TEKSING TOWARD STAAR

MATHEMATICS ®

GRADE 7

TEKS/STAAR-BASED

LESSONS

TEACHER GUIDE

Scope and Sequence
Six Weeks 1

GRADE 7 MATERIALS LIST - SIX WEEKS 3

SIX WEEKS	LESSON	ITEM	QUANTITY
3	1	Number cards (copy on cardstock, cut apart, and place in baggie) Percent cards (copy on cardstock, cut apart, and place in baggie)	1 set per pair of students 1 set per pair of students
3	2	No materials needed	
3	3	Centimeter grid paper 0.5 centimeter grid paper Circle Pi circles (copy on cardstock, cut apart, and place in baggie) Circular object Measuring tape Safety compass Centimeter ruler	1 per pair of students 1 per pair of students 1 set per group of 4 students 1 per group of 4 plus 3 extra 1 per student 1 per student 1 per student
3	4	4 colored tiles using 4 colors in a bag Penny Number cube	1 per pair of students 1 per pair of students 1 per pair of students
3	5	No materials needed	
3	6	No materials needed	
3	7	Rectangular prism Metric ruler Butcher paper	1 per pair of students 1 per pair of students 2 sheets per pair of students
3	8	Number cubes Butcher paper Colored Markers	2 per pair of students 1 per pair of students 2 sheets per pair of students
3	9	No materials needed	

SIX WEEKS 1

Lesson	TEKS-BASED LESSON	STAAR Category Standard	Spiraled Practice	Student Activity	Problem Solving	Skills and Concepts Homework
Lesson 1 _____ days	**7.2A**/extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of rational numbers.	Category 1 Supporting	SP 1 SP 2	SA 1 SA 2	PS 1 PS 2	Homework 1 Homework 2
Lesson 2 _____ days	**7.3A/**add, subtract multiply and divide rational numbers fluently	Category 2 Supporting	SP 3 SP 4	SA 1 SA 2 SA 3 SA 4	PS 1 PS 2 PS 3 PS 4	Homework 1 Homework 2 Homework 3 Homework 4
Lesson 3 _____ days	**7.3B/**apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication and division of rational numbers	Category 2 Readiness	SP 5 SP 6	SA 1 SA 2 SA 3	PS 1 PS 2	Homework 1 Homework 2
Lesson 4 _____ days	**7.5A/**generalize the critical attributes of similarity, including ratios within and between similar shapes **7.5C/**solve mathematical and real-world problems involving similar shapes and scale drawings	Category 3 Supporting Category 3 Readiness	SP 7 SP 8	SA 1 SA 2	PS 1 PS 2	Homework 1 Homework 2
Lesson 5 _____ days	**7.6A/**represent sample spaces for simple and compound events with and without technology **7.6E**/find the probabilities of a simple even and its complement and describe the relationship between the two.	Category 1 Supporting Category 1 Supporting	SP 9 SP 10	SA 1 SA 2 SA 3 SA 4	PS 1 PS 2 PS 3	Homework 1 Homework 2
Lesson 6 _____ days	**7.10A/**write one-variable, two-step equations and inequalities to represent constraints or conditions within problems **7.11A/**model and solve one-variable, two-step equations and inequalities **7.11B/**determine if the given value(s) make(s) one-variable, two-step equations and inequalities true	Category 2 Supporting Category 2 Readiness Category 2 Supporting	SP 11 SP 12 SP 13	SA 1 SA 2 SA 3	PS 1 PS 2	Homework 1 Homework 2
Lesson 7 _____ days	**7.12A/**compare two groups of numeric data using comparative dot plots….by comparing their shapes, centers and spreads	Category 4 Supporting	SP 14 SP 15	SA 1 SA 2 SA 3	PS 1 PS 2	Homework 1 Homework 2
Lesson 8 _____ days	**7.13A/**calculate the sales tax for a given purchase and calculate income tax for earned wages	Category 4 Supporting	SP 16 SP 17	SA 1 SA 2 SA 3	PS 1 PS 2	Homework 1 Homework 2

SIX WEEKS 1

Lesson	TEKS-BASED LESSON	STAAR Category Standard	Spiraled Practice	Student Activity	Problem Solving	Skills and Concepts Homework
Lesson 9 _____ days	**7.13B/**identify the components of a personal budget, including income, planned savings for college, retirement, and emergencies; taxes; fixed and variable expenses, and calculate what percentage each category comprises of the total budget	Category 4 Supporting Category 4 Supporting	SP 18 SP 19 SP 20	SA 1 SA 2	PS 1 PS 2	Homework 1 Homework 2
Review Assessment 2 days	**Six Weeks 1 Open-Ended Review** **Six Weeks 1 Assessment**					

TEACHER NOTES:

Materials List

GRADE 7 MATERIALS LIST - SIX WEEKS 1

SIX WEEKS	LESSON	ITEM	QUANTITY
1	1	Copies of Math Notes Page Copies of Problem-Solving Plan Copies of Problem-Solving Questions	2 per student 1 per student 1 per student
1	2	No Materials Needed	
1	3	blank 3 x 5 file cards	2 per pair of students
1	4	metric ruler protractor	1 per pair of students 1 per pair of students
1	5	Set of student name cards on cardstock in a baggie.	1 set per pair of students
1	6	Set of Equation/Inequality cards on cardstock in a baggie Set of Solution Set cards in a baggie. white paper	1 set per group of 4 1 set per pair of students 1 sheet per student
1	7	Student Height Data Record transparency (or copy to use on projection device) 1 sheet of poster size butcher paper or 1 sheet of poster size grid paper 1 set of colored markers 1 meter/yard stick	1 1 per group of 4 students 1 per group of 4 students 1 per group of 4 students
1	8	a sales advertisement flyer for a local department store. If this is not available, print one from a store's webpage.	1 per pair of students
1	9	No Materials Needed	

Mini-Assessment Answer Key

GRADE 7 TEKS-BASED ASSESSMENTS – SIX WEEKS 1
TEKS Correlation and Answer Key for Mini-Assessments

Mini-Assessment And TEKS Assessed	Question Number									
	1	2	3	4	5	6	7	8	9	10
Lesson 1 MA 7.2A	B	H	D	G	B	J	A	J	B	J
Lesson 2 MA 7.3A	B	G	B	J	D	G	C	J	C	J
Lesson 3 MA 7.3B	C	F	A	G	A	G	5.05	0.85	A	F
Lesson 4 MA 7.5B/7.5C	B 7.5C	43 7.5C	D 7.5C	F 7.5B	D 7.5B	J 7.5B	A 7.5C	J 7.5B	B 7.5C	J 7.5C
Lesson 5 MA 7.6A/7.6E	A 7.6E	G 7.6A	A 7.6A	J 7.6A	A 7.6E	J 7.6E	A 7.6A	G 7.6E	C 7.6E	J 7.6E
Lesson 6 MA 7.10A/7.11A/7.11B	B 7.11A	H 7.10A	B 7.11B	G 7.11B	18 7.11A	F 7.10A	17 7.11A	G 7.11A	B 7.11B	G 7.11B
Lesson 7 MA 7.12A	D	F	B	J	A	J	B	H	D	H
Lesson 8 MA 7.13A	B	F	C	G	B	161.78	C	G	C	J
Lesson 9 MA 7.13B	A	G	D	J	C	H	C	1296	B	G

Six Weeks 1
Lesson 1

7.2A Lesson and Assessment

Lesson Focus

For TEKS 7.2A, students should be able to demonstrate an understanding of how to represent probabilities and numbers. Students are expected to apply mathematical process standards to represent and use rational numbers in a variety of forms.

Students are also expected to extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of rational numbers.

Process Standards Incorporated Into Lesson

7.1B Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution

7.1D Communicate mathematical ideas, reasoning and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate

7.1F Analyze mathematical relationships to connect and communicate mathematical ideas

Materials Needed for Lesson

1. **Math Background**
   Per Student: 1 Math Notes page

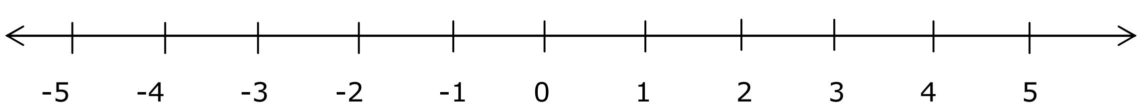
2. **Problem Solving 1**
   Per Student: 1 copy of Problem-solving Plan for math notebook, 1 copy of Problem-solving Questions

3. **Per Student:** 1 copy of all pages for student activities for this lesson, Skills and Concepts Homework, and mini-assessment for this lesson

Math Background-Understanding Rational Numbers

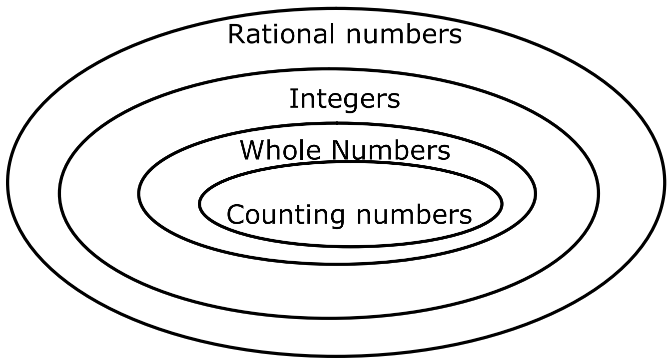
A group of items or numbers is called a set. A part of that set is called a **subset**. The set of numbers we use in our every day lives is the set of real numbers. These are the numbers that are located on a number line. One subset of the real numbers is the set of whole numbers. **Whole numbers** are the numbers 0, 1, 2, 3, 4… Each of these numbers has an opposite 0, -1, -2, -3, -4… When the whole numbers and their opposites are joined together the set of **integers** is created.

The set of integers are indicated in set notation as {…-4, -3, -2, -1, 0, 1, 2, 3, 4…}. These numbers are used to label a number line with the negative numbers located to the left of zero and the positive numbers located to the right of zero.



If zero is removed from the set of whole numbers, the set of **natural numbers** or **counting numbers** is created. The natural numbers can be indicated in set notation as $\{1, 2, 3, 4, 5, 6, 7, ...\}$.
The whole numbers, counting numbers, and integers are all subsets of a larger set called the rational numbers. When a number of the form $\frac{a}{b}$ is created where a and b are both integers but $b \neq 0$, then the set of **rational numbers** is created. For example, the ratio of 2 to 3 creates $\frac{2}{3}$, so $\frac{2}{3}$ is a rational number. The ratio of 10 to 2 creates $\frac{10}{2}$ or 5 which is a whole number as well as a rational number. A mixed number like $3\frac{1}{2}$ is a rational number because it can be rewritten as an improper fraction, $\frac{7}{2}$, which is the ratio of two integers.

The relationship between these sets of subsets of the real numbers can be shown with a Venn diagram.



This diagram shows that all whole numbers are integers, and all integers are rational numbers. When a set is included completely in another set on the diagram, then all members of the smaller set are also members of the larger set.

Some decimals are rational numbers and some decimals are not rational numbers. If the decimal terminates (ends) OR it has repeating digits, then it is a rational number.

1.25, 1.3, 1.001 are terminating decimals and thus are rational numbers. They can be expressed as a ratio of two integers.

$1.25 = \frac{125}{100}$ $\quad$ $1.3 = \frac{13}{10}$ $\quad$ $1.001 = \frac{1001}{1000}$

$0.\overline{3}$ and $0.\overline{6}$ are two of the most commonly used repeating decimals.

$0.\overline{3} = \frac{1}{3}$ $\quad$ $0.\overline{6} = \frac{2}{3}$

2.1357911…. and 0.646446444…. are examples of decimals that are NOT rational numbers. They do not terminate nor do they have repeating digits.

Example: Classify each number by naming the set(s) that it belongs to.

$\frac{1}{4}$ Rational number It is ratio of integers 1 and 4.

-0.15 Rational number It is the ratio of integers -15 and 100

43 Counting number, whole number, integer, and rational number

-13 Integer, rational number

$0.\overline{7}$ Rational number It is the ratio of integers 7 and 9

Identifying Number Sets Used in Real-World Situations

Numbers used in real-world situations can be whole numbers, integers, and rational numbers. When identifying the set of numbers that could be used in a particular situation, select the one that gives the most precise set. For example, if counting numbers is the set used to describe a situation, you could say whole numbers, integers, and rational numbers. By using the most specific set, counting numbers, it is understood that the other sets would work also.

Example: The number of dimes in a person's pocket

Whole numbers. This set best describes the number of dimes because the person may have 0, 1, 2, 3, … dimes in his pocket.

Example: The lengths of ribbon on 5 spools of ribbon

Positive rational numbers. This set best describes the lengths of ribbon on the spools because the lengths can be numbers like 3.5, $\frac{1}{2}$, 3, etc. Measurements must be positive numbers.

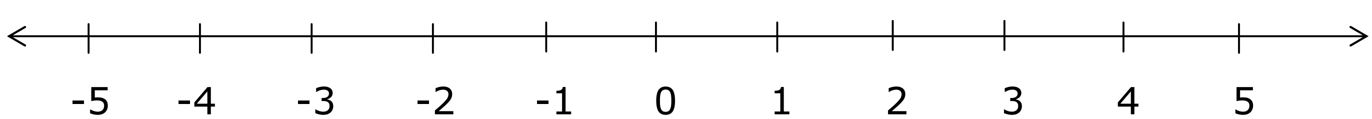
There are subsets of various sets of numbers that are described by a characteristic. For example, the whole numbers divisible by 6, are a subset of the whole numbers. This set would be 6, 12, 18, 24, 30, etc. This set could also be called the multiples of 6.

Some other subsets are even numbers, odd numbers, composite numbers, prime numbers, etc.

Understanding Rational Numbers

A group of items or numbers is called a **set**. A part of that set is called a **subset**. The set of numbers we use in our every day lives is the set of **real numbers.** These are the numbers that are located on a number line. One subset of the real numbers is the set of **whole numbers**. Whole numbers are the numbers 0, 1, 2, 3, 4… Each of these numbers has an opposite 0, -1, -2, -3, -4… When the whole numbers and their opposites are joined together the set of **integers** is created.

The set of integers are indicated in set notation as {…-4, -3, -2, -1, 0, 1, 2, 3, 4…}. These numbers are used to label a number line with the negative numbers located to the left of zero and the positive numbers located to the right of zero. We usually do not write the + sign on the whole numbers or positive integers.

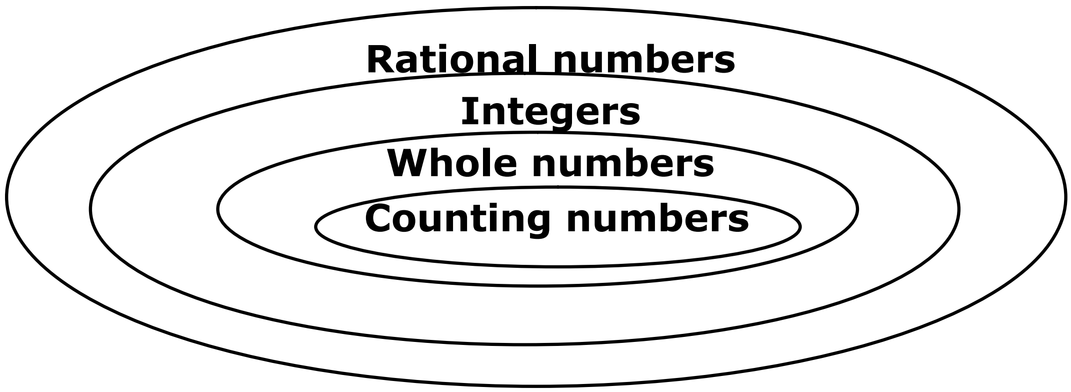


If zero is removed from the set of whole numbers, the set of **natural numbers** or **counting numbers** is created. The natural numbers can be indicated in set notation as $\{1, 2, 3, 4, 5, 6, 7, ...\}$.

