers (Signed Numbers) (~39 min)

5. The list below shows the temperature Maya recorded at 11:00 p.m. for four days last January.

Monday: -6°F

Tuesday: 0°F

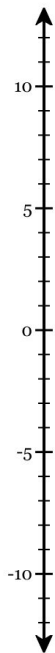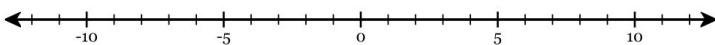Wednesday: -26°F

Thursday: -10°F

On which of the days did Maya record the highest (warmest) temperature?
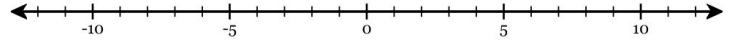
A. Monday   B. Tuesday

C. Wednesday   D. Thursday

6. Point M is located at -1. Plot Point M on the number line below.

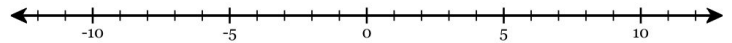**7.** Point Y is located at 11. Plot Point Y on the number line below.
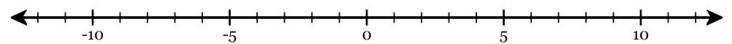
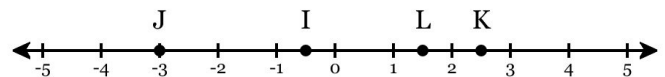**8.** Point L is located at 12. Plot Point L on the number line below.

9. Point D is located at 9. Plot Point D on the number line below.

10. Point V is located at -6. Plot Point V on the number line below.
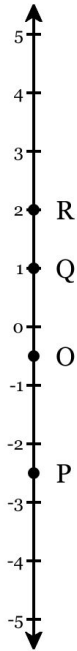
11. Which point represents the *opposite* of $\frac{1}{2}$?
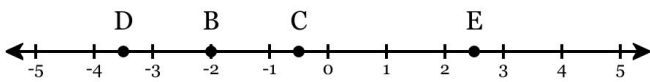
A. I   B. J   C. K   D. L

2

Integers (Signed Numbers) (~39 min)

12. Which point has the greatest absolute value?

A. O   B. P   C. Q   D. R

15. Which point has the greatest absolute value?

A. R   B. S   C. T   D. U

13. Which point represents a number whose absolute value is $3\frac{1}{2}$?

A. B   B. C   C. D   D. E

16. Plot 6½ and -6½ on the number line below.

Determine which number is greater.

Fill in the blank with < or >:   6½ _____ -6½

6½ is (greater than / less than) -6½ because it is further to the (left / right) on the number line.

14. Which point represents the *least* value on the number line?

A. Point I: $-4\frac{1}{2}$ B. Point I: $-5\frac{1}{2}$

C. Point K: $1\frac{1}{2}$ D. Point K: $2\frac{1}{2}$

17. Plot -3 and 8½ on the number line below.

Determine which number is greater.

Fill in the blank with < or >:   -3 _____ 8½

-3 is (greater than / less than) 8½ because it is further to the (left / right) on the number line.

Integers (Signed Numbers) (~39 min)

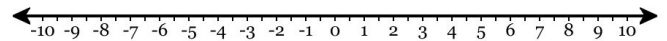**18.** Plot -3½ and -4 on the number line below.

```
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1  0  1  2  3  4  5  6  7  8  9  10
```

Determine which number is greater.

Fill in the blank with < or >:   -3½ _____ -4

-3½ is (greater than / less than) -4 because it is further to the (left / right) on the number line.

19. Plot -8 and 6½ on the number line below.

```
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1  0  1  2  3  4  5  6  7  8  9  10
```

Determine which number is greater.

Fill in the blank with < or >:   -8 _____ 6½

-8 is (greater than / less than) 6½ because it is further to the (left / right) on the number line.

20. Plot -4 and -6½ on the number line below.
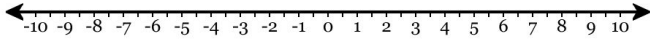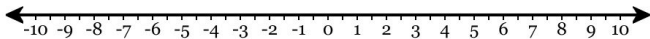
```
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1  0  1  2  3  4  5  6  7  8  9  10
```

Determine which number is greater.

Fill in the blank with < or >:   -4 _____ -6½

-4 is (greater than / less than) -6½ because it is further to the (left / right) on the number line.

21. Write the numbers below in order from least to greatest. Use commas to separate.

-4 -2 -14 -9 -6 12

22. Write the numbers below in order from least to greatest. Use commas to separate.

-2 -19 16 -20 12 -17

23. Write the numbers below in order from least to greatest. Use commas to separate.

14 15 -10 -9 -20 -13

24. Write the numbers below in order from least to greatest. Use commas to separate.

-6 -17 -7 -1 -10 -5

25. Write the numbers below in order from least to greatest. Use commas to separate.

-12 -4 -8 5 -3 -19

26. Write the numbers below in order from least to greatest. Use commas to separate.

-7.7 19.2 13.2 1.6 -14.4 -14.8

27. Write the numbers below in order from least to greatest. Use commas to separate.

-16.4 -16.1 1.1 -5.4 -11.3 -19.9

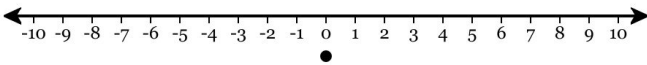**Integers (Signed Numbers) (~39 min)**

28. Write the numbers below in order from least to greatest. Use commas to separate.

| -18.6 | -1.4 | -5.2 | -17.6 | -9.3 | -5.6 |

29. Write the numbers below in order from least to greatest. Use commas to separate.

| -15.5 | 10 | -6.9 | -10.2 | -2.9 | -7.2 |

30. Write the numbers below in order from least to greatest. Use commas to separate.

| -17.4 | -2.6 | -1.5 | 17.6 | -9.8 | -17.1 |

31. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$2 + (-3)$$

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

$$2 + (-3) = \underline{\hspace{1cm}}$$

32. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$-3 + 10$$

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

$$-3 + 10 = \underline{\hspace{1cm}}$$

33. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$-8 + (-2)$$

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

$$-8 + (-2) = \underline{\hspace{1cm}}$$

34. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$1 + 8$$

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

$$1 + 8 = \underline{\hspace{1cm}}$$

35. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$2 + 8$$

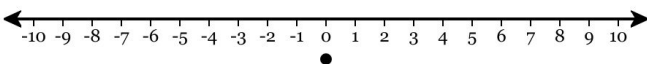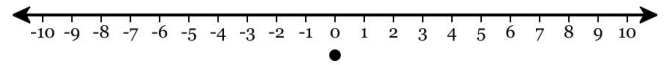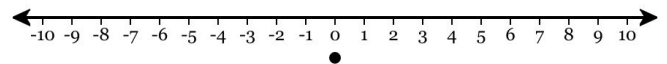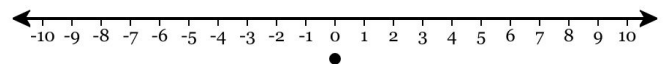-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

$$2 + 8 = \underline{\hspace{1cm}}$$

Integers (Signed Numbers) (~39 min)

36. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$-6 + (-3) + 6$$

What final answer do all of these three diagrams give?

37. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$3 + (-3) + 2$$
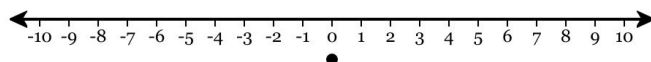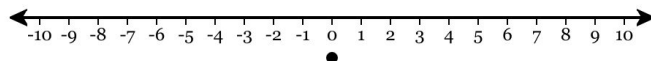
What final answer do all of these three diagrams give?

Integers (Signed Numbers) (~39 min)

38. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$2 + 7 + (-8)$$
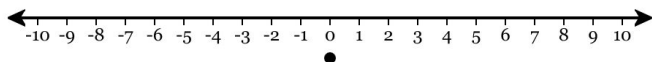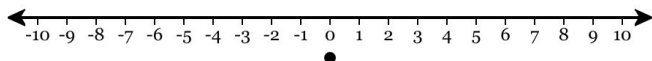
What final answer do all of these three diagrams give?

39. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.
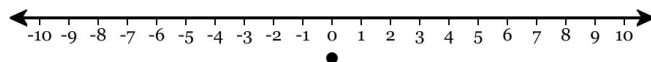
$$8 + (-7) + 2$$
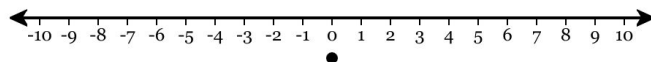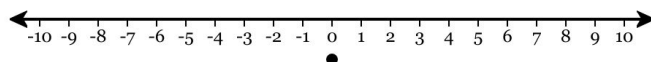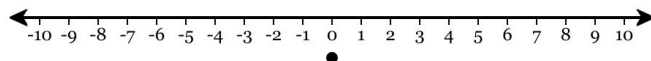
What final answer do all of these three diagrams give?

Integers (Signed Numbers) (~39 min)

40. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$-2 + 3 + (-3)$$
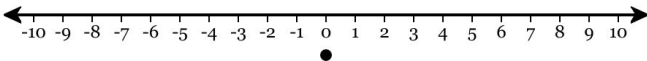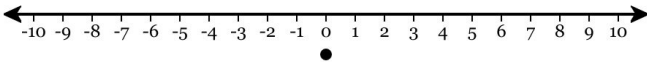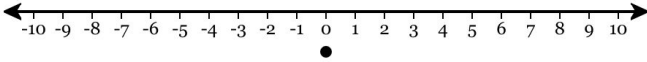
What final answer do all of these three diagrams give?

41. Plot 2 and -3 on the number line below. Find the distance between 2 and -3.
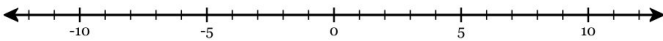
42. Plot -12 and -2 on the number line below. Find the distance between -12 and -2.
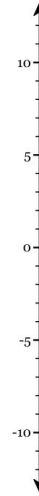
43. Plot 4 and 11 on the number line below. Find the distance between 4 and 11.

Integers (Signed Numbers) (~39 min)

44. Plot 11 and 5 on the number line below. Find the distance between 11 and 5.

```
        |
     10-+
        |
      5-+
        |
      0-+
        |
     -5-+
        |
    -10-+
        |
```

45. Plot 9 and -10 on the number line below. Find the distance between 9 and -10.

```
        |
     10-+
        |
      5-+
        |
      0-+
        |
     -5-+
        |
    -10-+
        |
```

Geometry Review (~32 min)

1. Given the two rectangles below. Find the area of the shaded region.

```
      8      2
   ┌──────┬────┐
 7 │      │    │
   │      │    │
   ├──────┘    │
 4 │           │
   └───────────┘
```

2. All of the quadrilaterals in the shape below are squares. Find the area of the shaded region.

```
          15
   ┌────┬───────┐
 9 │    │       │
   ├────┤       │
   │    ├───────┤
   │    │       │
   └────┴───────┘
```

3. One rectangle is "framed" within another. Find the area of the shaded region if the "frame" is 1 unit wide.

```
   ┌──────┐
   │ ┌──┐ │
   │ │ 3│ │
   │ │  │ │
   │ │  │ │
   │ │10│ │
   │ └──┘ │
   └──────┘
```

4. Use a straightedge to draw the height of $\triangle ABC$ from vertex A to side $\overline{BC}$. Try your best to form a right angle. (Note: you may have to extend side $\overline{BC}$ with your straightedge.) The length of this height is 5.19 inches. Label that length below.

B

3.6

C

7.3

5.4

A

The length of the triangle's base $\left(\overline{BC}\right)$ is _____ in. and the length of the height is _____ in. Therefore the area of the triangle is $\frac{1}{2}\times$_____$\times$_____ $=$ _____ in.

5. Use a straightedge to draw the height of $\triangle ABC$ from vertex A to side $\overline{BC}$. Try your best to form a right angle. (Note: you may have to extend side $\overline{BC}$ with your straightedge.) The length of this height is 3.73 inches. Label that length below.

C

6.9

6

B

4.3

A

The length of the triangle's base $\left(\overline{BC}\right)$ is _____ in. and the length of the height is _____ in. Therefore the area of the triangle is $\frac{1}{2}\times$_____$\times$_____ $=$ _____ in.

6. Use a straightedge to draw the height of $\triangle ABC$ from vertex A to side $\overline{BC}$. Try your best to form a right angle. (Note: you may have to extend side $\overline{BC}$ with your straightedge.) The length of this height is 3.43 inches. Label that length below.

A

3.7

B

7.9

5.7

C

The length of the triangle's base $\left(\overline{BC}\right)$ is _____ in. and the length of the height is _____ in. Therefore the area of the triangle is $\frac{1}{2}\times$_____$\times$_____ $=$ _____ in.

Geometry Review (~32 min)

7. The net below represents a three-dimensional object.

Which three-dimensional object does it represent?

A   B

C   D

8. The net below represents a three-dimensional object.

Which three-dimensional object does it represent?

A. triangular pyramid   B. cube

C. triangular prism   D. square pyramid

9. Which figure represents a net of the solid below?

A   B

C   D

10. Guadalupe is decorating the outside of a box in the shape of a right rectangular prism. The figure below shows a net for the box.

11 m

7 m

7 m

10 m

7 m

7 m

10 m

What is the surface area of the box, in square meters, that Guadalupe decorates?

11. Justin wraps a gift box in the shape of a square pyramid. The figure below shows a net for the gift box.

7.2 ft

7.6 ft

How much wrapping paper did he use, in square feet?

12. The figure below is a net for a triangular pyramid.

12.12 ft

14 ft

If all the triangles are equilateral, what is the surface area of the pyramid, in square feet?

Geometry Review (~32 min)

13. Find the perimeter of the figure below, in feet.

41.6 ft

8.8 ft

8.8 ft

12.8 ft

20.8 ft

12.8 ft

12.8 ft

8 ft

(Note: diagram is NOT to scale)

14. The perimeter of the figure below is 163.7 m. Find the length of the missing side.

11 m

11.3 m

11.3 m

11.3 m

11.3 m

11.3 m

11.3 m

11.3 m

11.3 m

26 m

26 m

?

(Note: diagram is NOT to scale)

15. The perimeter of the figure below is 145.8 ft. Find the length of the missing side.

43.8 ft

15 ft

15 ft

13.5 ft

21.9 ft

13.5 ft

13.5 ft

?
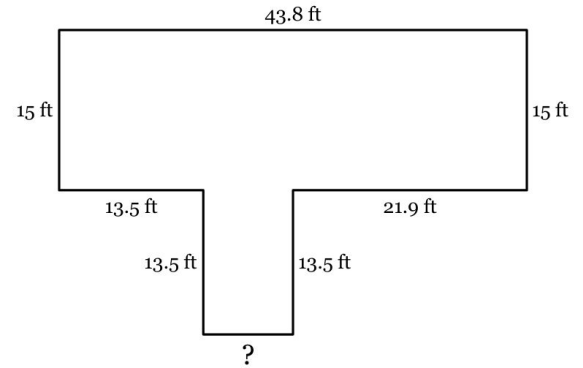
(Note: diagram is NOT to scale)

16. A rectangular prism has a length of 14m, a height of 6m, and a width of 20m. What is its volume, in cubic m?

17. A cube has an edge length of 10in. What is its volume, in cubic in?

18. A cube has an edge length of 10 centimeters. What is its volume, in cubic centimeters?

Probability & Statistics (~35 min)

1. Malika has a bag of candy full of 10 strawberry chews and 10 cherry chews that she eats one at a time. Which word or phrase describes the probability that she reaches in without looking and pulls out a strawberry chew?

A. an equal chance or 50-50   B. certain

C. likely   D. impossible

2. Which of these contexts describes a situation that is *certain*?

A. Rolling a number less than or equal to 6 on a standard six-sided die, numbered from 1 to 6.

B. Spinning a spinner divided into four equal-sized sections colored red/green/yellow/blue and landing on purple.

C. Winning a raffle that sold a total of 100 tickets if you bought 0 tickets.

D. Reaching into a bag full of 10 strawberry chews and 10 cherry chews without looking and pulling out a cherry chew.

3. A spinner for a board-game is divided into four equal-sized sections colored red, green, yellow, and blue. If you land on a line between the colors, you keep spinning until you land on a color. Lydia's turn is next. Which word or phrase describes the probability that she will land on blue or green?

A. an equal chance or 50-50   B. impossible

C. likely   D. certain

4. Arianna's school is selling 100 raffle-tickets to raise money for a new gymnasium. The grand-prize is a ten-speed mountain bike. Which word or phrase describes the probability that she will win the raffle if she buys 50 tickets?

A. likely   B. impossible

C. certain   D. an equal chance or 50-50

5. A spinner for a board-game is divided into four equal-sized sections colored red, green, yellow, and blue. If you land on a line between the colors, you keep spinning until you land on a color. Michael's turn is next. Which word or phrase describes the probability that he will land on red or yellow or green?

A. likely   B. impossible

C. certain   D. unlikely

6. John buys a ticket for a raffle with several prizes. The probability that he wins a prize is 0.81. Which word or phrase describes the probability that John will win a prize?

A. impossible   B. likely

C. certain   D. unlikely

7. The weather forecaster says that tomorrow there is a 6% chance that it will rain. Which word or phrase describes the probability that it will rain?

A. certain   B. impossible

C. an equal chance or 50-50   D. unlikely

8. Arianys is playing a board game. The probability that Arianys will lose a turn on her next turn is 0%. Which word or phrase describes the probability that Arianys will lose a turn?

A. impossible   B. an equal chance or 50-50

C. likely   D. unlikely

9. Through ten games of basketball this season, Parker has made 2 out of 4 of his free-throws. Which word or phrase describes the probability that Parker will hit his next free throw?

A. likely   B. an equal chance or 50-50

C. impossible   D. unlikely

Probability & Statistics (~35 min)

10. Charlotte is playing a board game. The probability that Charlotte will lose a turn on her next turn is 0.95. Which word or phrase describes the probability that Charlotte will lose a turn?

A. certain   B. unlikely

C. likely   D. an equal chance or 50-50

11. Bentley owns a small business selling ice-cream. He knows that in the last week 44 customers paid cash, 77 customers used a debit card, and 4 customers used a credit card.

Based on these results, express the probability that the next customer will pay with a debit card as a fraction in simplest form.

12. Aubree has a bag that contains orange chews, lemon chews, and peach chews. She performs an experiment. Aubree randomly removes a chew from the bag, records the result, and returns the chew to the bag. Aubree performs the experiment 28 times. The results are shown below:

   An orange chew was selected 14 times.
   A lemon chew was selected 3 times.
   A peach chew was selected 11 times.

Based on these results, express the probability that the next chew Aubree removes from the bag will be lemon chew as a percent to the nearest whole number.

13. In a popular online role playing game, players can create detailed designs for their character's "costumes," or appearance. Arianys sets up a website where players can buy and sell these costumes online. Information about the number of people who visited the website and the number of costumes purchased in a single day is listed below.

   310 visitors purchased no costume.
   119 visitors purchased exactly one costume.
   42 visitors purchased more than one costume.

Based on these results, express the probability that the next person will purchase no costume as a fraction in simplest form.

14. In a popular online role playing game, players can create detailed designs for their character's "costumes," or appearance. Brianna sets up a website where players can buy and sell these costumes online. Information about the number of people who visited the website and the number of costumes purchased in a single day is listed below.

   154 visitors purchased no costume.
   180 visitors purchased exactly one costume.
   8 visitors purchased more than one costume.

