

PRE-GED LESSON PLAN – MATHEMATICS - (Level 6.0 – 8.9)

COMPETENCY: 5.01 – Add, subtract, multiply and divide with whole numbers

CONNECTIONS: 5.05 and 5.15

CLASSROOM PROCEDURE:

Students will review adding, subtracting, multiplying, and dividing whole numbers. Students will practice applying the correct operation to word problems.

1. Pass out **Arithmetic Operations and Word Problems**
2. Tell students that the four arithmetic operations are **addition**, **subtraction**, **multiplication**, and **division**. Word problems are solved using one or more of these operations. When you add numbers, you find the **sum**. When you subtract numbers, you find the **difference**. When you multiply numbers, you find the **product**. When you divide numbers, you find the **quotient**. All the problems in today’s lesson deal only with whole numbers. **Whole numbers** are the set of numbers 0, 1, 2, 3, 4, 5 ... They do not include fractions, decimals, or negative numbers.
3. Have students take turns reading aloud the five sample problems on the handout. Complete the handout together with the class.
4. Pass out **Arithmetic Operations Practice and Review**. Students are to complete the handout on their own, or with a partner.
5. Use **Whole Numbers Quiz** as a student assessment.

VOCABULARY:

addition
subtraction
multiplication
division
sum
difference
product
quotient
perimeter
area

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Student Handouts:
Arithmetic Operations and Word Problems
Arithmetic Operations Practice and Review
Whole Numbers Quiz

Teaching Aids: Answer Key

SUPPLEMENTARY MATERIALS:

EVALUATION:

Whole Numbers Quiz

Arithmetic Operations and Word Problems

The four arithmetic operations are addition, subtraction, multiplication, and division. Word problems are solved using one or more of these operations.

The word problems in today's lesson can each be solved by using **one** arithmetic operation. In each of the following problems, the key word has been left out. Circle the correct key word and give the solution. Show your work.

- 1) Lavonne used to set her air conditioner thermostat at 72 degrees. To save energy, she _____ it 6 degrees. What is the new setting on her thermostat?
(*raised / lowered*)

- 2) Kara normally eats 2,500 calories a day. While on a special diet to lose weight, she ate 900 calories _____. How many calories a day did she eat on her diet?
(*more / less*)

- 3) Chris spent \$147 at the grocery store last week. To find out how much money he was spending each day for groceries, he _____ \$147 by 7. How much money was Chris spending daily?
(*multiplied / divided*)

- 4) Jason paid \$22 a day to rent a car. To find out how much that car would cost him for two weeks, he _____ \$22 by 14. How much did Jason pay to rent the car?
(*multiplied / divided*)

- 5) A company with 235 workers decided to _____ (*increase / decrease*) their work force by eliminating 85 jobs. How many employees will remain with the company?

Arithmetic Operations – Practice and Review

A) Addition Review: Find the sum of each problem. If the numbers are written horizontally, rewrite them in a column.

1)
$$\begin{array}{r} 6,484 \\ \underline{2,145} \end{array}$$

2) $425 + 36 + 77 + 9$

3) In order to fence in a field, you need to measure its perimeter. The **perimeter** is the distance around a figure. The field is rectangular and is 124 meters wide and 175 meters long. How many meters of fencing are needed?

B) Subtraction Review: Find the difference of each problem. If the numbers are written horizontally, rewrite them in a column.

4)
$$\begin{array}{r} 6,970 \\ \underline{-4,398} \end{array}$$

5) $1000 - 579$

6) The total weight of the Johnson family was 1,022 pounds. Everyone went on a diet. Six months later, their total weight was 878 pounds. How much weight did the family lose?

C) Multiplication Review: Find the product of each problem.

7)
$$\begin{array}{r} 8,395 \\ \times \quad 56 \\ \hline \end{array}$$

8) 84×20

9) In order to carpet a room, you have to find the **area** by multiplying the length and width of the room. How many square feet of carpet are needed for a room that measures 12 feet by 16 feet?

D) Division Review: Find the quotient of each problem.

10) $5 \overline{)2435}$

11) $8874 \div 9$

12) If you are driving an average of 70 mph on Interstate-95, how many hours will it take you to travel 350 miles?

Whole Numbers QUIZ

The following word problems can each be solved by using one operation. Choose addition, subtraction, multiplication or division. Show your work.

- 1) Jennifer bought a new couch for \$689. She made a down payment of \$65. What balance does she owe on the couch?

- 2) If Jennifer pays off the couch in one year, she will not have to pay interest. If she pays off her balance in 12 equal monthly installments, how much will she pay each month?

- 3) On a certain Florida map, one inch represents 250 miles. How far apart are two cities that are 9 inches apart on the map?

- 4) If a man who weighs 265 pounds decreases his weight by 70 pounds, how much will he weigh?

- 5) What is the perimeter of a room that measures 15 feet wide and 32 feet long?

- 6) What is the area of this room?

- 7) If you earned \$12 an hour, how much money would you earn working 40 hours a week?

- 8) How much money would you earn in one year? (A year has 52 weeks.)

- 9) A bakery produced 6,360 cookies in one day. The cookies were packed in boxes with 24 cookies in each box. How many boxes were used that day?

- 10) Brittany normally ate 1,900 calories a day. While on a special diet, she ate 1,100 calories more. How many calories a day did she eat on her diet?

Answer Keys

Arithmetic Operations and Word Problems

- | | | | |
|-------------|---------------|----------------|-------|
| 1) raised, | 78 degrees | 4) multiplied, | \$308 |
| 2) less, | 1600 calories | 5) decrease, | 150 |
| 3) divided, | \$21 | | |

Arithmetic Operations – Practice and Review

- | | |
|---------------|--------------------|
| 1) 8,629 | 7) 470,120 |
| 2) 547 | 8) 1,680 |
| 3) 598 feet | 9) 192 square feet |
| 4) 2,572 | 10) 487 |
| 5) 421 | 11) 986 |
| 6) 144 pounds | 12) 5 hours |

Whole Numbers QUIZ

- | | |
|---------------|--------------------|
| 1) \$624 | 6) 480 square feet |
| 2) \$52 | 7) \$480 |
| 3) 2250 miles | 8) \$24,960 |
| 4) 195 pounds | 9) 265 boxes |
| 5) 94 feet | 10) 3000 calories |

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.02 – Represent numbers in a variety of equivalent forms using integers, fractions, decimals, percents, exponents, and scientific notation

CONNECTIONS: 5.01 and 5.03

CLASSROOM PROCEDURE:

Students will write equivalent fractions, decimals and percentages; and write numbers in scientific notation.

1. Pass out **Equivalent Fractions, Decimals and Percents – Student Handout**.
2. Explain to the students that numbers can be written in different, but equivalent ways. For example, $\frac{1}{2}$, 0.5, and 50% are all **equivalent** because they all have the **same value**.
3. Use the **Teaching Transparency - Equivalent Fractions, Decimals and Percents** to demonstrate to the students how to fill in their chart.
4. The handout **Equivalent Numbers – Matching** can be used as an assessment.
5. Pass out **Scientific Notation – Student Handout**. Explain to the students that scientific notation is a way to simplify a very large or a very small number, and is always written as product of a number between one and ten, and a power of ten. For example, five million can be written in standard notation as 5,000,000 or in scientific notation as 5×10^6 . Five millionth can be written in standard notation as .000005 or in scientific notation as 5×10^{-6} .
6. Student Handout – **SCIENTIFIC NOTATIOAN – MATCHING** can be used as an assessment.
7. The card game, Math Rummy can be used as an extra activity to reinforce equivalent numbers.

VOCABULARY:

decimal
fraction
percent
equivalent
scientific notation
standard notation

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Student Handouts:
Equivalent Fractions, Decimals and Percents
Equivalent Numbers – Matching
Scientific Notation
Scientific Notation – Matching
Teaching Materials:
Equivalent Fractions, Decimals, Percents – Transparency
KEYS

SUPPLEMENTARY MATERIALS:

Math Rummy card game
Cardstock paper is needed to copy the cards for the game **Math Rummy**.
A copy of the cards, and the directions for the game are included.

EVALUATION:

Matching activity on equivalent fractions, decimals, and percentages; matching activity on scientific notation

Equivalent Fractions, Decimals and Percents – Student Handout

Fractions, Decimals and Percents are examples of equivalent numbers.

To write a fraction as a decimal, divide the fraction from top to bottom. For example, $\frac{5}{8}$ is $5 \div 8 = .625$. To write the decimal as a percent, move the decimal point two places to the right and add the percent sign.

	Fractions	Decimals	Percents
Sample	$\frac{5}{8}$	.625	62.5%
1			50%
2		.2	
3	$\frac{1}{8}$		
4		.06	
5	$\frac{3}{8}$		
6			60%
7	$\frac{1}{3}$		
8		.75	
9	$\frac{7}{8}$		
10			10%
11		.15	
12		.01	
13	$\frac{2}{3}$		
14			.05
15			100%

Equivalent Fractions, Decimals and Percents – Teaching Transparency

	Fractions	Decimals	Percents
Sample	$\frac{5}{8}$	.625	62.5%
1			50%
2		.2	
3	$\frac{1}{8}$		
4		.06	
5	$\frac{3}{8}$		
6			60%
7	$\frac{1}{3}$		
8		.75	
9	$\frac{7}{8}$		
10			10%
11		.15	
12		.01	
13	$\frac{2}{3}$		
14			5%
15			100%

Equivalent Fractions, Decimals and Percents – Answer Key

	Fractions	Decimals	Percents
Sample	$\frac{5}{8}$	.625	62.5%
1	$\frac{1}{2}$	.5	50%
2	$\frac{2}{10}$	.2	20%
3	$\frac{1}{8}$	.125	12.5%
4	$\frac{6}{100}$	.06	6%
5	$\frac{3}{8}$	.375	37.5%
6	$\frac{6}{10}$	.6	60%
7	$\frac{1}{3}$	.333 . . .	33.3%
8	$\frac{3}{4}$	.75	75%
9	$\frac{7}{8}$	.875	87.5%
10	$\frac{1}{10}$	.1	10%
11	$\frac{15}{100}$	.15	15%
12	$\frac{1}{100}$	.01	1%
13	$\frac{2}{3}$	.666 . . .	66.6%
14	$\frac{5}{100}$	.05	5%
15	$\frac{1}{1}$	1.0	100%

Equivalent Fractions, Decimals and Percents - Matching

Match the percent with the equivalent decimal or fraction:

_____1) 1%

A) .6

_____2) 6%

B) .5

_____3) 10%

C) .06

_____4) 25%

D) .1

_____5) 45%

E) 1.0

_____6) 50%

F) $\frac{9}{20}$

_____7) 60%

G) $\frac{99}{100}$

_____8) 75%

H) $\frac{3}{4}$

_____9) 99%

I) $\frac{1}{100}$

_____10) 100%

J) $\frac{1}{4}$

Scientific Notation – Student Handout

A) Example: Write 12,345,000 in scientific notation.

Move the decimal point to the left until it lands between the 1 and 2.

Answer: 1.2345×10^7 ← because the decimal point moved left 7 places.

PRACTICE: Write each number in scientific notation:

1) 4,567

2) 25,000,000

3) ten million

4) 200,000 human cells could fit on the head of a pin. Write this number in scientific notation.

B) Example: Write .00012345 in scientific notation.

Move the decimal point to the right until it lands between 1 and 2.

Answer: 1.2345×10^{-4} ← because the decimal point moved right four places.

PRACTICE: Write each number in scientific notation:

5) .00005

6) .00012

7) twelve thousandths

8) Human hair grows .0000000108 miles per hour. Write this number in scientific notation.

C) Example: Write 7.2×10^5 in standard notation

Answer: 720,000 ← because the decimal point moved right five places.

PRACTICE: Write each number in standard notation:

9) 4.7×10^6

10) 7.123×10^3

11) A super computer can perform 2.5×10^9 operations per second. Write this number in standard notation.

D) Example: Write 9×10^{-5} in standard notation.

Answer: .00009 ← because the decimal point moved to the left 5 places.

PRACTICE: Write each number in standard notation:

12) 5.17×10^{-4}

13) 1.9×10^{-6}

14) The diameter of a flu virus is approximately 6.047×10^{-5} . Write in standard notation.

Scientific Notation – Matching

Match the equivalent numbers.

- | | | | |
|---------|---------------|----|------------------------|
| ____1) | 5,1230 | A) | 5.123×10^4 |
| ____2) | 600,000 | B) | 1.5×10^{-7} |
| ____3) | 15,000,000 | C) | 1.5×10^7 |
| ____4) | 20,000,000 | D) | 5.123×10^{-2} |
| ____5) | 2,000,000,000 | E) | 6×10^5 |
| ____6) | .00006 | F) | 6×10^{-5} |
| ____7) | .05123 | G) | 2×10^{-7} |
| ____8) | .000012 | H) | 2×10^7 |
| ____9) | .0000002 | I) | 2×10^9 |
| ____10) | .00000015 | J) | 1.2×10^{-5} |

Equivalent Numbers – Matching - Answer Key

I 1)

B 6)

C 2)

A 7)

D 3)

H 8)

J 4)

G 9)

F 5)

E 10)

Scientific Notation – Student Handout - Answer Key

1) 4.567×10^3

8) 1.08×10^{-8}

2) 2.5×10^7

9) 4,700,000

3) 1.0×10^7

10) 7,123

4) 2.0×10^5

11) 2,500,000,000

5) 5.0×10^{-5}

12) .000517

6) 1.2×10^{-4}

13) .0000019

7) 1.2×10^{-2}

14) .00006047

Scientific Notation – Matching - Answer Key

A 1)

F 6)

E 2)

D 7)

C 3)

J 8)

H 4)

G 9)

I 5)

B 10)

MATH RUMMY

Directions:

2-5 players

1. Shuffle the deck of 60 cards.
2. Deal out 7 cards to each player.
3. Stack the rest of the cards face down. This is the stockpile.
4. Turn the top card of the stockpile over and lay it face up. This is the discard pile.
5. The first player begins by taking the top card from the stockpile OR the card from the discard pile. A card is discarded at the end of the play.
6. The next player to the left takes a turn. This player will also choose the top card from the stockpile OR the top card from the discard pile, and discard one card at the end of his/her turn. The game continues, one player at a time.
7. The object of the game is to make pairs. A pair is two cards with the same value. Every time a pair is made, the player lays the two cards down, face up, for everyone to check that the cards have equal value.
8. The goal of the game is to make as many pairs as possible.
9. The first person to lose all of their cards wins the game.