When a number of the form $\frac{a}{b}$ is created where *a* and *b* are both integers but $b \neq 0$, then the set of **rational numbers** is created. The ratio of 2 to 3 creates $\frac{2}{3}$, so $\frac{2}{3}$ is a rational number. The ratio of 10 to 2 creates $\frac{10}{2}$ or 5 which is a whole number as well as a rational number. Any rational number can be plotted on a number line.

A mixed number like $3\frac{1}{2}$ is a rational number because it can be rewritten as an improper fraction, $\frac{7}{2}$, which is the ratio of two integers.

The relationship between these sets of subsets of the real numbers can be shown with a Venn diagram.



This diagram shows that all counting numbers are whole numbers, all whole numbers are integers, and all integers are rational numbers.

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$1.25 = \frac{125}{100} = \frac{5}{4}$ $1.3 = \frac{13}{10}$ $1.001 = \frac{1001}{1000}$

$0.\overline{3}$ and $0.\overline{6}$ are two of the most commonly used repeating decimals.

$0.\overline{3} = \frac{1}{3}$ $0.\overline{6} = \frac{2}{3}$

Some other commonly used repeating decimals are $0.\overline{1}$, $0.\overline{2}$, $0.\overline{4}$, etc. These are the decimals to represent the ratios $\frac{1}{9}$, $\frac{2}{9}$, $\frac{4}{9}$, etc.

2.12345…. and 0.545445444…. are examples of decimals that are not rational numbers. They do not terminate nor do they have repeating digits.

Example: Classify each number by naming the set(s) that it belongs to.

$\frac{1}{4}$ Rational number It is ratio of integers 1 and 4.

-0.15 Rational number It is the ratio of integers -15 and 100

43 Counting number, whole number, integer, and rational number.

-13 Integer, rational number

$0.\overline{7}$ Rational number It is the ratio of integers 7 and 9

Problem-Solving Model

Step	Description of Step
1	**Analyze the given information.** • Summarize the problem in your own words. • Describe the main idea of the problem. • Identify information needed to solve the problem.
2	**Formulate a plan or strategy**. • Draw a picture or diagram. • Guess and check. • Find a pattern. • Act it out. • Create or use a chart or table. • Work a simpler problem. • Work backwards. • Make an organized list. • Use logical reasoning. • Brainstorm. • Write a number sentence or an equation
3	**Determine a solution.** • Estimate the solution to the problem. • Solve the problem.
4	**Justify the solution.** • Explain why your solution solves the problem.
5	**Evaluate the process and the reasonableness of your solution.** • Make sure the solution matches the problem. • Solve the problem in a different way.

Problem-Solving Questions

Directions:
- **Work with a partner.**
- **Write your answers on notebook paper.**
- **Answer questions 1-3.**
- **Complete the solution to the problem(s).**
- **Answer questions 4-10.**

1. What is the main idea of this problem?
2. What are the supporting details in this problem?
3. What skills, concepts, and understanding of math vocabulary are needed to be able to answer this problem?
4. Did this problem involve mathematics arising in everyday life, society, or the work place?
5. What is a good problem solving strategy for this problem?
6. Can you explain how you used any math tools, mental math, estimation, or number sense to solve this problem?
7. Did this problem involve using multiple representations (symbols, diagrams, graphs, math language)?
8. Did you use any relationships to solve this problem?
9. How can you justify your solution to the problem?
10. How can you check for reasonableness of your solution to this problem?

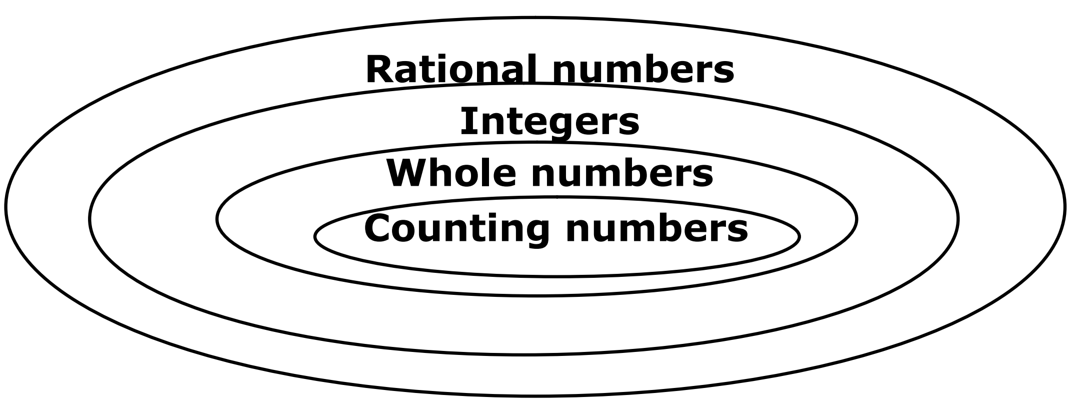
Problem-Solving 1

Problem 1: Which of the following statements are true? Use T or NT.

_____1. All integers are whole numbers
_____2. Any rational number can be expressed as the ratio of two integers.
_____3. Some decimal numbers are not rational numbers.
_____4. All integers are also rational numbers.
_____5. The set $\{8,\ 8.5,\ 10,\ -23\}$ are all rational numbers.
_____6. The set $\{-3,\ 19,\ 20,\ 0, -1\}$ are all integers.

For any statement you listed as NT, explain your reasoning.

Problem 2: Place -6, 0, 3.5, $\frac{12}{4}$, $-3\frac{1}{2}$ and $0.\overline{45}$ in the appropriate place on the Venn diagram.



Student Activity 1

Work with your partner to answer the following.

1. Complete the following statements by filling in the blank with an appropriate word or words.

   A group of objects or numbers is called a ___________.

   A part of a set is called a _________________.

   The set {1, 2, 3, 4, 5, 6, …} is called the set of _______________ _____________.

   The set {…-6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, …} is called the set of _______________.

   The set of numbers that can be expressed as the ratio of two integers is the set of ____________ numbers.

   A terminating decimal is a decimal that ____________________________________.

   A repeating decimal is a decimal that ______________________________________.

   $0.\overline{9}$ is a ______________ decimal and 1.4 is a __________________ decimal.

2. Place a √ in each column that names a set the given number belongs to.

	Rational Number	Integer	Whole Number	Counting Number
-16				
0				
1.5				
$\frac{21}{4}$				
$-4.\overline{2}$				
$-35\frac{2}{3}$				
1,250				
$0.\overline{12}$				

3. Name 3 integers that are NOT whole numbers.

   __________ __________ ___________

4. Name 3 rational numbers that are NOT integers.

   __________ __________ ___________

5. Name a rational number that would be between 3 and 3.1 on a number line.

6. Draw a Venn diagram that shows the relationship among rational numbers, integers, whole numbers, and natural numbers.

7. Place the following numbers in the appropriate set on the Venn diagram you drew in Question 6.

$217 \qquad -4 \qquad 1.1 \qquad \frac{21}{3} \qquad 3 \qquad 125 \qquad 0.\overline{4} \qquad -2\frac{1}{2}$

8. Identify each statement below as T(true) or NT(not true).

_____1. All prime numbers are integers.

_____2. All decimals are rational numbers.

_____3. All whole numbers are counting numbers.

_____4. All whole numbers are integers.

9. Name 2 counting numbers that will be between 3 and 6.5 on a number line.

10. Using a W for whole numbers, I for integers, and R for rational numbers, identify all the sets of numbers that have members in the given set.

$\{-1,\ -3,\ -14,\ -13\}$ ____________________

$\left\{\frac{22}{7},\ 3.\overline{14},\ 4,\ 0\right\}$ ____________________

$\left\{-20,\ -1.1,\ \frac{4}{3},\ -3\right\}$ ________________

Understanding Number Sets in Real-World Situations

Numbers used in real-world situations can be whole numbers, integers, and rational numbers. When identifying the set of numbers that could be used in a particular situation, select the one that gives the most precise set. For example, if counting numbers is the set used to describe a situation, you could say whole numbers, integers, and rational numbers. By using the most specific set, counting numbers, it is understood that the order sets would work also.

Example: The number of dimes in a person's pocket

Whole numbers. This set best describes the number of dimes because the person may have 0, 1, 2, 3, … dimes in his pocket.

Example: The lengths of ribbon on 5 spools of ribbon

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There are subsets of various sets of numbers that are described by a characteristic. For example, the whole numbers divisible by 6 are a subset of the whole numbers. This set would be 6, 12, 18, 24, 30, etc. This set could also be called the multiples of 6.

Some other subsets are even numbers, odd numbers, composite numbers, prime numbers, etc. All of these subsets we have studied in prior grades.

Problem-Solving 2

Problem 1: Identify the set of numbers that best describe the situations below.

- Numbers used in a phone number

____

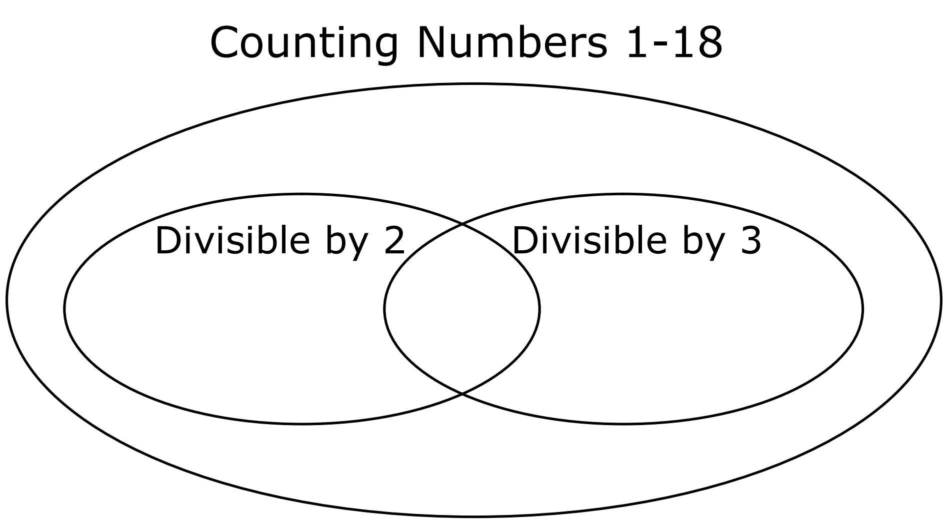
- Golf scores on a leaderboard

____

- Total cost of grocery store purchases

____

Problem 2: Place the counting numbers 1-18 on the Venn diagram below.



Student Activity 2

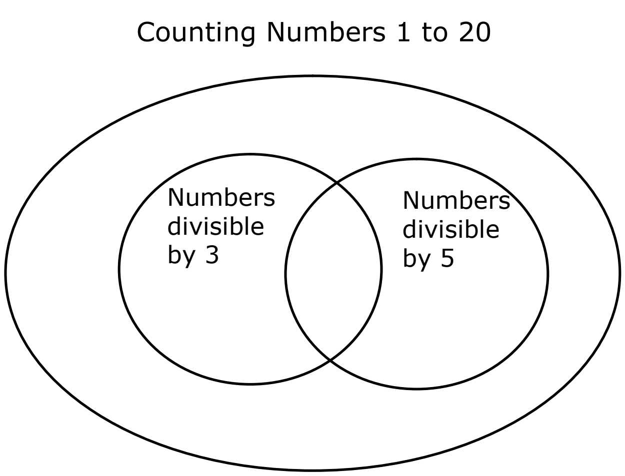
Work with your partner to answer the following.

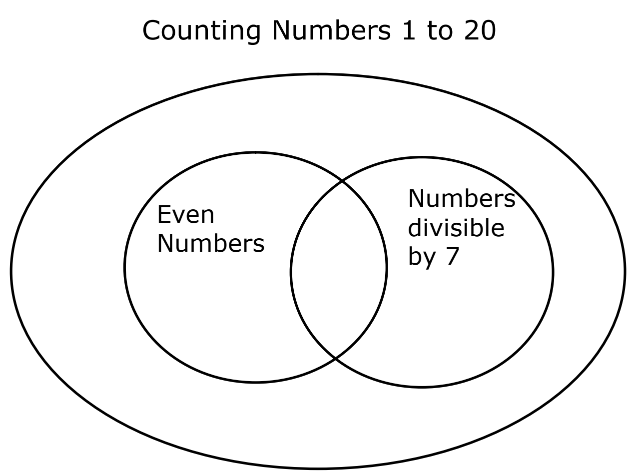
1. Identify the set of numbers that best describes each situation

- The amount of the ingredients used to make brownies
- The number of homeruns hit by a baseball team during the last game of the season
- A board game has a spinner with 3 sections- Lose your Turn, Move Forward, Move Backward and a number cube with the numbers 1-6. The number of moves you make after a spin and a roll
- The number of students on a school bus when it arrives at school in the morning
- The number of seconds recorded for the times of the participants running the 100 meter dash at a track meet
- The balance in a person's check register
- The height of a person in centimeters

2. How can you show the relationship among the set of rational numbers, integers, whole numbers, and counting numbers?

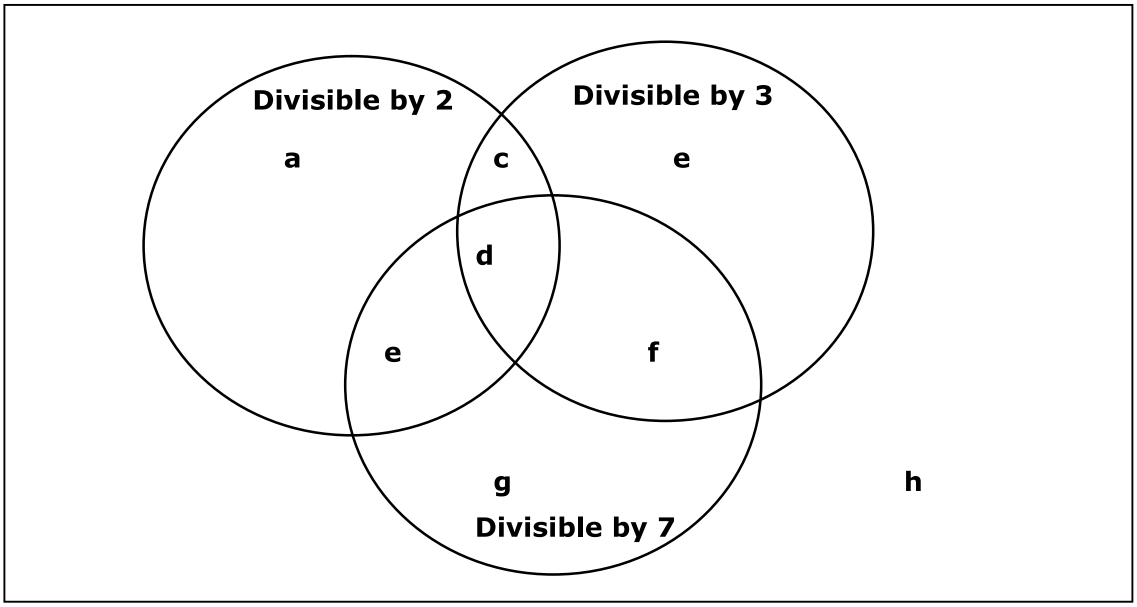
3. Fill in the following Venn diagrams with the counting numbers 1 to 20.