Based on these results, express the probability that the next person will purchase exactly one costume as a percent to the nearest whole number.

Probability & Statistics (~35 min)

15. A spinner is divided into five colored sections that are not of equal size: red, blue, green, yellow, and purple. The spinner is spun several times, and the results are recorded below:

Spinner Results

Color	Frequency
Red	9
Blue	11
Green	2
Yellow	10
Purple	2

Based on these results, express the probability that the next spin will land on blue as a fraction in simplest form.

16. Which event is **least likely** to occur?

A. Rolling a number less than 4 on a eight-sided die, numbered from 1 to 8.

B. Spinning a spinner divided into four equal-sized sections colored red/green/yellow/blue and landing on red or yellow or green or blue.

C. Winning a raffle that sold a total of 100 tickets, if you buy 74 tickets.

D. Reaching into a bag full of 7 strawberry chews and 73 cherry chews without looking and pulling out a strawberry chew.

17. Which event is **least likely** to occur?

A. Rolling a number less than 6 on a six-sided die, numbered from 1 to 6.

B. Spinning a spinner divided into five equal-sized sections colored red/green/yellow/blue/purple and landing on blue or purple.

C. Winning a raffle that sold a total of 100 tickets, if you buy 54 tickets.

D. Reaching into a bag full of 1 strawberry chews and 39 cherry chews without looking and pulling out a strawberry chew.

18. Which event is **most likely** to occur?

A. Rolling a number greater than or equal to 3 on a eight-sided die, numbered from 1 to 8.

B. Spinning a spinner divided into five equal-sized sections colored red/green/yellow/blue/purple and landing on green or purple.

C. Winning a raffle that sold a total of 100 tickets, if you buy 0 tickets.

D. Reaching into a bag full of 78 strawberry chews and 2 cherry chews without looking and pulling out a strawberry chew.

19. Which event is **least likely** to occur?

A. Rolling an even number or an odd number on a six-sided die, numbered from 1 to 6.

B. Spinning a spinner divided into five equal-sized sections colored red/green/yellow/blue/purple and landing on red or green.

C. Winning a raffle that sold a total of 100 tickets, if you buy 83 tickets.

D. Reaching into a bag full of 6 strawberry chews and 54 cherry chews without looking and pulling out a strawberry chew.

Probability & Statistics (~35 min)

20. Which event is **most likely** to occur?

A. Rolling a multiple of 3 on a six-sided die, numbered from 1 to 6.

B. Spinning a spinner divided into five equal-sized sections colored red/green/yellow/blue/purple and landing on red or blue or purple.

C. Winning a raffle that sold a total of 100 tickets, if you buy 23 tickets.

D. Reaching into a bag full of 34 strawberry chews and 6 cherry chews without looking and pulling out a strawberry chew.

21. David is trying to pick out an outfit for the first day of school. He can choose from 4 pairs of pants, 3 t-shirts, and 3 pairs of shoes. How many different outfits does David have to choose from?

22. Jevonte is designing a new board game, and is trying to figure out all the possible outcomes. How many different possible outcomes are there if he spins a spinner with four equal-sized sections labeled Red, Green, Blue, Orange and spins a spinner with 5 equal-sized sections labeled Monday, Tuesday, Wednesday, Thursday, Friday?

23. Three students, Lavaughn, Zahra, and Arianna, line up one behind the other. How many different ways can they stand in line?

24. Nora is organizing textbooks on her bookshelf. She has an English textbook, a math textbook, a physics textbook, and a health textbook. How many different ways can she line the textbooks up on her bookshelf?

25. Avani is designing a new board game, and is trying to figure out all the possible outcomes. How many different possible outcomes are there if she spins a spinner with four equal-sized sections labeled Red, Green, Blue, Orange and flips a coin?

Probability & Statistics (~35 min)

26. Find the median and mean of the data set below:

$$27, 31, 45, 12, 4, 19$$

30. Find the median and mean of the data set below:

$$1, 12, 5, 17, 7$$

27. Find the median and mean of the data set below:

$$21, 46, 9, 6$$

28. Find the median and mean of the data set below:

$$46, 9, 7, 32$$

29. Find the median and mean of the data set below:

$$10, 11, 30, 5, 18$$

Ratios & Proportions (~ 36 min)

1. Find the ratio of to squares in the diagram below.

△□□
△□□

Unsimplified ratio of triangles to squares:

☐ : ☐
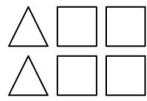
For every 1 triangle there are 2 squares, therefore the simplified ratio of triangles to squares is 1 : 2.

2. Find the ratio of to squares in the diagram below.

△□□□
△□□□
△□□□
△□□□

Unsimplified ratio of triangles to squares:

☐ : ☐
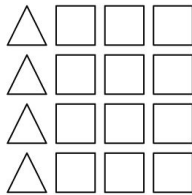
For every 1 triangle there are 3 squares, therefore the simplified ratio of triangles to squares is 1 : 3.

3. Find the ratio of circles to squares in the diagram below.

○□□□□
○□□□□
○□□□□

Unsimplified ratio of circles to squares:

☐ : ☐
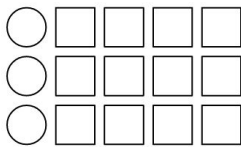
For every 1 circle there are 4 squares, therefore the simplified ratio of circles to squares is 1 : 4.

4. Find the ratio of squares to in the diagram below.

□△△△△△
□△△△△△
□△△△△△

Unsimplified ratio of squares to triangles:

☐ : ☐
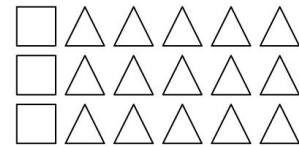
For every 1 square there are 5 triangles, therefore the simplified ratio of squares to triangles is 1 : 5.

5. Find the ratio of squares to circles in the diagram below.

□○
□○
□○
□○

Unsimplified ratio of squares to circles:

☐ : ☐

For every 1 square there are 1 circles, therefore the simplified ratio of squares to circles is 1 : 1.

6. There are 20 triangles and 4 squares. What is the simplest ratio of squares to triangles?

$$1 : 5$$

7. There are 6 circles and 9 triangles. What is the simplest ratio of circles to total shapes?

$$2 : 5$$

Ratios & Proportions (~ 36 min)

8. There are 20 circles and 8 triangles. What is the simplest ratio of triangles to total shapes?

$$2:7$$

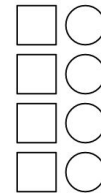**9.** There are 3 squares and 6 circles. What is the simplest ratio of squares to circles?

$$1:2$$

10. There are 10 squares and 6 circles. What is the simplest ratio of circles to squares?

$$3:5$$

11. Fill in the blanks to express the quantities given in ratio language. Ratios must be expressed in *simplest form.*

Number of Books Read in a Year:

Person	Books
Keshawn	66
Avery	11
Julian	55

For every 6 book(s) Keshawn read, Avery read 1 book(s).

12. Fill in the blanks to express the quantities given in ratio language. Ratios must be expressed in *simplest form.*

Distribution of Student Quiz Scores:

Quiz Score	Students
60s	35
70s	30
80s	5
90s	25

For every 5 student(s) scoring in the 90s, there was/were 7 student(s) scoring in the 60s.

13. Fill in the blanks to express the quantities given in ratio language. Ratios must be expressed in *simplest form.*

Number of Twitter Followers:

Person	Followers
Kehlani	14
Shaquana	35
Hannah	21
Leah	49

For every 5 follower(s) Shaquana has, Kehlani has 2 follower(s).

14. Fill in the blanks to express the quantities given in ratio language. Ratios must be expressed in *simplest form.*

Number of Boys and Girls in a Class:

Gender	Students
Boys	30
Girls	40

For every 3 boy(s) in the class, there is/are 4 girl(s) in the class.

ANSWER KEY

Ratios & Proportions (~ 36 min)

15. Fill in the blanks to express the quantities given in ratio language. Ratios must be expressed in *simplest form.*

Number of Students in Each Grade:

Grade	Students
9th Grade	36
10th Grade	27
11th Grade	63
12th Grade	9

For every 7 student(s) in 11th Grade, there is/are 3 student(s) in 10th Grade.

16. Yusuf and Dianelys are adding chocolate chips to a batch of pre-made cookie dough to make chocolate chip cookies. Yusuf mixes 2 cups of dough with 5 quarter-cups of chocolate chips and Dianelys mixes 4 cups of dough with 5 quarter-cups of chocolate chips. Whose cookies will be more chocolaty?

A. Yusuf's cookies will be more chocolaty.

B. Dianelys's cookies will be more chocolaty.

C. The two sets of cookies will be equally chocolaty.

17. Students are making lemonade from a powdered lemon drink mix. Meena mixes 4 cups of water and 5 teaspoons of powdered lemon mix. Nolan mixes 4 cups of water and 3 teaspoons of powdered lemon mix. Whose mix will be more lemony?

A. Meena's mix will be more lemony.

B. Nolan's mix will be more lemony.

C. The two mixes will be equally lemony.

18. Yusuf and Nora are making fruit salads for a picnic. Yusuf mixes 5 cups of melon and 4 cups of apple and Nora mixes 3 cups of melon and 4 cups of apple. Whose fruit salad will taste more melony?

A. Yusuf's fruit salad will be more melony.
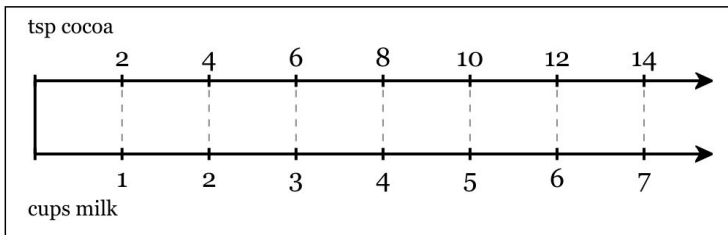
B. Nora's fruit salad will be more melony.

C. The two fruit salads will be equally melony.
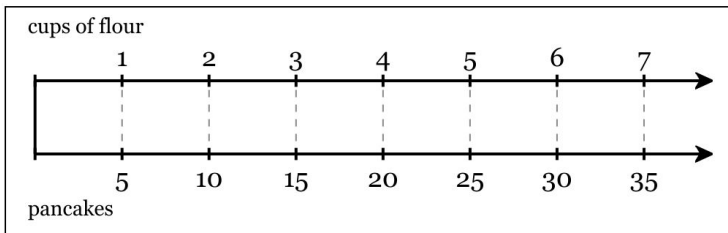
Ratios & Proportions (~ 36 min)

19. In art class students are mixing blue and red paint to make purple paint. Jeriel mixes 3 cups of blue paint and 2 cups of red paint. Fawzia mixes 3 cups of blue paint and 2 cups of red paint. Whose purple paint will be bluer?

A. Jeriel's purple paint will be bluer.

B. Fawzia's purple paint will be bluer.

C. The two purple paints will be equally blue.

20. A hot chocolate recipe calls for two teaspoons of cocoa for every cup of milk.

tsp cocoa

| 2 | 4 | 6 | 8 | 10 | 12 | 14 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

cups milk

21. A recipe calls for one cup of flour to make five pancakes. Fill in the blanks in the double number-line below.

cups of flour

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| 5 | 10 | 15 | 20 | 25 | 30 | 35 |

pancakes

22. A recipe calls for one cup of flour to make five pancakes. Fill in the blanks in the double number-line below.

cups of flour

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| 5 | 10 | 15 | 20 | 25 | 30 | 35 |

pancakes

23. To make salad dressing, combine two tablespoons of oil for every three tablespoons of vinegar. Fill in the blanks in the double number-line below.

tablespoons oil

| 2 | 4 | 6 | 8 | 10 | 12 | 14 |

| 3 | 6 | 9 | 12 | 15 | 18 | 21 |

tablespoons vinegar

24. There are twelve doughnuts in a dozen. How many doughnuts are there in four dozen?

doughnuts

| 12 |

| 1 | 4 |

dozens

48 doughnuts

25. Nine tubs of yogurt cost $36. How much does one tub of yogurt cost?

tubs of yogurt

| 1 | 9 |

| ____ | 36 |

dollars

4 dollars

ANSWER KEY

Ratios & Proportions (~ 36 min)

26. A tub of yogurt costs $4. How much do five tubs of yogurt cost?

tubs of yogurt

1   5

4

dollars

$$\boxed{20 \text{ dollars}}$$

27. To make salad dressing, combine one tablespoon of oil for every two tablespoons of vinegar. If a batch of salad dressing has five tablespoons of oil, how many tablespoons of vinegar does it have?

tablespoons of oil

1   5

2

tablespoons of vinegar

$$\boxed{10 \text{ tablespoons of vinegar}}$$

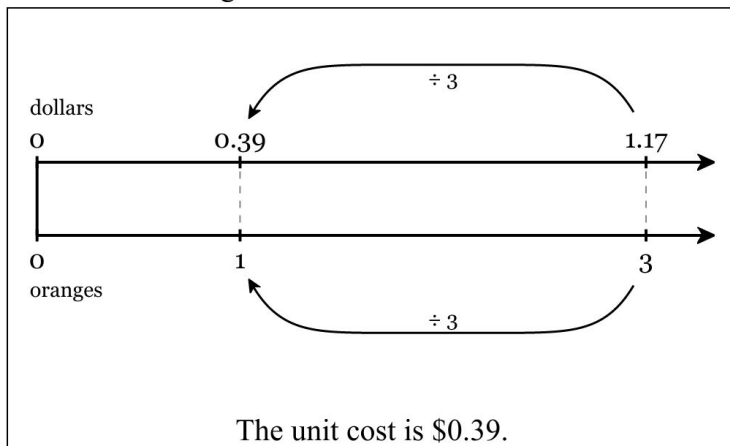**28.** A grocery store sells a bag of 3 oranges for $1.17. What is the unit cost? On the double number line below, fill in the given values, then use multiplication or division to find the missing value.

dollars

0   0.39   1.17   ÷ 3

0   1   3   ÷ 3
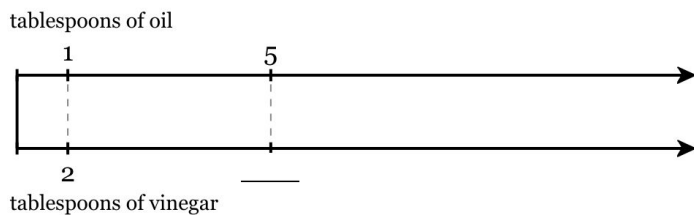
oranges

The unit cost is $0.39.

29. Kehlani read 12 books in 2 months. If she reads at a constant rate, how many books did she read each month? Give your answer as a whole number or a FRACTION in simplest form.

She read 6 books each month.

30. Jayden bought 3 chicken wings for $3.00. What's the unit cost of one wing?

The unit cost of one wing is $1.00.

31. Nakeisha read 2 books in 3 months. If she reads at a constant rate, how many books did she read each month? Give your answer as a whole number or a FRACTION in simplest form. On the double number line below, fill in the given values, then use multiplication or division to find the missing value.
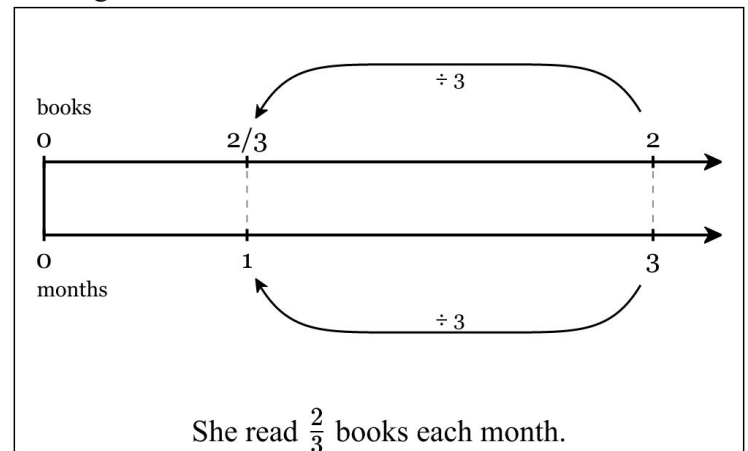
books

0   2/3   2   ÷ 3

0   1   3   ÷ 3

months

She read $\frac{2}{3}$ books each month.

32. The ratio of students to adults on a field trip is 22 to 2. Which table correctly represents this ratio?

A

Students	Adults
11	1
12	2
13	3

B

Students	Adults
22	2
24	4
26	6

C

Students	Adults
11	1
22	12
33	23

D

Students	Adults
22	2
33	3
44	4

33. A pump fills a pool at a constant rate. At the end of 5 minutes it has filled 2 gallons of water. Which table represents the relationship between the number of minutes and the number of gallons of water in the pool?

A

Time (minutes)	Water (gallons)
5	2
10	4
20	8

B

Time (minutes)	Water (gallons)
5	2
10	6
20	10

C

Time (minutes)	Water (gallons)
10	4
12	6
14	8

D

Time (minutes)	Water (gallons)
5	2
10	7
20	17

34. The diagram below represents the rate of making copies on a copy machine. Which table represents this rate?

A

Time (seconds)	Copies
1	6
2	12
3	18

B

Time (seconds)	Copies
1	2
2	4
3	6

C

Time (seconds)	Copies
6	1
12	2
18	3

D

Time (seconds)	Copies
2	1
4	2
6	3

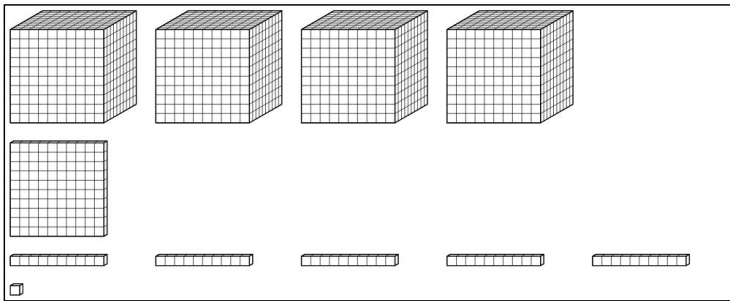ANSWER KEY

Base 10 Number Sense (~37 min)

1. Circle the blocks you would need to create a representation of 3553. The shapes represent 1000s, 100s, 10s, and 1s, respectively.

2. Circle the blocks you would need to create a representation of 4151. The shapes represent 1000s, 100s, 10s, and 1s, respectively.

3. Circle the blocks you would need to create a representation of 3031. The shapes represent 1000s, 100s, 10s, and 1s, respectively.
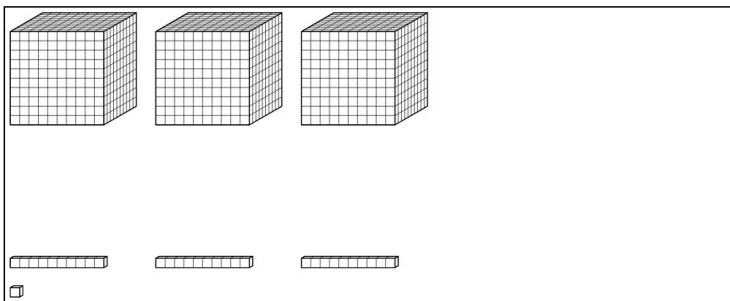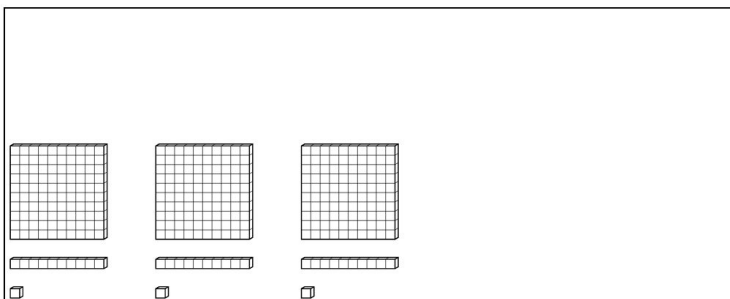
4. Circle the blocks you would need to create a representation of 333. The shapes represent 1000s, 100s, 10s, and 1s, respectively.