$\frac{1}{10}$	.1	$\frac{5}{50}$	$\frac{10}{100}$
$\frac{1}{8}$	.125	$\frac{5}{40}$	$\frac{125}{1000}$
$\frac{1}{5}$	.2	$\frac{2}{10}$	$\frac{20}{100}$

$\frac{1}{4}$	.25	$\frac{5}{20}$	$\frac{25}{100}$
$\frac{3}{10}$	.3	$\frac{15}{20}$	$\frac{30}{100}$
$\frac{1}{3}$	$\overline{.3}$	$\frac{3}{9}$	$\frac{33}{99}$

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.03 – Compare the relative size of integers, fractions, ratios, decimals, percents, numbers with exponents, square roots, and numbers in scientific notation

CONNECTIONS: 5.01 and 5.02

CLASSROOM PROCEDURE:

1. One way to compare the relative sizes of fractions, decimals, and percents is to write the numbers as decimals, and then compare the decimals by lining up the decimals in a column. Use the teaching transparency, **Comparing Fractions and Decimals** to demonstrate this process.
2. Pass out **Comparing Fractions and Decimals – Student Handout**. Students will practice comparing decimals and fractions by filling in the worksheet. Allow them to use their calculators.
3. Divide the class into groups of 3 or 4 to play **Math War**. Copy the three pages of cards on to card stock paper. Use a paper cutter to cut the cards into a deck. Each deck has 60 cards. (Make one deck for each group.) Pass out a copy of **Math War** directions to each group. Allow the students to use their calculators as an aid in the game. Throughout the game, students will be comparing the sizes of fractions and decimals.
4. **Solving Percent Problems as Proportions – Teaching Transparency** can be used to explain how to solve percents as proportions. Students are to copy the examples from the transparency on to their own handout. They will use this handout as a reference.
5. Pass out **Percent Word Problems – Student Handout**. Divide the class into groups to work on the problems together, using the previous handout as a guide for solving the percent word problems.

VOCABULARY:

fraction
decimal
percent
ratio
proportion

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Student Handouts:
Comparing Fractions and Decimals
Comparing Fractions and Decimals - Worksheet
Solving Percent Problems as Proportions
Percent Word Problems
Teaching Materials:
Comparing Fractions and Decimals – Transparency
Solving Percents as Proportions – Transparency
Answer KEYS

SUPPLEMENTARY MATERIALS:

Math War card game
Card stock paper is needed to copy the cards for the game **Math War**. A copy of the cards, and the directions for the game are included.

EVALUATION:

Student Handouts **Comparing Fractions and Decimals**, and **Percent Word Problems** can be used as assessments.

Comparing Fractions and Decimals – Transparency

You can compare the relative size of fractions and decimals by writing all the numbers as decimals, and then lining the decimals up in a column with the same number of places.

Example: Write $\frac{5}{8}$, $\frac{3}{5}$, $\frac{5}{7}$ and 0.65 in order from least to greatest.

Step one: $5 \div 8 = 0.625$

Step two: $3 \div 5 = 0.600$ ← add two zeroes

Step three: $5 \div 7 = 0.714$ ← round to three places

Step four: 0.650 ← add one zero

Answer: $\frac{3}{5}$, $\frac{5}{8}$, 0.65, $\frac{5}{7}$

PRACTICE – Write the following numbers in order from least to greatest:

1) 0.21, 0.212, 0.22, $\frac{1}{5}$

0.210

0.212

0.220

0.200

Answer: $\frac{1}{5}$, 0.21,
0.212, 0.22

2) 1, 1.1, 0.9, $\frac{1}{9}$

1.00

1.10

0.90

0.11

Answer: $\frac{1}{9}$, 0.9,
1, 1.1

3) $\frac{1}{3}$, 0.3, 0.33, $\frac{4}{11}$

0.333

0.300

0.330

0.364

Answer: 0.3, 0.33,
 $\frac{1}{3}$, $\frac{4}{11}$

Comparing Fractions and Decimals – Student Handout

You can compare the relative size of fractions and decimals by writing all the numbers as decimals, and then lining the decimals up in a column with the same number of places.

Example: Write $\frac{5}{8}$, $\frac{3}{5}$, $\frac{5}{7}$ and 0.65 in order from least to greatest.

Step one: $5 \div 8 = 0.625$

Step two: $3 \div 5 = 0.600$ ← add two zeroes

Step three: $5 \div 7 = 0.714$ ← round to three places

Step four: 0.650 ← add one zero

Answer: $\frac{3}{5}$, $\frac{5}{8}$, 0.65, $\frac{5}{7}$

PRACTICE – Write the following numbers in order from least to greatest:

1) 0.21, 0.212, 0.22, $\frac{1}{5}$ 2) 1, 1.1, 0.9, $\frac{1}{9}$ 3) $\frac{1}{3}$, 0.3, 0.33, $\frac{4}{11}$

Comparing Fractions and Decimals – Student Worksheet

Directions: Fill in the blank with $>$ (*greater than*), $<$ (*less than*), or $=$ (*equal to*)

1) $\frac{1}{2}$ ____ $\frac{1}{3}$ 2) $\frac{5}{8}$ ____ 0.525 3) 0.5 ____ $\frac{1}{2}$ 4) 0.50 ____ 0.05

5) $\frac{5}{8}$ ____ $\frac{3}{4}$ 6) 0.5 ____ .449 7) 0.2 ____ $\frac{1}{5}$ 8) $\frac{1}{3}$ ____ 0.3

9) $\frac{3}{7}$ ____ $\frac{4}{7}$ 10) 0.99 ____ 1.0 11) 0.9 ____ $\frac{1}{9}$ 12) 0.6 ____ 0.600

Write the following numbers in order from least to greatest:

13) 0.01, 0.11, 1.11, .001

14) $\frac{1}{3}$, $\frac{2}{7}$, 0.303, 0.3

Solving Percent Problems as Proportions – Teaching Transparency

- 1) A **ratio** is a comparison of two numbers and is written as a fraction.
- 2) A **percent is a ratio** that compares a number to **100**.
- 3) A **proportion** is an equality of two ratios. Proportions are solved by cross multiplying, and then dividing by the **coefficient** (the number attached to the variable).

Percent problems can be solved as proportions. Most percent problems can be solved like these examples:

- A) Out of a class of 30 students, 6 students earned A's on a test.
What percent of the students earned A's?

$$\frac{x}{100} = \frac{6}{30}$$

$$30x = 600$$

$$\underline{x = 20\%}$$

- B) 20% of a class of 30 students earned A's on a test. How many people earned A's? (You are finding the **part** of the class that earned A's)

$$\frac{20}{100} = \frac{x}{30}$$

$$100x = 600$$

$$\underline{x = 6 \text{ people}}$$

- C) 6 people in a class earned A's on a test. If 20% earned A's, how many people are in the class? (You are finding the **total** number in the class.)

$$\frac{20}{100} = \frac{6}{x}$$

$$20x = 600$$

$$\underline{x = 30 \text{ people}}$$

Percent Word Problems – Student Handout

Directions: Each of these percent problems are to be solved as proportions.

Step 1: Circle what you are solving for: the percent / the part / the whole

Step 2: Set up the proportion: $\frac{\text{percent}}{100} = \frac{\text{part}}{\text{whole}}$

Step 3: Solve the proportion

- 1) Out of 32 students, 25 passed their math test. What percent of the students passed?
(*the percent / the part / the whole*)

- 2) Sixty-three people attended the wedding, which was 84% of the people invited. How many people were invited? (*the percent / the part / the whole*)

- 3) James saved \$97.25 on a TV that was on sale for 25% off. What was the original price of the TV?
(*the percent / the part / the whole*)

- 4) How much sales tax would you pay for a \$159 purchase if sales tax is 6%?
(*the percent / the part / the whole*)

- 5) Jerica earns \$6.50 an hour. If she gets a 10% raise, how much more an hour will she be earning?
(*the percent / the part / the whole*)

- 6) Sixty-five out of eighty-five customers ordered hamburgers. What percent of customers ordered hamburgers? Round your answer to the hundredth's place. (*the percent / the part / the whole*)

ANSWER KEYS

Comparing Fractions and Decimals

- | | | | |
|----|---|-----|---|
| 1) | > | 8) | > |
| 2) | > | 9) | < |
| 3) | = | 10) | < |
| 4) | > | 11) | > |
| 5) | < | 12) | = |
| 6) | > | 13) | .001, 0.01, 0.11, 1.11 |
| 7) | = | 14) | $\frac{2}{7}$, 0.3, 0.303, $\frac{1}{3}$ |

Percent Word Problems

- | | | | |
|----|-------------|------------------------------------|-----------------|
| 1) | the percent | $\frac{x}{100} = \frac{25}{32}$ | $x = 78.125\%$ |
| 2) | the whole | $\frac{84}{100} = \frac{63}{x}$ | $x = 75$ people |
| 3) | the whole | $\frac{25}{100} = \frac{97.25}{x}$ | $x = \$389$ |
| 4) | the part | $\frac{6}{100} = \frac{x}{159}$ | $x = \$9.54$ |
| 5) | the part | $\frac{10}{100} = \frac{x}{6.50}$ | $x = \$.65$ |
| 6) | the percent | $\frac{x}{100} = \frac{65}{85}$ | $x = 76.47\%$ |

MATH WAR

Directions:

2-6 players

8. Shuffle the deck of 60 cards.
9. Deal out all the cards equally among the players.
10. Each player keeps their cards in a pile, face-down.
11. At the same time, each player turns over their top card.
12. The person who turns over the card with the highest value wins the round, takes all the cards, and puts them on the bottom of their pile.
13. If two (or more) players turn over cards of **equal value**, they have a “war”. They each take off the first three cards from the top of their pile and put them face-down. Next, they draw the fourth card off the top of their pile and turn it over, face-up. The person with the card of the highest value wins all eight cards.
14. When time is up, the person with the most cards wins. Or, the play continues until one person wins all the cards.

$\frac{1}{10}$	.1	$\frac{5}{50}$	$\frac{10}{100}$
$\frac{1}{8}$	.125	$\frac{5}{40}$	$\frac{125}{1000}$
$\frac{1}{5}$	.2	$\frac{2}{10}$	$\frac{20}{100}$

$\frac{1}{4}$	.25	$\frac{5}{20}$	$\frac{25}{100}$
$\frac{3}{10}$	.3	$\frac{15}{20}$	$\frac{30}{100}$
$\frac{1}{3}$	$\overline{.3}$	$\frac{3}{9}$	$\frac{33}{99}$

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.04 – Apply concepts of absolute value and perform operations with signed numbers

CONNECTIONS: 5.01

CLASSROOM PROCEDURE:

- Students will review and practice adding, subtracting, multiplying and dividing integers.
1. Tell students that **absolute value** is the **distance** a number is from **zero** on the number line. **Distance** is always expressed as a **positive number**. Ask students to identify other situations besides distance that are expressed as positive numbers. (Some examples are measurement, money, counting objects or people, latitude and longitude, etc.) Tell students that a **negative number** is the opposite of a positive number. One example of a situation that is expressed with negative numbers is owing money, or being in debt. Ask students to identify other situations that are expressed with negative numbers. (Other examples are land that is below sea level, underwater, digging a hole, temperature below zero degrees, losing yardage in a football game, loosing points in a game etc.) **The set of integers** includes positive numbers, negative numbers and zero. **Zero** is neither negative nor positive. Integers do not include fractions or decimals.
 2. Pass out **Integers and Absolute Value – Student Handout**. Allow the class to complete this handout in groups. Do not allow calculators in this lesson. This lesson is an exercise in mental math.
 3. Students will play the game **Mental Math Tic Tac Toe – Integers and Absolute Value** as practice in adding, subtracting, multiplying and dividing integers. The directions are on a transparency so the rules can be presented to the class.
 4. The **Integers and Absolute Value Quiz** can be used as an assessment. (No calculators!)

VOCABULARY:

absolute value
distance
number line
integers
positive number
negative number
zero

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Student Handouts:
Integers and Absolute Value
Integers and Absolute Value Quiz

Teaching Materials:
Mental Math Tic Tac Toe Directions on Transparency
Tic Tac Toe Cards – to be made on cardboard
Answer Keys

SUPPLEMENTARY MATERIALS:

EVALUATION:

Student Quiz on Integers and Absolute Value

Integers and Absolute Value – Student Handout

absolute value – the **distance** from a number to zero on the number line

distance – the space between two points (always **positive**)

positive number – a number **greater than zero**

negative number – a number **less than zero**

zero – neither negative or positive

set of integers – positive numbers, negative numbers, and zero

(A) **Absolute Value**: The answer is always positive. Simplify the expressions:

1) $|10|$ 2) $|-10|$ 3) $|7-10|$ 4) $|10-7|$ 5) $|10-10|$

(B) **Adding and Subtracting Integers**: When the signs are the **same**, find the **sum**.

6) $6 + 7$ 7) $-6 + (-7)$ 8) $-13 - 15$ 9) $-2 + (-4) + (-8)$

When the signs are **different**, find the **difference**.

10) $17 - 18$ 11) $18 - 17$ 12) $24 - 32$ 13) $-40 + 5$

A negative sign means “the opposite”. For example -5 means “the opposite of 5”.
 $-(-5)$ means the opposite of negative five, which is 5.

When there are two negative signs next to each other, the answer is positive.

14) $-(-7)$ 15) $4 - (-7)$ 16) $-4 - (-7)$ 17) $-(-5) - (-7) + (-18)$

(C) **Multiplying and Dividing Integers**: When the signs are the same, the answer is positive. When the signs are different, the answer is negative.

18) $(25)(5)$ 19) $(-9)(-9)$ 20) $-8(7)$ 21) $12(-5)$

22) $\frac{75}{3}$

23) $\frac{-81}{-9}$

24) $\frac{-64}{8}$

25) $\frac{56}{-8}$

Mental Math Tic Tac Toe

DIRECTIONS

Nine chairs are arranged in front of the room, facing the class, in three rows of three. This is the tic tac toe board.

Females sit on one side of the room. (Females are the X's)

Males sit on the other side of the room. (Males are the O's)

1. Flip a coin to see which team goes first.
2. The teacher holds the first card up so that the whole class can see the card, but the player who goes first is the only one who can answer. The first number that the player says is the final answer. (The teacher will determine the time limit.)
3. If the answer is correct, that student sits in one of the chairs on the tic tac toe board. The team is not allowed to tell the player where to sit.
4. The first student on the other team then takes a turn and tries to answer the problem on the next card. If that student gives a correct answer, then that student will also choose a seat on the tic tac toe board.
5. Turns are taken in seat order, alternating between the teams. The player answering the question cannot be helped by the rest of the team.
6. If a student gives an incorrect answer, the same card is shown to the other team, and that student does not sit on the tic tac toe board. This continues between the teams until the problem is answered correctly.
7. No one is allowed to talk during the game except the player who is taking a turn. No paper, pencil, or calculators may be used. This is an activity in mental math.
8. The three students who make a "tic tac toe" on the board win the round. If it is a CAT game, the side with the most players on the tic tac toe board wins the round.
9. Score can be kept on the chalk board to determine which team wins the most rounds.

Tic Tac Toe Cards

Note to the teacher: Write each of these expressions on separate cards, large enough to be seen by the whole class. Write the answer on the back of each card. Old file folders can be cut down for this purpose. Shuffle the cards so that they are presented in random order.