4. Look at the Venn diagram below. It contains the set of whole numbers 1-30.

Whole Numbers 1-30



- Describe verbally the numbers that would be in the section labeled a.

____

- List the number(s) that would be in section a.

- Describe verbally the numbers that would be in the section labeled c.

____

- List the number(s) that would be in section c.

- Describe verbally the numbers that would be in the section labeled g.

____

- List the number(s) that would be in section g.

- Describe verbally the numbers that would be in the section labeled d.

  ____

- List the number(s) that would be in section d.

- Describe verbally the numbers that would be in the section labeled b.

  ____

- List the number(s) that would be in section b.

- Describe verbally the numbers that would be in the section labeled h.

  ____

- List the number(s) that would be in section h.

- Describe verbally the numbers that would be in the section labeled f.

  ____

- List the number(s) that would be in section f.

- Describe verbally the numbers that would be in the section labeled e.

  ____

- List the number(s) that would be in section e.

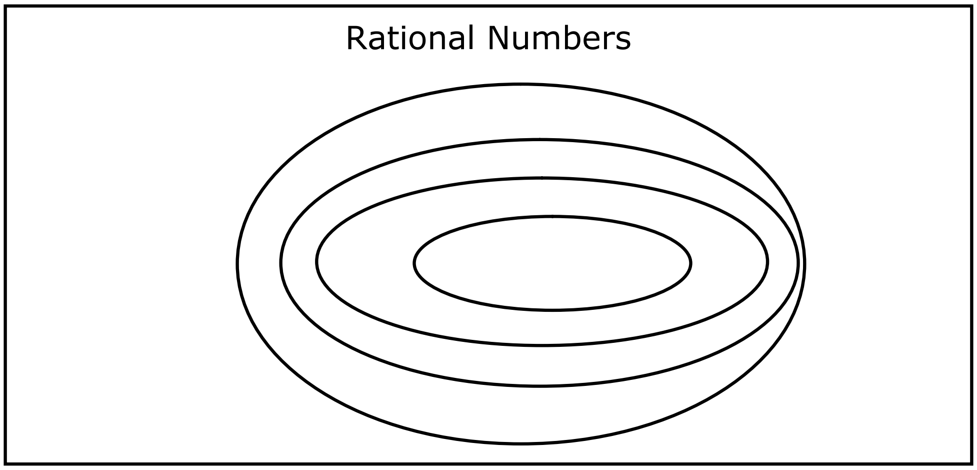
Are all the whole numbers 1-30 found in at least one of the sections? Explain your answer.

Were any of the sections empty? Explain

NAME____________________ DATE______________________ SCORE ___/5

7.2A Skills and Concepts Homework 1

1. Fill in the Venn diagram below showing the relationship of rational numbers, integers, whole numbers, and counting numbers



2. Place a √ in each column that the given number belongs to.

	Rational Number	Integer	Whole Number	Counting Number
–22				
–3.1				
113				
$\frac{5}{8}$				
0.242424...				

3. Name a whole number that is NOT a counting number. ________

4. Name 3 rational numbers that are NOT positive.

___________ ___________ _________

5. Name a rational number that is located between 31.5 and 31.6 on a number line. How do you know it is rational?

NAME____________________ DATE______________________ SCORE ___/5

7.2A Skills and Concepts Homework 2

1. Identify the set of numbers that best describes each situation.

   - The number of miles you could walk in 30 minutes

   - Possible number of cookies in a cookie jar

   - Number of fish caught in an hour of fishing

   - Scores of the top 5 golfers on a leader board

2. Explain how the set of integers differs from the set of counting numbers.

3. What is a composite number?

   Are composite numbers counting numbers? Explain

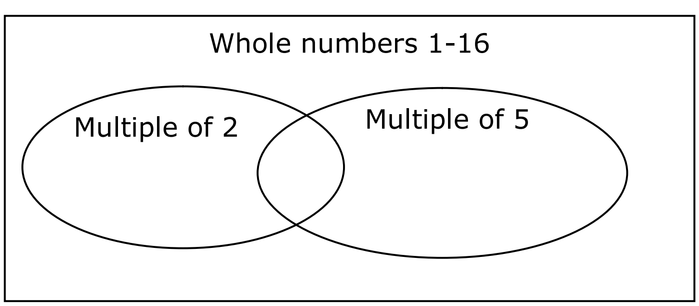
4. Identify which set of numbers are listed below.

   $\{\ldots -3,\ -2,\ -1,\ 0,\ 1,\ 2,\ 3,\ldots\}$ ______________________________

   $\{\ 0,\ 1,\ 2,\ 3,\ldots\}$ ______________________________

   $\{\ 0,\ 2,\ 4,\ 6,\ldots\}$ ______________________________

5. Fill in the Venn diagram below with whole numbers 1-16.



NAME____________________ DATE______________________ SCORE ___/10

Mini-Assessment 7.2A

1. Which number does NOT represent an integer?

   A 3

   B 20.1

   C –10

   D $\frac{20}{4}$

---

2. Which describes a rational number?

   F Any number found on a number line

   G All numbers greater than 0

   H Any number that can be expressed as the ratio of two integers where the denominator is not 0

   J Any decimal number

---

3. Which statement is true?

   A Every rational number is an integer.

   B Every whole number is a counting number.

   C Every integer is a whole number.

   D Every whole number is a rational number.

---

4. A coin collection contains nickels, dimes, and quarters. Which set of numbers would be used to describe the number of dimes in the collection?

   F Positive rational numbers

   G Counting numbers

   H Integers

   J Rational numbers

5. Which of the following does NOT represent a set of integers?

   A $\{3,\ 4,\ 6,\ 5\}$

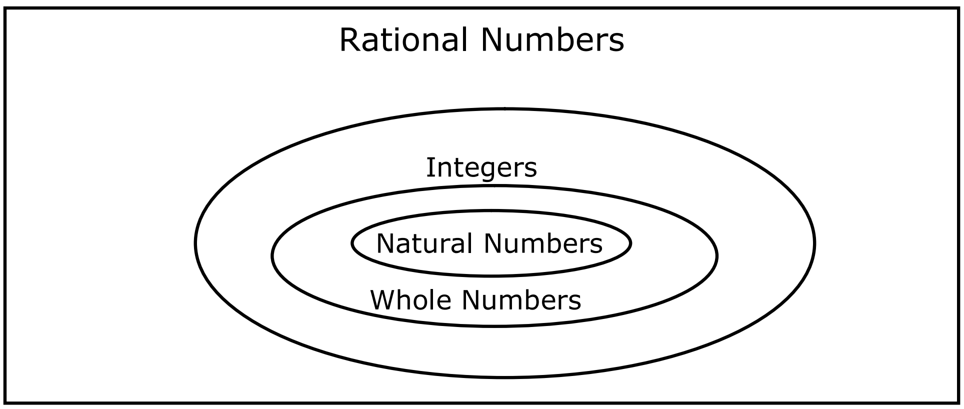
   B $\left\{\frac{4}{3},\ 12,\ 3.0,\ 9\right\}$

   C $\left\{\frac{12}{4},\ \frac{-8}{4},\ \frac{9}{3},\ 15\right\}$

   D $\{0,\ 13,\ 65,\ 100\}$

---

6. This Venn diagram shows the relationship of the subsets of the real number system.



   Which of the following sets would belong to the natural numbers?

   F $\{6,\ -5,\ 1.25\}$

   G $\{2,\ 4,\ 0.\overline{3}\}$

   H $\{-8,\ 4,\ 13,\ 25\}$

   J $\left\{\frac{16}{4},\ 8,\ 7,\ 9\right\}$

---

7. Which statement is NOT true?

   A -15 is a whole number and an integer.

   B -15 is an integer and a rational number.

   C -15 is a rational number but is not a whole number.

   D -15 is not a whole number.

8. Which number is a rational number that is NOT a whole number?

F 2

G 12

H $\frac{30}{10}$

J $\frac{17}{5}$

---

9. Rational numbers are a dense set. This means that between any two rational numbers on a number line there is another rational number. Which rational number is between 2.23 and 2.24 on a number line?

A 2.241

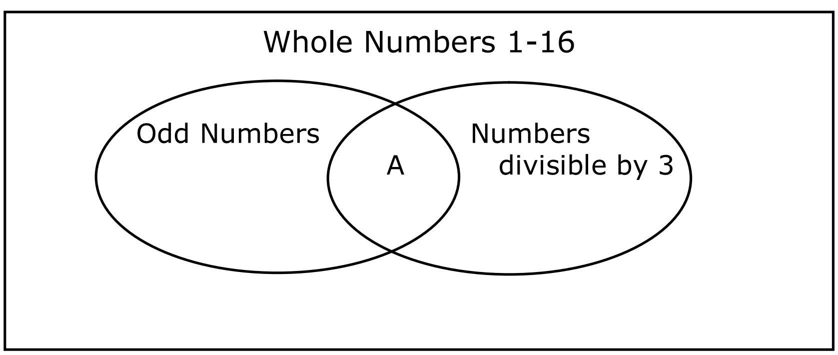
B 2.236

C 2.256

D 2.223

---

10. The Venn diagram below contains the whole numbers 1-16.



Which of the following lists names the numbers that would be located in section A?

F 1, 3, 6, 9, 12, 15

G 3, 6, 9, 12, 15

H 3, 9, 12

J 3, 9, 15

Six Weeks 1 Review and Assessment

Six Weeks 1 Review

This review can be used in the same manner as a Student Activity from the lessons. Notes can be used to complete the review and they can work with a partner. You can assign different portions to different partner pairs to be responsible for debriefing for the entire class. Students can complete any answers they did not get before the debriefing. They just need to use a different color to record any additional answers.

It can be completed entirely in class, or it can be taken home to be completed and then debriefed in class prior to the six week assessment.

Six Weeks 1 Review

Lesson 1: 7.2A

1. Place a √ in each column that the given number belongs to.

	Rational Number	Integer	Whole Number	Counting Number
-2.5				
-20				
113				
$\frac{5}{8}$				
$0.\overline{4}$				

2. Name 5 rational numbers that are NOT integers.

3. What type of decimals are rational numbers?

   Give an example of a decimal that is NOT rational.

Lesson 7.3A

1. What is the rule for adding a positive rational number and a negative rational number?

   What is the sum of $-2\frac{1}{2}$ and 4? Show your work.

2. What is the rule for subtracting two rational number?

   What is the value of $9-(-4)$?

   What is the value of $-10.4-(-4.2)$?

   What is the value of $9-17$?

   What is the rule for determining the sign of the product when multiplying rational numbers?

   What it the value of $(-3)(-4)$?

What is the value of $(3.5)(-8)$?

What is the rule for determining the sign of the quotient when dividing rational numbers?

What is the value of $(-300) \div (-4)$?

What is the value of $(-20) \div (2.5)$?

What is the value of $(-22) \div \left(2\frac{3}{4}\right)$?

Lesson 3: 7.3B

1. Dorothy wants to save $72.24 to buy her grandmother a special birthday gift. She has 12 weeks to save the money. If she wants to save the same amount each week, how much money, in dollars and cents, does she need to save each week? Show your work.

2. Susie is finishing a research project for her history class. On Monday and Tuesday she worked for $3\frac{1}{2}$ hours each day. On Wednesday she worked for $2\frac{3}{5}$ hours.

- What was the total number of hours she worked on the project these 3 days? Show your work.

- How many more hours did she work on the project on Tuesday than she did on Wednesday? Show your work.

Lesson 4: 7.5A 7.5C

1. Describe the characteristics of two similar quadrilaterals.

2. Triangle *ABC* is similar to triangle *DEF*.

   - $\angle A$ is congruent to $\angle$_____.

   - Complete the proportions below based on the similarity of the two triangles.

$$\frac{AB}{DE} = \frac{BC}{\quad} = \frac{AC}{\quad} \qquad \frac{AB}{BC} = \frac{DE}{\quad} \qquad \frac{AB}{AC} = \frac{DE}{\quad}$$

   - If *AB* = 15 cm, *AC* = 20 cm, and DF = 30 cm, what is the value of *DE*? Show your work.

Lesson 5: 7.6A 7.6E

1. Draw a sample space for drawing two names from a bag with the names James, Amy, and Lois written on pieces of paper.

2. A bag contains 10 green, 8 red, 7 blue and 5 yellow marbles.

   - What is the probability a person will NOT select a yellow marble when randomly selecting one marble from the bag?

   What is the probability a person will select a red marble when randomly drawing one marble from the bag?

3. If the probability of an event occurring is 35%, what is the probability of the event NOT occurring?

Lesson 6: 7.10A 7.11A 7.11B

1. A coin collection contains nickels and dimes. The collection contains 12 dimes. The number of dimes is 3 more than twice the number of nickels, *n*.
   Write an equation that represents the number of dimes in terms of *n*.

2. Model the inequality: $2(x + 3) < 8$

   Using your model, solve the inequality.

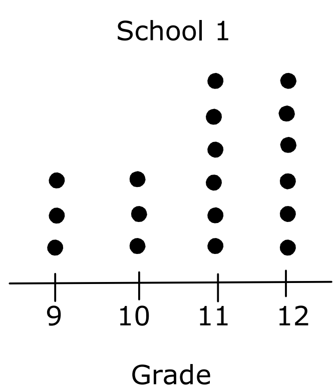
3. Does 8 belong to the solution set of $3x - 5 > 20$?

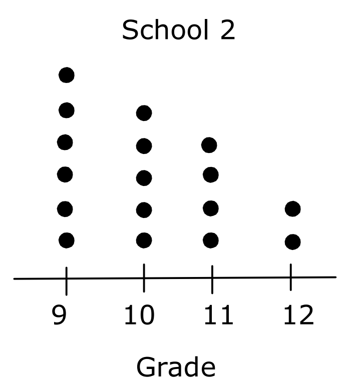
   Does 5 satisfy the equation $-4x + 3 = -17$?

Lesson 7: 7.12A

Look at the two dot plots.

1. The dot plots show the number of students in the high school orchestra in two high schools in Hebron Independent School District.





- How do the centers compare for the two dot plots?

  Center of School 1________ Center of School 2 _________

- How do the spreads compare for the two dot plots?

  Spread of School 1________ Spread of School 2 _________

- Make a true statement in comparing the shapes of the data for the two plots.

Lesson 8: 7.13A

1. What is the sales tax on an item costing $36.50 if the tax rate is 7.5%?

2. What is the total cost of an item that lists for $28 and has a tax rate of 8%?

3. Use the tax table below to determine the amount of tax Mr. Bradley, a single person, will pay the federal government if his taxable income is $68,138.

If Form 1040 line 43 (taxable income)-		You are Single	Married filing jointly
At least	But less than	Your tax is-	Your tax is-
$68,000	$68,050	$12,935	$9,311
$68,050	$68,100	$12,948	$9,319
$68,100	$68,150	$12,960	$9,326
$68,150	$68,200	$12,973	$9,334
$68,200	$68,250	$12,985	$9,341

He will owe ____________ in taxes. If he has had $12,480 withheld by his employer, does he owe more or will he get a refund? Explain your answer.

Lesson 9: 7.13B

1. Give two examples of fixed expenses.

   Give two examples of variable expenses.

2. What is the purpose of a budget?

3. The Smith family has a net monthly income of $3,800. They budget $760 a month for household expenses, such as food and supplies for the home. What percent of their monthly income do they budget for this expense category?

4. The table below shows Carson's monthly budget. To earn money, he works after school at his dad's bike shop.

Item	Income	Expense	Amount Available
Allowance	\$100		
Earning from after school Job (24 hours per week at \$7 per hr)	\$672		
Savings for Motorbike		\$40	
Entertainment		\$30	
Lunch		\$60	
Saving for College		\$100	
Clothes		\$60	
Miscellaneous Expenses		\$40	

Calculate the amount available.