5. Circle the blocks you would need to create a representation of 3133. The shapes represent 1000s, 100s, 10s, and 1s, respectively.

6. Circle the blocks you would need to create a representation of 5.401. The shapes represent 1s, .1s, .01s, and .001s, respectively.

7. Circle the blocks you would need to create a representation of 3.232. The shapes represent 1s, .1s, .01s, and .001s, respectively.

8. Circle the blocks you would need to create a representation of 2.133. The shapes represent 1s, .1s, .01s, and .001s, respectively.

Base 10 Number Sense (~37 min)

9. Circle the blocks you would need to create a representation of 1.215. The shapes represent 1s, .1s, .01s, and .001s, respectively.

10. Circle the blocks you would need to create a representation of 3.105. The shapes represent 1s, .1s, .01s, and .001s, respectively.
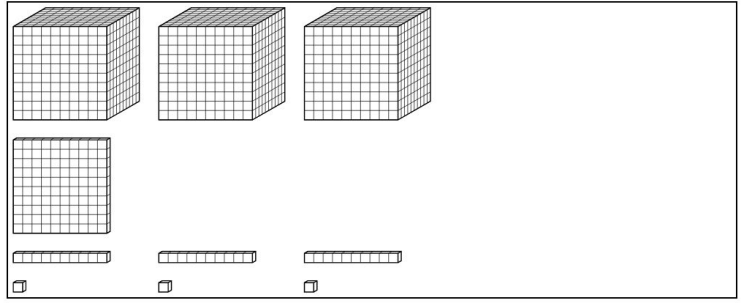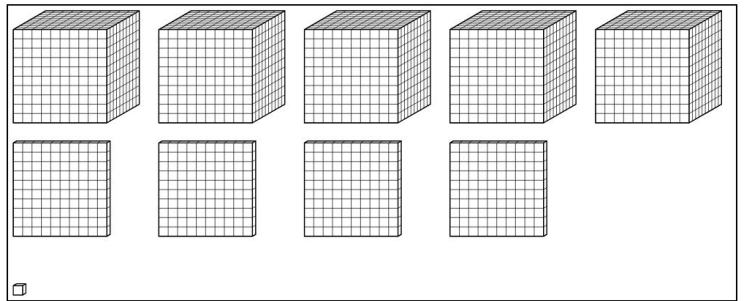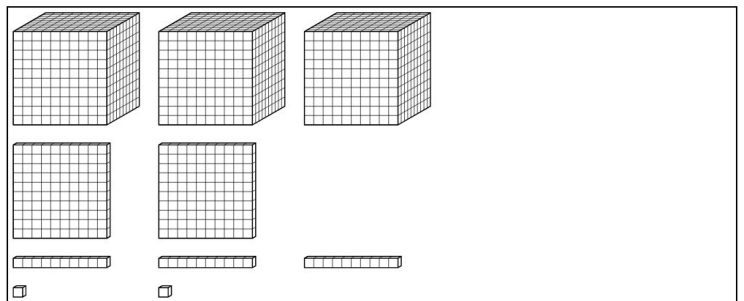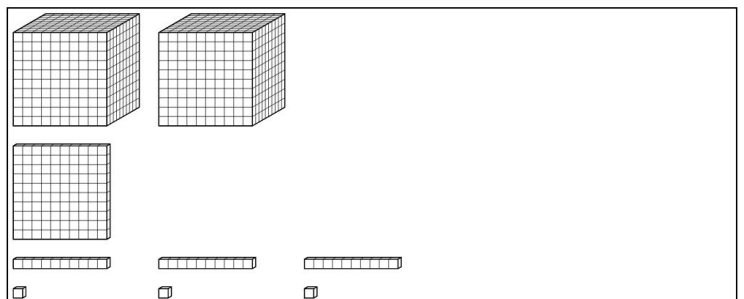

11. What number is represented by the base ten blocks shown below?

| 1 | 1/10 = .1 | 1/100 = .01 | 1/1000 = .001 |
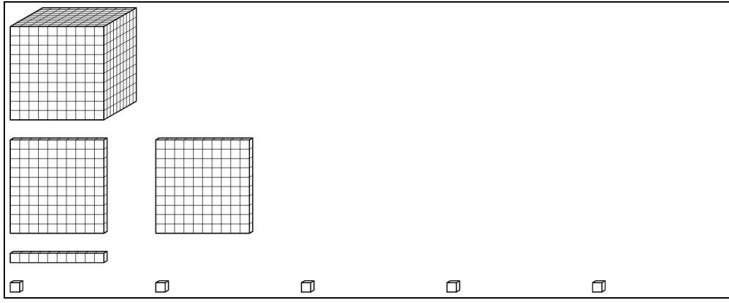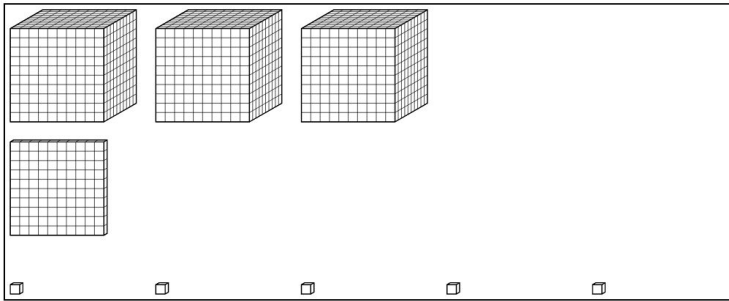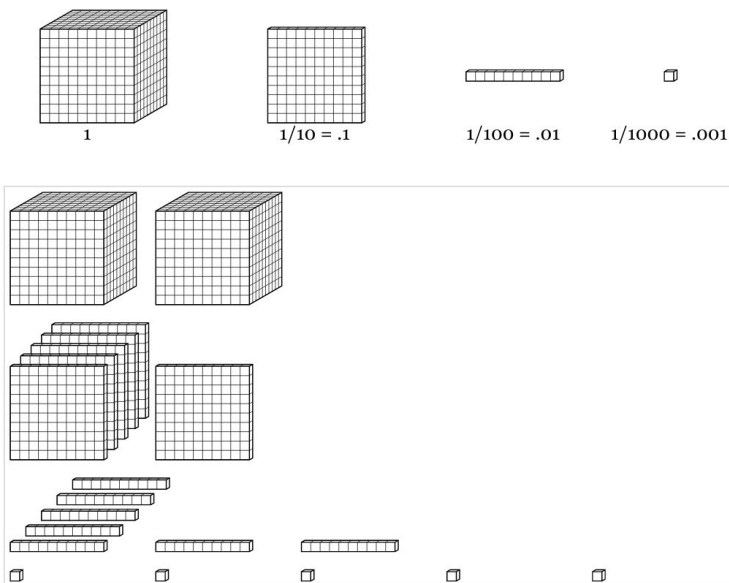
$$2.675$$

12. What number is represented by the base ten blocks shown below?
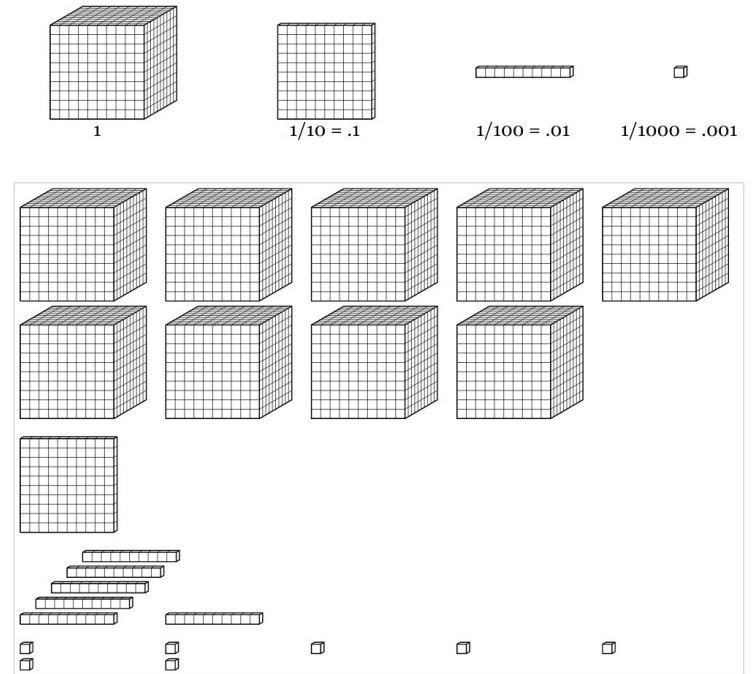
| 1 | 1/10 = .1 | 1/100 = .01 | 1/1000 = .001 |

$$9.167$$

13. What number is represented by the base ten blocks shown below?
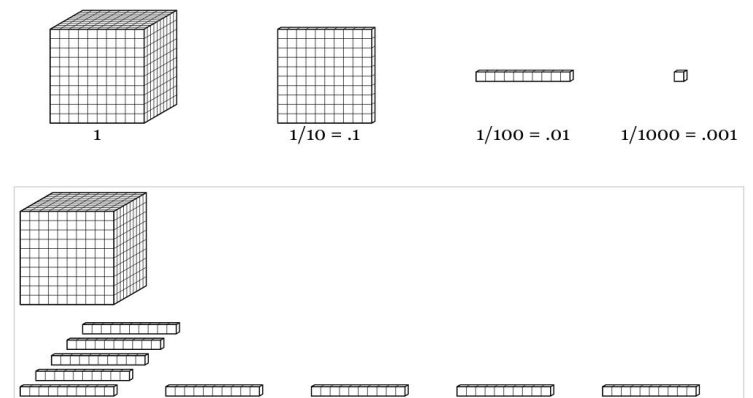
| 1 | 1/10 = .1 | 1/100 = .01 | 1/1000 = .001 |

$$1.09$$

ANSWER KEY

Base 10 Number Sense (~37 min)

14. What number is represented by the base ten blocks shown below?

1	1/10 = .1	1/100 = .01	1/1000 = .001
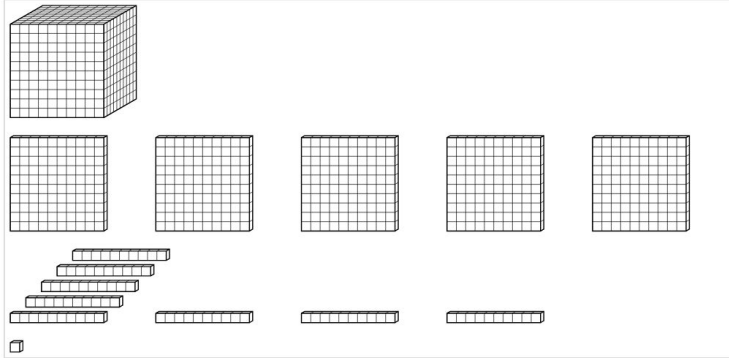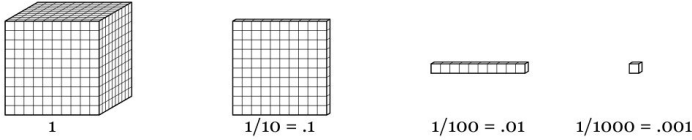
$$\boxed{1.581}$$

15. What number is represented by the base ten blocks shown below?

1	1/10 = .1	1/100 = .01	1/1000 = .001
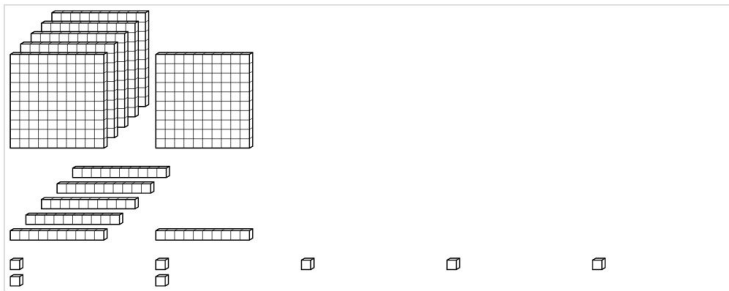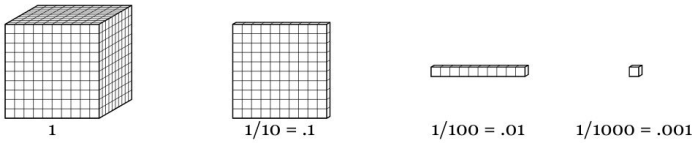
$$\boxed{0.667}$$

16. Write the numbers below in order from least to greatest. Use commas to separate.

3.6	4.3	3.9	2.3	1.7	1.5

$$\boxed{1.5, \ 1.7, \ 2.3, \ 3.6, \ 3.9, \ 4.3}$$

17. Write the numbers below in order from least to greatest. Use commas to separate.

1.1	1.3	4.4	3.6	0.8	4.6

$$\boxed{0.8, \ 1.1, \ 1.3, \ 3.6, \ 4.4, \ 4.6}$$

18. Write the numbers below in order from least to greatest. Use commas to separate.

2.6	7.1	2.2	6.8	6.4	1.6

$$\boxed{1.6, \ 2.2, \ 2.6, \ 6.4, \ 6.8, \ 7.1}$$

19. Write the numbers below in order from least to greatest. Use commas to separate.

2.3	3.6	3.2	2.9	3.1	3.8

$$\boxed{2.3, \ 2.9, \ 3.1, \ 3.2, \ 3.6, \ 3.8}$$

20. Write the numbers below in order from least to greatest. Use commas to separate.

3.4	2.6	5.4	2.8	5.6	4.9

$$\boxed{2.6, \ 2.8, \ 3.4, \ 4.9, \ 5.4, \ 5.6}$$

21. Evaluate: 140.9×10

$$\boxed{1409}$$

22. Evaluate: $525.8 \div 10$

$$\boxed{52.58}$$

23. Evaluate: $88.28 \div 10$

$$\boxed{8.828}$$

24. Evaluate: 104.995×10

$$\boxed{1049.95}$$

Base 10 Number Sense (~37 min)

25. Evaluate: 17.617×10

$$\boxed{176.17}$$

26. Compute. Express your answer as a whole number or decimal.

$$17 \times 10$$

$$\boxed{170}$$

27. Compute. Express your answer as a whole number or decimal.

$$71.9 \div 10^3$$

$$\boxed{0.0719}$$

28. Compute. Express your answer as a whole number or decimal.

$$87.9 \times 10$$

$$\boxed{879}$$

29. Compute. Express your answer as a whole number or decimal.

$$6824 \div 10$$

$$\boxed{682.4}$$

30. Compute. Express your answer as a whole number or decimal.

$$39000 \div 10$$

$$\boxed{3900}$$

31. $89,700$ is how many times greater than 8.97? 8.97 is what fractional part of $89,700$?

$89,700$ is <u>10000</u> times greater than 8.97

8.97 is <u>1/10000</u> of $89,700$

32. 8910 is how many times greater than 8.91? 8.91 is what fractional part of 8910?

8910 is <u>1000</u> times greater than 8.91

8.91 is <u>1/1000</u> of 8910

33. 5370 is how many times greater than 53.7? 53.7 is what fractional part of 5370?

5370 is <u>100</u> times greater than 53.7

53.7 is <u>1/100</u> of 5370

34. 7040 is how many times greater than 70.4? 70.4 is what fractional part of 7040?

7040 is <u>100</u> times greater than 70.4

70.4 is <u>1/100</u> of 7040

35. 3.2 is how many times greater than $.32$? $.32$ is what fractional part of 3.2?

3.2 is <u>10</u> times greater than $.32$

$.32$ is <u>1/10</u> of 3.2

ANSWER KEY

Base 10 Number Sense (~37 min)

36. Fill in the guided sentence below to explain how 8×10 relates to 2×10.

8 is <u>4 times</u> 2, so 8×10 is <u>4 times</u> 2×10.

$2 \times 10 = \underline{20}$ $8 \times 10 = \underline{80}$

37. Fill in the guided sentence below to explain how 28×3 relates to 7×3.

28 is <u>4 times</u> 7, so 28×3 is <u>4 times</u> 7×3.

$7 \times 3 = \underline{21}$ $28 \times 3 = \underline{84}$

38. Fill in the guided sentence below to explain how 18×2 relates to 6×2.

18 is <u>3 times</u> 6, so 18×2 is <u>3 times</u> 6×2.

$6 \times 2 = \underline{12}$ $18 \times 2 = \underline{36}$

39. Fill in the guided sentence below to explain how 60×7 relates to 6×7.

60 is <u>10 times</u> 6, so 60×7 is <u>10 times</u> 6×7.

$6 \times 7 = \underline{42}$ $60 \times 7 = \underline{420}$

40. Fill in the guided sentence below to explain how 40×8 relates to 10×8.

40 is <u>4 times</u> 10, so 40×8 is <u>4 times</u> 10×8.

$10 \times 8 = \underline{80}$ $40 \times 8 = \underline{320}$

41. Fill in the guided sentence below to explain how $.06 \times 5$ relates to 6×5.

.06 is <u>one hundredth</u> of 6, so

$.06 \times 5$ is <u>one hundredth</u> of 6×5.

$6 \times 5 = \underline{30}$ $.06 \times 5 = \underline{0.3}$

42. Fill in the guided sentence below to explain how $.07 \times 5$ relates to 7×5.

.07 is <u>one hundredth</u> of 7, so

$.07 \times 5$ is <u>one hundredth</u> of 7×5.

$7 \times 5 = \underline{35}$ $.07 \times 5 = \underline{0.35}$

43. Fill in the guided sentence below to explain how $.04 \times 9$ relates to 4×9.

.04 is <u>one hundredth</u> of 4, so

$.04 \times 9$ is <u>one hundredth</u> of 4×9.

$4 \times 9 = \underline{36}$ $.04 \times 9 = \underline{0.36}$

Base 10 Number Sense (~37 min)

44. Fill in the guided sentence below to explain how $.003 \times 2$ relates to 3×2.

$.003$ is <u>one thousandth</u> of 3, so

$.003 \times 2$ is <u>one thousandth</u> of 3×2.

$3 \times 2 = \underline{6}$ $\qquad\qquad$ $.003 \times 2 = \underline{0.006}$

45. Fill in the guided sentence below to explain how $.004 \times 7$ relates to 4×7.
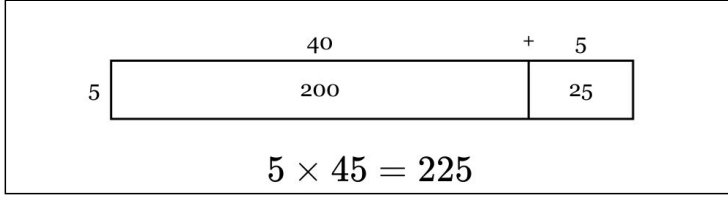
$.004$ is <u>one thousandth</u> of 4, so

$.004 \times 7$ is <u>one thousandth</u> of 4×7.