$|-50-75|$	$|-10-13|$	$|36-16|$	$|75-60|$	$|5-8|$
$|-5-10|$	$|3-10|$	$|-10+10|$	$|60-72|$	$|15-20|$
$|7-8|$	$|-8+(-7)|$	$|2-9|$	$|15-26|$	$|35-41|$
$|17-8|$	$|8-17|$	$|-6+(-6)|$	$|-2+(-3)+(-4)|$	$|-11+(-13)|$
$-6(8)$	$(-7)(-7)$	$3(-13)$	$(-3)(-15)$	$25(-5)$
$-6(-11)$	$12(-4)$	$5(12)$	$-9(-9)$	$(-7)(-8)$
$15(4)$	$-5(15)$	$8(-7)$	$(9)(-8)$	$(-2)(3)(-2)$
$-4(3)(-2)$	$5(-3)(2)$	$(-11)(-5)$	$(5)(-5)(10)$	$-2(6)(5)$
$\frac{-24}{8}$	$\frac{-15}{-3}$	$\frac{-25}{5}$	$\frac{90}{-3}$	$\frac{-64}{-8}$
$\frac{32}{4}$	$\frac{18}{3}$	$\frac{100}{25}$	$\frac{150}{75}$	$\frac{-66}{-11}$
$\frac{49}{-7}$	$\frac{64}{-8}$	$\frac{39}{13}$	$\frac{24}{-6}$	$\frac{36}{6}$
$\frac{42}{-7}$	$\frac{-56}{8}$	$\frac{35}{-7}$	$\frac{-45}{-9}$	$\frac{54}{6}$
$-11+(-13)$	$-14-12$	$75-101$	$6+(-6)+(-6)$	$15-20+(-5)$
$-11+(-11)-8$	$-25+(-25)+(-25)$	$20-32$	$17-20$	$-20+17+(-3)$
$-6+(-5)$	$-8+(-8)$	$-12+3$	$3-12$	$14-7+(-7)$
$24-14+14$	$36-46-10$	$17-9-7$	$-6+(-7)$	$-12+(-13)$
$-11(-4)$	$-4(-6)$	$16(-9)$	$25(-75)$	$-15(-5)$
$-(-10)+46$	$-(-12)+(-12)$	$-(-8)(-7)$	$(-2)+(-8)-(-15)$	$(-7)+(-3)-20$
$100-80-15$	$65-15-10$	$16(-12)$	$9(-9)$	$13-11+7$
$-6+(-6)-10$	$-14+9-14)-8$	$19(-9)$	$15(-15)+5$	$3(-7)+12$

Integers and Absolute Value Quiz

Simplify the following expressions using mental math. No calculators.

1) $|10 - 5|$

2) $|8 - 12|$

3) $|6 - 6|$

4) $-6 + (-5)$

5) $10 - 15$

6) $6 + (-3) + (-4)$

7) $10 - (-12)$

8) $-14 - (-7)$

9) $-(-9)$

10) $-3(-7)$

11) $7(8)$

12) $(-8)(8)$

13) $-6(9)$

14) $5(-15)$

15) $(-2)(-3)(-4)$

16) $\frac{75}{15}$

17) $\frac{-60}{-12}$

18) $\frac{-64}{8}$

19) $\frac{42}{-7}$

20) $\frac{54}{-9}$

Answer Keys

Integers and Absolute Value - Handout

- | | | |
|--------|---------|---------|
| 1) 10 | 10) -1 | 19) 81 |
| 2) 10 | 11) 1 | 20) -56 |
| 3) 3 | 12) -8 | 21) -60 |
| 4) 3 | 13) -35 | 22) 25 |
| 5) 0 | 14) 7 | 23) 9 |
| 6) 13 | 15) 11 | 24) -8 |
| 7) -13 | 16) 3 | 25) -7 |
| 8) -28 | 17) -6 | |
| 9) -14 | 18) 125 | |

Integers and Absolute Value Quiz

- | | | |
|--------|---------|---------|
| 1) 5 | 8) -7 | 15) -24 |
| 2) 4 | 9) 9 | 16) 5 |
| 3) 0 | 10) 21 | 17) 5 |
| 4) -11 | 11) 56 | 18) -8 |
| 5) -5 | 12) -64 | 19) -6 |
| 6) -1 | 13) -54 | 20) -6 |
| 7) 22 | 14) -75 | |

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.05 – Calculate area, perimeter, volume, capacity, surface area, and mass and solve problems involving customary and metric measurements.

CONNECTIONS: 5.06, 5.08, 5.14

CLASSROOM PROCEDURE:

- Students will measure a can of soda and a box of animal crackers to determine the surface area and volume of a cylinder and a rectangular prism.
1. Assign each of the students ahead of time to bring in a can of soda and a box of animal crackers. (Or collect the money and purchase the items. The approximate cost of a generic can of soda and a box of animal crackers is \$1.20)
 2. Have students copy the lesson vocabulary and definitions off the transparency. Discuss the definitions together with the class to be sure that the students understand the terms that will be used in the activity.
 3. Pass out **Measurement – Student Worksheets** to each of the students. Have the students do this activity individually. Discuss the answers with the class.
 3. Pass out metric rulers and **Surface Area and Volume Activity** handouts to each of the students. Each student should have a can of soda and a box of animal crackers. Divide the class into cooperative groups to complete this activity. Students will need their calculators and may need instruction in using the calculator for π and for squaring.
 4. Students will be measuring the box and the can in centimeters. Instruct the students to measure the box to the nearest half centimeter, and the can to the nearest whole centimeter. Since they will be using calculator π , they will also need instruction in how to round their final answers.
 5. Since the can is not a true cylinder, students may have difficulty measuring it. Tell students to estimate the height of the can to the nearest whole centimeter. Also, instruct students to use the string from the animal crackers box to measure around the can to find the circumference.
 6. When students complete this activity, they may drink their soda and eat their animal crackers.
 7. Students may be assessed with the lesson quiz.

VOCABULARY:

area
 surface area
 perimeter
 circumference
 diameter
 radius
 volume
 cylinder
 rectangular prism

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

cans of sodas and boxes of animal crackers
 centimeter rulers
 calculators
Student Handouts:
 Measurement Worksheet
 Surface Area and Volume Activity
Teaching Aids:
 Vocabulary Transparency
 Answer Keys

SUPPLEMENTARY MATERIALS:

EVALUATION:

Students will successfully measure their cylinder and rectangular prism.

 Lesson Quiz is also included.

VOCABULARY – Transparency

Copy the vocabulary and definitions below.

area – the number of **square units** needed to cover the surface of a geometric figure

$$\text{Area of a circle} = \pi r^2$$

$$\text{Area of a rectangle} = \text{length} \times \text{width}$$

surface area – the sum of the areas of all the surfaces (faces) of a geometrical solid

$$\text{S. A. of a rectangular prism} = 2(lw) + 2(hw) + 2(lh)$$

$$\text{S. A. of a cylinder} = 2(\pi r^2) + \pi dh$$

perimeter – the distance around a geometric figure

circumference – the distance around a circle $C = \pi d$

radius (r) – the distance from the center of a circle to any point on the circle

diameter (d) – the distance across a circle through its center

volume – the number of **cubic units** needed to fill a container, or a geometric solid

$$\text{Volume of a rectangular prism} = \text{length} \times \text{width} \times \text{height}$$

$$\text{Volume of a cylinder} = \pi r^2 h$$

cylinder – geometric solid with two parallel circular bases and a curved side connecting the bases (shaped like a can)

rectangular prism – a geometric solid with parallel rectangular bases (shaped like a box)

Measurement – Student Worksheet

Matching – Choose the correct measurement for each of the following situations. Fill in the blank with the letter of the best response. Answers may be used more than once.

- | | |
|---|-----------------------------------|
| (A) volume of a cylinder | (B) volume of a rectangular prism |
| (C) diameter of a circle | (D) radius of a circle |
| (E) circumference of a circle | (F) area of a circle |
| (G) perimeter of a rectangle | (H) area of a rectangle |
| (J) surface area of a rectangular prism | (K) surface area of a cylinder |

- ___ 1. The amount of paper needed to completely wrap a box.
- ___ 2. The number of ounces needed to fill a can of soup.
- ___ 3. The length of metal stripping needed to put around the edge of a circular table.
- ___ 4. The amount of water it would take to fill a fish tank
- ___ 5. How much stain is needed to cover the top of a round table.
- ___ 6. The amount of weather stripping needed to put around a door.
- ___ 7. Rope stretched across a circular swimming pool, dividing the pool in half.
- ___ 8. The number of tiles needed to tile a hallway.
- ___ 9. The amount of paint needed to completely cover a log.
- ___ 10. The amount of paint needed to cover a bedroom wall.
- ___ 11. The length of a string from the center of a circle to the edge of the circle.
- ___ 12. The amount of material needed to cover the top of a round bed.

VOLUME AND SURFACE AREA ACTIVITY



This box of animal crackers is shaped like a **rectangular prism**.

- 1) Use your centimeter ruler to find the length, width, and height of the box, rounded to the nearest half centimeter.

The length is _____ cm

The width is _____ cm

The height is _____ cm

- 2) Use the following formula to find the volume of the box:

$$V = \text{length} \times \text{width} \times \text{height}$$

- 3) Use the following formula to find the surface area of the box:

$$S.A. = 2(lw) + 2(hw) + 2(lh)$$

This can of soda is almost shaped like a **cylinder**.

- 1) Carefully remove the string from the box of animal crackers.
- 2) Use the string to measure around the can to find the circumference.
- 3) Use your centimeter ruler to measure the length of the string, rounded to the nearest half centimeter. The circumference of the can is _____ cm
- 4) Plug the circumference into this formula to find the diameter of the can:

$$d = \frac{c}{\pi}$$
 Round to the hundredth's place. The diameter is _____ cm
- 5) To find the radius, divide the diameter by 2. The radius is _____ cm
- 6) Measure the height of the can to the nearest whole centimeter.
 The height of the can is _____ cm
- 7) Find the volume of the can by using the formula below.
 Round to a whole number.

$$V = \pi r^2 h$$



- 8) To find the surface area of the can, use the formula below. Round to a whole number.

$$S.A. = 2(\pi r^2) + \pi dh$$

Lesson Quiz

(A) Matching – Match the vocabulary words in the first column with the definitions in the second column.

- | | |
|----------------------------|---|
| _____ 1) cylinder | A) The distance around a circle. |
| _____ 2) rectangular prism | B) The distance across a circle through its center. |
| _____ 3) area | C) The distance from the center of a circle to any point on the circle. |
| _____ 4) perimeter | D) The number of square units needed to cover a surface. |
| _____ 5) circumference | E) The distance around a geometric figure. |
| _____ 6) radius | F) The number of cubic units needed to fill a container. |
| _____ 7) diameter | G) A geometric solid shaped like a can. |
| _____ 8) volume | H) A geometric solid shaped like a box. |

(B) Use your calculator to answer the questions below. Show your steps.

- 9) Find the area of a circle with a diameter of 5 centimeters.
- 10) Find the circumference of the same circle.
- 11) Find the perimeter of a rectangle that measures 6 inches long and 3.5 inches wide.
- 12) Find the area of the same rectangle.

Answer Keys

Measurement – Student Worksheet

 J 1.

 A 2.

 E 3.

 B 4.

 F 5.

 G 6.

 C 7.

 H 8.

 K 9.

 H 10.

 D 11.

 F 12.

Volume and Surface Area Activity

1. Length = 13 cm
Width = 4.5 cm
Height = 7 cm

2. $V = 409.5 \text{ cm}^3$

3. $S.A. = 362 \text{ cm}^2$

4. $D = 6.84 \text{ cm}$

5. $r = 3.42 \text{ cm}$

6. $H = 12 \text{ cm}$

7. $V = 441 \text{ cm}^3$

8. $S.A. = 331 \text{ cm}^2$

Lesson Quiz

 G 1.

 H 2.

 D 3.

 E 4.

9. $A = 19.63 \text{ cm}^2$

10. $C = 15.7 \text{ cm}$

 A 5.

 C 6.

 B 7.

 F 8.

11. $P = 19 \text{ inches}$

12. $A = 21 \text{ inches}^2$

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.06 – Apply beginning principles of algebra including solving one-step algebraic equations, writing one-step equations from word problems, and using simple formulas

CONNECTIONS: 5.04, 5.15

CLASSROOM PROCEDURE:

1. As a review and warm-up exercise, write the following expressions on the board and have the students solve them using mental math: 1) $-6 + (-7)$ 2) $12 - 22$ 3) $-20 + 15$ 4) $-54 \div -6$ 5) 12×-5
6) $55 \div -5$ 7) $-52 - 14$ 8) -8×-8 9) $-66 \div -11$ 10) $-46 + 14$
2. Tell students the above problems are **expressions** because they involve numbers and operations. An **equation** is a statement of equality between two expressions. An equation has an = sign. In today's lesson, students will translate sentences into equations, and solve and check one-step equations.
3. Write the words ADD, SUBTRACT, MULTIPLY, DIVIDE on the chalkboard, or on a transparency. Ask the students to list as many words as they can think of for each operation. For example, ADD is sum, plus, more, increase; SUBTRACT is difference, minus, less, decrease; MULTIPLY is product, times, double; DIVIDE is quotient, halved, etc.
4. Use the **Solving One-Step Equations Transparency** to demonstrate solving one step equations. Discuss these terms or expressions used in the lesson: **variable** – a letter used to represent a number
isolate the variable – to separate the variable from the numbers, or to put the numbers on the opposite side of the equal sign from the variable
opposite operation – addition is opposite of subtraction and multiplication is opposite of division
5. Divide students into cooperative groups to work on **Writing Equations – Student Worksheet**.
6. Students will then complete **Solving and Writing One-Step Equations** individually, or in their groups.
7. The **Writing and Solving Equations Quiz** can be used as an assessment.

VOCABULARY:

expression
equation
sum
difference
product
quotient
variable
isolate
opposite operation

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Student Handouts:
Writing Equations – Student Worksheet
Solving and Writing One-Step Equations
Writing and Solving Equations Quiz

Teaching Aids:
Solving One-Step Equations Transparency
Answer Keys

SUPPLEMENTARY MATERIALS:

EVALUATION:

Students will successfully complete the Writing and Solving One-Step Equations Quiz.

Solving One-Step Equations – Transparency

The goal in solving one-step equations is to isolate the variable. You isolate the variable by performing the opposite operation.

Example 1: The product of a number and 5 equals negative 65.

$$5n = -65 \quad (\text{since the 5 is multiplying with the } x, \text{ you } \underline{\text{divide}} \text{ both sides of the equation by 5})$$

$$n = -13$$

$$5(-13) = -65 \quad (\text{to check your solution, substitute } -13 \text{ back into the equation})$$

$$-65 = -65$$

Example 2: The quotient of a number and -3 equals -15.

$$\frac{n}{-3} = -15 \quad (\text{since } x \text{ is dividing with } -3, \text{ you } \underline{\text{multiply}} \text{ both sides of the equation by } -3)$$

$$n = 45$$

$$\frac{45}{-3} = -15 \quad (\text{check your solution})$$

$$-15 = -15$$

Example 3: The sum of a number and ten equals negative 12.

$$n + 10 = -12 \quad (\text{since } x \text{ is adding with 10, you } \underline{\text{subtract}} \text{ 10 from both sides of the equation.})$$

$$n = -22$$

$$-22 + 10 = -12 \quad (\text{check your solution})$$

$$-12 = -12$$

Example 4: The difference between a number and 14 equals 30.

$$n - 14 = 30 \quad (\text{since 14 is subtracting from } x, \text{ you } \underline{\text{add}} \text{ 14 to both sides of the equation.})$$

$$n = 44$$

$$44 - 14 = 30 \quad (\text{check your solution})$$

$$30 = 30$$

Writing Equations – Student Worksheet

Choose the equation that matches the sentence.