Which of Carson's expenses are variable expenses?

GRADE 7 MATHEMATICS

TEKS/STAAR Six Weeks 1 Assessment

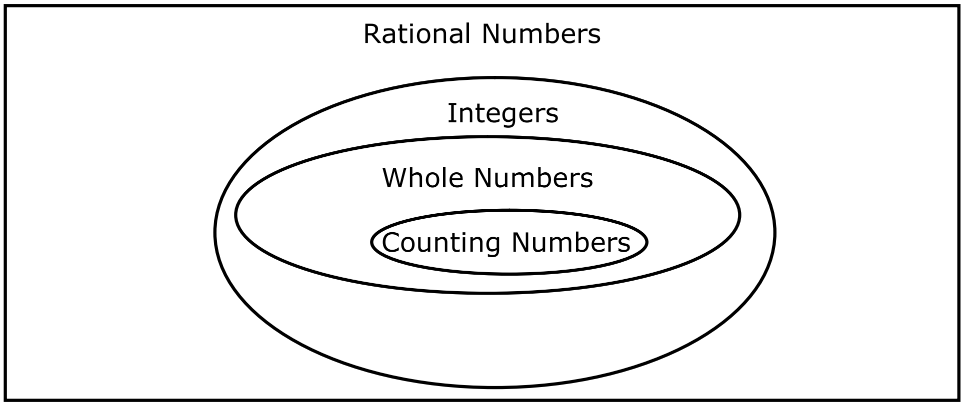
Make 1 copy of the Six Weeks Assessment for each student. Students answer these questions individually. Record class performance on the Class Profile Sheet and individual student performance on the Individual Student Profile Sheet.

Answer Key:		STAAR Category/TEKS
1.	A	Category 1/7.2A
2.	H	Category 1/7.3B
3.	C	Category 2/7.3B
4.	18	Category 3/7.11A
5.	D	Category 2/7.10A
6.	F	Category 3/7.5A
7.	D	Category 1/7.6A
8.	H	Category 1/7.6E
9.	C	Category 2/7.10A
10.	G	Category 4/7.13A
11.	B	Category 4/7.12A
12.	24	Category 3/7.5C
13.	B	Category 4/7.13A
14.	F	Category 2/7.11B
15.	A	Category 1/7.6E
16.	G	Category 2/7.11A
17.	C	Category 4/7.3A
18.	J	Category 3/7.11A
19.	C	Category 4/7.5C
20.	720	Category 3/7.13A

GRADE 7 MATHEMATICS

TEKS/STAAR Six Weeks 1 Assessment

1. This Venn diagram shows the relationship of the subsets of the rational number system.



Which of the following sets would belong to the integers?

A $\{7, \ -3, 17\}$

B $\{4, \ 3, 0.\overline{6}\}$

C $\{-5, \ 14.3, 10, 125\}$

D $\left\{\frac{24}{8}, \ 3, 17.6, 29\right\}$

---

2. Cindy works on the weekends at the local coffee shop. Last Saturday she worked 7.5 hours and on Sunday she worked 8 hours. She earns $9 per hour. How much did she earn last weekend?

F $97.00

G $89.50

H $139.50

J $109.00

---

3. After 5 turns in a board game, Beau is on square 16. His next three turns he moves back 2 squares, moves ahead 4 squares, and moves back 3 squares. He must reach square 28 to win the game. After these three turns, how many squares is he from winning the game?

A 12 squares

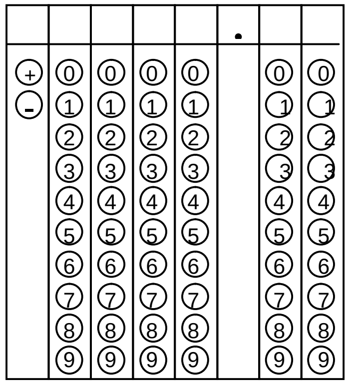
B 10 squares

C 13 squares

D 15 squares

4. In a coin collection, the number of dimes is 6 more than twice the number of nickels. If the collection has 42 dimes, how many nickels are in the collection?

   Record your answer on the grid below. Be sure to use the correct place value.



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5. James has more than 43 game coins. James has 7 more than 4 times as game coins as Steven. If x represents the number of game coins Steven has, which inequality can be used to determine the possible number of game coins Steven has?

   A $7 + 4x < 43$

   B $4x - 7 > 43$

   C $7x + 4 > 43$

   D $4x + 7 > 43$

---

6. Which statement is true?

   F All squares are similar because they have all corresponding sides proportional and all 4 angles are congruent right angles.

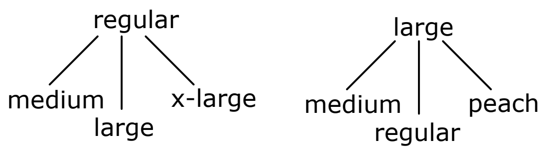
   G All right triangles are similar because they all have a right angle.

   H All isosceles triangles are similar because they all have a pair of base angles congruent.

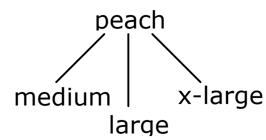
   J All rectangles are similar because they all quadrilaterals with 4 right angles.

7. Lemonade is sold in medium, large and x-large sizes at a convenience store. The two flavors sold are regular and peach. Which of the following represents all of the combinations of the flavors and sizes of lemonade sold at the convenience store?

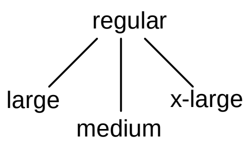
A



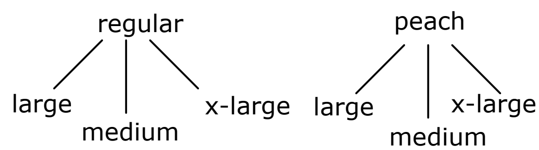
C



B



D



8. A bag contains 8 yellow cubes, 7 blue cubes, and 5 red cubes. If you select a cube at random, what is the probability the cube will NOT be red?

F 35%

G 65%

H 75%

J 25%

9. The width of a rectangle is 24 inches. The width is 12 inches less than three times the length, *x*. Which equation represents this situation?

A $12x - 3 = 24$

B $3x + 12 = 24$

C $3x - 12 = 24$

D $12 - 3x = 24$

10. Leticia bought a new tablet for $375. She had to pay a sales tax of 8%. What was the amount of sales tax she paid on the tablet?

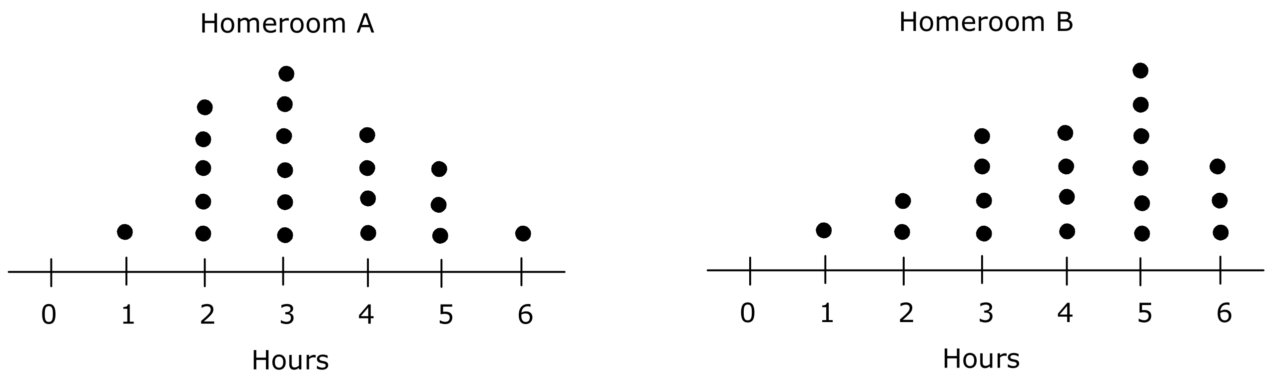
F $405

G $30

H $3

J $20

11. The dot plots below show the numbers of hours students in two homerooms spent on exercise each week.



Which statement is supported by the information in the dot plots above?

A In comparing the shape of the data for the two dot plots, Homeroom A has more students who spend more than 3 hours on exercise than Homeroom B.

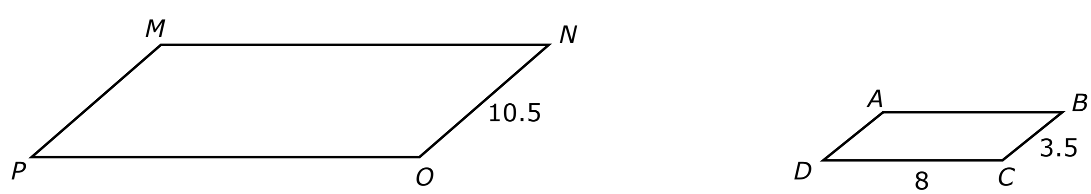
B In comparing the shape of the data for the two dot plots, Homeroom A has twice as many students who spend 2 or less hours on exercise as Homeroom B.

C In comparing the spread of the data, Homeroom A has a larger spread than Homeroom B.

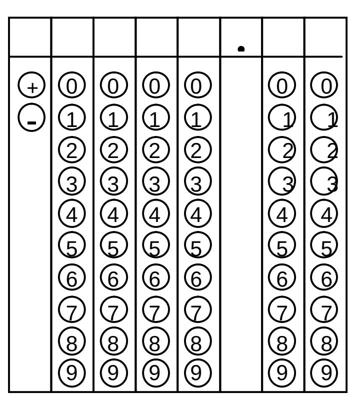
D In comparing the centers of the data, Homeroom A has a center of 3 hours and Homeroom B has a center of 5 hours.

---

12. Parallelogram *ABCD* is similar to parallelogram *MNOP*.



What is the length of $\overline{PO}$?
Record your answer on the grid below. Be sure to use the correct place value.



13. The tax table for taxable income between $36,000 and $36,300 is shown below.

If Form 1040 line 43 (taxable income) is-		And you are single	And you are married filing jointly
At least	But less than	Your tax is-	Your tax is-
$36,000	$36,050	$4,958	$4,511
$36,050	$36,100	$4,965	$4,519
$36,100	$36,150	$4,973	$4,526
$36,150	$36,200	$4,980	$4,534
$36,200	$36,250	$4,988	$4,541
$36,250	$36,300	$4,998	$4,949

Mr. Jing's family has taxable earnings this year of $36,163. They have paid $4,345 in withholding taxes from their earnings. Mr. Jing and his wife file jointly. Have they paid enough in withholding for their taxes?

A No, they will need to pay an additional $289 to the federal government.

B No, they will need to pay an additional $189 to the federal government.

C Yes, they will get a refund check for $189.

D Yes, they will get a refund check for $289.

---

14. For which equation is $x = 3.5$ a solution?

F $3x + 0.5 = 11$

G $3x - 2.5 = 7$

H $4x - 3 = 12$

J $-2x - 4 = -3$

---

15. A spinner has 5 equal sections labeled -1, 0, 3, -2, and 4. If the spinner is spun one time, what is the probability it will land on integer that is NOT a whole number?

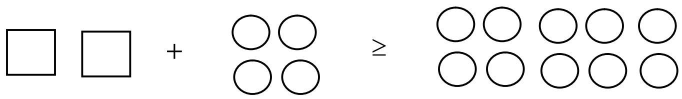
A 40%

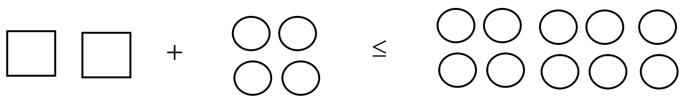
B 25%

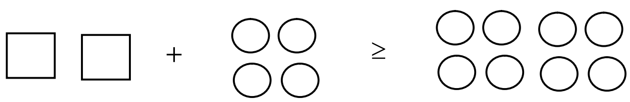
C 60%

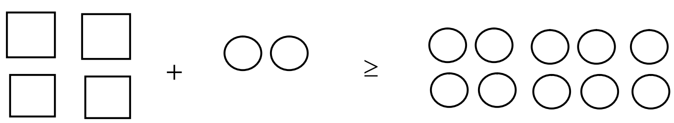
D 75%

16. If a square represents x and a circle represents 1, which of the models below best represent $2x + 4 \leq 10$?

F 

G 

H 

J 

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17. Which statement is NOT true?

A $5 - 8 = -3$

B $-2\frac{1}{2} \times \frac{5}{4} = -3\frac{1}{8}$

C $-6 + 3\frac{1}{8} = -3\frac{1}{8}$

D $-6 \div -12 = 0.5$

---

18. A carpenter had two pieces of lumber that totaled more than 70 feet in length. The shorter piece was 10 feet shorter than the longer piece. Which inequality can be used to find the range of lengths of the longer piece, *x*?

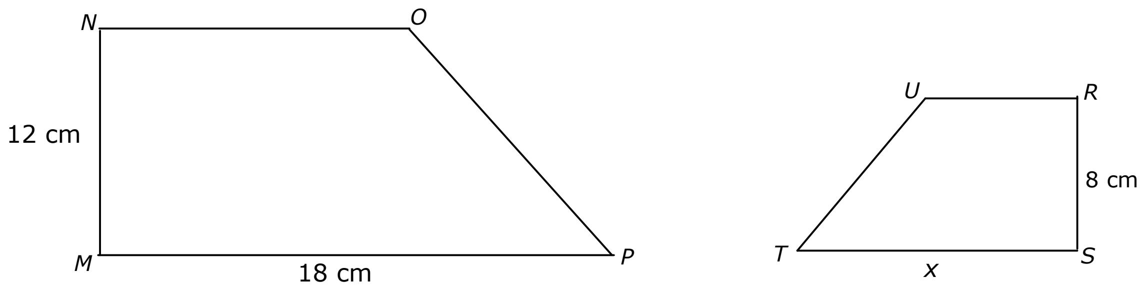
F $x - 10 + x < 70$

G $x - 10 > 70$

H $x + 10 + x > 70$

J $x - 10 + x > 70$

19. Quadrilateral *MNOP* is similar to quadrilateral *SRUT*.



Which proportion can be used to find the value of *x*?

A $\frac{12}{x} = \frac{8}{18}$

B $\frac{18}{x} = \frac{8}{12}$

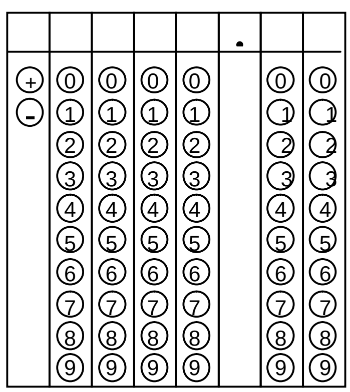
C $\frac{x}{18} = \frac{8}{12}$

D $\frac{18}{8} = \frac{12}{x}$

---

20. The Alcott family has a monthly net income of $3,600. They budget 15% for household expenses and 5% for savings. What amount do they budget for these two categories?

Record your answer on the grid below. Be sure to use the correct place value.