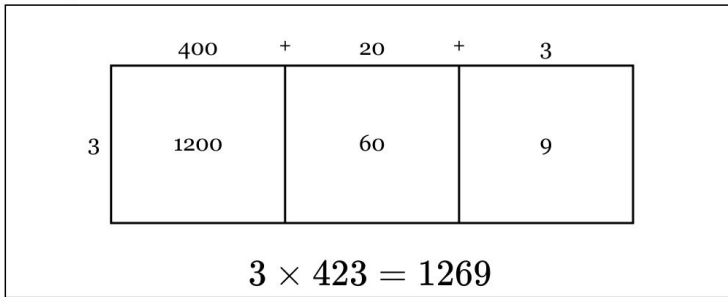$4 \times 7 = \underline{28}$ $\qquad\qquad$ $.004 \times 7 = \underline{0.028}$

Mathematical Models for Operations (~35 min)

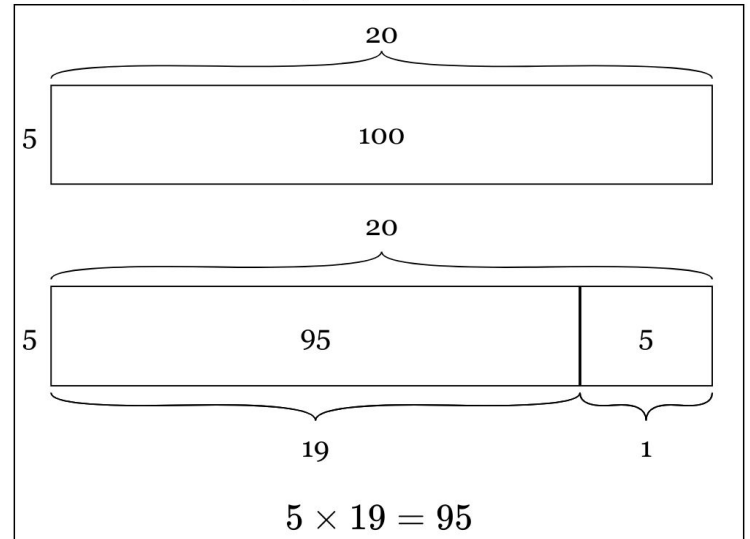**1.** Write the missing values in the area model for multiplication below.

	40	+	5
5	200		25

$$5 \times 45 = 225$$

2. Write the missing values in the area model for multiplication below.

	400	+	20	+	3
3	1200		60		9

$$3 \times 423 = 1269$$

3. Find 2×49 using an area model and subtraction.

50

2	100

50

2	98	2

49   1

$$2 \times 49 = 98$$

4. Find 5×19 using an area model and subtraction.

20

5	100

20

5	95	5

19   1

$$5 \times 19 = 95$$

5. Enter the missing values in the area model for multiplication below.

$$8 \times 0.68$$

	Tenths	Hundredths
	0.6	+ 0.08
8	4.8	0.64

$$8 \times 0.68 = 5.44$$

Mathematical Models for Operations (~35 min)

6. Enter the missing values in the area model for multiplication below.

$$6 \times 6.7$$

Ones		Tenths
6	+	0.7

6	36	4.2

$$6 \times 6.7 = 40.2$$

7. The squares below each represent a unit or a whole.

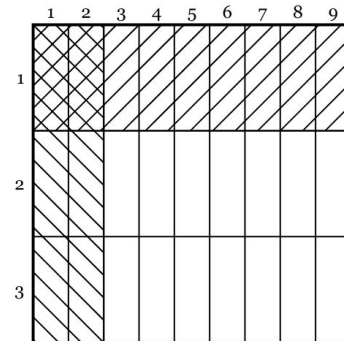$$\underbrace{\frac{1}{3}}_{\text{Fraction 1}} \times \underbrace{\frac{2}{9}}_{\text{Fraction 2}}$$

For each, write in the box below the fraction represented by the shaded area.

$$\boxed{\frac{1}{3}} \qquad \boxed{\frac{2}{9}}$$

The two diagrams above have been overlapped in the diagram below:

How many little rectangles are in the overlapping shaded region? $\boxed{2}$

How many little rectangles are there altogether? $\boxed{27}$

Fill in the blanks below to create the multiplication problem represented by the diagrams above. Write the product in unsimplified form.
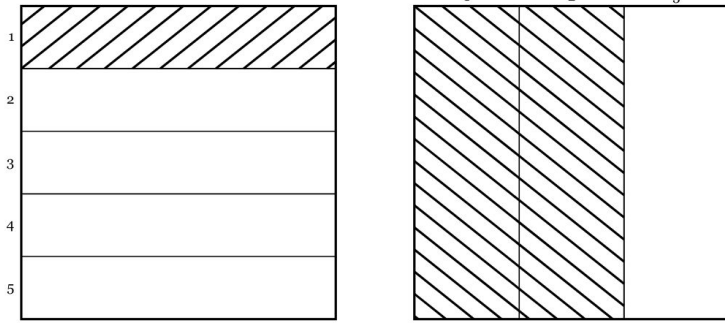
$$\boxed{\frac{1}{3}} \times \boxed{\frac{2}{9}} = \boxed{\frac{2}{27}}$$

ANSWER KEY

Mathematical Models for Operations (~35 min)

8. The squares below each represent a unit or a whole.

$$\underbrace{\frac{1}{5}}_{\text{Fraction 1}} \times \underbrace{\frac{2}{3}}_{\text{Fraction 2}}$$
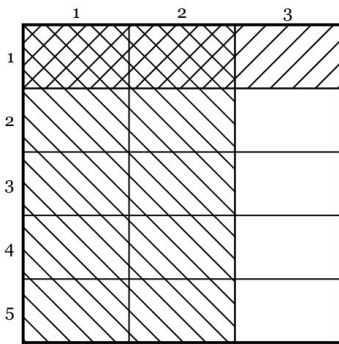
For each, write in the box below the fraction represented by the shaded area.

$$\frac{1}{5}$$

$$\frac{2}{3}$$

The two diagrams above have been overlapped in the diagram below:

How many little rectangles are in the overlapping shaded region? $\boxed{2}$

How many little rectangles are there altogether? $\boxed{15}$

Fill in the blanks below to create the multiplication problem represented by the diagrams above. Write the product in unsimplified form.

$$\boxed{\frac{1}{5}} \times \boxed{\frac{2}{3}} = \boxed{\frac{2}{15}}$$

9. Solve $0.038 + 0.017$ with the open number line. Add or take back thousandths or hundredths until you've added 0.017. Draw arcs on the number line to keep track of the jumps you make. Label each arc with the jump's distance and the numbers you land on.
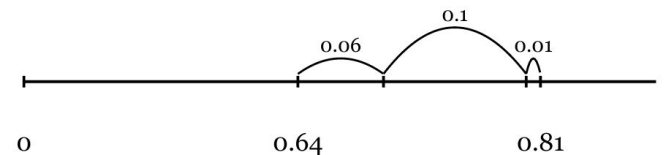
There are many different ways to solve these problems. Here is one common strategy:

0.002   0.01   0.005
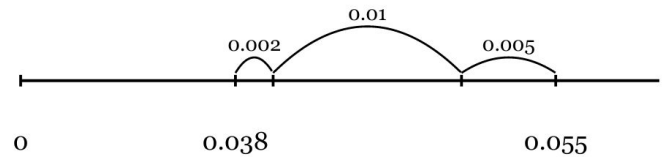
0   0.038   0.055

$$0.038 + 0.017 = 0.055$$

10. Solve $0.64 + 0.17$ with the open number line. Add or take back hundredths or tenths until you've added 0.17. Draw arcs on the number line to keep track of the jumps you make. Label each arc with the jump's distance and the numbers you land on.

There are many different ways to solve these problems. Here is one common strategy:

0.06   0.1   0.01

0   0.64   0.81

$$0.64 + 0.17 = 0.81$$

Mathematical Models for Operations (~35 min)

11. Solve $0.095 - 0.067$ by removal. Remove or add back thousandths or hundredths until you've removed 0.067. Draw arcs on the number line to keep track of the jumps you make. Label each arc with the jump's distance and the numbers you land on.

There are many different ways to solve these problems. Here is one common strategy:
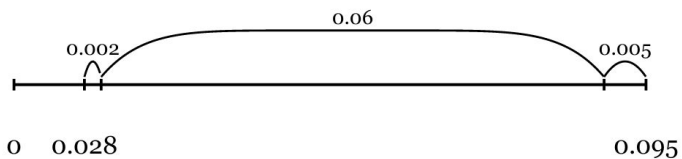
$$0.095 - 0.067 = 0.028$$

12. Solve $0.93 - 0.68$ by removal. Remove or add back hundredths or tenths until you've removed 0.68. Draw arcs on the number line to keep track of the jumps you make. Label each arc with the jump's distance and the numbers you land on.

There are many different ways to solve these problems. Here is one common strategy:
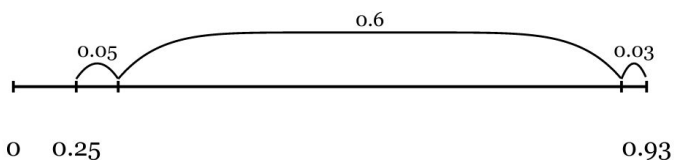
$$0.93 - 0.68 = 0.25$$

13. Complete the standard algorithm for $347 + 447$, including any "carried," or regrouped digits, if necessary.

14. Complete the standard algorithm for $378 + 190$, including any "carried," or regrouped digits, if necessary.

15. Complete the standard algorithm for $21.2 + 98.7$, including any "carried," or regrouped digits, if necessary.

Note: you may have some boxes "left over." You can leave them empty or fill in "missing" 0's and/or decimal points.

Mathematical Models for Operations (~35 min)

16. Complete the standard algorithm for $24.7 + 2.63$, including any "carried," or regrouped digits, if necessary.

Note: you may have some boxes "left over." You can leave them empty or fill in "missing" 0's and/or decimal points.

```
   □  1  □  □  □
   2  4  .  7  0
+     2  .  6  3
─────────────────
   □  2  7  .  3  3
```

17. Complete the standard algorithm for $713 - 549$, including any "borrowed" digits, if necessary.

```
   6  ¹0
   7̸  1̸  ¹3
-  5  4   9
──────────────
   1  6   4
```

18. Complete the standard algorithm for $202 - 93$, including any "borrowed" digits, if necessary.

```
   1     9
   2̸  0̸  ¹2
-  □  9   3
──────────────
   1  0   9
```

Order of Operations (~33 min)

1. Without dividing, determine if $59,310$ is divisible by 9 and explain how you know.

> $59,310$ is divisible by 9 because the sum of its digits is divisible by 9.

2. Without dividing, determine if $26,912$ is divisible by 3 and explain how you know.

> $26,912$ isn't divisible by 3 because the sum of its digits is not divisible by 3.

3. Without dividing, determine if $18,704$ is divisible by 4 and explain how you know.

> $18,704$ is divisible by 4 because its last two digits are divisible by 4.

4. Without dividing, determine if $75,376$ is divisible by 6 and explain how you know.

> $75,376$ isn't divisible by 6 because it's not divisible by both 2 and 3.

5. Use multiplication to expand the expression below. Then compute.

$$6^2$$

$$\boxed{6 \times 6 = 36}$$

6. Use an exponent to condense the expression below. Then compute.

$$4 \times 4 \times 4 \times 4$$

$$\boxed{4^4 = 256}$$

7. Use multiplication to expand the expression below. Then compute.

$$0^3$$

$$\boxed{0 \times 0 \times 0 = 0}$$

8. Use an exponent to condense the expression below. Then compute.

$$6 \times 6 \times 6 \times 6$$

$$\boxed{6^4 = 1296}$$

9. What is the value of the expression $2 \cdot 4^2 + 8 + 9 \cdot 2$?

$$\boxed{58}$$

10. What is the value of the expression $3 \times 6 + 9^2$?

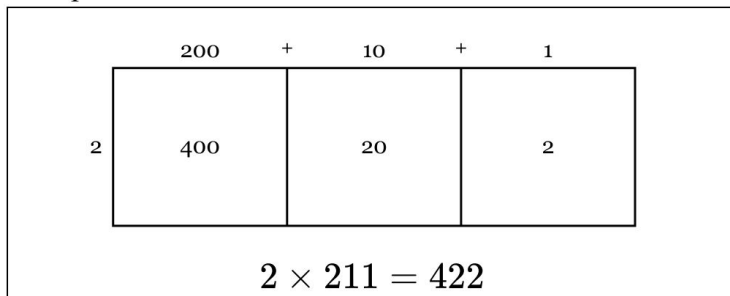$$\boxed{99}$$

Order of Operations (~33 min)

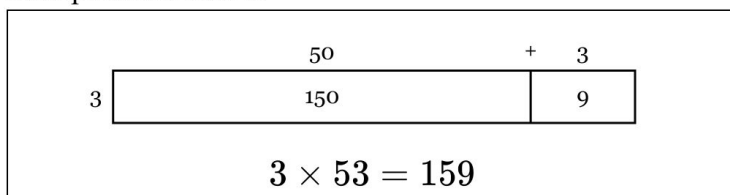**11.** What is the value of the expression $\frac{(9^2-65)}{4^2}$?

$$\boxed{1}$$

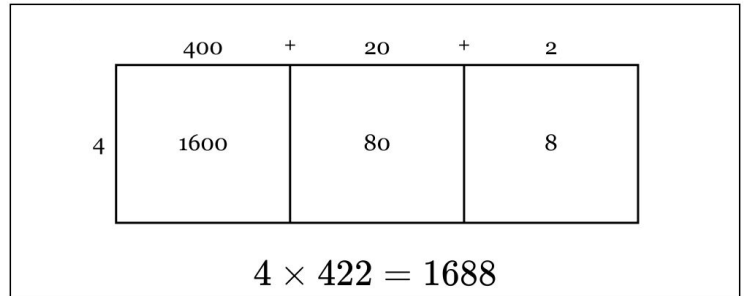**12.** What is the value of the expression $6 \times 2^2 + 6 + 6 \times 2$?

$$\boxed{42}$$

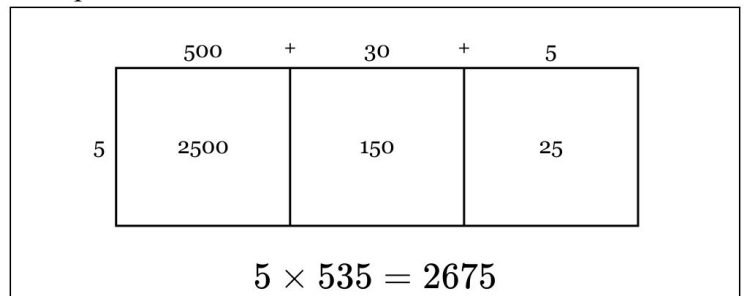**13.** Write the missing values in the area model for multiplication below.

	200	+	10	+	1
2	400		20		2

$$2 \times 211 = 422$$

14. Write the missing values in the area model for multiplication below.

	50	+	3
3	150		9

$$3 \times 53 = 159$$

15. Write the missing values in the area model for multiplication below.

	400	+	20	+	2
4	1600		80		8

$$4 \times 422 = 1688$$

16. Write the missing values in the area model for multiplication below.

	500	+	30	+	5
5	2500		150		25

$$5 \times 535 = 2675$$

17. Which expression is NOT equivalent to $24 + 18$?

A. $\boxed{3(8+5)}$ B. $3(8+6)$

C. $6(4+3)$ D. $2(12+9)$

18. Which expression is equivalent to $90 + 20$?

A. $2(45+9)$ B. $3(30+20)$

C. $\boxed{10(9+2)}$ D. $5(85+4)$

ANSWER KEY

Order of Operations (~33 min)

19. Which expression is NOT equivalent to $60 + 12$?

A. $6(10 + 2)$ B. $3(20 + 4)$

C. $2(30 + 5)$ D. $2(30 + 6)$

25. What is the value of the expression $9z + 3$ when $z = 9$?

84

20. Which expression is NOT equivalent to $100 + 20$?

A. $10(10 + 2)$ B. $4(96 + 5)$

C. $2(50 + 10)$ D. $5(20 + 4)$

26. What is the value of the expression $5x^2 - 3x - 10$ when $x = 3$?

26

21. Represent the following sentence as an algebraic expression, where "a number" is the letter x.

9 is multiplied by a number.

$9x$

27. What is the value of the expression $x + 4y$ when $x = 9$ and $y = 3$?

21

22. Represent the following sentence as an algebraic expression, where "a number" is the letter x.

The difference of 5 and a number.

$5 - x$

23. Represent the following sentence as an algebraic expression, where "a number" is the letter x.

The quotient of a number and 9.

$x/9$

28. What is the value of the expression $5w^2 - 3w + 8$ when $w = 2$?

22

24. Represent the following sentence as an algebraic expression, where "a number" is the letter x.

8 less than a number.

$x - 8$

Order of Operations (~33 min)

29. What value of x makes the equation below true?

$$6x - 8 = 46$$

A. 6   B. 7   C. 8   D. 9

30. Which equation has the solution $x = 7$?

A. $6x - 5 = -37$ B. $5x + 1 = 33$

C. $6x + 7 = 49$ D. $3x + 6 = 51$

31. Which equation has the solution $x = 7$?

A. $4x + 5 = 57$ B. $5x + 7 = 41$

C. $3x - 1 = 20$ D. $9x - 1 = -62$

32. What value of x makes the equation below true?

$$9x + 10 = 28$$

A. 2   B. 8   C. 10   D. 20

ANSWER KEY

GCF, LCM & Fraction Sense (~60 min)

1. What is the greatest common factor of 9 and 21?

$$\boxed{3}$$

2. What is the greatest common factor of 4, 44, and 20?

$$\boxed{4}$$

3. What is the greatest common factor of 44, 40, and 20?

$$\boxed{4}$$

4. What is the greatest common factor of 48, 42, and 12?

$$\boxed{6}$$

5. What is the least common multiple of 2 and 10?

$$\boxed{10}$$

6. What is the least common multiple of 2, 3, and 9?

$$\boxed{18}$$

7. What is the least common multiple of 2, 6, and 8?

$$\boxed{24}$$

**8.** What is the least common multiple of 6 and 8?

$$\boxed{24}$$

9. Assume that each circle shown below represents one unit. Express the shaded amount as a single fraction and as a mixed number.
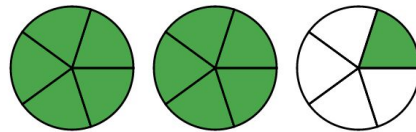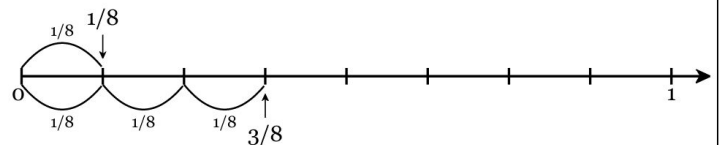

Fraction: $\dfrac{11}{5}$

Mixed Number: $2\dfrac{1}{5}$

10. Assume that each circle shown below represents one unit. Express the shaded amount as a single fraction and as a mixed number.
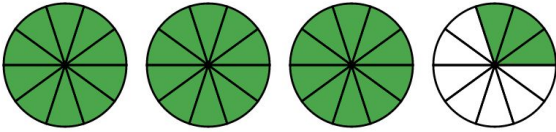
Fraction: $\dfrac{33}{10}$

Mixed Number: $3\dfrac{3}{10}$

11. Assume that each circle shown below represents one unit. Express the shaded amount as a single fraction and as a mixed number.
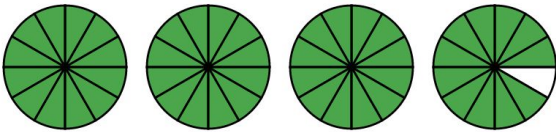
Fraction: $\dfrac{47}{12}$

Mixed Number: $3\dfrac{11}{12}$

12. Assume that each circle shown below represents one unit. Express the shaded amount as a single fraction and as a mixed number.
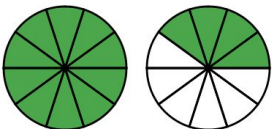
Fraction: $\dfrac{14}{10}$

Mixed Number: $1\dfrac{4}{10}$

13. Use the number line to determine which fraction is larger: $\frac{5}{8}$ or $\frac{4}{8}$. (a) Draw evenly spaced lines to *partition*, or break, the segment from 0 to 1 into the appropriate number of pieces. (b) Plot $\frac{5}{8}$ on the number line. (c) Plot $\frac{4}{8}$ on the number line. (d) Complete the sentence below.
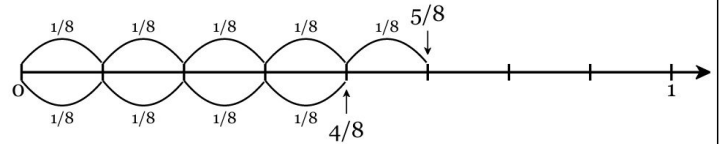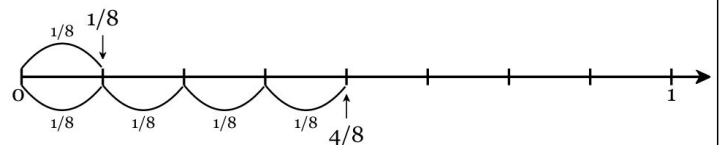

$\frac{5}{8}$ is **greater** than $\frac{4}{8}$ because 5 is **greater** than 4, and the two fractions have **the same** denominators.