___ 1) The product of a number and 16 is 80.

(A) $n + 16 = 80$ (B) $16n = 80$ (C) $\frac{n}{16} = 80$

___ 2) The number of weeks divided by 12 is 8.

(A) $\frac{w}{12} = 8$ (B) $\frac{12}{w} = 8$ (C) $w - 12 = 8$

___ 3) \$16 less than a number is \$32.

(A) $n - \$16 = \32 (B) $\$16 - n = \32 (C) $\frac{\$16}{n}$

___ 4) The quotient of a number and negative 12 is 36.

(A) $-12n = 36$ (B) $\frac{-12}{n} = 36$ (C) $\frac{n}{-12} = 36$

___ 5) 15 more than Bryan's age is 27.

(A) $b - 15 = 27$ (B) $b + 27 = 15$ (C) $15 + b = 27$

___ 6) The sum of negative 17 and a number is negative 36.

(A) $-17x = -36$ (B) $17 - x = 36$ (C) $-17 + x = -36$

___ 7) The difference of a number and 8 is 47.

(A) $n - 8 = 47$ (B) $8 - n = 47$ (C) $\frac{n}{8} = 47$

___ 8) The difference of 8 and a number is 47.

(A) $n - 8 = 47$ (B) $8 - n = 47$ (C) $\frac{n}{8} = 47$

___ 9) A number increased by 35 gives 53.

(A) $n - 35 = 53$ (B) $35 - n = 53$ (C) $n + 35 = 53$

___ 10) Twelve cookies shared by a number of people gives 3 cookies each.

(A) $12p = 3$ (B) $\frac{12}{p} = 3$ (C) $\frac{p}{12} = 3$

___ 11) Twice a number is -22. (A) $n + 2 = -22$ (B) $2n = -22$ (C) $\frac{n}{2} = -22$

___ 12) Half a number is -22. (A) $n + 2 = -22$ (B) $2n = -22$ (C) $\frac{n}{2} = -22$

Writing and Solving One-Step Equations

A) Solve and check each equation.

1) $x + 12 = 36$ 2) $n - 17 = 14$ 3) $n - 15 = -20$ 4) $-5x = 55$ 5) $\frac{x}{10} = 13$

6) $n + (-7) = 32$ 7) $-6x = -54$ 8) $x + 14 = -52$ 9) $\frac{x}{-8} = -8$ 10) $\frac{x}{12} = -5$

B) Translate each sentence into an equation. Solve and check the equation.

11) A number decreased by 16 is 32.

12) The product of a number and negative 11 is negative 66.

13) The sum of a number and -14 is -46 .

14) The quotient of a number and -9 is 8.

Writing and Solving Equations – Quiz

Directions: Translate each of the following sentences into equations.
Solve and Check each equation:

- 1) The sum of a number and -16 is 52 .

- 2) The difference of a number and 18 is 52 .

- 3) The quotient of a number and -7 is 9 .

- 4) $\$5$ less than a number is $\$72$.

- 5) The product of -12 and a number is -48 .

- 6) Four more than a number is -24 .

- 7) Twice a number is -16 .

- 8) Half a number is -12 .

- 9) $\$42$ increased by a number is $\$59$.

- 10) A number divided by 9 is -81 .

ANSWER KEYS

Writing Equations

 B 1)

 A 2)

 A 3)

 C 4)

 C 5)

 C 6)

 A 7)

 B 8)

 C 9)

 B 10)

 B 11)

 C 12)

Writing and Solving One-Step Equations

1) $x = 24$

2) $n = 31$

3) $n = -5$

4) $x = -11$

5) $x = 130$

6) $n = 39$

7) $x = 9$

8) $x = -66$

9) $x = 64$

10) $x = -60$

11) $n - 16 = 32; n = 48$

12) $-11n = -66; n = 6$

13) $n + (-14) = -46; n = -32$

14) $\frac{n}{-9} = 8; n = -72$

Writing and Solving Equations – Quiz

1) $n + (-16) = 52; n = 68$

2) $n - 18 = 52; n = 70$

3) $\frac{n}{9} = 9; n = -63$

4) $n - \$5 = \$72; n = \$77$

5) $-12n = -48; n = 4$

6) $n + 4 = -24; n = -28$

7) $2n = -16; n = -8$

8) $\frac{n}{2} = -12; n = -24$

9) $\$42 + n = \$59; n = \$17$

10) $\frac{n}{9} = -81; n = -729$

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.07 – Collect, organize and display data in tables, charts, and graphs, describing any patterns and relationships in the data.

CONNECTIONS: 5.01, 5.02, 5.03, 5.06, 5.08

CLASSROOM PROCEDURE:

- Students will gather data and construct a circle graph using a compass and a protractor.
1. Two days before this lesson, tell the students to keep a log of all of their activities for a 24 hour period.
 2. Discuss the lesson vocabulary with the students:
circle graph – a type of graph, shaped like a circle, used to compare parts of a whole
data – numerical information gathered for statistical purposes
compass – an instrument used for drawing circles
protractor – an instrument used to measure angles
 3. Pass out compasses and protractors to the students. Demonstrate how to draw circles with the compass; have the students practice drawing circles. Demonstrate how to draw angles with the protractor; have students practice drawing angles of various degrees. Explain to students that there are 360 degrees in a circle.
 4. Give each student **Constructing a Circle Graph – Student Handout #1**. Discuss Steps #1-4, then allow the students about 10 minutes to complete the steps.
 5. Put the **Sample Circle Graph – Transparency #1** on the overhead as an example for the students.
 6. Next, use **A Day in a Student’s Life – (Sample Circle Graph) Transparency #2** to explain to the students how proportions were used to find the degrees and percents for the sample circle graph.
 7. Give each student a **Constructing a Circle Graph – Student Handout #2**.
 8. Use **Constructing a Circle Graph – Transparency #3** as a guide to help students fill in their own chart using their own data.
 9. Students will now construct their own circle graph on a blank sheet of paper, following steps #6–13 on their first handout.

VOCABULARY:

circle graph
data
compass
protractor

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Each student will need:
 protractor, compass, ruler, calculator, black marker, colored pencils, and a blank sheet of paper
Student Handouts:
 Constructing a Circle Graph – Handouts #1 & #2
Teaching Transparencies:
 Sample Circle Graph – Transparency #1
 A Day in a Student’s Life – Transparency #2
 Constructing a Circle Graph – Transparency #3

SUPPLEMENTARY MATERIALS:

EVALUATION:

The students will prove mastery by gathering data and constructing a circle graph.

Constructing a Circle Graph – Student Handout #1

1. Keep a log of all of your activities for a 24 hour period.
2. Divide all of your activities into 6-7 categories. Examples of the categories could be sleeping, working, school, household chores, homework, reading, errands, TV, computer, video games, hanging out with friends, eating, relaxing, etc. Limit yourself to no more than seven categories. (If necessary, categories can be combined.)
3. Count the number of hours spent in each category, rounded to the nearest half hour. Make sure the total number of hours equals 24.
4. Rank order your categories from greatest to least amount of time.
5. Fill in the chart on the next handout.
6. On a blank sheet of paper, use a compass to draw a large circle.
7. From the center point of the circle, draw a line straight up to the top edge of the circle. This will be the beginning of your first (largest) category.
8. Using a protractor, measure the degrees of your first (largest) category. Draw another line that marks the end of the first category and the beginning of the next (second largest) category.
9. Continue this process until you have divided your circle into your 6-7 categories.
10. Label each category with a black marker.
11. Write the percent in each category.
12. Color each category a different color, using colored pencils.
13. Write a title on the top of your paper. Be creative with your title!

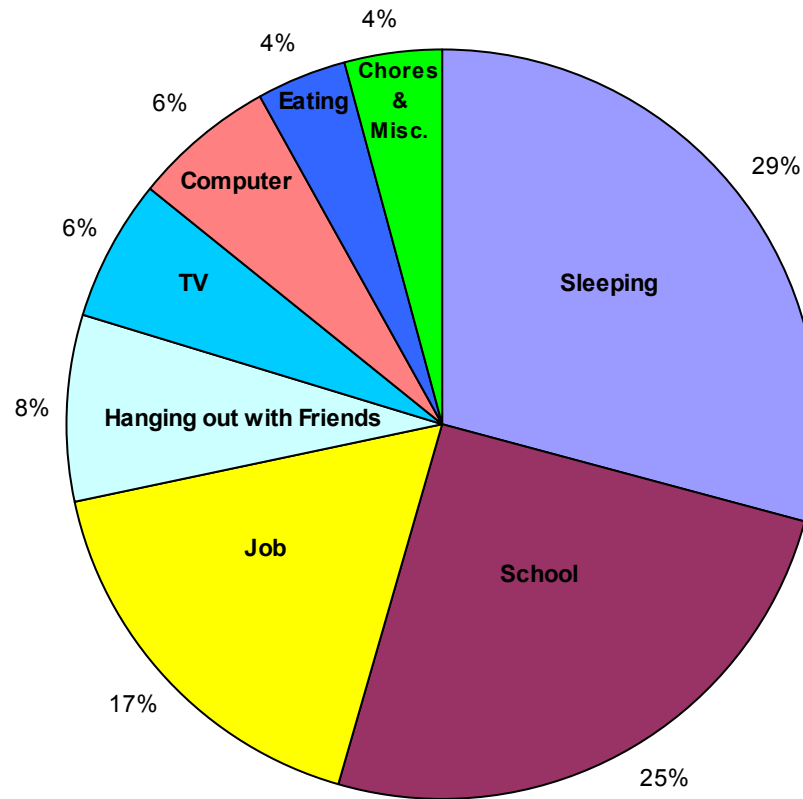
Constructing a Circle Graph – Student Handout #2

Directions:

- 1) Fill in the first column with the title of each of your 6 or 7 categories.
- 2) Fill in the second column with the number of hours spent in each category.
- 3) In the third column, write in the number of hours (for each category). This number is written over the number 24 because there are twenty-four hours in a day. When you solve each proportion for x, you will write your solution in the 4th column, which is the number of degrees for that category on your circle graph.
- 4) In the 5th column, write the number of hours (for each category) over 24. When you solve each proportion for x, you will write your solution in the last column, which is the percent for that category on your circle graph.

Category	Number of hours (h)	Proportion to find degrees	Degrees	Proportion to find percent	Percent
		$\frac{\quad}{24} = \frac{x}{360}$		$\frac{\quad}{24} = \frac{x}{100}$	
		$\frac{\quad}{24} = \frac{x}{360}$		$\frac{\quad}{24} = \frac{x}{100}$	
		$\frac{\quad}{24} = \frac{x}{360}$		$\frac{\quad}{24} = \frac{x}{100}$	
		$\frac{\quad}{24} = \frac{x}{360}$		$\frac{\quad}{24} = \frac{x}{100}$	
		$\frac{\quad}{24} = \frac{x}{360}$		$\frac{\quad}{24} = \frac{x}{100}$	
		$\frac{\quad}{24} = \frac{x}{360}$		$\frac{\quad}{24} = \frac{x}{100}$	
		$\frac{\quad}{24} = \frac{x}{360}$		$\frac{\quad}{24} = \frac{x}{100}$	
		$\frac{\quad}{24} = \frac{x}{360}$		$\frac{\quad}{24} = \frac{x}{100}$	

A Day in a Student's Life - Sample Circle Graph Transparency #1



A Day in a Student's Life (Sample Circle Graph) Transparency #2

Category	Number of hours (h)	Proportion to find degrees	Degrees	Proportion to find percent	Percent
Sleeping	7	$\frac{7}{24} = \frac{x}{360}$	105°	$\frac{7}{24} = \frac{x}{100}$	29%
School	6	$\frac{6}{24} = \frac{x}{360}$	90°	$\frac{6}{24} = \frac{x}{100}$	25%
Job	4	$\frac{4}{24} = \frac{x}{360}$	60°	$\frac{4}{24} = \frac{x}{100}$	17%
Hanging out with Friends	2	$\frac{2}{24} = \frac{x}{360}$	30°	$\frac{2}{24} = \frac{x}{100}$	8%
TV	1.5	$\frac{1.5}{24} = \frac{x}{360}$	22.5°	$\frac{1.5}{24} = \frac{x}{100}$	6%
Computer	1.5	$\frac{1.5}{24} = \frac{x}{360}$	22.5°	$\frac{1.5}{24} = \frac{x}{100}$	6%
Eating	1	$\frac{1}{24} = \frac{x}{360}$	15°	$\frac{1}{24} = \frac{x}{100}$	4%
Chores & misc.	1	$\frac{1}{24} = \frac{x}{360}$	15°	$\frac{1}{24} = \frac{x}{100}$	4%

Constructing a Circle Graph - Transparency #3

Category	Number of hours (h)	Proportion to find degrees	Degrees	Proportion to find percent	Percent
		$\frac{h}{24} = \frac{x}{360}$		$\frac{h}{24} = \frac{x}{100}$	
		$\frac{h}{24} = \frac{x}{360}$		$\frac{h}{24} = \frac{x}{100}$	
		$\frac{h}{24} = \frac{x}{360}$		$\frac{h}{24} = \frac{x}{100}$	
		$\frac{h}{24} = \frac{x}{360}$		$\frac{h}{24} = \frac{x}{100}$	
		$\frac{h}{24} = \frac{x}{360}$		$\frac{h}{24} = \frac{x}{100}$	
		$\frac{h}{24} = \frac{x}{360}$		$\frac{h}{24} = \frac{x}{100}$	
		$\frac{h}{24} = \frac{x}{360}$		$\frac{h}{24} = \frac{x}{100}$	
		$\frac{h}{24} = \frac{x}{360}$		$\frac{h}{24} = \frac{x}{100}$	
		$\frac{h}{24} = \frac{x}{360}$		$\frac{h}{24} = \frac{x}{100}$	

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.08 – Using measuring tools and other devices such as rulers, protractors, scales, meters and gauges to collect data.

CONNECTIONS: 5.01, 5.02, 5.05, 5.18

CLASSROOM PROCEDURE:

1. Pass out 6 or 12 inch rulers to students. Ask the students how many parts an inch is divided into. (16)
 Tell the class they will be measuring distance to the nearest $\frac{1}{8}$ inch. Ask students to find $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, and $\frac{7}{8}$ on their rulers. Next, have the students write down these fractions, then change them into decimals using their calculators to divide the fractions.
2. Pass out the Florida maps. Tell students to measure the **scale** at the bottom of the map. (The scale measures 1 inch and represents 80 miles.) As practice, have students measure the distance between Gainesville and Ocala on the map, rounded to the nearest eighth. Tell students to multiply the decimal distance between the cities on the map by 80 to determine the actual distance: ($.375 \times 80 = 30 \text{ miles.}$)
3. Tell students to follow the same procedure to find the distances between the cities for problems #1-12. Tell students to solve problems 13 and 14 **without** measuring. All answers are to be rounded to the nearest mile.
4. Students will need centimeter rulers for the next activity. Ask students how many parts a centimeter is divided into on the centimeter ruler. (10) Tell students they will be measuring distance in this activity to the nearest half centimeter.
5. Pass out the **Finding Area** handouts. Students will measure each figure, then use the formulas to find the **area**. Remind students that their answers will be in centimeters squared.