Scope and Sequence
Six Weeks 3

TEKSING TOWARD STAAR SCOPE AND SEQUENCE
Grade 7 Mathematics

SIX WEEKS 3

Lesson	TEKS-BASED LESSON	STAAR Category Standard	Spiraled Practice	Student Activity	Problem Solving	Skills and Concepts Homework
Lesson 1 _____ days	**7.4D/** solve problems involving….percents of decrease and percent of decrease and financial literacy problems	Category 2 Readiness	SP 41 SP 42	SA 1 SA 2 SA 3	PS 1 PS 2	Homework 1 Homework 2
Lesson 2 _____ days	**7.7A/**represent linear relationships using verbal descriptions, tables, ….,that simplify to the form $y = mx + b$.	Category 2 Readiness	SP 43 SP 44	SA 1 SA 2 SA 3	PS 1 PS 2	Homework 1 Homework 2
Lesson 3 _____ days	**7.8C/**use models to determine the approximate formulas for the circumference and area of a circle and connect the models to the actual formulas **7.5B/**describe π as the ratio of the circumference of a circle and its diameter **7.9B/**determine the circumference and area of circles	Not Tested Category 3 Supporting Category 3 Readiness	SP 45 SP 46 SP 47	SA 1 SA 2	PS 1	Homework 1 Homework 2
Lesson 4 _____ days	**7.6I/**determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces	Category 1 Readiness	SP 48 SP 49	SA 1 SA 2 SA 3	PS 1 PS 2	Homework 1 Homework 2
Lesson 5 _____ days	**7.8B/**explain verbally and symbolically the relationship between the volume of a triangular prism and a triangular pyramid having both congruent bases and heights and connect that relationship to the formulas **7.9A/** solve problems involving the volume of ….triangular prisms and triangular pyramids	Not Tested Category 3 Readiness	SP 50 SP 51	SA 1 SA 2	PS 1 PS 2	Homework 1 Homework 2
Lesson 6 _____ days	**7.9C/**determine the area of composite figures containing combinations of rectangles, squares, parallelograms, trapezoids, triangles, semicircles, and quarter circles	Category 3 Readiness	SP 52 SP 53	SA 1 SA 2	PS 1 PS 2	Homework 1 Homework 2
Lesson 7 _____ days	**7.9D/**solve problems involving the lateral and total surface area of a rectangular prism,…rectangular pyramid,..by determining the area of the shape's net	Category 3 Supporting	SP 54 SP 55 SP 56	SA 1 SA 2 SA 3	PS 1 PS 2	Homework 1 Homework 2

SIX WEEKS 3

Lesson	TEKS-BASED LESSON	STAAR Category Standard	Spiraled Practice	Student Activity	Problem Solving	Skills and Concepts Homework
Lesson 8 _____ days	**7.6G/**solve problems using data represented in…dot plots, including part-to-whole and part-to-part comparisons and equivalents	Category 4 Readiness	SP 57 SP 58	SA 1 SA 2 SA 3	PS 1 PS 2	Homework 1 Homework 2
Lesson 9 _____ days	**7.12B/**use data from a random sample to make inferences about a population **7.6F/**use data from a random sample to make inferences about a population	Category 4 Supporting Not Tested	SP 59 SP 60	SA 1 SA 2 SA 3	PS 1 PS 2	Homework 1 Homework 2
Review **Assessment** 2 days	**Six Weeks 3 Open-Ended Review** **Six Weeks 3 Assessment**					

Teacher Notes:

Materials List

GRADE 7 MATERIALS LIST - SIX WEEKS 3

SIX WEEKS	LESSON	ITEM	QUANTITY
3	1	Number cards (copy on cardstock, cut apart, and place in baggie) Percent cards (copy on cardstock, cut apart, and place in baggie)	1 set per pair of students 1 set per pair of students
3	2	No materials needed	
3	3	Centimeter grid paper 0.5 centimeter grid paper Circle Pi circles (copy on cardstock, cut apart, and place in baggie) Circular object Measuring tape Safety compass Centimeter ruler	1 per pair of students 1 per pair of students 1 set per group of 4 students 1 per group of 4 plus 3 extra 1 per student 1 per student 1 per student
3	4	4 colored tiles using 4 colors in a bag Penny Number cube	1 per pair of students 1 per pair of students 1 per pair of students
3	5	No materials needed	
3	6	No materials needed	
3	7	Rectangular prism Metric ruler Butcher paper	1 per pair of students 1 per pair of students 2 sheets per pair of students
3	8	Number cubes Butcher paper Colored Markers	2 per pair of students 1 per pair of students 2 sheets per pair of students
3	9	No materials needed	

Mini-Assessment Answer Key

GRADE 7 TEKS-BASED ASSESSMENTS – SIX WEEKS 3
TEKS Correlation and Answer Key for Mini-Assessments

Mini-Assessment And TEKS Assessed	Question Number									
	1	2	3	4	5	6	7	8	9	10
Lesson 1 MA 7.4D	C	3.84	D	H	B	H	C	G	C	J
Lesson 2 MA 7.7A	A	G	C	H	C	H	D	F	B	F
Lesson 3 MA 7.8C/7.5B/7.9B	A 7.5B	G 7.9B	14.5 7.9B	H 7.5B	C 7.9B	H 7.9B	A 7.9B	G 7.5B	C 7.9B	24 7.9B
Lesson 4 MA 7.6I	D	F	C	J	B	G	D	G	A	J
Lesson 5 MA 7.8B/7.9A	A 7.8B	G 7.8B	1360 7.8B	J 7.9A	C 7.9A	623.5 7.9A	B 7.9A	G 7.9A	D 7.9A	180 7.9A
Lesson 6 MA 7.9C	C	H	182.2	F	C	79.5	A	F	B	G
Lesson 7 MA 7.9D	C	J	114	H	A	196	C	G	B	F
Lesson 8 MA 7.6G	A	H	B	J	C	G	D	G	B	F
Lesson 9 MA 7.12B/7.6F	B	F	C	H	A	G	D	F	C	J

Six Weeks 3
Lesson 4

Six Weeks 3
Lesson 4

7.6I Lesson and Assessment

Lesson Focus

For TEKS 7.6I, students should be able to demonstrate an understanding of how to represent probabilities and numbers. Students apply mathematical process standards to probability and statistics to describe or solve problems involving proportional relationships.

Students are expected to determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces.

Process Standards Incorporated Into Lesson

7.1A apply mathematics to problems arising in everyday life, society, and the workplace

7.1B Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution

7.1D Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.

7.1E Create and use representations to organize, record, and communicate mathematical ideas

Materials Needed for Lesson

1. **Per Student:** 1 copy of all pages for student activities for this lesson, Skills and Concepts Homework, and mini-assessment for this lesson

2. Student Activity 3: **Per Pair of Students**: 1 bag of 4 colored tiles using 4 colors; 1 penny; 1 number cube

Math Background-Determining Experimental and Theoretical Probabilities using Data

Recall from an earlier lesson, the probability of an event is the ratio of the number of favorable outcomes to the number of possible outcomes.

$$P(\text{event}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

There are two types of probabilities. One probability is called the theoretical probability. The theoretical probability ratio is still $\frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$. For example, if you toss a coin, there are 2 possible outcomes, a tail or a head. The theoretical probability of tossing a head is $\frac{1}{2}$. The theoretical probability of tossing a tail is also $\frac{1}{2}$.

The other type of probability is called the experimental probability. The experimental probability ratio is $\frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$. The data used in the ratio is based on an experiment of trials.

For example, if you toss a coin 50 times, you could get 25 heads and 25 tails which would match the theoretical probability. However, it is more likely you would get data such as 27 tails and 23 heads. If this were the data you recorded for tossing a penny 50 times, the experimental probability of tossing a head would NOT be $\frac{1}{2}$. It would $\frac{\text{number of heads}}{\text{number of tosses}}$ or $\frac{23}{50}$, which is less than $\frac{1}{2}$.

The more possible outcomes you have, the more likely the experimental probability will be closer to the theoretical probability. If you tossed a coin 2000 times, you would expect the number of heads and the number of tails to be close to 1000 each or $\frac{1}{2}$ of the tosses.

Since a probability is a ratio of two values, it can be expressed as a fraction, decimal, or percent. If the probability is $\frac{1}{2}$, then it can be written also as 0.5 or 50%.

Example: A bag contains 5 red tiles, 6 blue tiles, and 4 yellow tiles. Benny randomly selects a tile from the bag. What is the theoretical probability he will select a red tile? A yellow tile? A blue tile?

$$P(r) = \frac{\text{number of red tiles}}{\text{number of tiles}} = \frac{5}{15} = \frac{1}{3}$$

The theoretical probability of randomly drawing a red tile is $\frac{1}{3}$ or $33\frac{1}{3}\%$.

$$P(y) = \frac{\text{number of yellow tiles}}{\text{number of tiles}} = \frac{4}{15}$$

The theoretical probability of randomly drawing a yellow tile is $\frac{4}{15}$ or $26\frac{2}{3}\%$.

$$P(b) = \frac{\text{number of blue tiles}}{\text{number of tiles}} = \frac{6}{15} = \frac{2}{5}$$

The theoretical probability of randomly drawing a blue tile is $\frac{2}{5}$ or 40%.

Example: A bag contains 5 red tiles, 6 blue tiles, and 4 yellow tiles. Benny randomly selects a tile from the bag. Benny draws a tile from the bag, records it color, and returns the tile to the bag before drawing another tile. He does this 40 times. The results of his experiment are recorded in the table below.

Color	red	blue	yellow
No. of Draws	12	18	10

Based on Benny's data from his experiment, what is the experimental probability the next tile he draws from the bag will be red?

$$P(r) = \frac{\text{number of red draws}}{\text{number of draws}} = \frac{12}{40} = \frac{3}{10} \text{ or } 30\%$$

Based on Benny's data from his experiment, what is the experimental probability the next tile he draws from the bag will be yellow?

$P(y) = \dfrac{\text{number of yellow draws}}{\text{number of draws}} = \dfrac{10}{40} = \dfrac{1}{4}$ or 25%

Based on Benny's data from his experiment, what is the experimental probability the next tile he draws from the bag will be blue?

$P(b) = \dfrac{\text{number of blue draws}}{\text{number of draws}} = \dfrac{18}{40} = \dfrac{9}{20}$ or 45%

Example: Using the two examples above, compare the theoretical probability to the experimental probability of drawing each color tile.

RED:

The theoretical probability of drawing a red is $\frac{1}{3}$ or $33\frac{1}{3}\%$. The experimental probability of drawing a red is $\frac{3}{10}$ or 30%. The theoretical probability is slightly larger than the experimental probability.

YELLOW:

The theoretical probability of drawing a yellow is $\frac{4}{15}$ or $26\frac{2}{3}\%$. The experimental probability of drawing a yellow is $\frac{1}{4}$ or 25%. The theoretical probability is slightly larger than the experimental probability.

BLUE: The theoretical probability of drawing a blue is $\frac{2}{5}$ or 40%. The experimental probability of drawing a blue is $\frac{9}{20}$ or 45%. The experimental probability is slightly larger than the theoretical probability.

The sum of the three theoretical probabilities and the sum of the three experimental probabilities must each be 1 or 100%. Use that as a check to make sure you have not miscalculated.

Simple events are when there is one event. The event can be tossing a coin, rolling a number cube, drawing a card, spinning a spinner, etc. Compound events are when you have more than one event occurring. The events could be tossing a coin and spinning a spinner, tossing a coin and rolling a number cube, drawing a card and spinning a spinner, spinning 2 different spinners, etc.

Compound events can be events that are independent events. Independent events are events that the results of one event do NOT affect the results of the other event. An example of independent events is tossing a coin and spinning a spinner. If the results of one event do affect the results of the second event, then they are dependent events. An example of dependent events is drawing 2 tiles from a bag, one at a time, and NOT replacing the first tile before drawing the second tile. The first draw affects the number of tiles in the bag for the second draw.

Where there are two independent events, the probability of certain events occurring is the product of the probability of each event occurring. $P(A \text{ and } B) = P(A) \times P(B)$

When there are two dependent events, the probability of certain events occurring is the probability of the first event times the probability of the second event occurring given the occurrence of the first event. This is written P(A and B)= P(A) $\times$ P(B/A)

Example: A bag contains 5 red marbles and 10 blue marbles. You are to select a marble, record its color, replace the marble in the bag, and then draw a second marble. What is the probability you will draw 2 marbles that are red?

The P(r) = $\frac{5}{15} = \frac{1}{3}$ for the first draw. The P(r) = $\frac{5}{15} = \frac{1}{3}$ for the second draw.

The P(r and r) = $\frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$.
These were independent events.

Example: A bag contains 5 red marbles and 10 blue marbles. You are to select a marble, record its color, do NOT replace the marble in the bag, and then draw a second marble. What is the probability you will draw 2 marbles that are red?

The P(r) = $\frac{5}{15} = \frac{1}{3}$ for the first draw. The P(r) = $\frac{4}{14} = \frac{2}{7}$ for the second draw. (1 red has been drawn and NOT replaced so there are only 4 red marbles now and there are only 14 marbles)

The P(r and r) = $\frac{1}{3} \times \frac{2}{7} = \frac{2}{21}$.

These were dependent events.

The probabilities of drawing 2 red marbles are not the same for the two examples. Replacing the marble back in the bag before drawing the second marble makes the events independent. Which situation had the greater probability of occurring?

Determining Theoretical and Experimental Probabilities using Sample Spaces

A **sample space** of an event is a set of all the possible outcomes of the event. The set can be a list, a tree diagram, or a table.

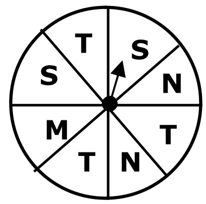
A sample space for tossing a coin is {heads, tails}. A sample space for rolling a 1-6 number cube is the list: 1, 2, 3, 4, 5, and 6.

To determine the probability of an event using a sample space, use the same ratio $\frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$. Look at the sample space and count the number of favorable outcomes for the numerator of the ratio. Count the total number of entries in the set for the denominator of the ratio.

Example: What is the probability of rolling a 6 on a 1-6 number cube?

A sample space for rolling a number cube is {1, 2, 3, 4, 5, 6}. The number of favorable outcomes (a 6) is 1. The number of entries in the set is 6. The ratio that represents the probability is $\frac{1}{6}$.

Example: If you spin the spinner below, what is the probability you will spin a T?



A sample space for the spinner is {S, T, S, N, T, N, T, M}. The probability or spinning a T is $\frac{\text{number of Ts}}{\text{number of outcomes}}$. P(T)= $\frac{3}{8}$

Example: You are rolling a number cube and tossing a coin. What is the probability you will roll a 4 and toss a tails?

A sample space for the number cube is {1, 2, 3, 4, 5, 6}

A sample space for tossing a coin is {heads, tails}

P (4)= $\frac{1}{6}$ P(tails) = $\frac{1}{2}$ P(4 and tails)=$\frac{1}{6} \times \frac{1}{2} = \frac{1}{12}$

A sample space for both events could be the list: 1/tails; 1/heads; 2/tails; 2/heads; 3/tails; 3/heads; 4/tails; 4/heads; 5/tails; 5/heads; 6/tails; 6/heads

There are 12 items in the list and 1 in the list is 4/tails. The probability would be $\frac{1}{12}$.

Example: A dessert store kept a record of the number of slices of apple pie they sold one day last week. They also recorded the choice of topping. The table shows the sample space of the apple pie slices sold that day.

Topping	Whipped Cream	Ice Cream	No Topping
Number Served	32	25	43

What is the probability the next slice of apple pie ordered will have a whipped cream topping?

Total the number of slices served. 32 + 25+ 43 = 100. P(WC) = $\frac{32}{100}$ or 32%.

Determining Theoretical and Experimental Probabilities Using Data

Recall from an earlier lesson, the probability of an event is the ratio of the number of favorable outcomes to the number of possible outcomes.

$$P(\text{event}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

There are two types of probabilities. One probability is called the theoretical probability. The **theoretical probability** ratio is still:

$$\frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}.$$

For example, if you toss a coin, there are 2 possible outcomes, a tail or a head. The theoretical probability of tossing a head is $\frac{1}{2}$. The theoretical probability of tossing a tail is also $\frac{1}{2}$.