14. Use the number line to determine which fraction is larger: $\frac{1}{8}$ or $\frac{3}{8}$. (a) Draw evenly spaced lines to *partition*, or break, the segment from 0 to 1 into the appropriate number of pieces. (b) Plot $\frac{1}{8}$ on the number line. (c) Plot $\frac{3}{8}$ on the number line. (d) Complete the sentence below.

$\frac{1}{8}$ is **less** than $\frac{3}{8}$ because 1 is **less** than 3, and the two fractions have **the same** denominators.
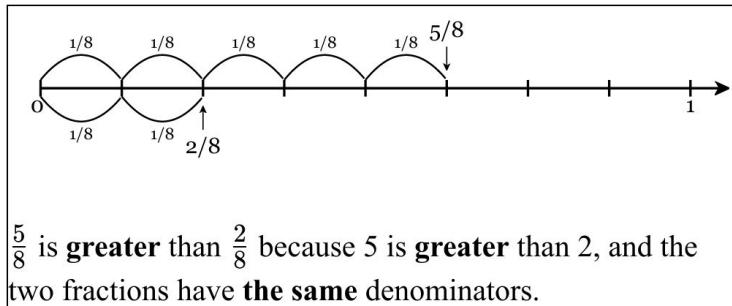
15. Use the number line to determine which fraction is larger: $\frac{1}{8}$ or $\frac{4}{8}$. (a) Draw evenly spaced lines to *partition*, or break, the segment from 0 to 1 into the appropriate number of pieces. (b) Plot $\frac{1}{8}$ on the number line. (c) Plot $\frac{4}{8}$ on the number line. (d) Complete the sentence below.

$\frac{1}{8}$ is **less** than $\frac{4}{8}$ because 1 is **less** than 4, and the two fractions have **the same** denominators.

ANSWER KEY

16. Use the number line to determine which fraction is larger: $\frac{5}{8}$ or $\frac{2}{8}$. (a) Draw evenly spaced lines to *partition*, or break, the segment from 0 to 1 into the appropriate number of pieces. (b) Plot $\frac{5}{8}$ on the number line. (c) Plot $\frac{2}{8}$ on the number line. (d) Complete the sentence below.

$\frac{5}{8}$ is **greater** than $\frac{2}{8}$ because 5 is **greater** than 2, and the two fractions have **the same** denominators.

17. Simplify: $\frac{70}{88}$

$$\boxed{\dfrac{35}{44}}$$

18. Simplify: $\frac{18}{30}$

$$\boxed{\dfrac{3}{5}}$$

19. Simplify: $\frac{22}{90}$

$$\boxed{\dfrac{11}{45}}$$

20. Simplify: $\frac{45}{66}$

$$\boxed{\dfrac{15}{22}}$$

21. Use the number line to determine which fraction is larger: $\frac{5}{7}$ or $\frac{7}{9}$. The segment from 0 to 1 has been partitioned into 63 pieces, the smallest number needed to plot both fractions. (a) Plot a fraction equivalent to $\frac{5}{7}$. (b) Plot a fraction equivalent to $\frac{7}{9}$. (c) Complete the sentence below.
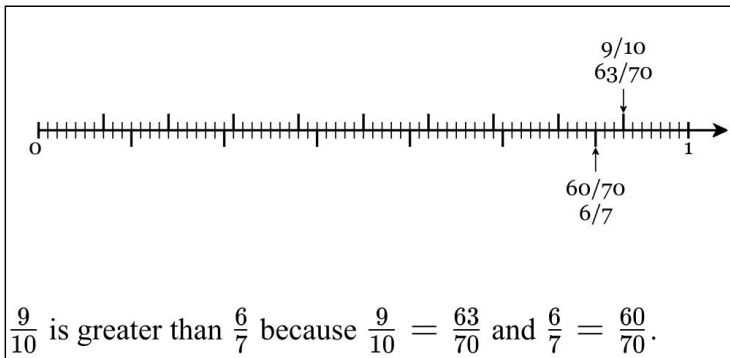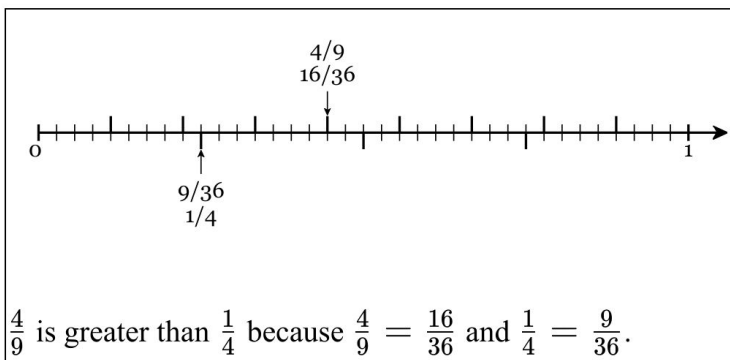

$\frac{5}{7}$ is less than $\frac{7}{9}$ because $\frac{5}{7} = \frac{45}{63}$ and $\frac{7}{9} = \frac{49}{63}$.

22. Use the number line to determine which fraction is larger: $\frac{8}{9}$ or $\frac{5}{7}$. The segment from 0 to 1 has been partitioned into 63 pieces, the smallest number needed to plot both fractions. (a) Plot a fraction equivalent to $\frac{8}{9}$. (b) Plot a fraction equivalent to $\frac{5}{7}$. (c) Complete the sentence below.

$\frac{8}{9}$ is greater than $\frac{5}{7}$ because $\frac{8}{9} = \frac{56}{63}$ and $\frac{5}{7} = \frac{45}{63}$.

23. Use the number line to determine which fraction is larger: $\frac{9}{10}$ or $\frac{6}{7}$. The segment from 0 to 1 has been partitioned into 70 pieces, the smallest number needed to plot both fractions. (a) Plot a fraction equivalent to $\frac{9}{10}$. (b) Plot a fraction equivalent to $\frac{6}{7}$. (c) Complete the sentence below.

$\frac{9}{10}$ is greater than $\frac{6}{7}$ because $\frac{9}{10} = \frac{63}{70}$ and $\frac{6}{7} = \frac{60}{70}$.

24. Use the number line to determine which fraction is larger: $\frac{4}{9}$ or $\frac{1}{4}$. The segment from 0 to 1 has been partitioned into 36 pieces, the smallest number needed to plot both fractions. (a) Plot a fraction equivalent to $\frac{4}{9}$. (b) Plot a fraction equivalent to $\frac{1}{4}$. (c) Complete the sentence below.

$\frac{4}{9}$ is greater than $\frac{1}{4}$ because $\frac{4}{9} = \frac{16}{36}$ and $\frac{1}{4} = \frac{9}{36}$.

25. Round 7.473 to the nearest tenth.

$$\boxed{7.5}$$

26. Round 1.5 to the nearest whole number.

$$\boxed{2}$$

27. Round 2.1486 to the nearest hundredth.

$$\boxed{2.15}$$

28. Round 3.4 to the nearest whole number.

$$\boxed{3}$$

 ANSWER KEY

29. The squares below each represent a unit or a whole.

$$\underbrace{\frac{1}{2}}_{\text{Fraction 1}} \times \underbrace{\frac{4}{9}}_{\text{Fraction 2}}$$
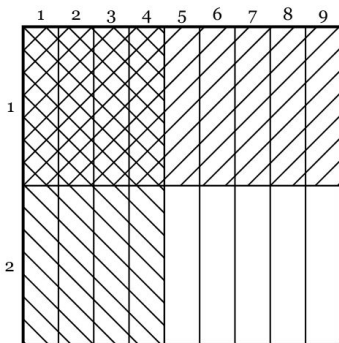
For each, write in the box below the fraction represented by the shaded area.
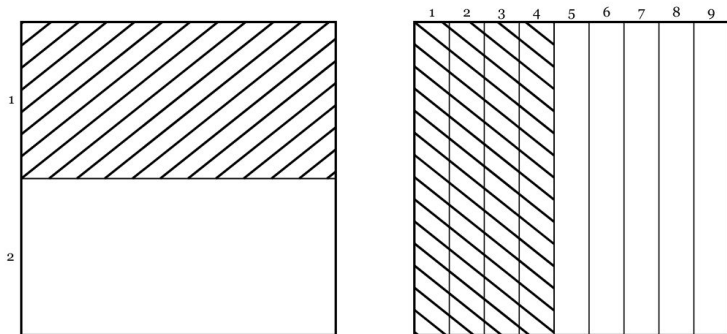
$$\boxed{\frac{1}{2}} \qquad \boxed{\frac{4}{9}}$$

The two diagrams above have been overlapped in the diagram below:

How many little rectangles are in the overlapping shaded region? $\boxed{4}$
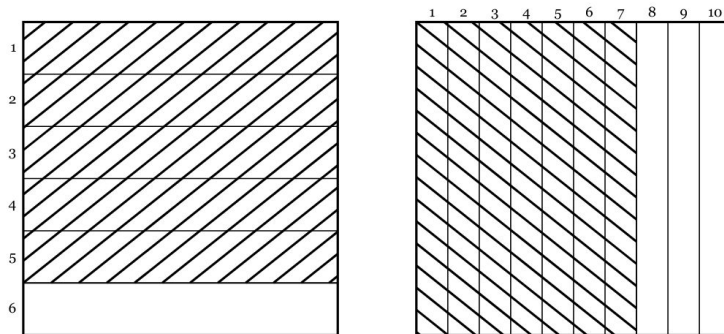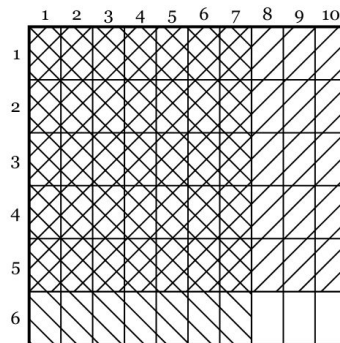
How many little rectangles are there altogether? $\boxed{18}$

Fill in the blanks below to create the multiplication problem represented by the diagrams above. Write the product in unsimplified form.

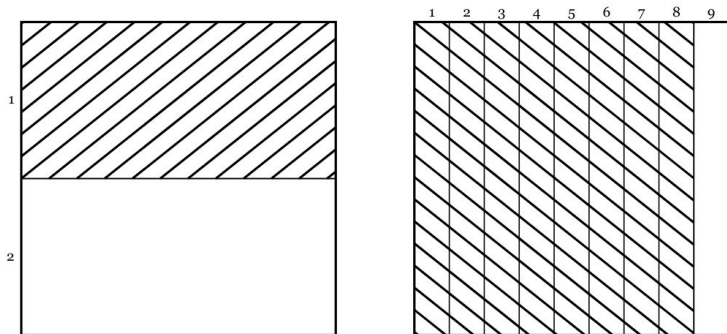$$\boxed{\frac{1}{2}} \times \boxed{\frac{4}{9}} = \boxed{\frac{4}{18}}$$

30. The squares below each represent a unit or a whole.

$$\underbrace{\frac{5}{6}}_{\text{Fraction 1}} \times \underbrace{\frac{7}{10}}_{\text{Fraction 2}}$$
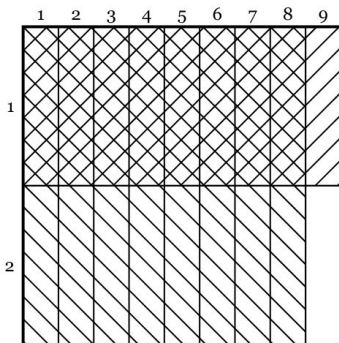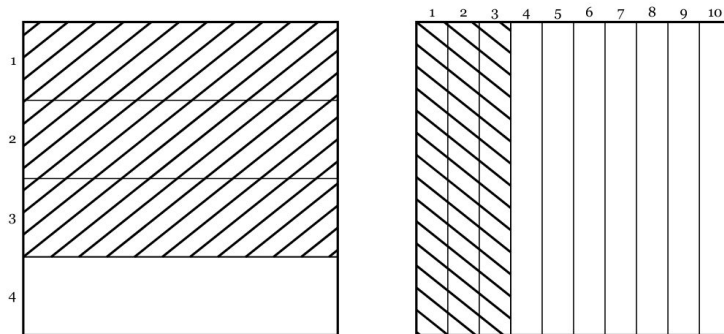
For each, write in the box below the fraction represented by the shaded area.

$$\boxed{\frac{5}{6}} \qquad \boxed{\frac{7}{10}}$$

The two diagrams above have been overlapped in the diagram below:

How many little rectangles are in the overlapping shaded region? $\boxed{35}$

How many little rectangles are there altogether? $\boxed{60}$

Fill in the blanks below to create the multiplication problem represented by the diagrams above. Write the product in unsimplified form.

$$\boxed{\frac{5}{6}} \times \boxed{\frac{7}{10}} = \boxed{\frac{35}{60}}$$

31. The squares below each represent a unit or a whole.

$$\underbrace{\frac{1}{2}}_{\text{Fraction 1}} \times \underbrace{\frac{8}{9}}_{\text{Fraction 2}}$$

For each, write in the box below the fraction represented by the shaded area.

$$\boxed{\frac{1}{2}} \qquad \boxed{\frac{8}{9}}$$

The two diagrams above have been overlapped in the diagram below:

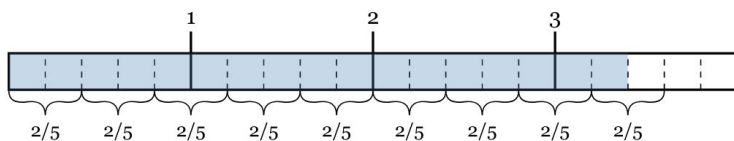How many little rectangles are in the overlapping shaded region? $\boxed{8}$

How many little rectangles are there altogether? $\boxed{18}$

Fill in the blanks below to create the multiplication problem represented by the diagrams above. Write the product in unsimplified form.

$$\boxed{\frac{1}{2}} \times \boxed{\frac{8}{9}} = \boxed{\frac{8}{18}}$$

32. The squares below each represent a unit or a whole.

$$\underbrace{\frac{3}{4}}_{\text{Fraction 1}} \times \underbrace{\frac{3}{10}}_{\text{Fraction 2}}$$

For each, write in the box below the fraction represented by the shaded area.

$$\boxed{\frac{3}{4}} \qquad \boxed{\frac{3}{10}}$$

The two diagrams above have been overlapped in the diagram below:
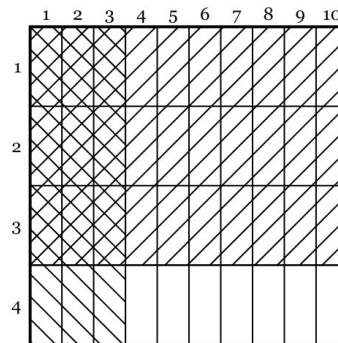
How many little rectangles are in the overlapping shaded region? $\boxed{9}$

How many little rectangles are there altogether? $\boxed{40}$

Fill in the blanks below to create the multiplication problem represented by the diagrams above. Write the product in unsimplified form.

$$\boxed{\frac{3}{4}} \times \boxed{\frac{3}{10}} = \boxed{\frac{9}{40}}$$

33. The model below represents a division problem.

2/5 2/5 2/5 2/5 2/5 2/5 2/5 2/5 2/5
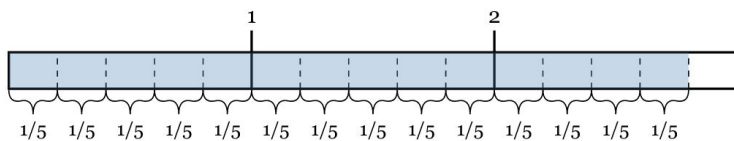
Which equation is represented by the model?

A. $3\frac{2}{5} \div \frac{2}{5} = 8\frac{1}{2}$ ⬚

B. $\frac{2}{5} \div 8\frac{1}{2} = 3\frac{2}{5}$

C. $3\frac{2}{5} \div \frac{2}{5} = 8\frac{1}{5}$

D. $\frac{2}{5} \div 3\frac{2}{5} = 8\frac{1}{2}$

34. The model below represents a division problem.

1/5 1/5 1/5 1/5 1/5 1/5 1/5 1/5 1/5 1/5 1/5 1/5 1/5 1/5

Which equation is represented by the model?

A. $\frac{1}{5} \div 14 = 2\frac{4}{5}$

B. $14 \div \frac{1}{5} = 2\frac{4}{5}$

C. $2\frac{4}{5} \div \frac{1}{5} = 14$ ⬚

D. $\frac{1}{5} \div 2\frac{4}{5} = 14$

35. The model below represents a division problem.

2/5 2/5 2/5 2/5 2/5 2/5

Which equation is represented by the model?

A. $11 \div \frac{1}{5} = 2\frac{1}{5}$

B. $\frac{1}{5} \div 11 = 2\frac{1}{5}$

C. $\frac{2}{5} \div 5\frac{1}{2} = 2\frac{1}{5}$

D. $2\frac{1}{5} \div \frac{2}{5} = 5\frac{1}{2}$ ⬚

36. The model below represents a division problem.

1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4 1/4

Which equation is represented by the model?