VOCABULARY:

scale
 area
 square
 rectangle
 trapezoid
 parallelogram
 triangle
 circle

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

6 or 12 inch rulers
 centimeter rulers
 Florida Map handouts
 Finding Area handouts
 Answer Key

SUPPLEMENTARY MATERIALS:

EVALUATION:

The students may be assessed by successfully completing both the map and the finding area activities.



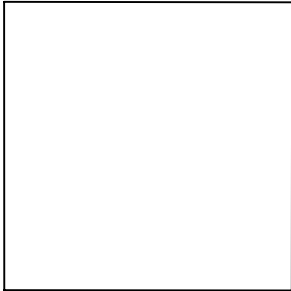
Map used with permission from [World Sites Atlas](http://www.sitesatlas.com), using the link <http://www.sitesatlas.com>.

Measure the distances between the cities on the map to the nearest eighth inch. Then find the actual distance between the cities, in miles.

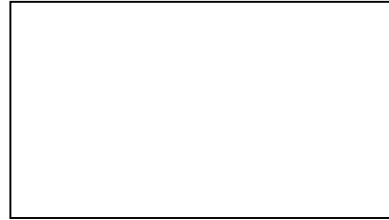
- | | |
|---------------------------------------|---------------------------------------|
| 1. Pensacola to Crestville _____ | 8. Melbourne to West Palm Beach _____ |
| 2. Crestview to Marianna _____ | 9. West Palm Beach to Miami _____ |
| 3. Marianna to Tallahassee _____ | 10. Miami to Key Largo _____ |
| 4. Tallahassee to Lake City _____ | 11. Key Largo to Marathon _____ |
| 5. Lake City to Jacksonville _____ | 12. Marathon to Key West _____ |
| 6. Jacksonville to Ormond Beach _____ | 13. Jacksonville to Key West _____ |
| 7. Ormond Beach to Melbourne _____ | 14. Pensacola to Key West _____ |

Finding Area

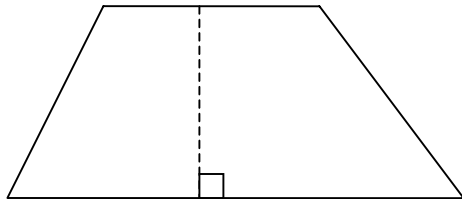
Directions: Measure the figures below to the nearest half centimeter, then find the area.



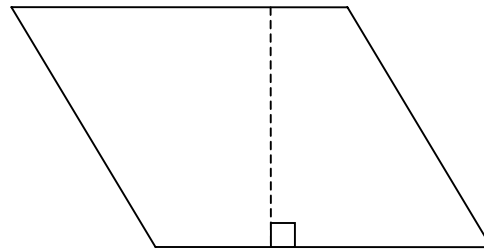
Square
 S^2



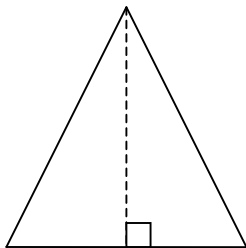
Rectangle
 $l \times w$



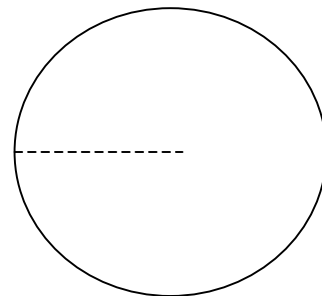
Trapezoid
 $.5h(b_1 + b_2)$



Parallelogram
 $b \times h$



Triangle
 $.5(b \times h)$



Circle
 πr^2

Answer Keys

Florida Map

1) 50 miles

2) 80 miles

3) 60 miles

4) 100 miles

5) 60 miles

6) 80 miles

7) 90 miles

8) 100 miles

9) 70 miles

10) 50 miles

11) 50 miles

12) 40 miles

13) 480 miles

14) 830 miles

Finding Area

Square: 16 cm^2

Trapezoid: 11.25 cm^2

Triangle: 4.5 cm^2

Rectangle: 15 cm^2

Parallelogram: 13.5 cm^2

Circle: 12.56 cm^2

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.09 – Plot graph of linear equations, identifying the slope, the x and y-intercepts, and parallel or perpendicular lines.

CONNECTIONS: 5.06, 5.07

CLASSROOM PROCEDURE:

1. Introduce the lesson vocabulary. A **coordinate plane** is two perpendicular number lines, called **axes**, intersecting at the **origin**. The **horizontal** line is called the **x-axis**; the **vertical** line is called the **y-axis**.
2. Pass out **Coordinate Plane** handouts to each student. Discuss the parts of the coordinate plane. Tell students that an **ordered pair** is a pair of numbers used to locate a point on the coordinate plane and is written in the form (x, y). Demonstrate graphing ordered pairs, and then have students complete the handout by graphing the points listed on the Table of Values.
3. Pass out **Finding Slope** and **Graphing Lines from a Table of Values** handouts to each student. Tell students that when they “read” a line on a coordinate plane, they read the line from left to right, as if they were reading a sentence in a book. A line going uphill, from left to right, has a positive slope; a line going downhill, from left to right, has a negative slope. A horizontal line has a zero slope, and a vertical line has an undefined slope. **Slope** is a ratio that compares the change in the y-coordinate to the change in the x-coordinate; it is the steepness of the line. Demonstrate the slope formula by finding the slope of the line $y = 2x + 3$. Use the points on the line (-1, 1) and (2, 7) to plug into the formula. Have students complete the handouts with a partner, or in cooperative groups.
4. Draw parallel and perpendicular lines on the board. Tell students that **parallel lines** are lines in the same plane that never intersect. **Perpendicular lines** are two lines that intersect to form right angles.
5. Pass out the handout **Parallel and Perpendicular Lines**, and have students complete the handout. Guide students into discovering that parallel lines have the same slope, and the slope of perpendicular lines have a product of -1.
6. Pass out the handout **Graphing Lines Using X and Y-Intercepts**. Read and complete this handout together with the class. Assign the students these linear equations to graph using x and y-intercepts, then find the slope of each line: 1) $y = 3x + 1$ 2) $y = 3x - 2$ 3) $y = -2x + 4$ 4) $y = -2x - 1$

VOCABULARY:

coordinate plane
 axes
 origin
 x-axis
 y-axis
 horizontal
 vertical
 ordered pair
 Table of Values
 slope
 parallel lines
 perpendicular lines
 x and y-intercepts

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Student Handouts:
 Coordinate Plane
 Finding Slope
 Graphing Lines from a Table of Values
 Parallel and Perpendicular Lines
 Graphing Lines Using X and Y-Intercepts

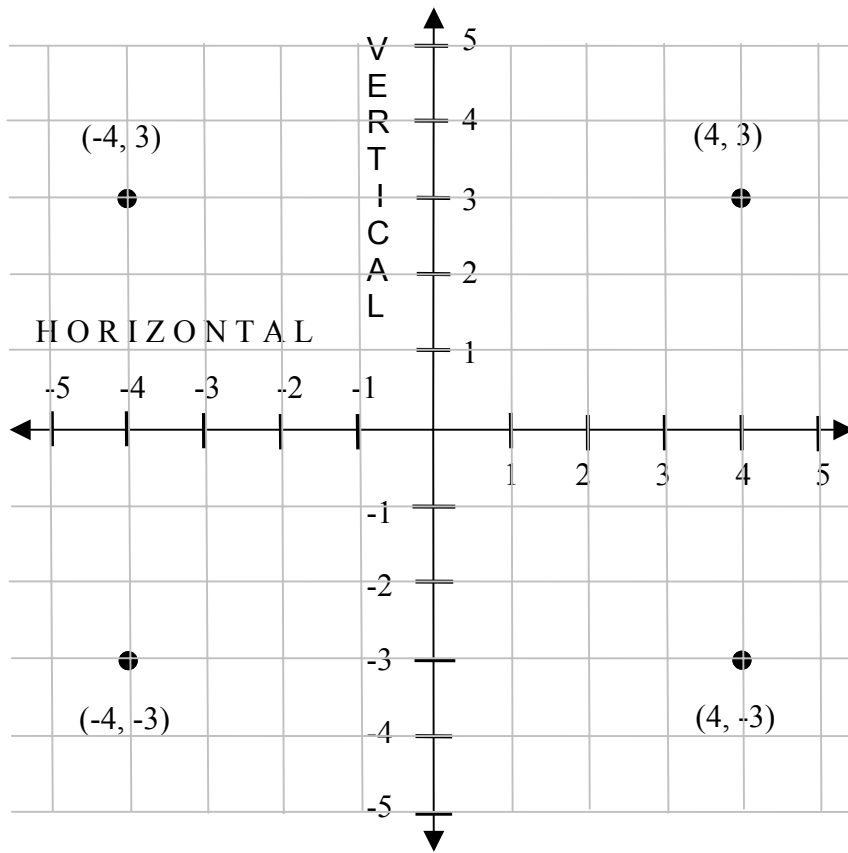
Teacher Aid: Answer Keys

SUPPLEMENTARY MATERIALS:

EVALUATION:

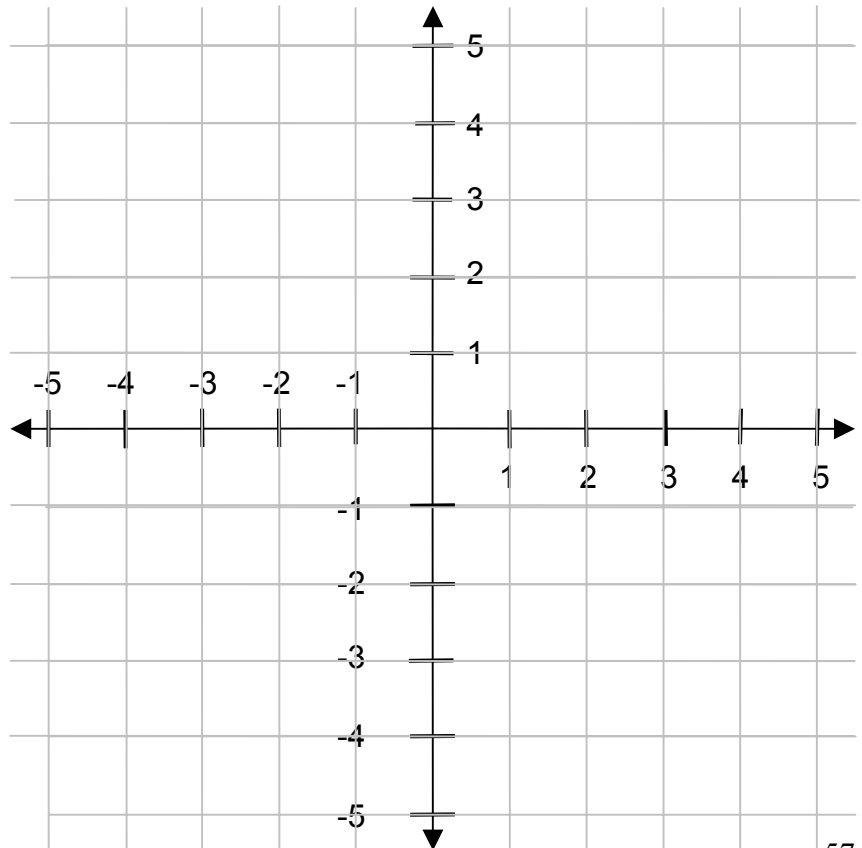
Students will successfully graph the equations in Step 6 of Classroom Procedure. They will find the slope of each line.

Coordinate Plane



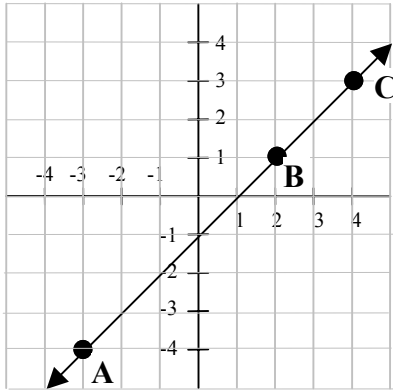
Graph each ordered pair from the table below. Label each point (x, y)

x	y
0	0
3	2
-4	1
5	-3
-3	-3
4	0
0	-2

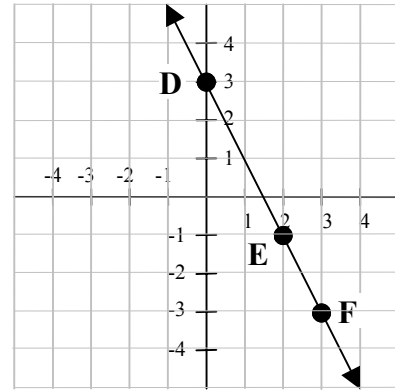


Finding Slope

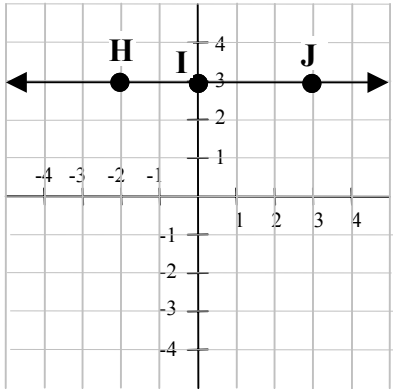
1) Positive Slope



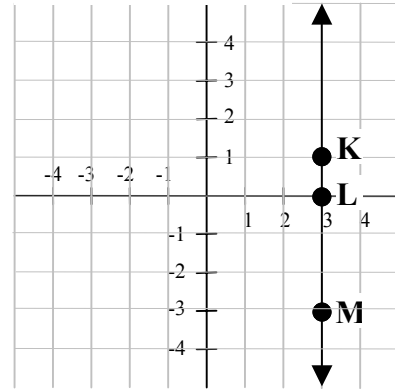
2) Negative Slope



3) Zero Slope (Horizontal Line)



4) Undefined Slope (Vertical Line)



Name the coordinates of the points:

A _____ D _____ H _____ K _____

B _____ E _____ I _____ L _____

C _____ F _____ J _____ M _____

Slope Formula $\frac{y_2 - y_1}{x_2 - x_1}$

Calculate the slope of each line using two points:

1) _____

3) _____

2) _____

4) _____

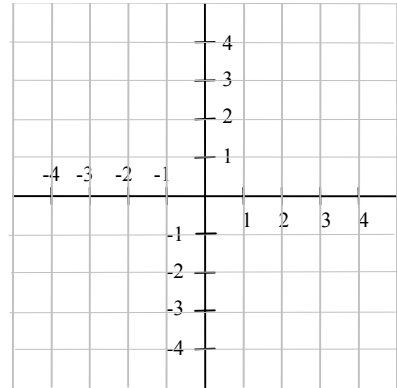
Graphing Lines from a Table of Values

Below are the equations for three lines. Graph each line using the points listed on the Table of Values. Find the slope of each line using the slope formula:

$$\frac{y_2 - y_1}{x_2 - x_1}$$

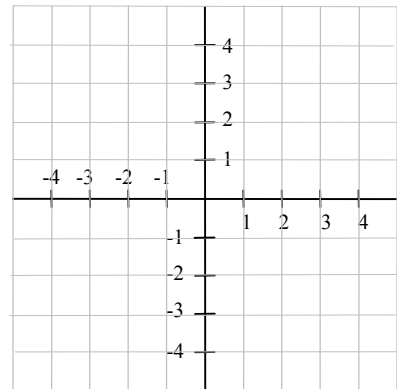
1) $y = x - 1$

x	y
2	1
4	3
0	-1



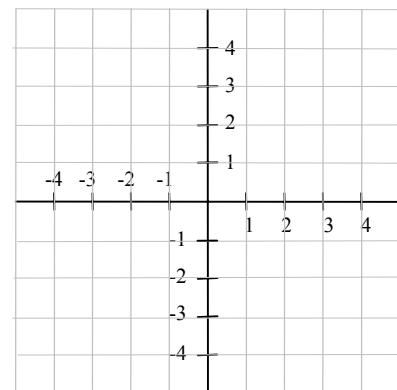
2) $y = -2x$

x	y
-1	2
0	0
1	-2



3) $y = -3$

x	y
-4	-3
0	-3
4	-3



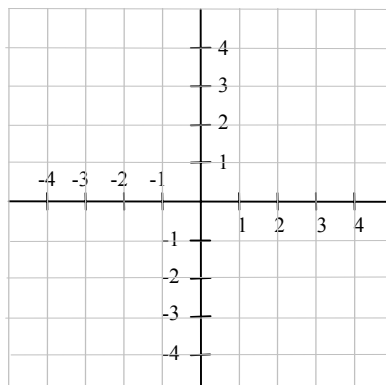
Parallel and Perpendicular Lines

1) **Parallel lines** are lines that do not intersect.