The other type of probability is called the **experimental probability**. The experimental probability ratio is still:

$$\frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}.$$

The data used in the ratio is based on an experiment of trials. For example, if you toss a coin 50 times, you could get 25 heads and 25 tails which would match the theoretical probability. However, it is more likely you would get data such as 27 tails and 23 heads. If this were the data you recorded for tossing a penny 50 times, the experimental probability of tossing a head would NOT be $\frac{1}{2}$. It would $\frac{\text{number of heads}}{\text{number of tosses}}$ or $\frac{23}{50}$, which is less than $\frac{1}{2}$.

The more possible outcomes you have, the more likely the experimental probability will be closer to the theoretical probability. If you tossed a coin 2,000 times, you would expect the number of heads and the number of tails to be close to 1,000 each or $\frac{1}{2}$ of the tosses.

Since a probability is a ratio of two values, it can be expressed as a fraction, decimal, or percent. If the probability is $\frac{1}{2}$, then it can be written also as 0.5 or 50%.

Example: A bag contains 5 red tiles, 6 blue tiles, and 4 yellow tiles. Benny randomly selects a tile from the bag. What is the theoretical probability he will select a red tile? a yellow tile? a blue tile?

$$P(r) = \frac{\text{number of red tiles}}{\text{number of tiles}} = \frac{5}{15} = \frac{1}{3}$$

The theoretical probability of randomly drawing a red tile is $\frac{1}{3}$ or $33\frac{1}{3}\%$.

$$P(y) = \frac{\text{number of yellow tiles}}{\text{number of tiles}} = \frac{4}{15}$$

The theoretical probability of randomly drawing a yellow tile is $\frac{4}{15}$ or $26\frac{2}{3}\%$.

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The theoretical probability of randomly drawing a blue tile is $\frac{2}{5}$ or 40%.

Example: A bag contains 5 red tiles, 6 blue tiles, and 4 yellow tiles. Benny randomly selects a tile from the bag. Benny draws a tile from the bag, records it color, and returns the tile to the bag before drawing another tile. He does this 40 times. The results of his experiment are recorded in the table below.

Color	red	blue	yellow
No. of Draws	12	18	10

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Based on Benny's data from his experiment, what is the experimental probability the next tile he draws from the bag will be yellow?

$$P(y) = \frac{\text{number of yellow draws}}{\text{number of draws}} = \frac{10}{40} = \frac{1}{4} \text{ or } 25\%$$

Based on Benny's data from his experiment, what is the experimental probability the next tile he draws from the bag will be blue?

$$P(b) = \frac{\text{number of blue draws}}{\text{number of draws}} = \frac{18}{40} = \frac{9}{20} \text{ or } 45\%$$

Example: Using the two examples above, compare the theoretical probability to the experimental probability of drawing each color tile.

RED:

The theoretical probability of drawing a red is $\frac{1}{3}$ or $33\frac{1}{3}\%$. The experimental probability of drawing a red is $\frac{3}{10}$ or 30%. The theoretical probability is slightly larger than the experimental probability.

YELLOW:

The theoretical probability of drawing a yellow is $\frac{4}{15}$ or $26\frac{2}{3}\%$. The experimental probability of drawing a yellow is $\frac{1}{4}$ or 25%. The theoretical probability is slightly larger than the experimental probability.

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The sum of the three theoretical probabilities and the sum of the three experimental probabilities must each be 1 or 100%. Use it as a check to make sure you have not miscalculated.

Simple events are when there is one event. The event can be tossing a coin, rolling a number cube, drawing a card, spinning a spinner, etc.

Compound events are when you have more than one event occurring. The events could be tossing a coin and spinning a spinner, tossing a coin and rolling a number cube, drawing a card and spinning a spinner, spinning 2 different spinners, etc.

Compound events can be events that are independent events or dependent events.

Independent events are events that the results of one event do NOT affect the results of the other event. An example of independent events is tossing a coin and spinning a spinner.

If the results of one event do affect the results of the second event, then they are **dependent events**. An example of dependent events is drawing 2 tiles from a bag, one at a time, and NOT replacing the first tile before drawing the second tile. The first draw affects the number of tiles in the bag for the second draw.

Where there are two independent events, the probability of certain events occurring is the product of the probability of each event occurring.
P(A and B)= P(A) $\times$ P(B)

When there are two dependent events, the probability of certain events occurring is the probability of the first event times the probability of second event occurring given the occurrence of the first event.

This is written P(A and B)= P(A) $\times$ P(B/A)

Example: A bag contains 5 red marbles and 10 blue marbles. You are to select a marble, record its color, replace the marble in the bag, and then draw a second marble. What is the probability you will draw 2 marbles that are red?

The P(r) = $\frac{5}{15} = \frac{1}{3}$ for the first draw. The P(r) = $\frac{5}{15} = \frac{1}{3}$ for the second draw.

The P(r and r) = $\frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$.

These were independent events.

Example: A bag contains 5 red marbles and 10 blue marbles. You are to select a marble, record its color, do NOT replace the marble in the bag, and then draw a second marble. What is the probability you will draw 2 marbles that are red?

The P(r) = $\frac{5}{15} = \frac{1}{3}$ for the first draw. The P(r) = $\frac{4}{14} = \frac{2}{7}$ for the second draw. (1 red has been drawn and NOT replaced so there are only 4 red marbles now and there are only 14 marbles)

The P(r and r) = $\frac{1}{3} \times \frac{2}{7} = \frac{2}{21}$.

These were dependent events.

The probabilities of drawing 2 red marbles are not the same for the two examples. Replacing the marble back in the bag before drawing the second marble makes the events independent. Which situation had the greater probability of occurring?

Problem-Solving 1

Problem 1: Eight number cards are placed face down on a table. The numbers on the cards are 1, 3, 5, 6, 8, 10, 11, and 15. Barbara randomly selects a card and turns it over. What is the probability she selected:

a) the 11 card

b) a card with an even number

c) a card with an odd number

d) a card with a number with 2 digits

e) a card with a number that is a factor of 15

Problem 2: Sarah rolled a 1-6 number cube 54 times. The results of her experiment are shown in the table below.

Number	1	2	3	4	5	6
Frequency	6	9	10	9	10	10

- What is the experimental probability of rolling a 3 the next roll?

- What is the experimental probability of rolling a 2 the next roll?

Student Activity 1

Work with your partner to answer the following questions.

Problem 1: Explain the difference between a theoretical probability and an experimental probability.

Give an example of a theoretical probability.

Problem 2: You are rolling a 1-6 number cube. What is the probability you will roll:

- a 5?
- a 2?
- a number greater than 2?
- a number less than 5?

Problem 3: Suppose you roll the number cube two times. What is the probability you will roll:
Show your work.

- a 2 on the first roll and a 1 on the second roll?
- a 3 of the first roll and a number greater than 3 on the second roll?
- a 5 on both rolls?

Problem 4: What is the difference between dependent and independent events?

- Give an example of 2 independent events.
- Give an example of 2 dependent events

Problem 5: How is the probability of two independent events occurring different from the probability of 2 dependent events occurring?

Problem 6: A bag contains 12 marbles. Nine of the marbles are white and 3 of the marbles are red. You are two draw 2 marbles from the bag. What is the probability that you will draw:

- a white marble and then a red marble if you replace the first marble before drawing the second marble? Show your work.
- a white marble and then a red marble if you do NOT replace the first marble before drawing the second marble? Show your work.
- two red marbles, if the first marble is replaced before drawing the second marble?
- two red marbles, if the first marble is NOT replaced before drawing the second marble?

Problem 7: If you toss a coin and roll a 1-6 number cube, what is the probability you will toss a head and roll a 5?

Problem 8: In an experiment you tossed a coin 50 times and rolled a number cube 50 times. You tossed a head 30 times. The table below shows the frequency of each number for the number cube rolls.

Number	1	2	3	4	5	6
Frequency	6	9	10	9	7	9

What is the experimental probability on the next toss and roll you will get a head and a 4?

Determining Theoretical Probability and Experimental Probability using Sample Spaces

A **sample space** of an event is a set of all the possible outcomes of the event. The set can be a list, a tree diagram, or a table.

A sample space for tossing a coin is {heads, tails}. A sample space for rolling a 1-6 number cube is the list: 1, 2, 3, 4, 5, and 6.

To determine the probability of an event using a sample space, use the same ratio

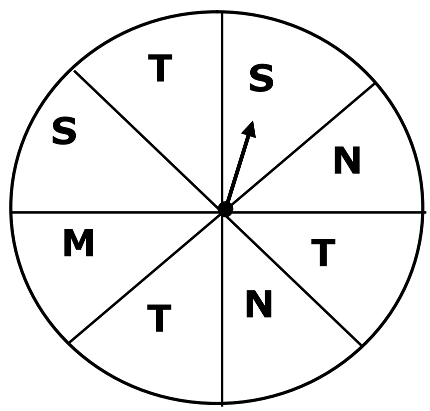
$$\frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}.$$

Look at the sample space and count the number of favorable outcomes for the numerator of the ratio. Count the total number of entries in the set for the denominator of the ratio.

Example: What is the probability of rolling a 6 on a 1-6 number cube?

A sample space for rolling a number cube is {1, 2, 3, 4, 5, 6}. The number of favorable outcomes (6) is 1. The number of entries in the set is 6. The ratio that represents the probability is $\frac{1}{6}$.

Example: If you spin the spinner below, what is the probability you will spin a T?



A sample space for the spinner is {S, T, S, N, T, N, T, M}. The probability or spinning a T is

$$\frac{\text{number of Ts}}{\text{number of outcomes}}. \quad P(T) = \frac{3}{8}$$

Example: You are rolling a number cube and tossing a coin. What is the probability you will roll a 4 and toss a tails?

A sample space for the number cube is {1, 2, 3, 4, 5, 6}

A sample space for tossing a coin is {heads, tails}

P (4)= $\frac{1}{6}$ P(tails) = $\frac{1}{2}$

P(4 and tails)=$\frac{1}{6} \times \frac{1}{2} = \frac{1}{12}$

A sample space for both events could be the list: 1/tails; 1/heads; 2/tails; 2/heads; 3/tails; 3/heads; 4/tails; 4/heads; 5/tails; 5/heads; 6/tails; 6/heads

There are 12 items in the list and 1 in the list is 4/tails. The probability would be $\frac{1}{12}$.

Example: A dessert store kept a record of the number of slices of apple pie they sold one day last week. They also recorded the choice of topping. The table shows the sample space of the apple pie slices sold that day.

Topping	Whipped Cream	Ice Cream	No Topping
Number Served	32	25	43

What is the probability the next slice of apple pie ordered will have a whipped cream topping?

Total the number of slices served. 32 + 25+ 43 = 100. P(WC) = $\frac{32}{100}$ or 32%.

Problem-Solving 2

Problem 1:

- Give a sample space for spinning a spinner that has 5 equal spaces numbered 1,2,3,4, and 5.

- What is the probability you will spin a 3?

- What is the probability you will spin an even number?

Problem 2:

- Create a sample space for spinning the spinner in Problem 1 and tossing a penny.

- What is the probability you will spin a 3 and toss a head?

- What is the probability you will spin a number larger than 2 and toss a tail?

Student Activity 2

Work with your partner to answer the following questions.

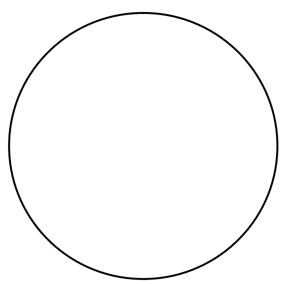
Problem 1: What is a sample space?

Give a sample space for tossing a coin and rolling a 1-6 number cube.

Problem 2: Using the sample space you gave in Problem 1, what is the probability you will:

- toss a head and roll a 6?
- toss a tail and roll a number larger than 3?
- toss a head and roll an even number?

Problem 3: Use the circle below to create a spinner with 3 equal sectors. Label the sectors A, B, and C.



- Create a sample space to show the outcomes of 2 spins of the spinner.
- What is the probability you will:
  spin A A?

  spin C A?

not spin a BC?

not spin a B either spin?

Problem 4: Benny and Laurie worked together to complete an experiment. Benny tossed a coin and recorded the results of the toss. He did this 50 times. Laurie rolled a number cube and recorded the number she rolled. She did this 50 times. The data they collected is shown below.

Heads	Tails
21	29

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

Using the sample space for the results of their experiment, find the following probabilities. Show your work.

- Tossing a head and rolling a 2
- Tossing a head and rolling a 4 or 5
- Tossing a tail and rolling an odd number
- Tossing a tail and rolling a factor of 6
- Tossing a head and NOT rolling a 5

How does the experimental probability of rolling a 5 compare to the theoretical probability of rolling a 5?

How does the experimental probability of tossing a head compare to the theoretical probability of tossing a head?

Teacher Notes for Student Activity 3

MATERIALS: Per Pair of Students: 1 bag of 4 colored tiles using 4 colors; 1 penny; 1 number cube

PROCEDURE:
- Distribute materials to pairs of students.
- Students complete Student Activity 3.

Before students begin working, ask the following questions:
- How can you create a frequency table for the results of an experiment?
- Can you create a sample space for an event?

During Student Activity 3, roam the room and listen for the following:
- Do the students understand how to make the frequency table for their event?
- Do the students understand how to analyze their data and answer questions about the probabilities of their event?

During Student Activity 3, roam the room and look for the following:
- Are students working together to answer their questions?

Answers to these questions can be used to support decisions related to further whole class instruction or group and individual student instruction during tutorial settings.

Student Activity 3

MATERIALS: Per Pair of Students: 1 bag of 4 different colored tiles; 1 penny; 1 number cube

PROBLEMS:
- How can you make a sample space for an event?
- How can you make a frequency table for an event?

PROCEDURE: Work with your partner to complete this activity. Identify Student 1 and Student 2.
Part I:
- Open your bag of colored tiles. List the color of your tiles on the frequency table below.
- Create a sample space to represent the outcomes of drawing a tile from the bag. Use the space below to write your sample space.
- Create a sample space for rolling the number cube. Use the space below to write your sample space.
- Create a sample space for drawing a tile AND rolling the number cube. Use the space below to write your sample space.

Sample space for the drawing a tile:

Sample space for rolling a number cube:

Sample space for the drawing a tile AND rolling a number cube:

Experiment 1:
- Student 1 will draw a tile from the bag and record the color by tallying on the frequency chart below. Replace the tile in the bag and drawing again. Student 1 will do this 50 times and record the results of the drawings on the frequency chart below by tally marks. After all the draws, total the tally marks and complete the last row of the chart.

Color				
Frequency				
Total Draws				

- Student 2 will toss the number cube 50 times and record the results of the tosses on the frequency chart below by tally marks. After all the tosses, total the tally marks and complete the last row of the chart.

Number	**1**	**2**	**3**	**4**	**5**	**6**
Frequency						
Total Tosses						

Using the data in the charts of the experiment, answer the following questions.

- What is the probability that the next draw and toss will be a _________ tile and a 3? (Use the first color you listed on the frequency table.)

- How does this probability compare to the theoretical probability you will draw a ______ tile and toss a 3? (Use the third color you listed on the frequency table.) (Use your sample space from the other page.)

- What is the probability that the next draw and toss will be a _______ tile and a 6? (Use the second color you listed on the frequency table.)

- What is the probability that the next draw and toss will be a _______ tile and a 2 or 3? (Use the third color you listed on the frequency table.)

- What is the probability that the next draw and toss will be a _______ tile and an even number? (Use the fourth color you listed on the frequency table.)