A. $\frac{1}{4} \div 15 = 3\frac{3}{4}$

B. $15 \div \frac{1}{4} = 3\frac{3}{4}$

C. $3\frac{3}{4} \div \frac{1}{4} = 15$ ⬚

D. $\frac{1}{4} \div 3\frac{3}{4} = 15$

37. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{5}{16} - \frac{1}{12}$$

$$\boxed{\frac{11}{48}}$$

38. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{5}{7} - \frac{1}{6}$$

$$\boxed{\frac{23}{42}}$$

39. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.
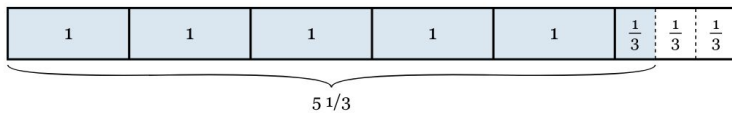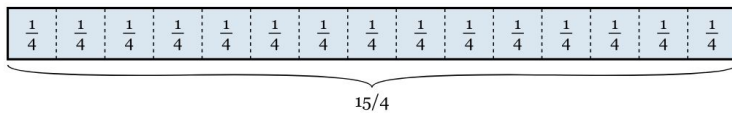
$$\frac{4}{9} + \frac{1}{63}$$

$$\boxed{\frac{29}{63}}$$

40. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{2}{7} - \frac{1}{7}$$

$$\boxed{\frac{1}{7}}$$

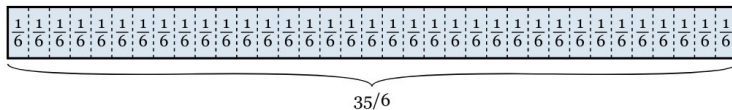**41.** Convert $5\frac{1}{3}$ into an improper fraction.

| 1 | 1 | 1 | 1 | 1 | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ |

5 1/3

$$\boxed{\frac{16}{3}}$$

42. Convert $\frac{15}{4}$ into a mixed number.

| $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{4}$ |

15/4

$$\boxed{3\frac{3}{4}}$$

43. Convert $\frac{35}{6}$ into a mixed number.

35/6

$$\boxed{5\frac{5}{6}}$$

44. Convert $\frac{11}{3}$ into a mixed number.

| $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ | $\frac{1}{3}$ |

11/3

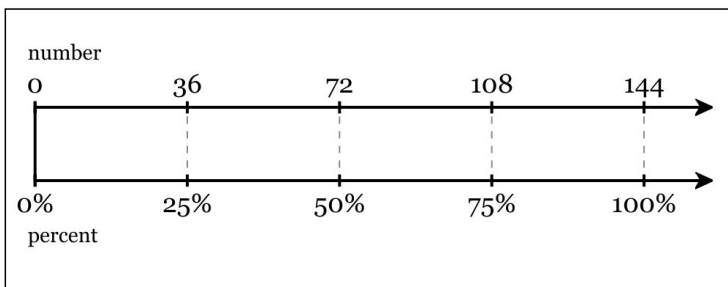$$\boxed{3\frac{2}{3}}$$

ANSWER KEY

Percents Review (~33 min)

1. Fill in the following values on the double number line below: (a) 0% of 180 (b) 100% of 180 (c) 50% of 180 (d) 25% of 180 (e) 75% of 180

number
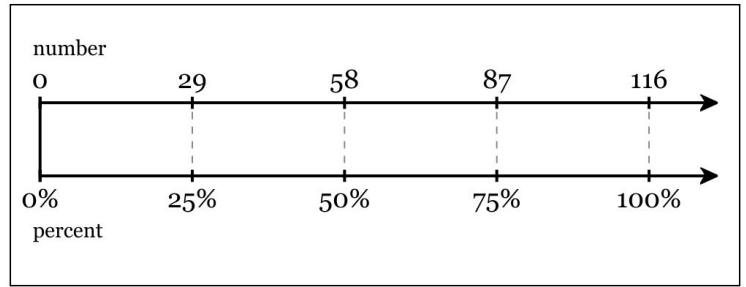0   45   90   135   180

0%   25%   50%   75%   100%
percent

2. Fill in the following values on the double number line below: (a) 0% of 156 (b) 100% of 156 (c) 50% of 156 (d) 25% of 156 (e) 75% of 156
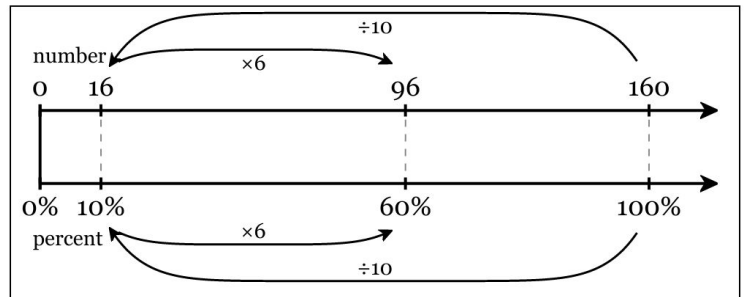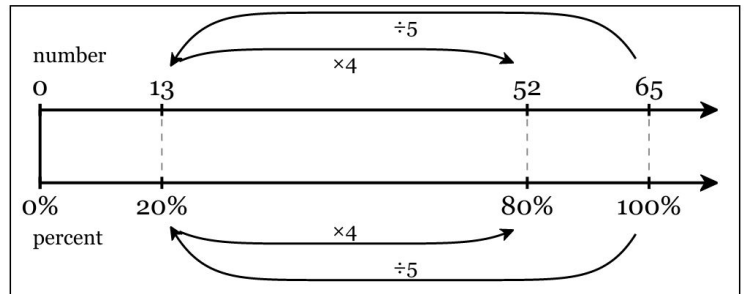
number
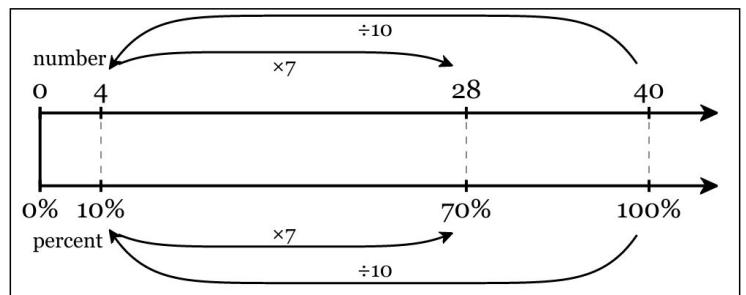0   39   78   117   156

0%   25%   50%   75%   100%
percent

3. Fill in the following values on the double number line below: (a) 0% of 144 (b) 100% of 144 (c) 50% of 144 (d) 25% of 144 (e) 75% of 144

number
0   36   72   108   144

0%   25%   50%   75%   100%
percent

4. Fill in the following values on the double number line below: (a) 0% of 116 (b) 100% of 116 (c) 50% of 116 (d) 25% of 116 (e) 75% of 116

number
0   29   58   87   116

0%   25%   50%   75%   100%
percent

5. (a) Find 10% of 160. (b) Use 10% to find 60% of 160. Write your answers on the double number line below.

÷10
number   ×6
0   16   96   160

0%   10%   60%   100%
percent   ×6
÷10

6. (a) Find 20% of 65. (b) Use 20% to find 80% of 65. Write your answers on the double number line below.

÷5
number   ×4
0   13   52   65

0%   20%   80%   100%
percent   ×4
÷5

7. (a) Find 10% of 40. (b) Use 10% to find 70% of 40. Write your answers on the double number line below.

÷10
number   ×7
0   4   28   40

0%   10%   70%   100%
percent   ×7
÷10

Percents Review (~33 min)

8. (a) Find 10% of 85. (b) Use 10% to find 70% of 85. Write your answers on the double number line below.

9. If 80% of a number is 64 and 15% of the same number is 12, find 95% of that number.

$$\boxed{76}$$

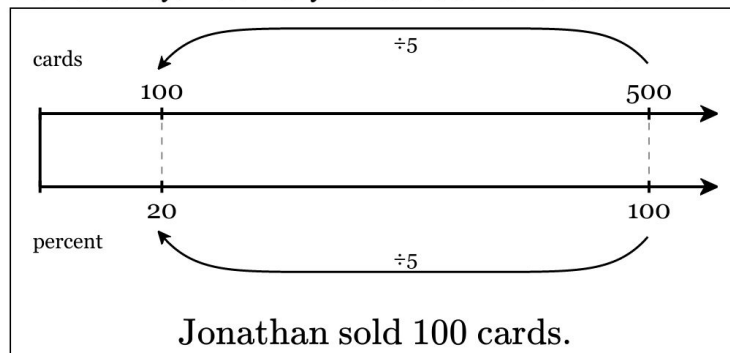**10.** If 45% of a number is 60, find 15% of that number.

$$\boxed{20}$$

11. If 5% of a number equals 9, find 50% of that number.

$$\boxed{90}$$

12. If 25% of a number is 65 and 85% of the same number is 221, find 60% of that number.

$$\boxed{156}$$

13. Bob's Gift Shop sold 500 cards for Mother's Day. One salesman, Jonathan, sold 20% of the cards sold for Mother's Day. How many cards did Jonathan sell?

Jonathan sold 100 cards.

14. Violet has a coin collection. She keeps 10 of the coins in her box, which is 5% of the collection. How many total coins are in her collection?
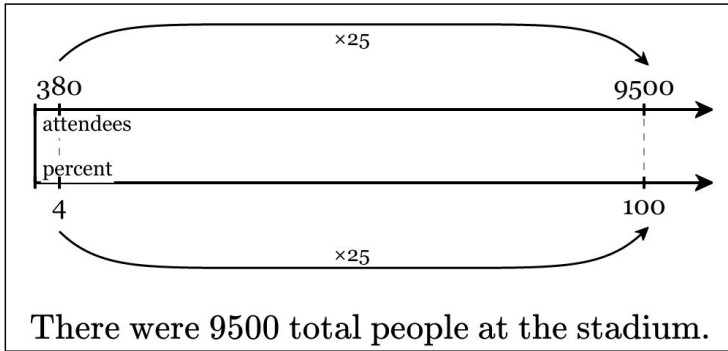

There are 200 total coins in Violet's collection.

15. The 12 students in the Environmental Club represent 4% of the students in the seventh grade. How many students are in the seventh grade?

There are 300 total students in seventh grade.

ANSWER KEY

Percents Review (~33 min)

16. At a football stadium, 4% of the fans in attendance were teenagers. If there were 380 teenagers at the football stadium, what was the total number of people at the stadium?

```
                    ×25
  380                              9500
  ├─────────────────────────────────┤──────────►
  attendees
  │                                  │
  percent
  4                                  100
                    ×25
```
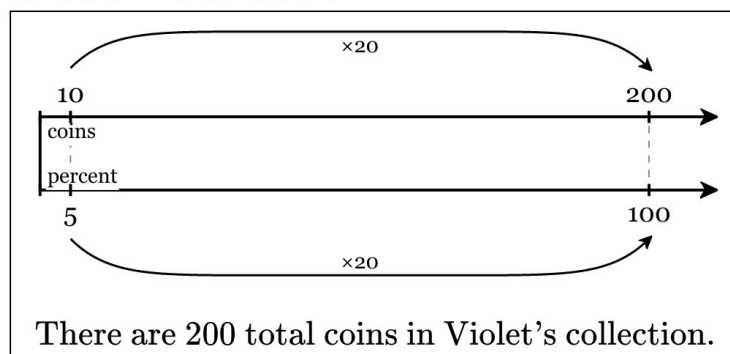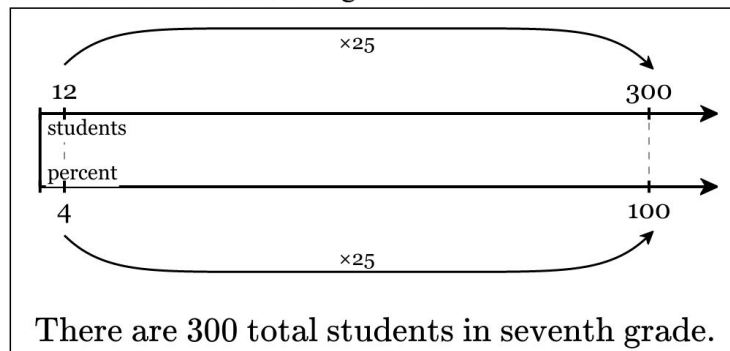
There were 9500 total people at the stadium.

17. 7 is what percent of 20?

$$\boxed{35\%}$$

18. What is 88% of 350?

$$\boxed{308}$$

19. 252 is what percent of 700?

$$\boxed{36\%}$$

20. What is 77% of 700?

$$\boxed{539}$$

21. A university's freshman class has 1900 students. 61% of those students are majoring in Engineering. How many students in the freshman class are Engineering majors?

$$\boxed{1159}$$

22. A bakery sold 9 vanilla cupcakes in a day, which was 3% of the total number of cupcakes sold that day. How many total cupcakes did the bakery sell that day?

$$\boxed{300}$$

23. A bakery sold a total of 180 cupcakes in a day, and 63 of them were mocha flavored. What percentage of cupcakes sold that day were mocha flavored?

$$\boxed{35}$$

Integers (Signed Numbers) (~39 min)

1. The list below shows the temperature Nathaniel recorded at 11:00 p.m. for four days last January.
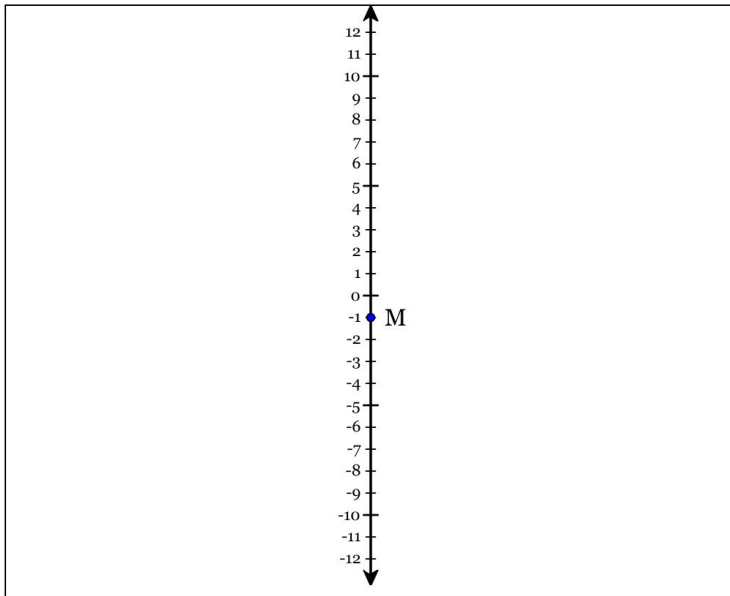
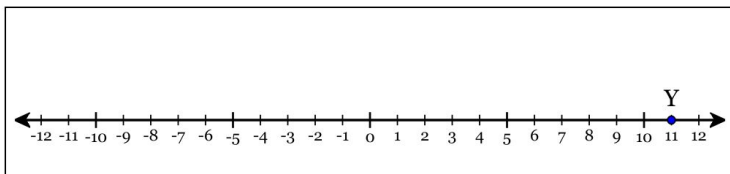Monday: 15°F

Tuesday: -21°F

Wednesday: -12°F

Thursday: -8°F

On which of the days did Nathaniel record the lowest (coldest) temperature?

A. Monday   B. Tuesday

C. Wednesday   D. Thursday

2. The table below shows the elevation at which different artifacts were found in an archeological dig.

Artifact	Elevation
arrow head	858 feet
bone	−1153 feet
necklace	0 feet
clay bowl	−803 feet
woven blanket	473 feet

Which of these artifacts was discovered at the highest elevation?

A. necklace   B. woven blanket

C. bone   D. arrow head

3. The stock market gained and lost value over the first four days of the week.

STOCK MARKET VALUE

Day	Change
Monday	−15.03
Tuesday	−31.34
Wednesday	+48.16
Thursday	−48.34

On which day did the stock market lose the most value?

A. Monday   B. Tuesday

C. Wednesday   D. Thursday

4. The stock market gained and lost value over the first four days of the week.

STOCK MARKET VALUE

Day	Change
Monday	−95.25
Tuesday	−70.19
Wednesday	+3.92
Thursday	+54.96

If the stock market lost value on Friday, which value could represent this change?

A. −9.01   B. 0

C. +3.68   D. +100.58

Integers (Signed Numbers) (~39 min)

5. The list below shows the temperature Maya recorded at 11:00 p.m. for four days last January.

　　Monday: -6°F

　　Tuesday: 0°F

　　Wednesday: -26°F

　　Thursday: -10°F

On which of the days did Maya record the highest (warmest) temperature?
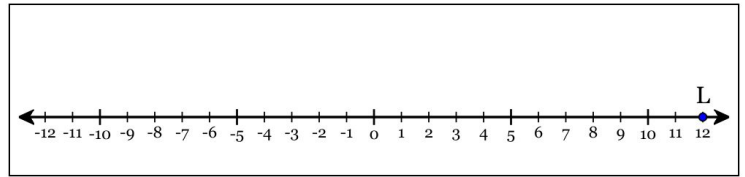
A. Monday

B. Tuesday

C. Wednesday　　D. Thursday

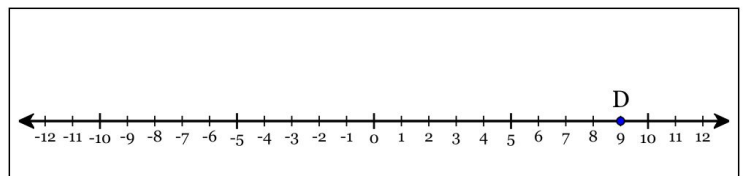**6.** Point M is located at -1. Plot Point M on the number line below.
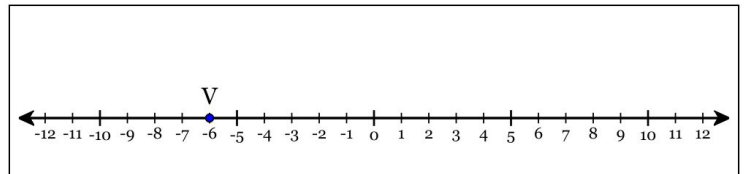
7. Point Y is located at 11. Plot Point Y on the number line below.

8. Point L is located at 12. Plot Point L on the number line below.

9. Point D is located at 9. Plot Point D on the number line below.

10. Point V is located at -6. Plot Point V on the number line below.

11. Which point represents the *opposite* of $\frac{1}{2}$?

A. I　　　B. J　　C. K　　D. L

Integers (Signed Numbers) (~39 min)

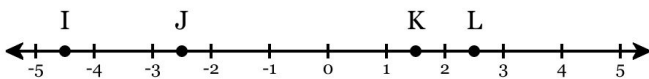**12.** Which point has the greatest absolute value?
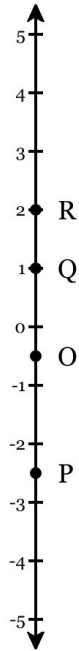
A. O   B. P   C. Q   D. R

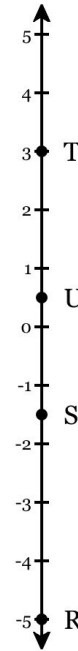**13.** Which point represents a number whose absolute value is $3\frac{1}{2}$?
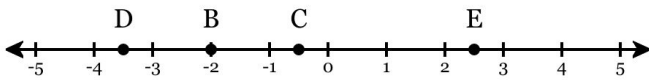
A. B   B. C   C. D   D. E

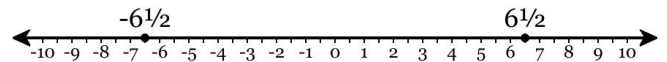**14.** Which point represents the *least* value on the number line?