Use the Tables of Values below to graph lines A and B in the same coordinate plane:

A)	x	y
	-4	1
	-2	0
	2	-2

B)	x	y
	-2	4
	0	3
	2	2



Find the slope of each line.

Line A: _____ Line B: _____

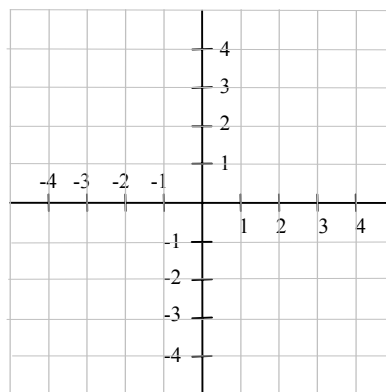
What can you conclude about the slopes of parallel lines?

2) **Perpendicular lines** are two lines that intersect and form right angles.

Use the Tables of Values below to graph lines C and D in the same coordinate plane:

C)	x	y
	-2	-4
	-1	-1
	0	2

D)	x	y
	-3	-1
	0	-2
	3	-3

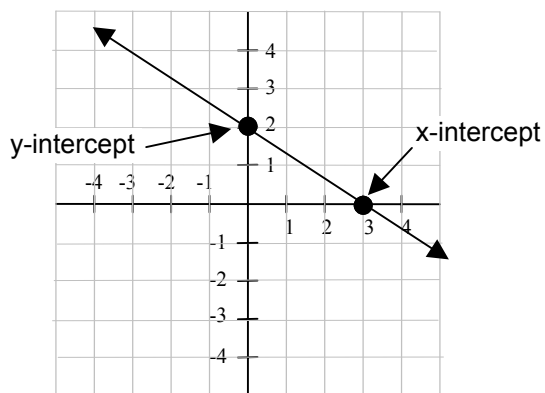


Find the slope of each line.

Line C: _____ Line D: _____

What can you conclude about the slopes of perpendicular lines?

Graphing Lines Using X and Y-Intercepts



- 1) Name the point of the y-intercept.
(Your answer is an ordered pair.)
- 2) Name the point of the x-intercept.
(Your answer is an ordered pair.)
- 3) Find the slope of the line.

The equation of the above line is $y = -\frac{2}{3}x + 2$. One way to graph a linear equation is to find the x and y-intercepts.

EXAMPLE: Graph $y = 2x + 4$.

First, plug **0** into the equation in place of **x** and solve for **y**.

$$y = 2(0) + 4$$

$$y = 4$$

(0, 4) is the y-intercept

Second, plug **0** into the equation in place of **y** and solve for **x**.

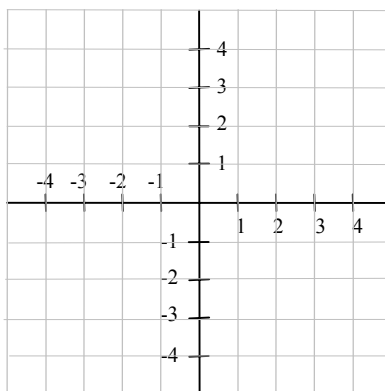
$$0 = 2x + 4$$

$$-4 = 2x$$

$$-2 = x$$

(-2, 0) is the x-intercept

Third, graph (0, 4) and (-2, 0) on the graph below. Then draw the line.



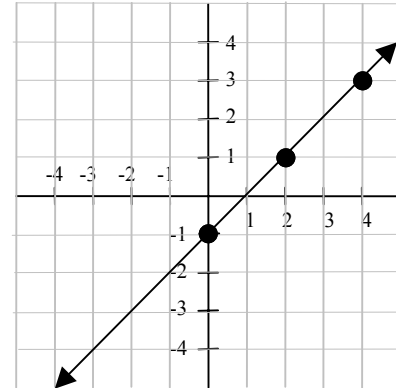
Answer Key

Graphing Lines from a Table of Values

1) $y = x - 1$

x	y
2	1
4	3
0	-1

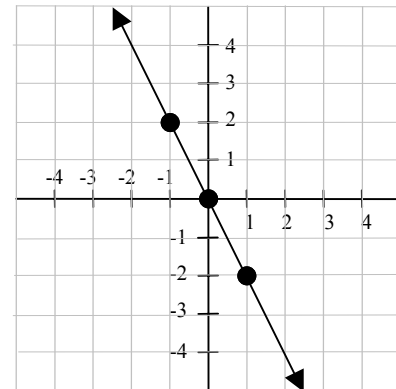
Slope = 1



2) $y = -2x$

x	y
-1	2
0	0
1	-2

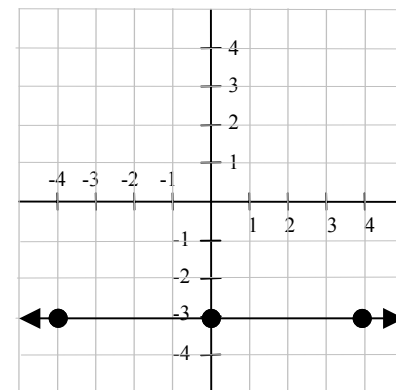
Slope = -2



3) $y = -3$

x	y
-4	-3
0	-3
4	-3

Slope = 0



Answer Key

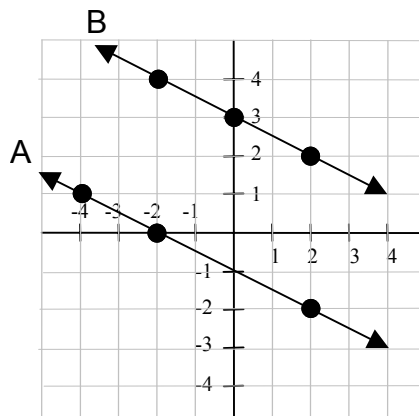
Parallel and Perpendicular Lines

1) **Parallel lines** are lines that do not intersect.

Use the Tables of Values below to graph lines A and B in the same coordinate plane:

A) x	y
-4	1
-2	0
2	-2

B) x	y
-2	4
0	3
2	2



Find the slope of each line:

Line A: $-\frac{1}{2}$ Line B: $-\frac{1}{2}$

What can you conclude about the slopes of parallel lines?

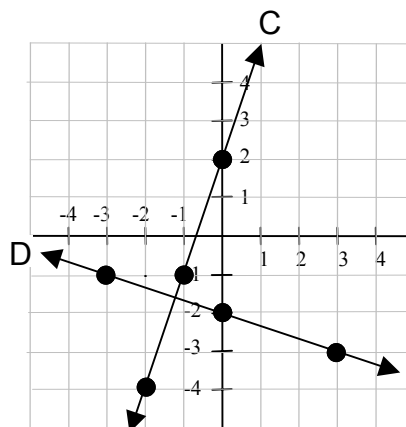
The slopes of parallel lines are equal.

2) **Perpendicular lines** are two lines that intersect and form right angles.

Use the Tables of Values below to graph lines C and D in the same coordinate plane:

C) x	y
-2	-4
-1	-1
0	2

D) x	y
-3	-1
0	-2
3	-3



Find the slope of each line.

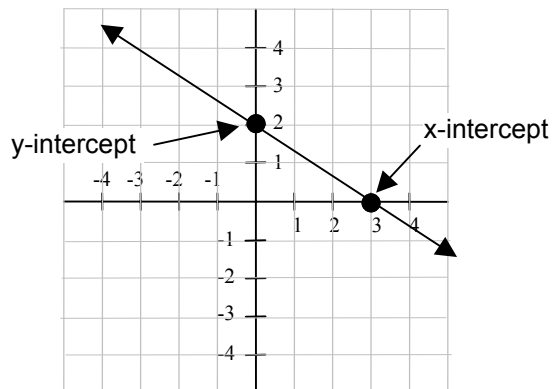
Line C: 3 Line D: $-\frac{1}{3}$

What can you conclude about the slopes of perpendicular lines?

The product of the slopes of perpendicular lines is -1.

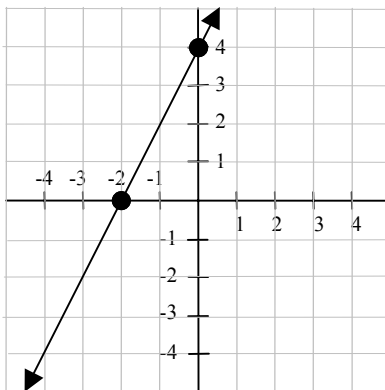
Answer Key

Graphing Lines Using X and Y-Intercepts



- 1) Name the point of the y-intercept.
(0, 2)
- 2) Name the point of the x-intercept.
(3, 0)
- 3) Slope = $-\frac{2}{3}$

Graph (0, 4) and (-2, 0) on the graph below.
Then draw the line.



PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.10 – Draw, identify, and analyze two or three-dimensional shapes applying concepts of regularity, symmetry, congruence, and similarity.

CONNECTIONS: 5.09

CLASSROOM PROCEDURE:

1. Tell the class that when a shape can be folded so that one side fits exactly over the other side, the shape is **symmetric**. The fold line is called the **line of symmetry**. Ask students to give examples of objects or shapes that are symmetric. (snow flakes, circles, squares, rectangles, hearts, four leaf clovers, diamonds, etc.)
2. Pass out **Lines of Symmetry** handouts. Discuss the lines of symmetry in the kite and rectangle. Tell students that a **regular polygon** has equal angles and sides. All regular polygons are symmetric. Have students complete the handout on their own, then have the class discuss their answers.
3. Pass out **Drawing Two and Three Dimensional Figures** handouts and rulers to the class. Tell the class that a two-dimensional figure has length and width; and a three-dimensional figure has length, width, AND depth. Review graphing ordered pairs with the class, and then tell the class they will be drawing three two-dimensional figures on the coordinate plane, and one three-dimensional figure.
4. Draw a pair of congruent quadrilaterals on the chalkboard, with the vertices marked ABCD and EFGH. Tell the class that the figures are congruent because they are exactly the same size and shape. Figure $ABCD \cong EFGH$. Rotate one of the figures and have the students then match the congruent angles and sides.
5. Students will complete **Congruent Figures** handout on their own as an assessment of this lesson.

VOCABULARY:

symmetric
line of symmetry
regular polygon
equilateral triangle
two-dimensional
three-dimensional
right triangle
trapezoid
parallelogram
cube
pentagon
congruent

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Rulers
Student Handouts:
Lines of Symmetry
Drawing Two and Three Dimensional Figures
Congruent Figures
Teaching Aids:
Answer Keys

SUPPLEMENTARY MATERIALS:

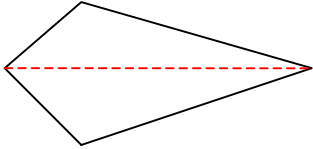
EVALUATION:

Students will successfully complete the **Congruent Figures** handout.

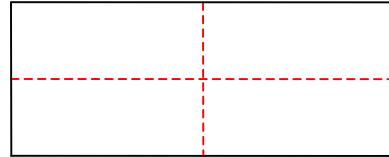
Lines of Symmetry

When you draw a figure and its reflection, you create a figure that's **symmetric**.
A line of symmetry divides a symmetrical figure into two congruent (equal) halves.

A kite has one line of symmetry:

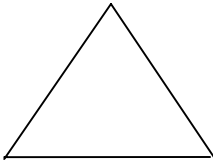


A rectangle has two lines of symmetry:

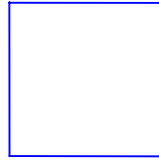


A **regular polygon** has equal angles and sides.