Part II: Experiment 2:

- Student 1 will toss the penny 25 times and Student 2 will tally the results in the chart Student 2 will toss the penny 25 times and Student 1 will continue the tally of the results in the chart.

	Heads	Tails
Total		

Using the frequency tables from Experiment 1 and the frequency table for the penny toss, answer the following questions.

- What is the probability of tossing a head and drawing a (first color listed) tile?

- What is the probability of tossing a tail and rolling a 5?

- What is the probability of tossing a head, rolling a 2, and drawing a (second color listed) tile?

- When tossing the penny and rolling the cube, does one outcome of tossing the penny and rolling a particular number appear to have a larger probability than any other similar outcome?

  If so, what is the outcome?

  Theoretically, should there be one outcome with a larger probability? Explain your answer.

Part III:

- Did you have any difficulties in answering any of the questions in this activity?_____ If so, which questions?
- Did you have any difficulties in creating the frequency tables?
- How did you check your frequency table to make sure you had completed the experiment?
- Create a compound event using all three frequency charts. Write the event below, and then find the probability of the event occurring.

NAME____________________ DATE______________________ SCORE ___/5

7.6I Skills and Concepts Homework 1

1. What is the ratio that represents the probability of a simple event occurring?

2. What is the probability you will:

   - toss a head on a coin?

   - roll a 4 on a 1-6 number cube?

3. What is the probability you will toss a head and roll a 4 on a 1-6 number cube?

4. What are compound events?

   What are independent events of a compound event?

   What are dependent events of a compound event?

   Give an example of independent events and an example of dependent events.

5. How do you find the probability of independent and dependent events?

NAME____________________ DATE______________________ SCORE ___/5

7.6I Skills and Concepts Homework 2

1. What is a sample space?

   Give a sample space for drawing a tile from a bag that contains 1 red tile, 1 blue tile, 1 green tile, and 1 yellow tile.

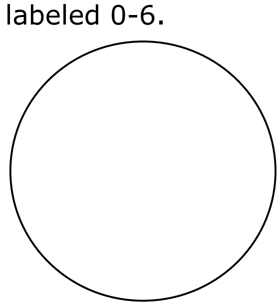
2. Joanie tossed a nickel 30 times. She tallied 18 heads and 12 tails.

   - What is the experimental probability the next toss will be a tail?
   - What is the experimental probability the next toss will be a head?
   - What is the theoretical probability the next toss will be head?

3. Make a sample space for tossing a nickel and rolling a 1-6 number cube.

   - How many items are in your sample space? ___________
   - What is the probability of tossing a head and rolling a 1?
   - What is the probability of tossing a tail and rolling a 3 or 5? Circle the favorable outcomes in the sample space you created.

4. Create a spinner with 7 equal spaces labeled 0-6.



- Create a sample space for tossing a coin and spinning the spinner.

- How many elements are in your sample space? _________

- How many elements in your sample space contain a 3?

- How many elements in your sample space contain a head?

- How many elements in your sample space contain both a head and a 3?

- What is the probability you will spin a 3 and toss a head?

5. A bag contains 3 white marbles and 2 black marbles.

   - You draw a marble, record it color, and do NOT replace it before drawing a second marble. What is the probability you will draw a white marble and then a black marble?

   - You draw a marble, record it color, and replace it before drawing a second marble. What is the probability you will draw a white marble and then a black marble?

   - Which of the two situations above are dependent events?

   - Which of the two situations has the larger probability of occurring?

NAME____________________ DATE______________________ SCORE ___/10

Mini-Assessment 7.6I

1. A 1-6 number cube is tossed two times. What is the probability the first toss will be a 5 and the second toss will be a 3?

A $\frac{1}{3}$

B $\frac{1}{6}$

C $\frac{1}{18}$

D $\frac{1}{36}$

---

2. The table below shows the frequency of each number of a 1-6 number cube when the cube was rolled 100 times.

Number	1	2	3	4	5	6
Frequency	17	22	10	21	16	14

Based on the data in the table, what is the probability that on the next roll a multiple of 2 will be rolled?

F 57%

G 43%

H 35%

J 24%

---

3. A jawbreaker candy machine has 30 red jawbreakers, 40 green jawbreakers, 25 yellow jawbreakers, and 30 blue jawbreakers. If Lana puts 1 coin in the machine and gets 1 jawbreaker, what is the probability the jawbreaker is green?

A $\frac{1}{4}$

B $\frac{1}{125}$

C $\frac{8}{25}$

D $\frac{1}{40}$

4. When rolling two 1-6 number cubes, the table below shows the possible products for the two numbers rolled.

X	1	2	3	4	5	6
1	1	2	3	4	5	6
2	2	4	6	8	10	12
3	3	6	9	12	15	18
4	4	8	12	16	20	24
5	5	10	15	20	25	30
6	6	12	18	24	30	36

If Kendra rolled two number cubes, what is the probability she will roll a product of 12?

F $\frac{11}{36}$

G $\frac{1}{3}$

H $\frac{5}{18}$

J $\frac{1}{9}$

---

5. When rolling two 1-6 number cubes, the table below shows the possible sums for the two numbers rolled.

+	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

Which of the following statements is NOT true based on the information in the sample space above?

A The probability of rolling a sum of 2 is the same as the probability of rolling a sum of 12.

B The probability of rolling a sum of 5 is the same as the probability of rolling a sum of 8.

C The probability of rolling a sum of 10 is greater than the probability of rolling a sum of 3.

D The probability of rolling a sum of 7 has the greatest probability of all the sums.

6. A new shoe comes in three colors: red, white, or black. It also comes in whole sizes 5 to 9. The sample space for randomly selecting a pair of the shoes for a display is shown below.

   {red, 5; red, 6; red, 7; red, 8; red, 9; white, 5; white, 6; white, 7; white, 8; white, 9; black, 5; black, 6; black, 7; black, 8; black, 9}

   What is the probability a clerk will select a white shoe that is either a 7 or 8 for the display?

   F $\frac{1}{8}$

   G $\frac{2}{15}$

   H $\frac{1}{3}$

   J $\frac{2}{5}$

---

7. A deli menu has 3 types of salad: house salad, Caesar salad, and fruit salad. The menu also has 3 types of sandwiches: ham, chicken, and turkey. If Margie randomly selects 1 salad and 1 sandwich from the menu, what is the probability she will select a ham sandwich and a fruit salad?

   A $\frac{1}{2}$

   B $\frac{1}{3}$

   C $\frac{1}{6}$

   D $\frac{1}{9}$

---

8. The table below shows the frequency of tossing a penny and a nickel 60 times. The results show the results of the toss for the penny and then the nickel. H, T indicates a head on the penny and a tails on the nickel.

Result	H, H	H, T	T, T	T, H
Frequency	14	12	18	16

   Based on the data in the table, what is the experimental probability that on the next toss the penny will be tails and the nickel will be heads?

   F $\frac{1}{16}$

   G $\frac{4}{15}$

   H $\frac{1}{4}$

   J $\frac{1}{3}$

9. A bag contains 3 red beads and 4 white beads. Joan drew a bead from the bag, did not replace it, and drew a second bead. What is the probability Joan drew a white bead on both draws?

A $\frac{2}{7}$

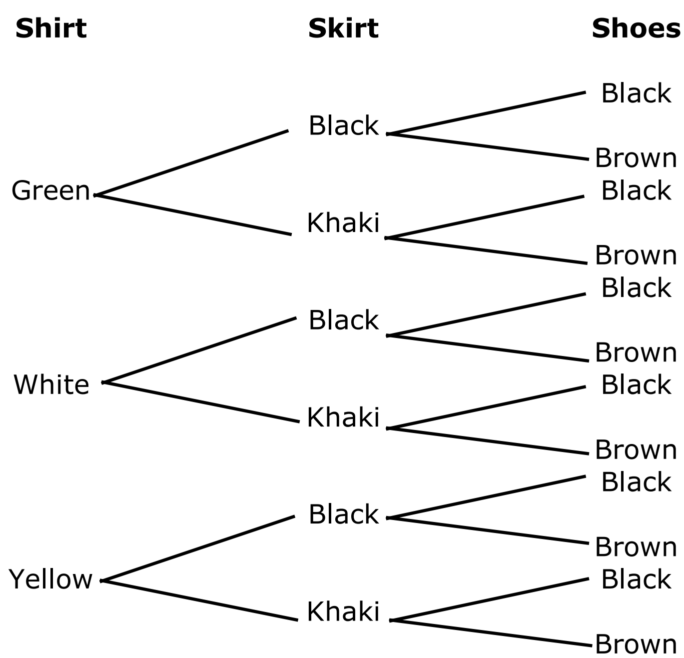
B $\frac{1}{7}$

C $\frac{3}{7}$

D $\frac{1}{2}$

---

10. The tree diagram below shows the possible outcomes for Lindsey choosing an outfit of 1 shirt, 1 skirt, and 1 pair of shoes.



What is the probability that Lindsey randomly chooses an outfit that has a green shirt?

F $\frac{1}{2}$

G $\frac{5}{12}$

H $\frac{1}{4}$

J $\frac{1}{3}$

Six Weeks 3 Review and Assessment

Six Weeks 3 Review

This review can be used in the same manner as a Student Activity from the lessons. Notes can be used to complete the review and they can work with a partner. You can assign different portions to different partner pairs to be responsible for debriefing for the entire class. Students can complete any answers they did not get before the debriefing. They just need to use a different color to record any additional answers.

It can be completed entirely in class, or it can be taken home to be completed and then debriefed in class prior to the six week assessment.

Six Weeks 3 Review

Lesson 1: 7.4D

1. What is a percent of change?

   What are the two types of percent of change?

   Explain how to find a percent of change.

2. If a value increases from 4 to 6, what is the percent of increase?

3. If a value decreases from 80 to 64, what is the percent of decrease?

4. If the sales tax is 8%, what will be the amount of tax on an item that cost $48?

Lesson 2: 7.7A

1. Represent the following phrases with a mathematical expression.
   - 3 units more than the width ________________________
   - 14 units less than the length ________________________
   - Five times as much money ______________________________
   - One-fourth of the perimeter __________________________

2. Complete the table below so that it represents the equation $y = 3x + 2$

x	-3	6	9	12
$y = 3x + 2$				
y				

3. Complete the table below so that it represents the verbal description:

The longest side of a triangle, *y*, is 6.5 units longer than the shortest side, *x*.

x	4	5	8	11
y				

4. Write a verbal description that represents the linear relationship shown in the equations below. *x* represents the number of sports cards Jonas has and *y* represents the number of sports cards Brent has.

- $y = 4x - 2$

- $y = \frac{1}{2}x + 8$

5. Write the equation and verbal description that represents the linear relationship shown in the table below. *x* represents the height of a triangle and *y* represents the base of a triangle.

x	3	4	6	12
y	7	9	13	25

Lesson 3: 7.8C/7.5B/7.9B

1. Write three formulas that can be used for working problems with circles.

2. Find the circumference and area of a circle with the given diameter. Find them in terms of π and approximated to the nearest hundredth if needed. Show the formula you used and the work you did.

- 10 units

- 24 units

3. Determine what positive number was squared to give the value below.

- 25 is the square of _________________.
- 81 is the square of _________________.
- 16 is the square of _________________.

4. The area of a circle is 100π square inches. What is the radius of the circle?

5. What is the area of a circle whose diameter is 8 units? Give your answer in terms of π and an approximation to the nearest tenth of a square unit. Show your work.

6. π is the ratio of the ______________ of a circle to the _____________ of the circle. It has a rational approximation of __________.

Lesson 4: 7.6I

1. What is the ratio that represents the probability of a simple event occurring?

2. What is the probability you will:

- toss a head on a nickel?

- roll an even number on a 1-6 number cube?

3. Beatrice tossed a nickel 30 times. She tallied 16 heads and 14 tails.

   - What is the experimental probability the next toss will be a tail?

   - What is the experimental probability the next toss will be a head?

   - What is the theoretical probability the next toss will be head?

4. Make a sample space for tossing a nickel and rolling a 1-6 number cube.

   - How many items are in your sample space? __________
   - What is the probability of tossing a head and rolling a 4?
   - What is the probability of tossing a tail and rolling an even number?
   - Are these events independent events or dependent events? ____________________ Explain your answer.

5. A bag contains 3 white marbles and 3 black marbles.

   - You draw a marble, record it color, and do NOT replace it before drawing a second marble. What is the probability you will draw a white marble and then a black marble?

   - You draw a marble, record it color, and replace it before drawing a second marble. What is the probability you will draw a white marble and then a black marble?

Lesson 5: 7.8B/7.9A

1. A triangular prism and a triangular pyramid have congruent bases and heights. The volume of the prism is 183 cubic units. What is the volume of the pyramid? Show your work.

2. A triangular prism and a triangular pyramid have congruent bases and heights. The prism's triangular base has a height of 14 centimeters and a base of 9 centimeters. It has a volume of 504 cubic centimeters. What are the volume and the height of the pyramid? Show your work.

3. A triangular prism has a volume of 378 cubic units. The height of the prism is 18 units. What is the area of the base of the prism? Show your work.

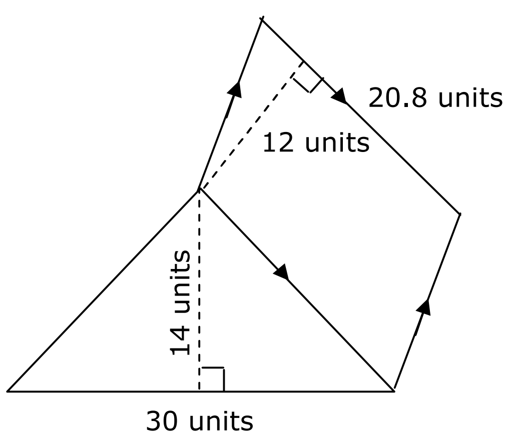
The area of the base is ___________ square units.

Lesson 6: 7.9C

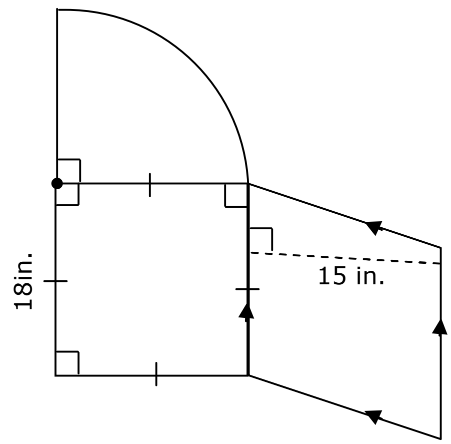
1. Create a composite figure using a rectangle, a square, and a right triangle. Label the dimensions.

Find the area of your figure.

2. Find the area of the composite figure.



3. Find the area of the composite figure below.



Step 1:

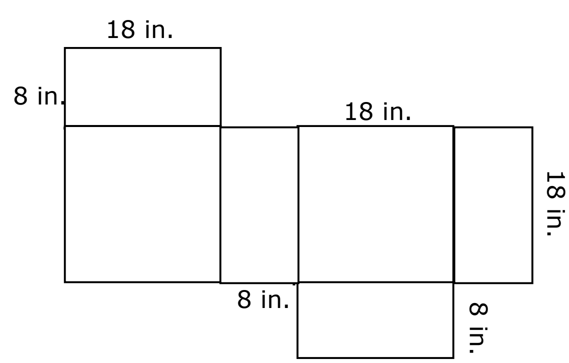
Step 2:

Step 3:

Lesson 7: 7.9D

1. List the steps used to find the total surface area of a rectangular prism.

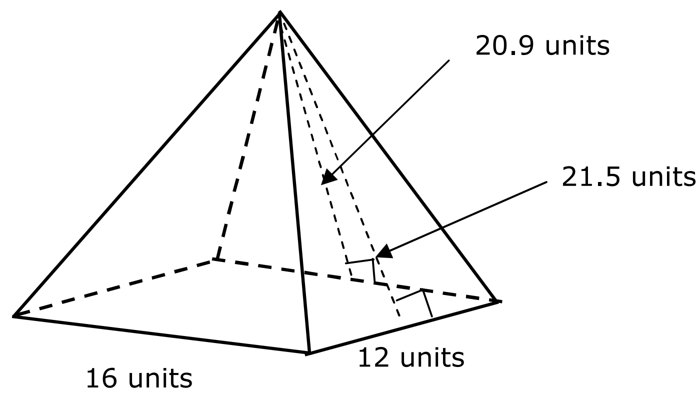
2. The figure below is a net of a rectangular prism. What are the dimensions of the prism?
______in. by ______in. by ______in. What is the total surface area of the rectangular prism?
Show your work.