A. Point I: $-4\frac{1}{2}$ B. Point I: $-5\frac{1}{2}$

C. Point K: $1\frac{1}{2}$ D. Point K: $2\frac{1}{2}$
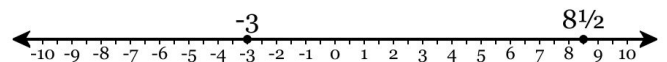
15. Which point has the greatest absolute value?

A. R   B. S   C. T   D. U

16. Plot 6½ and -6½ on the number line below.

6½ > -6½

6½ is greater than -6½ because it is further to the right on the number line.

17. Plot -3 and 8½ on the number line below.

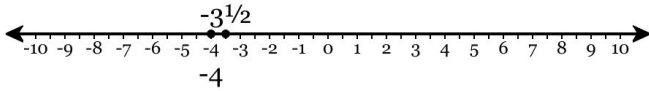-3 < 8½

-3 is less than 8½ because it is further to the left on the number line.
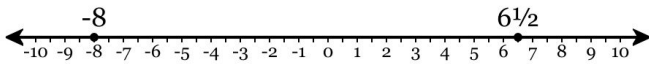
Integers (Signed Numbers) (~39 min)

18. Plot -3½ and -4 on the number line below.

```
                     -3½
    ←───────────────●─────────────────────→
   -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
                     -4
```

-3½ > -4

-3½ is greater than -4 because it is further to the right on the number line.

19. Plot -8 and 6½ on the number line below.

```
         -8                          6½
    ←────●───────────────────────────●──────→
   -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
```

-8 < 6½

-8 is less than 6½ because it is further to the left on the number line.

20. Plot -4 and -6½ on the number line below.

```
            -6½   -4
    ←───────●─────●───────────────────────→
   -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10
```

-4 > -6½

-4 is greater than -6½ because it is further to the right on the number line.

21. Write the numbers below in order from least to greatest. Use commas to separate.

$$\boxed{-4}\ \boxed{-2}\ \boxed{-14}\ \boxed{-9}\ \boxed{-6}\ \boxed{12}$$

$$\boxed{-14,\ -9,\ -6,\ -4,\ -2,\ 12}$$

22. Write the numbers below in order from least to greatest. Use commas to separate.

$$\boxed{-2}\ \boxed{-19}\ \boxed{16}\ \boxed{-20}\ \boxed{12}\ \boxed{-17}$$

$$\boxed{-20,\ -19,\ -17,\ -2,\ 12,\ 16}$$

23. Write the numbers below in order from least to greatest. Use commas to separate.

$$\boxed{14}\ \boxed{15}\ \boxed{-10}\ \boxed{-9}\ \boxed{-20}\ \boxed{-13}$$

$$\boxed{-20,\ -13,\ -10,\ -9,\ 14,\ 15}$$

24. Write the numbers below in order from least to greatest. Use commas to separate.

$$\boxed{-6}\ \boxed{-17}\ \boxed{-7}\ \boxed{-1}\ \boxed{-10}\ \boxed{-5}$$

$$\boxed{-17,\ -10,\ -7,\ -6,\ -5,\ -1}$$

25. Write the numbers below in order from least to greatest. Use commas to separate.

$$\boxed{-12}\ \boxed{-4}\ \boxed{-8}\ \boxed{5}\ \boxed{-3}\ \boxed{-19}$$

$$\boxed{-19,\ -12,\ -8,\ -4,\ -3,\ 5}$$

26. Write the numbers below in order from least to greatest. Use commas to separate.

$$\boxed{-7.7}\ \boxed{19.2}\ \boxed{13.2}\ \boxed{1.6}\ \boxed{-14.4}\ \boxed{-14.8}$$

$$\boxed{-14.8,\ -14.4,\ -7.7,\ 1.6,\ 13.2,\ 19.2}$$

27. Write the numbers below in order from least to greatest. Use commas to separate.

$$\boxed{-16.4}\ \boxed{-16.1}\ \boxed{1.1}\ \boxed{-5.4}\ \boxed{-11.3}\ \boxed{-19.9}$$

$$\boxed{-19.9,\ -16.4,\ -16.1,\ -11.3,\ -5.4,\ 1.1}$$

Integers (Signed Numbers) (~39 min)

28. Write the numbers below in order from least to greatest. Use commas to separate.

| -18.6 | -1.4 | -5.2 | -17.6 | -9.3 | -5.6 |

$$-18.6, \ -17.6, \ -9.3, \ -5.6, \ -5.2, \ -1.4$$

29. Write the numbers below in order from least to greatest. Use commas to separate.

| -15.5 | 10 | -6.9 | -10.2 | -2.9 | -7.2 |

$$-15.5, \ -10.2, \ -7.2, \ -6.9, \ -2.9, \ 10$$

30. Write the numbers below in order from least to greatest. Use commas to separate.

| -17.4 | -2.6 | -1.5 | 17.6 | -9.8 | -17.1 |

$$-17.4, \ -17.1, \ -9.8, \ -2.6, \ -1.5, \ 17.6$$

31. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.
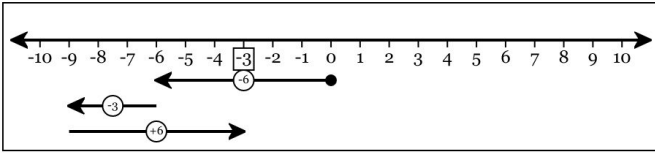
$$2 + (-3)$$
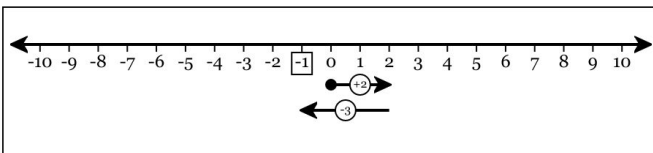
$$2 + (-3) = \mathbf{-1}$$

32. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$-3 + 10$$
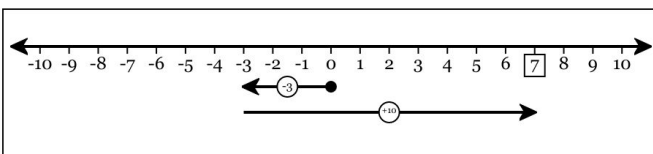
$$-3 + 10 = \mathbf{7}$$

33. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$-8 + (-2)$$
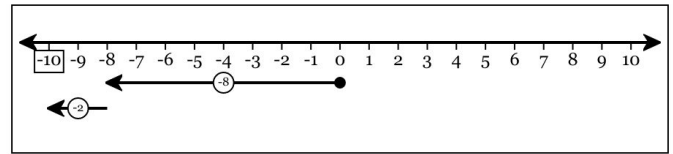
$$-8 + (-2) = \mathbf{-10}$$

34. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$1 + 8$$
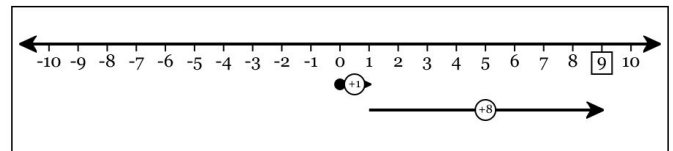
$$1 + 8 = \mathbf{9}$$

35. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.
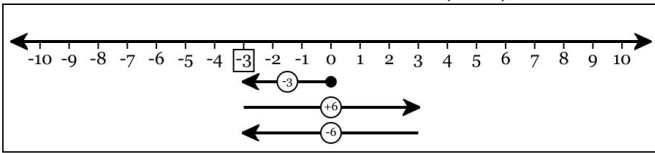
$$2 + 8$$
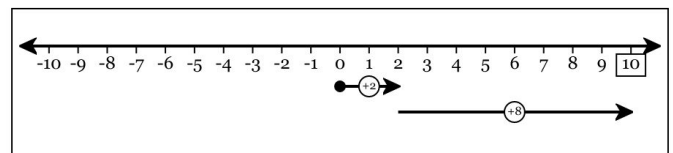
$$2 + 8 = \mathbf{10}$$

Integers (Signed Numbers) (~39 min)

36. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.
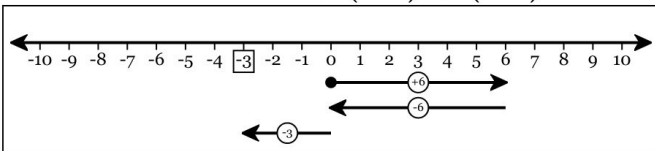
$$-6 + (-3) + 6$$
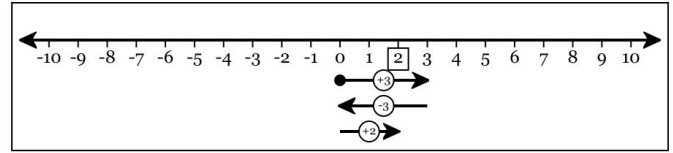

Possible alternate order: $-3 + 6 + (-6)$

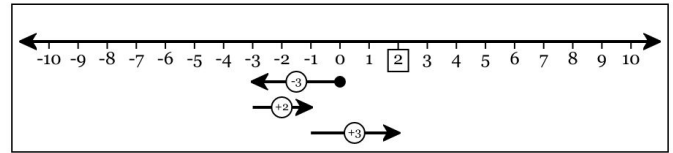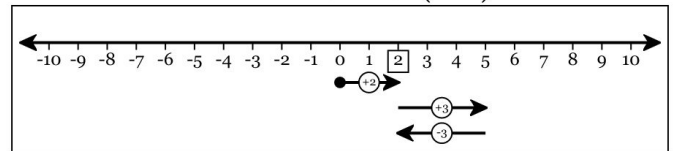*Possible alternate order:* $6 + (-6) + (-3)$

What final answer do all of these three diagrams give?

$$\boxed{-3}$$

37. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$3 + (-3) + 2$$

Possible alternate order: $-3 + 2 + 3$

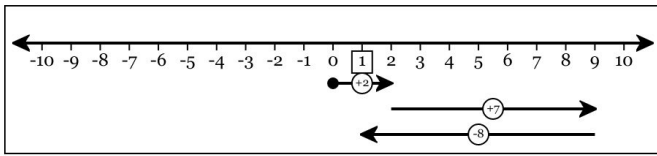*Possible alternate order:* $2 + 3 + (-3)$
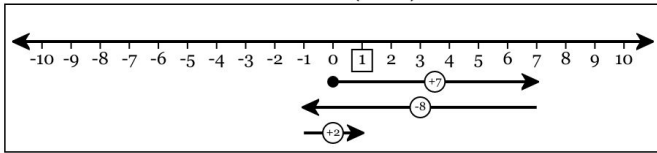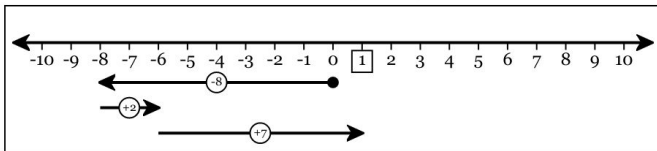

What final answer do all of these three diagrams give?

$$\boxed{2}$$

ANSWER KEY

Integers (Signed Numbers) (~39 min)

38. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$2 + 7 + (-8)$$

Possible alternate order: $7 + (-8) + 2$

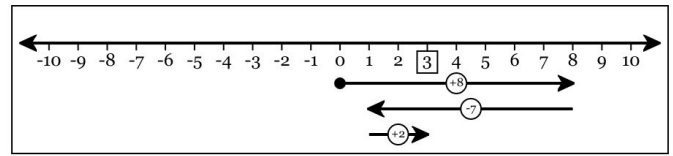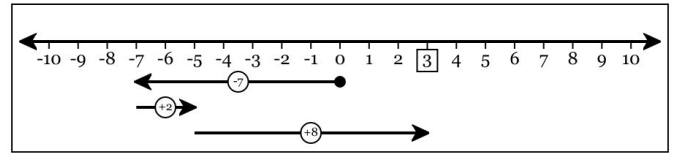*Possible alternate order:* $-8 + 2 + 7$

What final answer do all of these three diagrams give?

$\boxed{1}$

39. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.
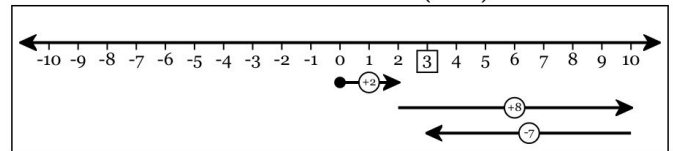
$$8 + (-7) + 2$$

Possible alternate order: $-7 + 2 + 8$
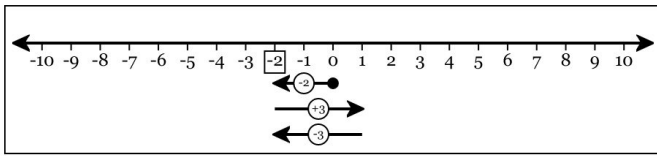

Possible alternate order: $2 + 8 + (-7)$

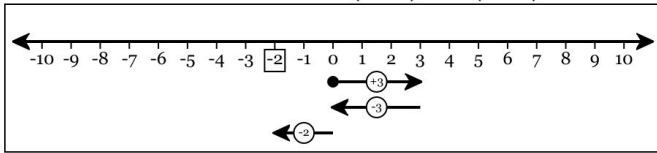What final answer do all of these three diagrams give?

$\boxed{3}$

Integers (Signed Numbers) (~39 min)

40. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.
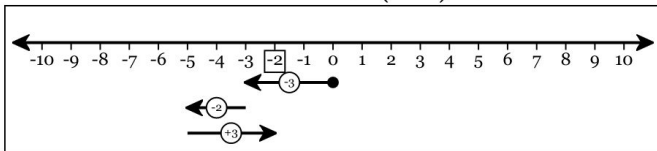
$$-2 + 3 + (-3)$$

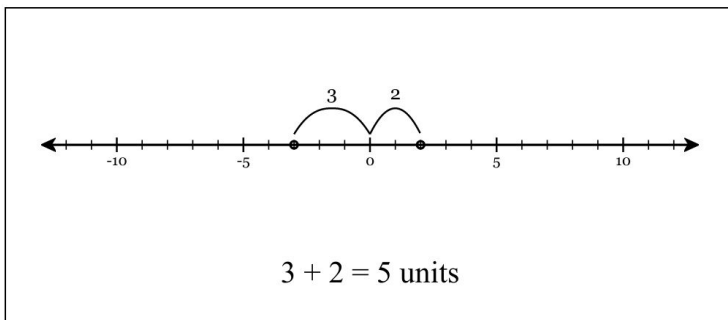*Possible alternate order:* $3 + (-3) + (-2)$
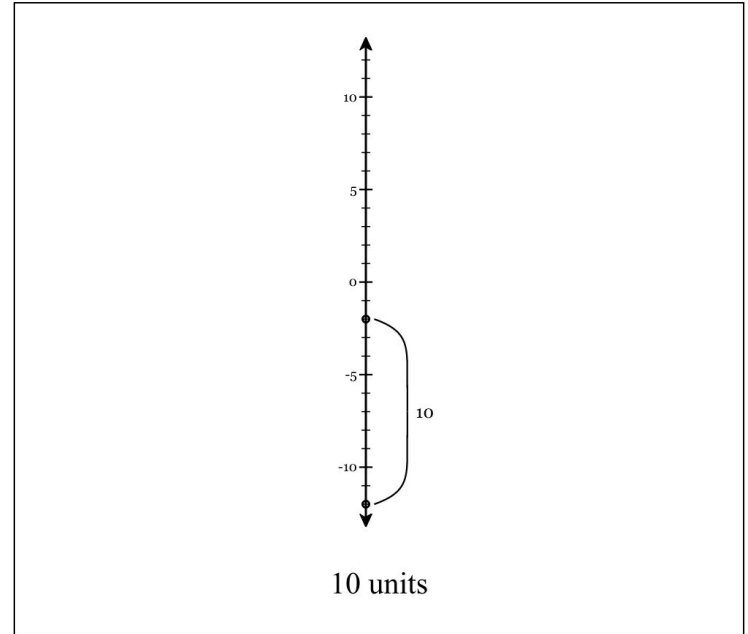

Possible alternate order: $-3 + (-2) + 3$

What final answer do all of these three diagrams give?

-2

41. Plot 2 and -3 on the number line below. Find the distance between 2 and -3.

$3 + 2 = 5$ units

42. Plot -12 and -2 on the number line below. Find the distance between -12 and -2.

10 units

43. Plot 4 and 11 on the number line below. Find the distance between 4 and 11.

7 units

ANSWER KEY

Integers (Signed Numbers) (~39 min)

44. Plot 11 and 5 on the number line below. Find the distance between 11 and 5.

6 units

45. Plot 9 and -10 on the number line below. Find the distance between 9 and -10.

$10 + 9 = 19$ units

Geometry Review (~32 min)

1. Given the two rectangles below. Find the area of the shaded region.

8   2

7

4

54 units^2

3. One rectangle is "framed" within another. Find the area of the shaded region if the "frame" is 1 unit wide.

3

10

30 units^2

2. All of the quadrilaterals in the shape below are squares. Find the area of the shaded region.

15

9

189 units^2

Geometry Review (~32 min)

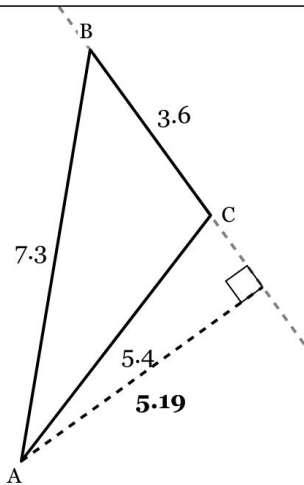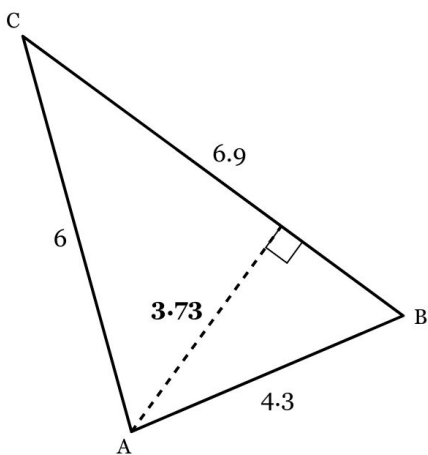**4.** Use a straightedge to draw the height of $\triangle ABC$ from vertex A to side $\overline{BC}$. Try your best to form a right angle. (Note: you may have to extend side $\overline{BC}$ with your straightedge.) The length of this height is 5.19 inches. Label that length below.

The length of the triangle's base $\left(\overline{BC}\right)$ is **3.6** in. and the length of the height is **5.19** in. Therefore the area of the triangle is $\frac{1}{2} \times \mathbf{3.6} \times \mathbf{5.19} = \mathbf{9.342}$ in.

5. Use a straightedge to draw the height of $\triangle ABC$ from vertex A to side $\overline{BC}$. Try your best to form a right angle. (Note: you may have to extend side $\overline{BC}$ with your straightedge.) The length of this height is 3.73 inches. Label that length below.

The length of the triangle's base $\left(\overline{BC}\right)$ is **6.9** in. and the length of the height is **3.73** in. Therefore the area of the triangle is $\frac{1}{2} \times \mathbf{6.9} \times \mathbf{3.73} = \mathbf{12.8685}$ in.