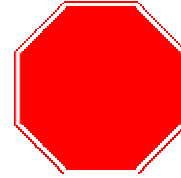
Draw all lines of symmetry for each regular polygon below:



equilateral
triangle

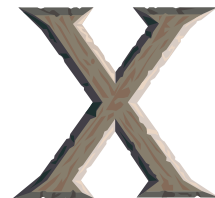
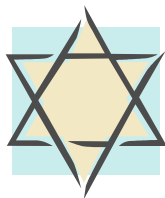
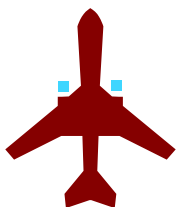
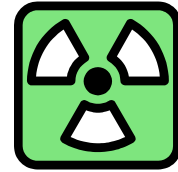
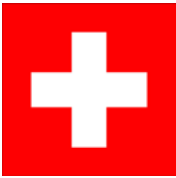


square



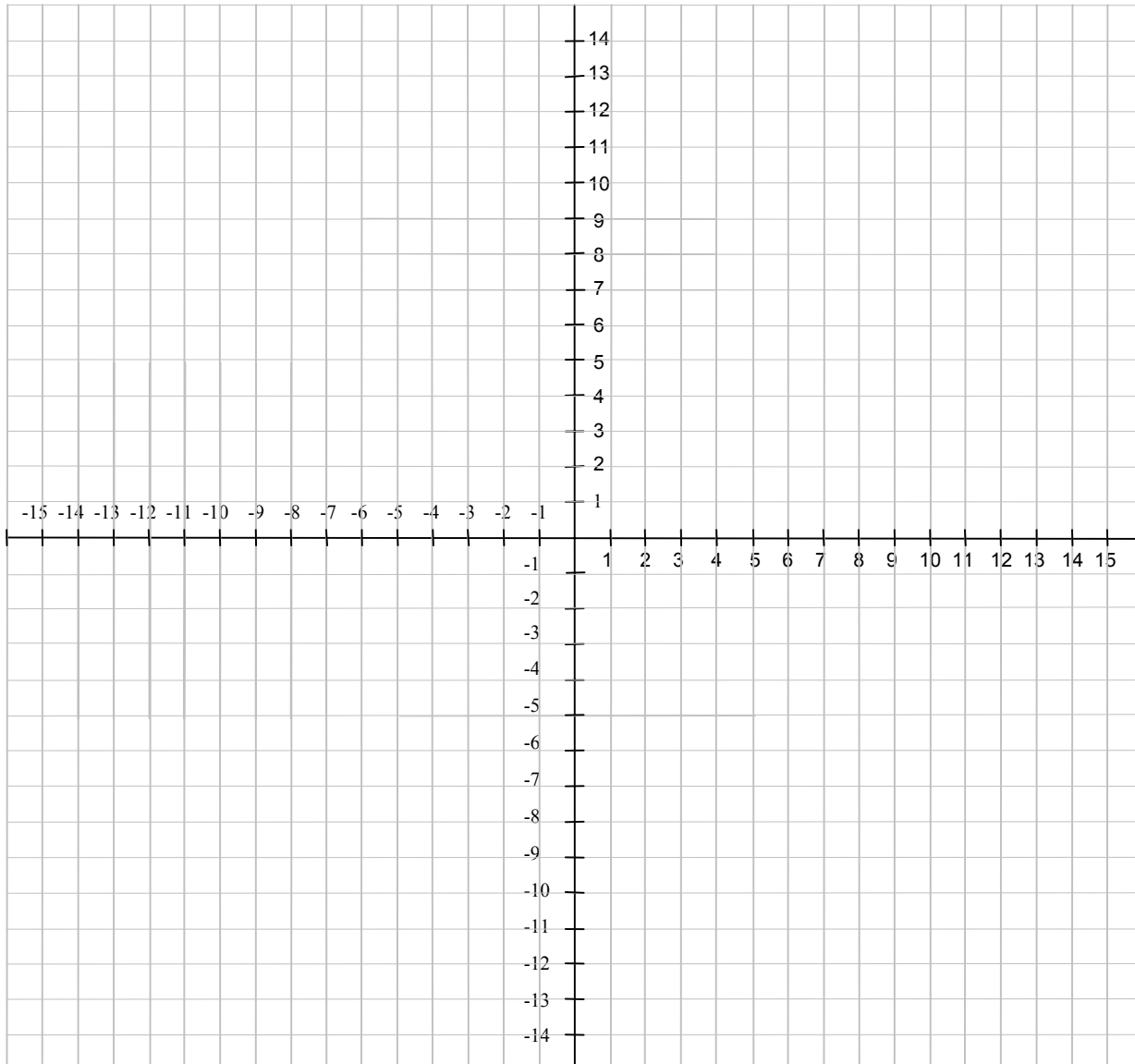
octagon

Draw all lines of symmetry for each object below:



Drawing Two and Three Dimensional Figures

- 1) Graph and label the points: (A) (4, 3) (B) (4, 13) (C) (12, 3)
Draw the line segments: AB, BC, CA
Name the shape_____.
- 2) Graph and label the points: (D) (-12, 3) (E) (-15, 12) (F) (-1, 12) (G) (-4, 3)
Draw the line segments: DE, EF, FG, GD
Name the shape_____.
- 3) Graph and label the points: (H) (-15, -9) (I) (-12, -2) (J) (-4, -2) (K) (-7, -9)
Draw the line segments: HI, IJ, JK, KH
Name the shape_____.
- 4) Graph and label the points: (L) (4, -11) (M) (4, -5) (N) (7, -3) (O) (14, -3) (P) (14, -9)
(Q) (11, -11) (R) (11, -5)
Draw the line segments: LM, MN, NO, OP, PQ, QR, RO, RM, LQ
Name the shape_____.



Congruent Figures

Figures that have the same size and shape are **congruent**.

Follow these directions to draw congruent figures below:

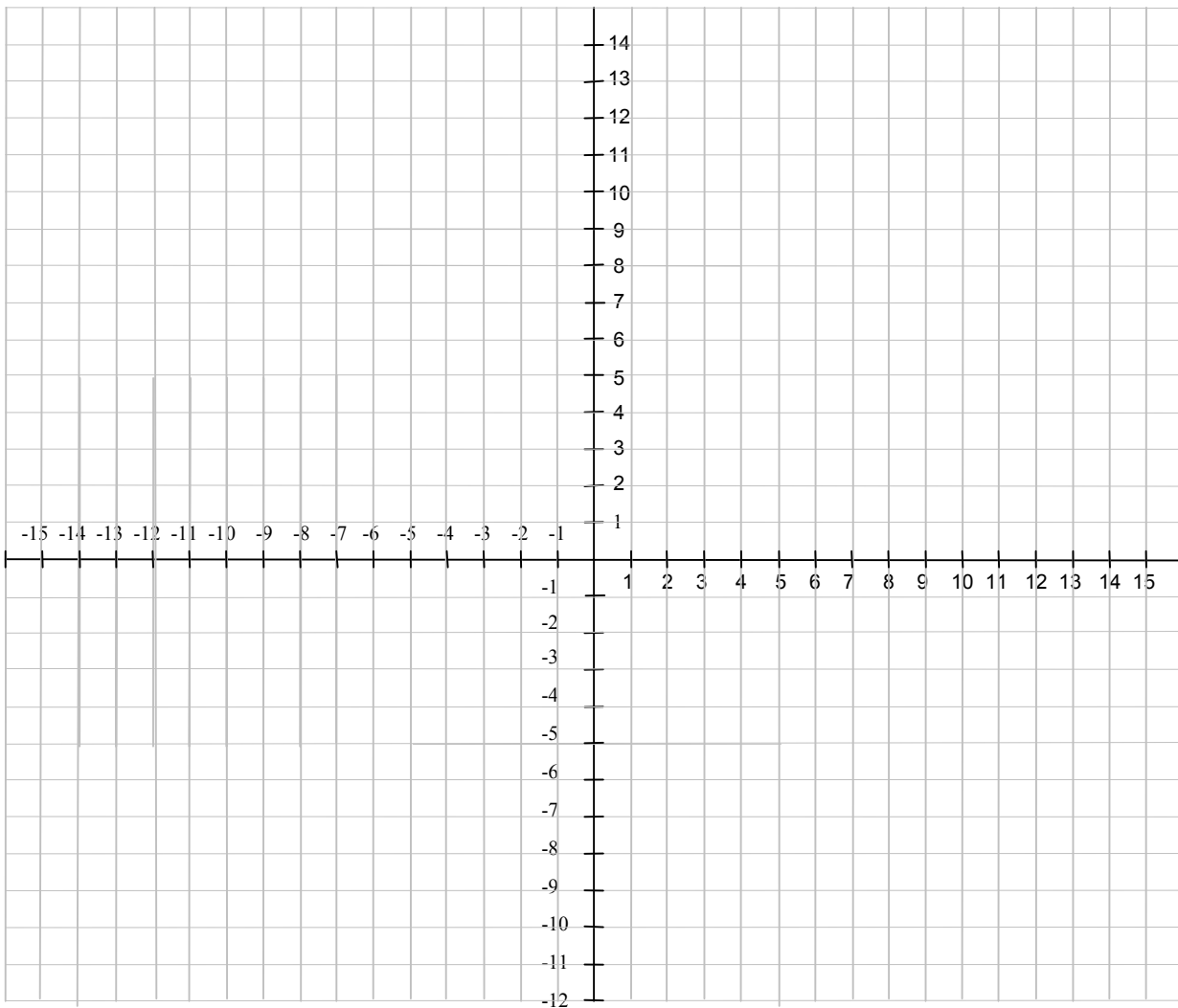
1) Graph and label the points: (A) (3, 3) (B) (3, 11) (C) (11, 11) (D) (15, 3)

Draw the line segments: AB, BC, CD, DA

2) Graph and label these points: (E) (-2, 2) (F) (-2, 14) (G) (-10, 10) (H) (-10, 2)

Draw the line segments: EF, FG, GH, HE

3) $ABCD \cong EHG$ List all the congruent angles and sides:



4) Graph and label the points: (I) (-3, -5) (J) (-8, -2) (K) (-13, -5) (L) (-11, -10) (M) (-5, -10)

Draw the line segments: IJ, JK, KL, LM, MI

5) Graph and label these points: (N) (4, -8) (O) (6, -3) (P) (12, -3) (Q) (14, -8) (R) (9, -11)

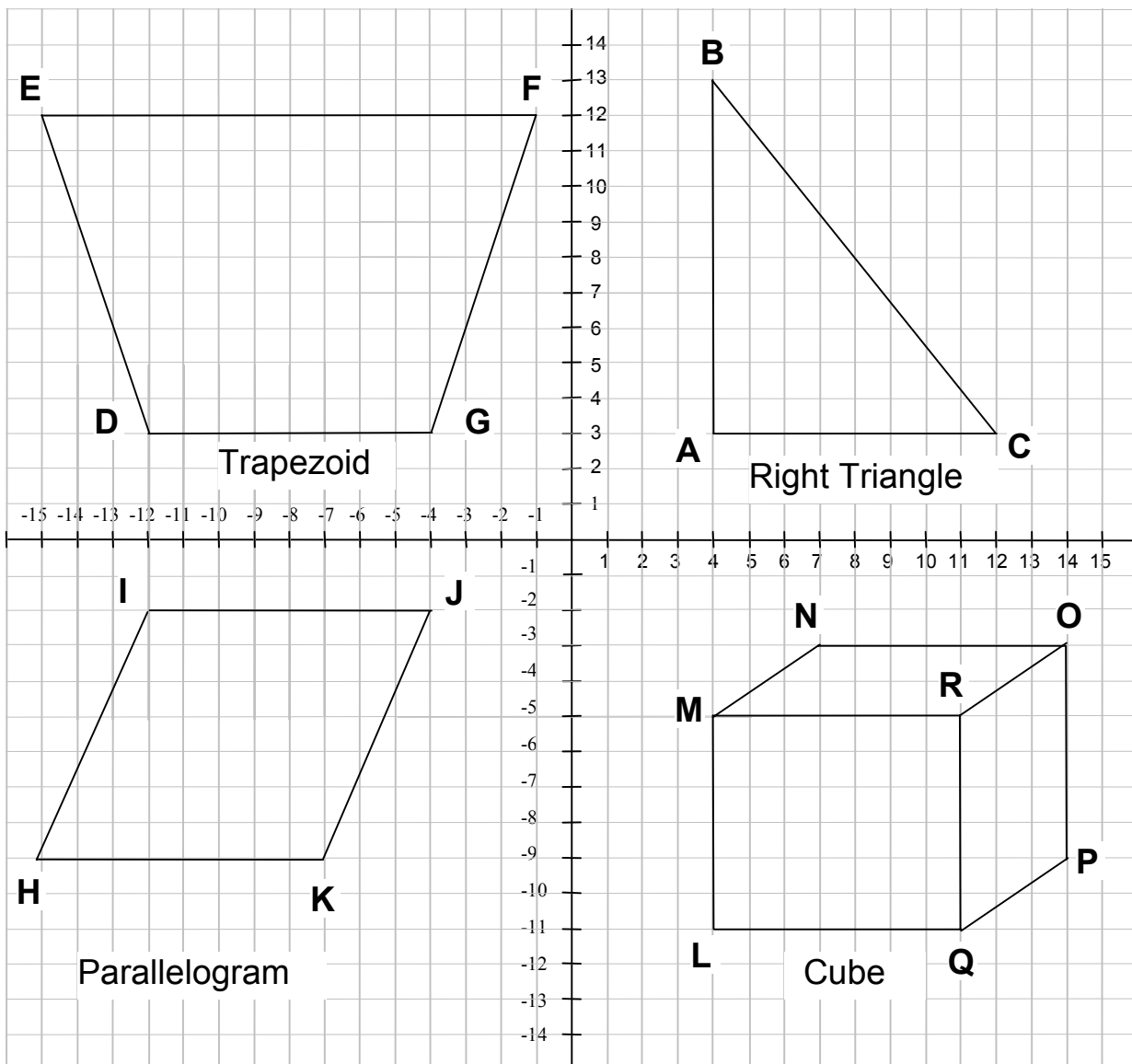
Draw the line segments: NO, OP, PQ, QR, RN

6) $IJKLM \cong NOPQR$. Since the figures are regular pentagons, all the sides and all the angles are congruent. Draw all lines of symmetry in the pentagons.

Answer Key

Drawing Two and Three Dimensional Figures

- 1) Graph and label the points: (A) (4, 3) (B) (4, 13) (C) (12, 3)
Draw the line segments: AB, BC, CA
Name the shape right triangle.
- 2) Graph and label the points: (D) (-12, 3) (E) (-15, 12) (F) (-1, 12) (G) (-4, 3)
Draw the line segments: DE, EF, FG, GD
Name the shape trapezoid.
- 3) Graph and label the points: (H) (-15, -9) (I) (-12, -2) (J) (-4, -2) (K) (-7, -9)
Draw the line segments: HI, IJ, JK, KH
Name the shape parallelogram.
- 4) Graph and label the points: (L) (4, -11) (M) (4, -5) (N) (7, -3) (O) (14, -3) (P) (14, -9) (Q) (11, -11) (R) (11, -5)
Draw the line segments: LM, MN, NO, OP, PQ, QR, RO, RM, LQ
Name the shape cube.



Answer Key Congruent Figures

Figures that have the same size and shape are congruent.