3. Describe the faces of a rectangular pyramid.

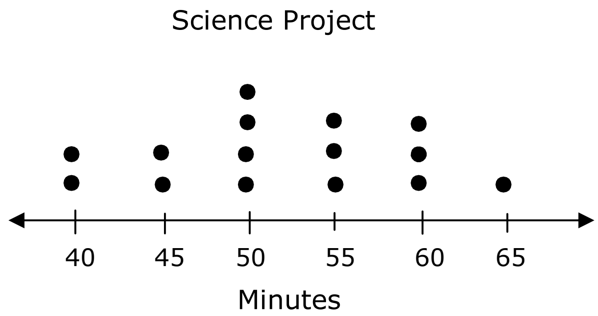
4. Do the heights of the four triangular lateral faces have to be congruent?

5. Draw a net for the rectangular pyramid below. Find the total and lateral area for the pyramid using the net.



Lesson 8: 7.6G

1. Below is a dot plot representing the number of minutes a group of seventh grade students spent on a science project last week.



- What percent of the students spent less than 50 minutes on the project?

- Of the students who spent less than 55 minutes, what percent spent 45 minutes?

- What is the ratio of the number of students who spent less than 50 minutes to the number of students who spent more than 50 minutes?

Lesson 9: 7.12B/7.6F

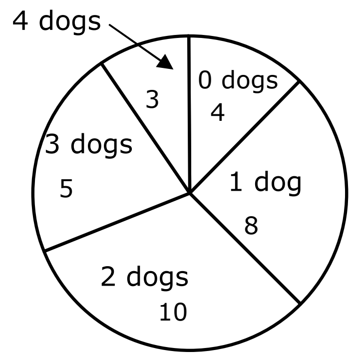
1. What is a population used for data gathering?

2. What do you need to consider when choosing a sample?

3. Mrs. White was buying a dozen eggs. She always opens the egg cartons and looks to see if any of the eggs are cracked. She had to open 4 cartons before she found one that had 12 eggs that none were cracked. If the egg storage area at the store has 80 dozen eggs, about how many would you predict have cracked eggs?

4. A survey was done to see how many dogs the students at a middle school had for their pet. Look at the circle graph below. Each sector of the circle is identified by the number of dogs and the number of students.

Number of Pet Dogs



- How many students participated in the survey? __________

- If the middle school has 500 students, do you think this is a large enough sample? ________
  Explain.

- If all the students surveyed were seventh graders, would that be a good sample? ________

  Explain.

- What percent of the students surveyed has 1 dog?

- What percent of the students who had more than 1 dog had 3 dogs?

GRADE 7 MATHEMATICS

TEKS/STAAR Six Weeks 3 Assessment

Make 1 copy of the Assessment for each student. Students answer these questions individually. Record class performance on the Class Profile Sheet and individual student performance on the Individual Student Profile Sheet.

Answer Key:		**STAAR Category/TEKS**
1.	B	Category 2/7.4D
2.	F	Category 1/7.6I
3.	D	Category 3/7.5B
4.	G	Category 3/7.9C
5.	B	Category 3/7.9B
6.	J	Category 4/7.6G
7.	B	Category 3/7.9A
8.	G	Category 3/7.9D
9.	C	Category 3/7.9C
10.	H	Category 2/7.7A
11.	C	Category 2/7.4D
12.	F	Category 4/7.12B
13.	D	Category 3/7.9D
14.	7	Category 1/7.6I
15.	844.56	Category 1/7.4D
16.	F	Category 3/7.6G
17.	C	Category 3/7.9A
18.	H	Category 3/7.7A
19.	C	Category 3/7.12B
20.	G	Category 3/7.9B

GRADE 7 MATHEMATICS

TEKS/STAAR Six Weeks 3 Assessment

1. Jennifer scored 80 on her quiz last week. This week she scored 96. What was the percent of increase on the quiz score?

   A 15%

   B 20%

   C $16\frac{2}{3}\%$

   D 25%

---

2. Lance flipped a quarter 30 times. He flipped a head 18 times and a tail 12 times. Using his data, what is the experimental probability Lance will flip a tail on the next flip?

   F 40%

   G 25%

   H 45%

   J 50%

---

3. Which of the following expressions can be used to determine the approximate diameter of a circle with a circumference of 50 inches?

   A $3.14 \div 50$

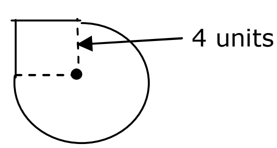
   B $50 \div 2$

   C 50×3.14

   D $50 \div 3.14$

---

4. Look at the composite figure below. A vertex of the square is the center of the circle. The side length of the square and the radius of the circle is 4 units. To the nearest whole unit, what is the area of the figure?



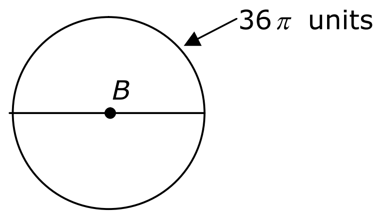
   F 76 square units

   G 54 square units

   H 24 square units

   J 108 square units

5. Look at circle B below. The circumference of the circle is 36π units.



Which best represents the area of circle B?

A 1,963 square units

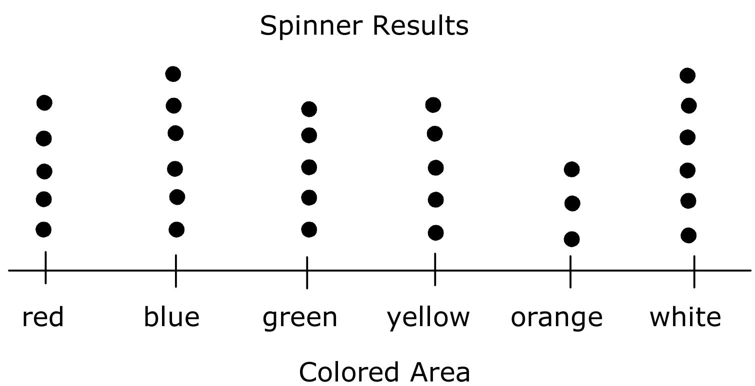
B 1,017 square units

C 113 square units

D 4,069 square units

---

6. A spinner used for a board game is divided into 6 equal colored areas. The dot plot below shows the number of times the spinner landed on a color as Jennifer played the board game with her friends.



Which statement is supported by the data shown in the dot plot?

F The spinner landed on orange 12% of the spins.

G The spinner landed on red 15% of the spins.

H The spinner landed on yellow 20% of the spins.

J The spinner landed on blue 20% of the spins.

.

7. A triangular prism has a volume of 120 cubic inches. Its height is 15 inches. Which of the following describes the area of the base of the prism?

A 101 square inches

B 8 square inches

C 6.4 square inches

D 5.8 square inches

---

8. A triangular prism and pyramid have congruent bases and heights. The volume of the pyramid is 606 cubic centimeters. What is the volume of the prism?

F 202 cubic centimeters

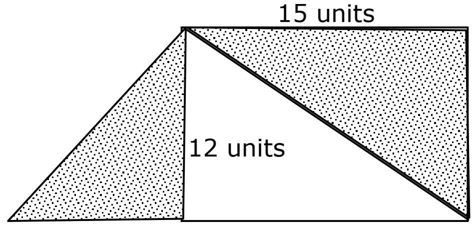
G 1,818 cubic centimeters

H 1,212 cubic centimeters

J 252 cubic centimeters

---

9. The composite figure below consists of a rectangle and a triangle.



What is the area of the shaded part of the composite figure?

A 96 square units

B 150 square units

C 138 square units

D 240 square units

---

10. The number of boys in a club is 2 more than three times the number of girls. Which equation represents this relationship?

F $b = g + 2$

G $g = 2b + 3$

H $b = 3g + 2$

J $b = 3g - 2$

11. Last week the fire department responded to 12 emergency calls. This week they responded to only 8 emergency calls. What is the percent of decrease in the number of emergency calls from last week to this week?

A 12.5 %

B 37.5 %

C $33\frac{1}{3}$ %

D 60 %

---

12. A survey of 400 radio listeners was conducted to find the number who listened to a weekly sports program. Of the listeners surveyed, 250 said that they had listened to the sports program at least once. If an additional 2,800 listeners are surveyed, which is the best prediction of the number of those listeners who have listened to the sports program at least once?

F 1,750

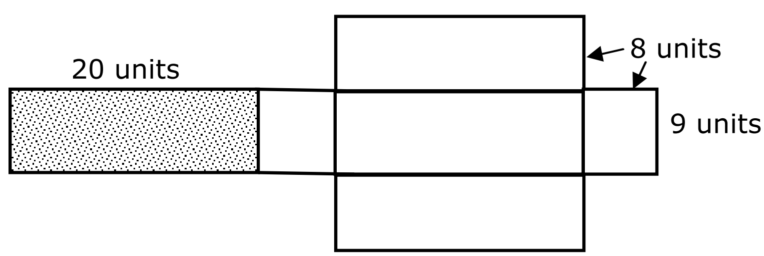
G 1,000

H 2,150

J 2,000

---

13. The net of a rectangular prism is shown below. One of the bases is shaded.



Which best represents the total surface area of the prism?

A 644 square units

B 364 square units

C 464 square units

D 824 square units

14. A bag contains 14 green tiles, 10 red tiles, and 16 blue tiles. What is the theoretical probability that you will randomly select a red tile?

F 25%

G 16%

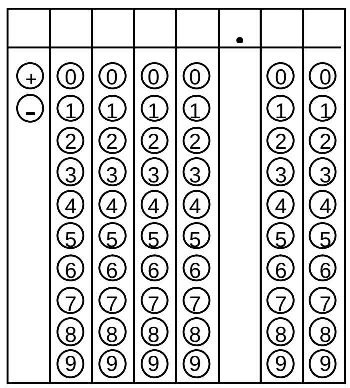
H 40%

J 35%

---

15. A new television's regular price is $920. It is on sale with a 15% discount. Ms. Adams buys the television on sale and pays an 8% sales tax. What was the total cost of the television?

Record your answer on the grid below. Be sure to use the correct place value.



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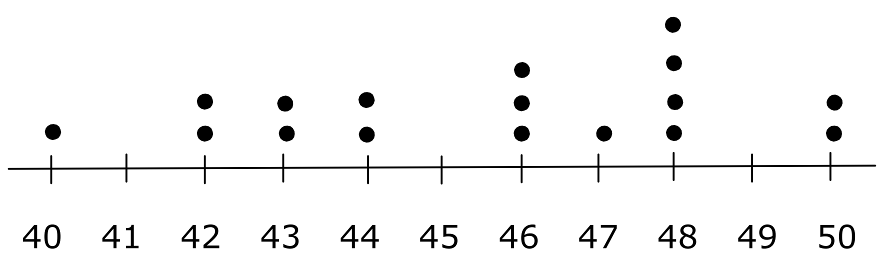
16. Look at the dot plot below. It displays in whole units the perimeter of triangles the class created.

Perimeters of Triangles in units



What percent of the triangles with perimeters larger than 44 units have a perimeter of 50 units?

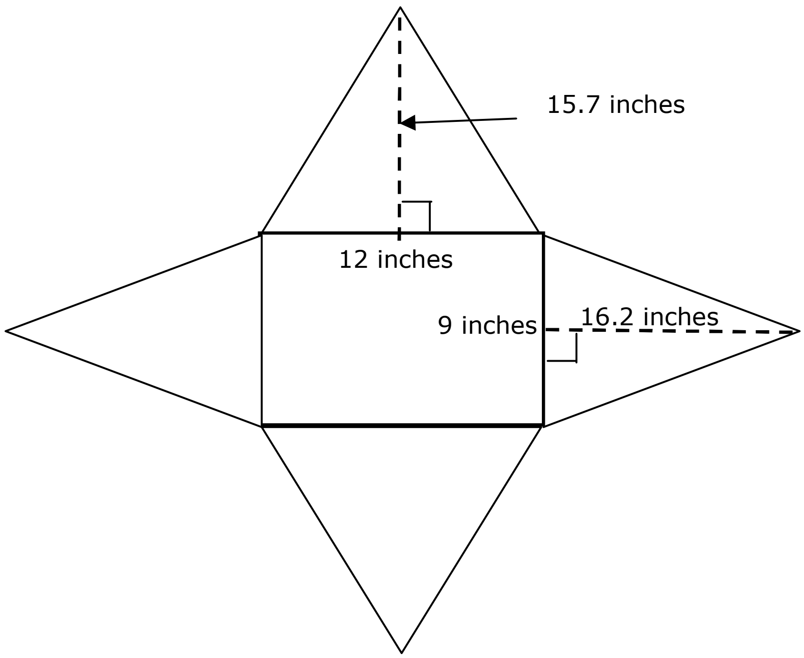
F 20%

G 40%

H 10%

J 30%

17. A rectangular pyramid's net is shown below.



Which best represents the total surface area of the pyramid?

A 108 square inches

B 221 square inches

C 442 square inches

D 499 square inches

---

18. Which table can be represented by the equation $y = 4x - 2$?

F

x	0	3.5	5
y	2	12	18

H

x	–6	2	0
y	–26	6	–2

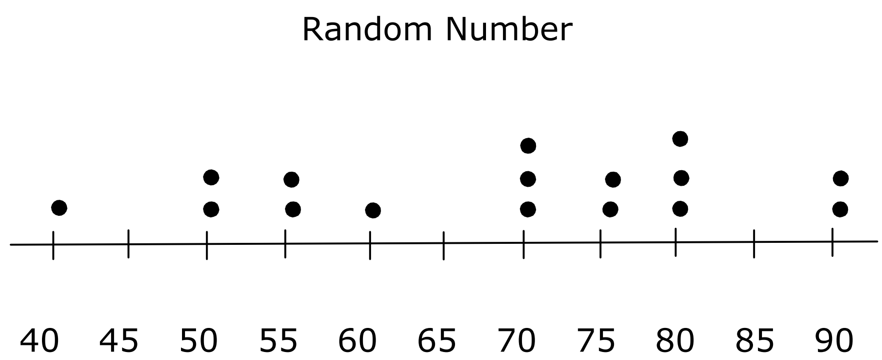
G

x	6	3	7
y	20	10	26

J

x	1	4	2
y	2	14	7

19. Look at the dot plot below. It displays a list of random multiples of 5 between and including 40 and 90 that were given by partner pairs in a class.



Which statement is true about the data in the data plot?

A 40% of the numbers have a 0 in the units column.

B 37.5% of the numbers have a 4 or 5 in the ten's column.

C 50% of the numbers have a 7 or 8 in the ten's column.

D 25% of the numbers chosen was a 75.

---

20. Which best approximates the circumference of a circle with a radius of 19 units?

F 24 units

G 119 units

H 144 units

J 38 units