6. Use a straightedge to draw the height of $\triangle ABC$ from vertex A to side $\overline{BC}$. Try your best to form a right angle. (Note: you may have to extend side $\overline{BC}$ with your straightedge.) The length of this height is 3.43 inches. Label that length below.
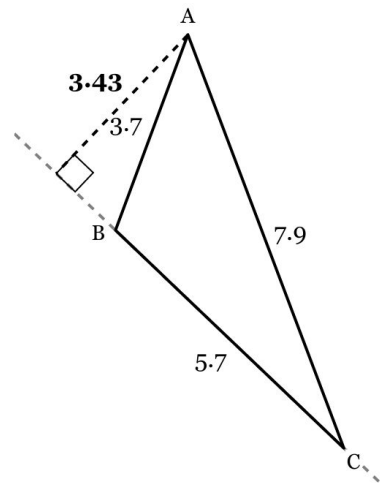

The length of the triangle's base $\left(\overline{BC}\right)$ is **5.7** in. and the length of the height is **3.43** in. Therefore the area of the triangle is $\frac{1}{2} \times \mathbf{5.7} \times \mathbf{3.43} = \mathbf{9.7755}$ in.
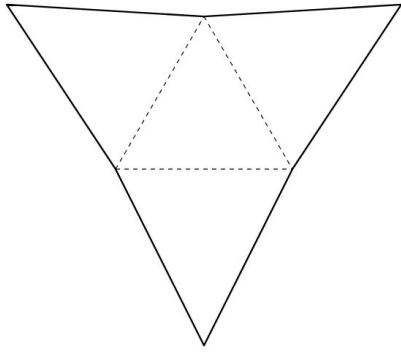
ANSWER KEY

Geometry Review (~32 min)

7. The net below represents a three-dimensional object.

Which three-dimensional object does it represent?

A

B

C

D
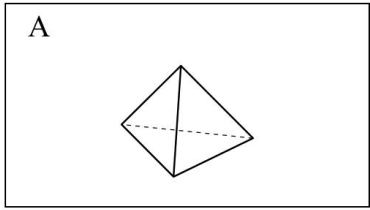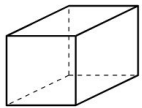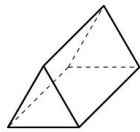
8. The net below represents a three-dimensional object.
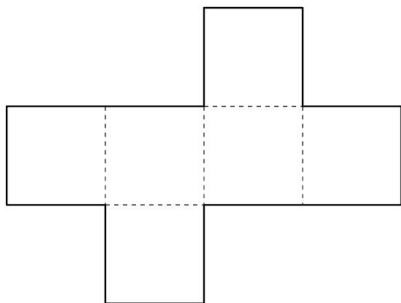
Which three-dimensional object does it represent?

A. triangular pyramid   B. cube

C. triangular prism   D. square pyramid

9. Which figure represents a net of the solid below?
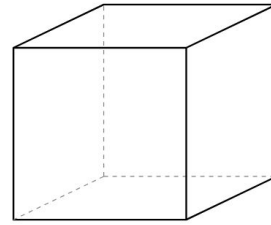
A
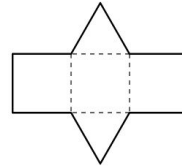
B
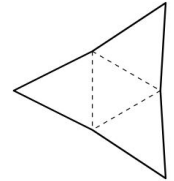
C
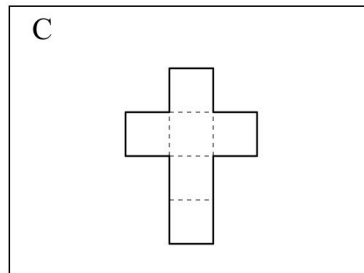
D
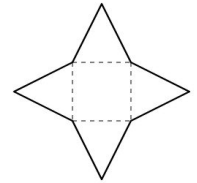
Geometry Review (~32 min)

10. Guadalupe is decorating the outside of a box in the shape of a right rectangular prism. The figure below shows a net for the box.
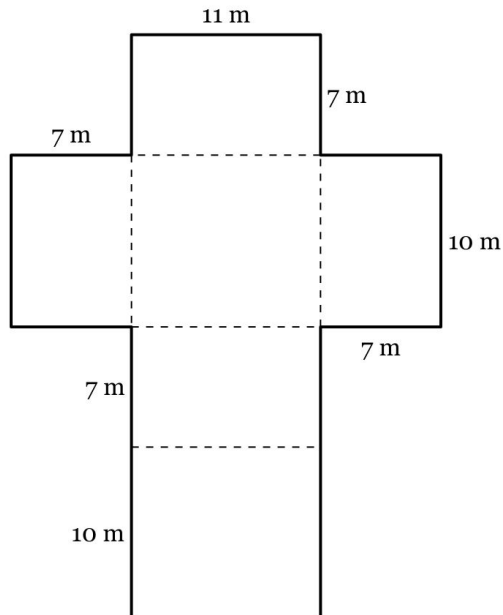
What is the surface area of the box, in square meters, that Guadalupe decorates?

$$A = 514 \text{ m}^2$$
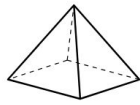
11. Justin wraps a gift box in the shape of a square pyramid. The figure below shows a net for the gift box.
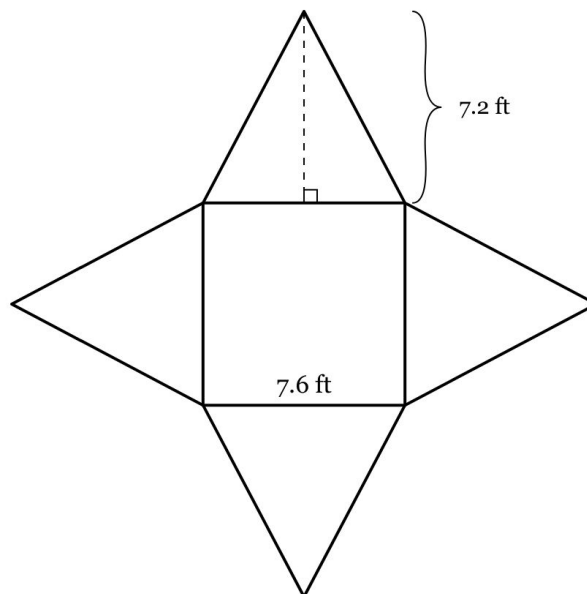
How much wrapping paper did he use, in square feet?

$$A = 167.2 \text{ ft}^2$$

12. The figure below is a net for a triangular pyramid.
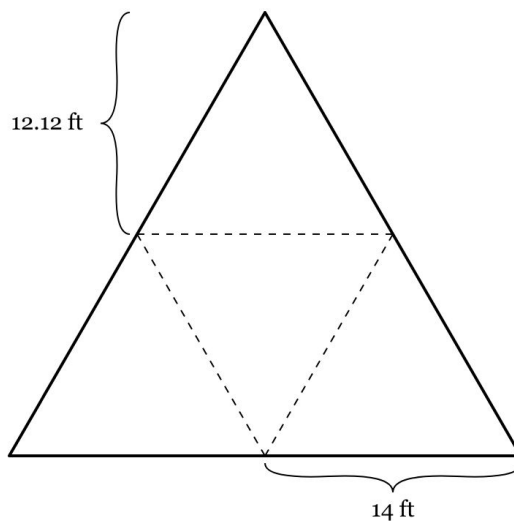
If all the triangles are equilateral, what is the surface area of the pyramid, in square feet?

$$A = 339.36 \text{ ft}^2$$

ANSWER KEY

Geometry Review (~32 min)

13. Find the perimeter of the figure below, in feet.

41.6 ft

8.8 ft 8.8 ft

12.8 ft 20.8 ft

12.8 ft 12.8 ft

8 ft
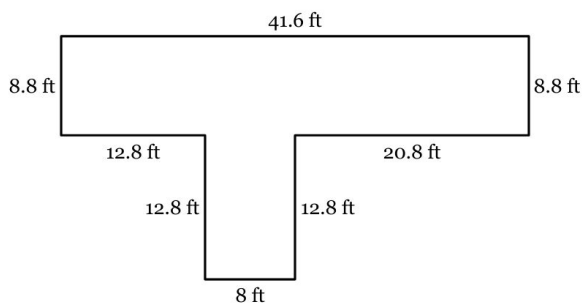
(Note: diagram is NOT to scale)

$$\boxed{126.4 \text{ ft}}$$

14. The perimeter of the figure below is 163.7 m. Find the length of the missing side.

11 m

11.3 m 11.3 m

11.3 m 11.3 m

11.3 m 11.3 m

11.3 m 11.3 m

26 m 26 m

?
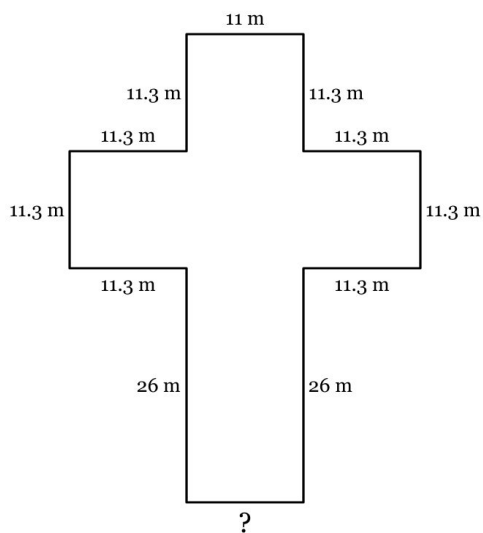
(Note: diagram is NOT to scale)

$$\boxed{10.3 \text{ m.}}$$

15. The perimeter of the figure below is 145.8 ft. Find the length of the missing side.

43.8 ft

15 ft 15 ft

13.5 ft 21.9 ft

13.5 ft 13.5 ft

?
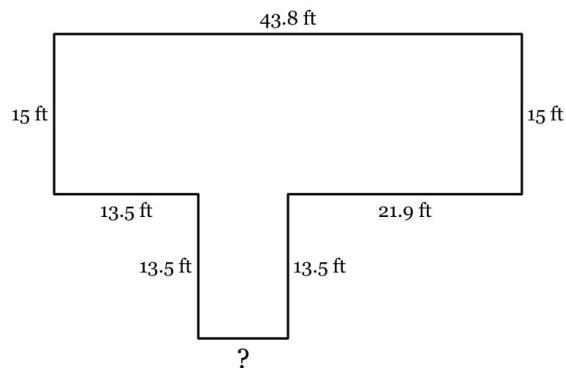
(Note: diagram is NOT to scale)

$$\boxed{9.6 \text{ ft.}}$$

16. A rectangular prism has a length of 14m, a height of 6m, and a width of 20m. What is its volume, in cubic m?

$$\boxed{V = 1680 \text{ m}^3}$$

17. A cube has an edge length of 10in. What is its volume, in cubic in?

$$\boxed{V = 1000 \text{ in}^3}$$

Geometry Review (~32 min)

18. A cube has an edge length of 10 centimeters. What is its volume, in cubic centimeters?

$$V = 1000 \text{ centimeters}^3$$

ANSWER KEY

Probability & Statistics (~35 min)

1. Malika has a bag of candy full of 10 strawberry chews and 10 cherry chews that she eats one at a time. Which word or phrase describes the probability that she reaches in without looking and pulls out a strawberry chew?

A. an equal chance or 50-50   B. certain

C. likely   D. impossible

2. Which of these contexts describes a situation that is *certain*?

A. Rolling a number less than or equal to 6 on a standard six-sided die, numbered from 1 to 6.

B. Spinning a spinner divided into four equal-sized sections colored red/green/yellow/blue and landing on purple.

C. Winning a raffle that sold a total of 100 tickets if you bought 0 tickets.

D. Reaching into a bag full of 10 strawberry chews and 10 cherry chews without looking and pulling out a cherry chew.

3. A spinner for a board-game is divided into four equal-sized sections colored red, green, yellow, and blue. If you land on a line between the colors, you keep spinning until you land on a color. Lydia's turn is next. Which word or phrase describes the probability that she will land on blue or green?

A. an equal chance or 50-50   B. impossible

C. likely   D. certain

4. Arianna's school is selling 100 raffle-tickets to raise money for a new gymnasium. The grand-prize is a ten-speed mountain bike. Which word or phrase describes the probability that she will win the raffle if she buys 50 tickets?

A. likely   B. impossible

C. certain   D. an equal chance or 50-50

5. A spinner for a board-game is divided into four equal-sized sections colored red, green, yellow, and blue. If you land on a line between the colors, you keep spinning until you land on a color. Michael's turn is next. Which word or phrase describes the probability that he will land on red or yellow or green?

A. likely   B. impossible

C. certain   D. unlikely

6. John buys a ticket for a raffle with several prizes. The probability that he wins a prize is 0.81. Which word or phrase describes the probability that John will win a prize?

A. impossible   B. likely

C. certain   D. unlikely

7. The weather forecaster says that tomorrow there is a 6% chance that it will rain. Which word or phrase describes the probability that it will rain?

A. certain   B. impossible

C. an equal chance or 50-50   D. unlikely

8. Arianys is playing a board game. The probability that Arianys will lose a turn on her next turn is 0%. Which word or phrase describes the probability that Arianys will lose a turn?

A. impossible   B. an equal chance or 50-50

C. likely   D. unlikely

9. Through ten games of basketball this season, Parker has made 2 out of 4 of his free-throws. Which word or phrase describes the probability that Parker will hit his next free throw?

A. likely   B. an equal chance or 50-50

C. impossible   D. unlikely

Probability & Statistics (~35 min)

10. Charlotte is playing a board game. The probability that Charlotte will lose a turn on her next turn is 0.95. Which word or phrase describes the probability that Charlotte will lose a turn?

A. certain B. unlikely

C. likely D. an equal chance or 50-50

11. Bentley owns a small business selling ice-cream. He knows that in the last week 44 customers paid cash, 77 customers used a debit card, and 4 customers used a credit card.

Based on these results, express the probability that the next customer will pay with a debit card as a fraction in simplest form.

$$\frac{77}{125}$$

12. Aubree has a bag that contains orange chews, lemon chews, and peach chews. She performs an experiment. Aubree randomly removes a chew from the bag, records the result, and returns the chew to the bag. Aubree performs the experiment 28 times. The results are shown below:

An orange chew was selected 14 times.
A lemon chew was selected 3 times.
A peach chew was selected 11 times.

Based on these results, express the probability that the next chew Aubree removes from the bag will be lemon chew as a percent to the nearest whole number.

11

13. In a popular online role playing game, players can create detailed designs for their character's "costumes," or appearance. Arianys sets up a website where players can buy and sell these costumes online. Information about the number of people who visited the website and the number of costumes purchased in a single day is listed below.

310 visitors purchased no costume.
119 visitors purchased exactly one costume.
42 visitors purchased more than one costume.

Based on these results, express the probability that the next person will purchase no costume as a fraction in simplest form.

$$\frac{310}{471}$$

14. In a popular online role playing game, players can create detailed designs for their character's "costumes," or appearance. Brianna sets up a website where players can buy and sell these costumes online. Information about the number of people who visited the website and the number of costumes purchased in a single day is listed below.

154 visitors purchased no costume.
180 visitors purchased exactly one costume.
8 visitors purchased more than one costume.

Based on these results, express the probability that the next person will purchase exactly one costume as a percent to the nearest whole number.

53

Probability & Statistics (~35 min)

15. A spinner is divided into five colored sections that are not of equal size: red, blue, green, yellow, and purple. The spinner is spun several times, and the results are recorded below:

Spinner Results

Color	Frequency
Red	9
Blue	11
Green	2
Yellow	10
Purple	2

Based on these results, express the probability that the next spin will land on blue as a fraction in simplest form.

$$\frac{11}{34}$$

16. Which event is **least likely** to occur?

A. Rolling a number less than 4 on a eight-sided die, numbered from 1 to 8.

B. Spinning a spinner divided into four equal-sized sections colored red/green/yellow/blue and landing on red or yellow or green or blue.

C. Winning a raffle that sold a total of 100 tickets, if you buy 74 tickets.

D. Reaching into a bag full of 7 strawberry chews and 73 cherry chews without looking and pulling out a strawberry chew.

17. Which event is **least likely** to occur?

A. Rolling a number less than 6 on a six-sided die, numbered from 1 to 6.

B. Spinning a spinner divided into five equal-sized sections colored red/green/yellow/blue/purple and landing on blue or purple.

C. Winning a raffle that sold a total of 100 tickets, if you buy 54 tickets.

D. Reaching into a bag full of 1 strawberry chews and 39 cherry chews without looking and pulling out a strawberry chew.

18. Which event is **most likely** to occur?

A. Rolling a number greater than or equal to 3 on a eight-sided die, numbered from 1 to 8.

B. Spinning a spinner divided into five equal-sized sections colored red/green/yellow/blue/purple and landing on green or purple.

C. Winning a raffle that sold a total of 100 tickets, if you buy 0 tickets.

D. Reaching into a bag full of 78 strawberry chews and 2 cherry chews without looking and pulling out a strawberry chew.

19. Which event is **least likely** to occur?

A. Rolling an even number or an odd number on a six-sided die, numbered from 1 to 6.

B. Spinning a spinner divided into five equal-sized sections colored red/green/yellow/blue/purple and landing on red or green.

C. Winning a raffle that sold a total of 100 tickets, if you buy 83 tickets.

D. Reaching into a bag full of 6 strawberry chews and 54 cherry chews without looking and pulling out a strawberry chew.

Probability & Statistics (~35 min)

20. Which event is **most likely** to occur?

A. Rolling a multiple of 3 on a six-sided die, numbered from 1 to 6.

B. Spinning a spinner divided into five equal-sized sections colored red/green/yellow/blue/purple and landing on red or blue or purple.

C. Winning a raffle that sold a total of 100 tickets, if you buy 23 tickets.

D. Reaching into a bag full of 34 strawberry chews and 6 cherry chews without looking and pulling out a strawberry chew.

21. David is trying to pick out an outfit for the first day of school. He can choose from 4 pairs of pants, 3 t-shirts, and 3 pairs of shoes. How many different outfits does David have to choose from?

36

22. Jevonte is designing a new board game, and is trying to figure out all the possible outcomes. How many different possible outcomes are there if he spins a spinner with four equal-sized sections labeled Red, Green, Blue, Orange and spins a spinner with 5 equal-sized sections labeled Monday, Tuesday, Wednesday, Thursday, Friday?

20

23. Three students, Lavaughn, Zahra, and Arianna, line up one behind the other. How many different ways can they stand in line?

6

24. Nora is organizing textbooks on her bookshelf. She has an English textbook, a math textbook, a physics textbook, and a health textbook. How many different ways can she line the textbooks up on her bookshelf?

24

25. Avani is designing a new board game, and is trying to figure out all the possible outcomes. How many different possible outcomes are there if she spins a spinner with four equal-sized sections labeled Red, Green, Blue, Orange and flips a coin?

8

ANSWER KEY

Probability & Statistics (~35 min)

26. Find the median and mean of the data set below:

$$27, 31, 45, 12, 4, 19$$

Median $= 23$
Mean $= 23$

27. Find the median and mean of the data set below:

$$21, 46, 9, 6$$

Median $= 15$
Mean $= 20.5$

28. Find the median and mean of the data set below:

$$46, 9, 7, 32$$

Median $= 20.5$
Mean $= 23.5$

29. Find the median and mean of the data set below:

$$10, 11, 30, 5, 18$$

Median $= 11$
Mean $= 14.8$

30. Find the median and mean of the data set below:

$$1, 12, 5, 17, 7$$

Median $= 7$
Mean $= 8.4$