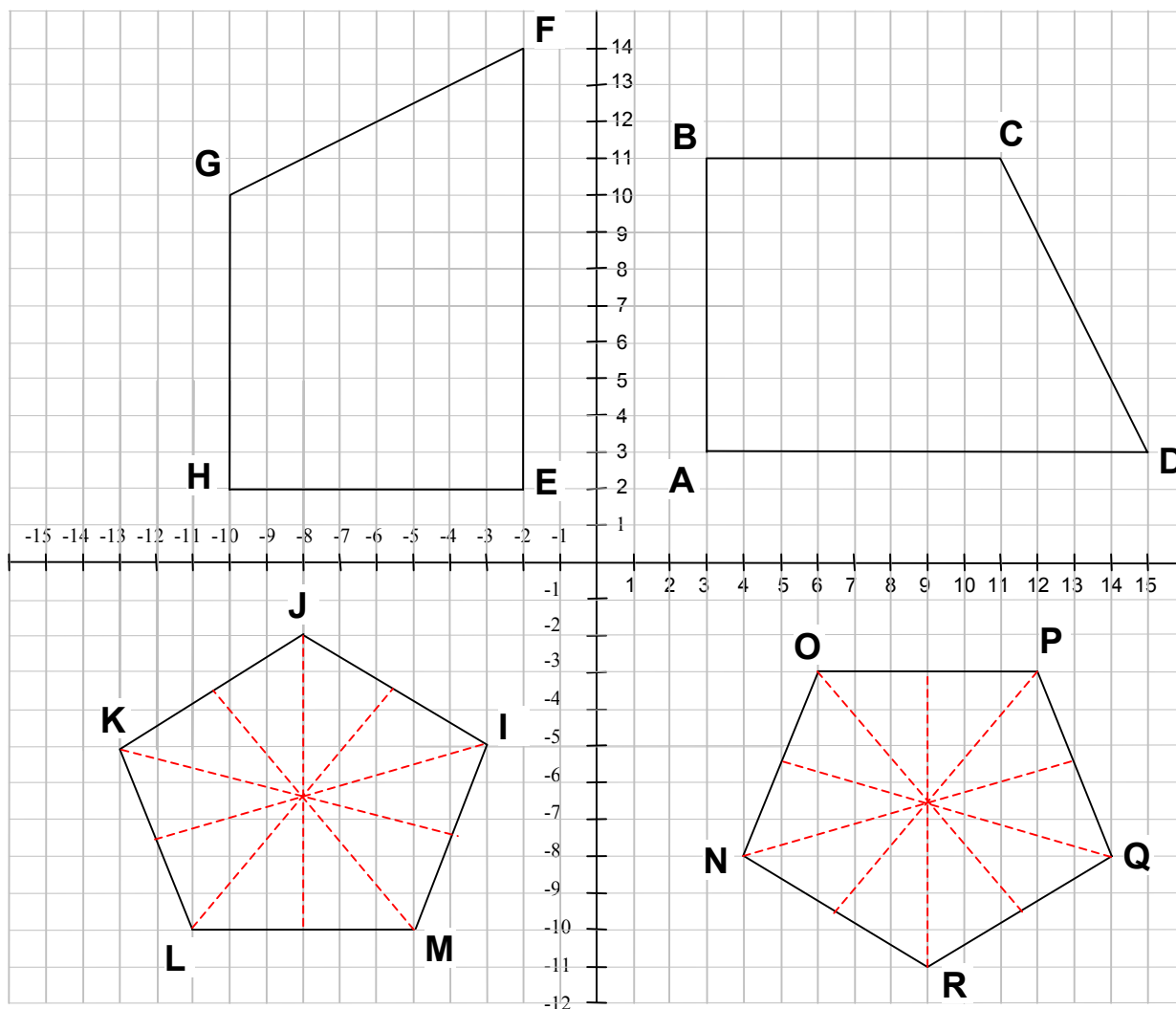
Follow these directions to draw congruent figures below:

1) Graph the and label the points: (A) (3, 3) (B) (3, 11) (C) (11, 11) (D) (15, 3)
Draw the line segments: AB, BC, CD, DA

2) Graph and label these points: (E) (-2, 2) (F) (-2, 14) (G) (-10, 10) (H) (-10, 2)
Draw the line segments: EF, FG, GH, HE

3) $ABCD \cong EHG F$ List all the congruent angles and sides:

$$\begin{array}{llll} \angle A \cong \angle E & \angle C \cong \angle G & AB \cong EH & CD \cong GF \\ \angle B \cong \angle H & \angle D \cong \angle F & BC \cong HG & DA \cong FE \end{array}$$



4) Graph and label the points: (I) (-3, -5) (J) (-8, -2) (K) (-13, -5) (L) (-11, -10) (M) (-5, -10)
Draw the line segments: IJ, JK, KL, LM, MI

5) Graph and label these points: (N) (4, -8) (O) (6, -3) (P) (12, -3) (Q) (14, -8) (R) (9, -11)
Draw the line segments: NO, OP, PQ, QR, RN

6) $IJKLM \cong NOPQR$. Since the figures are regular pentagons, all the sides and all the angles are congruent. Draw all lines of symmetry in the pentagons.

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.11 – Find the mean, median, mode and range of a set of data in a real-life situation using a scientific calculator, when appropriate.

CONNECTIONS: 5.01, 5.02, 5.03, 5.06, 5.07

CLASSROOM PROCEDURE:

Students will conduct a survey.

1. Have students copy the lesson vocabulary and definitions off the transparency. Discuss the definitions together with the class to be sure that the students understand the terms to be used in this activity.
2. Depending on the number of students in the class, students can work individually, with a partner, or with a small group. Each person (or group) will formulate a survey question that has a numerical answer. Sample Questions: How many hours a week do you work? How many brothers and sisters do you have? How many pets live at your house? How many hours a week do you spend at school? How many hours a week do you spend playing video/computer games? What is the last grade of school you completed? How many states have you visited, or lived in?
3. Each group will write their own survey question. The groups will be numbered – The number of the group will correspond with the number of their question. One person in the class will type all the survey questions on a handout that will be copied and distributed to all the people in the class.
4. Each person in the class will answer all the survey questions.
5. Each group will analyze the data of the survey question that they wrote. They will find the mean, median, mode and range of the results for their survey question only.
6. Distribute large sheets of paper, or posters, markers, and rulers to each person (or group). Each person (or group) will creatively display their results. Each poster should contain the following: Question clearly stated, Mean, Median, Mode, Range of the results.
7. Each group (or person) will present their findings to the class, using the poster as a visual aid.

VOCABULARY:

data
statistics
mean
median
mode
range

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Teaching Transparency –
Measures of Central Tendency

calculators
poster paper
markers
rulers

SUPPLEMENTARY MATERIALS:

EVALUATION:

Students will be find the mean, median, mode and range of the results of their survey question. The data will be creatively displayed on a poster.

MEASURES of CENTRAL TENDENCY

- 1) **DATA** – Numerical information gathered for statistical purposes.
- 2) **STATISTICS** – Information that has been collected, analyzed, and presented in an organized fashion.
- 3) **MEAN** – The sum of the numbers in a set of data divided by the number of pieces in the data.
- 4) **MEDIAN** – The middle number in a set of data, organized from least to greatest. If there are two middle numbers, add the two numbers together and divide by two.
- 5) **MODE** – The number that appears most often in a set of data.
- 6) **RANGE** – The difference between the least and greatest numbers in a set of data.

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.12 – Define and give examples of number properties, and apply the correct order of operations.

CONNECTIONS: 5.01, 5.04

CLASSROOM PROCEDURE:

1. As a warm-up activity, review adding, subtracting, and multiplying signed numbers with the class:
1) $-5 + -6$ 2) $8 + (-7)$ 3) $(-5) + 17$ 4) $-7(-6)$ 5) $5(-8)$
2. Review combining like terms to simplify algebraic expressions:
1) $x + 3x$ 2) $5 + 18 + x + x$ 3) $8 \cdot 5 \cdot n$ 4) $9(9n)$ 5) $-2(15n)$
3. Use **Number Properties – Teaching Transparency** to review the basic properties with the class. The students should copy down the properties and examples.
4. For this lesson, it is preferable that students not be permitted to use calculators. Students will complete **Using Number Properties** worksheet individually, or in cooperative groups.
5. Pass out **The Distributive Property** handouts to students. Discuss the Distributive Property and demonstrate the example at the top of the page. Students will complete the handout in groups.
6. Pass out **Order of Operations** handouts to students. Discuss the correct order of operations with the class, going over the example given at the top of the handout. Students can complete this worksheet individually, or in their cooperative groups.
7. Students can be assessed by successfully completing the **Quiz** without the use of a calculator.
8. As an extra activity, students can play KRYPTO. The rules and cards are included.

VOCABULARY:

Commutative Property of Addition
Commutative Property of Multiplication
Associative Property of Addition
Associative Property of Multiplication
Distributive Property

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Student Handouts:
Using Number Properties
The Distributive Property
Order of Operations
Quiz – Properties and Order of Operations
Teaching Aids:
Number Properties – Teaching Transparency
Answer Keys

SUPPLEMENTARY MATERIALS:

KRYPTO – A game that can be played to reinforce order of operations.

A copy of the cards, and the directions for the game are included. Cardstock paper is needed to copy the cards for the game.

EVALUATION:

Students may be assessed with the quiz on properties and order of operations.

Number Properties – Teaching Transparency

- 1) **The Commutative Property of Addition** – You can change the order in which numbers are added and the sum stays the same. $a + b = b + a$

Example: Use the commutative property of addition to help simplify this algebraic expression:

$$5 + 7x + (-7) + 2x + 5$$

$$5 + 5 + (-7) + 7x + 2x \quad (\text{Rearrange the terms to make adding easier.})$$

$$\underline{\mathbf{3 + 9x}}$$

- 2) **The Commutative Property of Multiplication** – You can change the order in which numbers are multiplied and the product stays the same. $a \times b = b \times a$

Example: Use the commutative property of multiplication to help simplify this algebraic expression:

$$y \cdot 10 \cdot 11 \cdot 7$$

$$7 \cdot 11 \cdot 10 \cdot y \quad (\text{Rearrange the terms to make multiplying easier.})$$

$$\underline{\mathbf{770y}}$$

- 3) **The Associative Property of Addition** – You can change the grouping of numbers when adding and the sum stays the same. $a + (b + c) = (a + b) + c$

Example: Use the associative property of addition to help simplify this algebraic expression:

$$(y + 8) + 17$$

$$y + (8 + 17) \quad (\text{Group the numbers together.})$$

$$\underline{\mathbf{y + 25}}$$

- 4) **The Associative Property of Multiplication** – You can change the grouping of numbers when multiplying and the product stays the same. $a(bc) = (ab)c$

Example: Use the associative property of multiplication to help simplify this algebraic expression:

$$9(5n)$$

$$(9 \cdot 5)n \quad (\text{Group the numbers together.})$$

$$\underline{\mathbf{45n}}$$

Using Number Properties

Use the Commutative Property of Addition to rewrite each expression, then simplify.

1) $x + (-5) + 3x + 17$ 2) $x + 5 + 18 + 5 + x$ 3) $25 + 7 + 2n + 3 + 25$

Use the Commutative Property of Multiplication to rewrite each expression, then simplify.

4) $12 \cdot 8 \cdot n \cdot 5$ 5) $2 \cdot 26 \cdot y \cdot 5$ 6) $n \cdot 4 \cdot 9 \cdot 5$

Use the Associative Property of Addition to regroup each expression, then simplify.

7) $(n + 22) + 8$ 8) $(y + 16) + 15$ 9) $7 + (9 + n)$

Use the Associative Property of Multiplication to regroup each expression, then simplify.

10) $12(8n)$ 11) $9(9y)$ 12) $11(7x)$

The Distributive Property

For all numbers a , b , and c : $a \times (b + c) = a \times b + a \times c$

Examples: $5(n + 5) = 5n + 25$

$$8(x - 7) = 8x - 56$$

$$-6(8 + y) = -48 + (-6y)$$

$$-9(9 - m) = -81 + 9m$$

Use the distributive property to simplify these algebraic expressions:

1) $6(n + 7)$ 2) $8(y + 12)$ 3) $10(12 - x)$ 4) $-3(n + 11)$

5) $-7(y - 6)$ 6) $5(m - 8)$ 7) $9(x + 8)$ 8) $-6(8 + y)$

9) $-6(n - 12)$ 10) $-2(-6 + x)$ 11) $-3(-5 - y)$ 12) $5(n + 7) + 3(n - 4)$

Order of Operations

The order for performing operations is as follows:

1. Work inside the parenthesis first.
2. Simplify the exponents.
3. Next, multiply and divide, or divide and multiply (whichever comes first) from left to right.
4. Finally, add and subtract, or subtract and add (whichever comes first) from left to right.

Example: $12 - 6(-8 + 2 \cdot 6) + 5^2$ ← Multiply in the parenthesis first

$12 - 6(-8 + 12) + 5^2$ ← Add inside the parenthesis

$12 - 6(4) + 5^2$ ← Simplify the exponent

$12 - 6(4) + 25$ ← Multiply

$12 - 24 + 25$ ← Add and subtract from left to right

$-12 + 25$ ← Simplify

13

Simplify the following expressions using Order of Operations:

1) $6 + 7 \cdot 4 + 8$ 2) $6 \cdot 3 \div 2 + 5$ 3) $3^2 + 12 \div 6 \cdot 6$ 4) $7 \cdot 3 + 7 \cdot 4$

5) $8(4 + 4 \cdot 4)$ 6) $5 \cdot (10 + 7 - 8) \div 9 + 4$ 7) $100 - 6(5 + 2 \cdot 5) + 3^2 \cdot 4$

QUIZ – Properties and Order of Operations

Match the correct property with each statement below. Write the letter of the property in the space provided.

- (A) Commutative Property of Addition (B) Commutative Property of Multiplication
(C) Associative Property of Addition (D) Associative Property of Multiplication
(E) Distributive Property

___1) $5(x + 12) = 5x + 60$

___2) $6(7n) = (6 \cdot 7)n$

___3) $7 + (12 + y) = (7 + 12) + y$

___4) $5 + 35 = 35 + 5$

___5) $6 + x + 7 + 2x + 4 = 4 + 6 + 7 + x + 2x$

___6) $7 \cdot n \cdot 5 \cdot 2 = 5 \cdot 2 \cdot 7 \cdot n$

___7) $10(6 + 7) = (10 \cdot 6) + (10 \cdot 7)$

___8) $n \cdot 35 = 35n$

Use the properties to simplify the following expressions:

9) $-2(y + 15)$ 10) $7 \cdot n \cdot 5 \cdot 2$ 11) $6(x - 7)$ 12) $3n + 17 + 7 + n + 8$

Use Order of Operations to simplify the expressions below:

13) $6 + 7 \cdot 7$ 14) $5^2 + 2(12 \div 4 + 5 \cdot 4)$ 15) $3^2 + 36 \div 6 \cdot 4$

Answer Key

Using Number Properties

Use the Commutative Property of Addition to rewrite each expression, then simplify.

1) $x + (-5) + 3x + 17$

$$x + 3x + 17 - 5$$

$$4x + 12$$

2) $x + 5 + 18 + 5 + x$

$$x + x + 5 + 5 + 18$$

$$2x + 28$$

3) $25 + 7 + 2n + 3 + 25$

$$25 + 25 + 7 + 3 + 2n$$

$$60 + 2n$$

Use the Commutative Property of Multiplication to rewrite each expression, then simplify.

4) $12 \cdot 8 \cdot n \cdot 5$

$$8 \cdot 5 \cdot 12 \cdot n$$

$$480n$$

5) $2 \cdot 26 \cdot y \cdot 5$

$$2 \cdot 5 \cdot 26 \cdot y$$

$$260y$$

6) $n \cdot 4 \cdot 9 \cdot 5$

$$4 \cdot 5 \cdot 9 \cdot n$$

$$180n$$

Use the Associative Property of Addition to regroup each expression, then simplify.

7) $(n + 22) + 8$

$$n + (22 + 8)$$

$$n + 30$$

8) $(y + 16) + 15$

$$y + (16 + 15)$$

$$y + 31$$

9) $7 + (9 + n)$

$$(7 + 9) + n$$

$$16 + n$$

Use the Associative Property of Multiplication to regroup each expression, then simplify.

10) $12(8n)$

$$(12 \cdot 8)n$$

$$96n$$

11) $9(9y)$

$$(9 \cdot 9)y$$

$$81y$$

12) $11(7x)$

$$(11 \cdot 7)x$$

$$77x$$

Answer Keys

The Distributive Property

1) $6n + 42$ 2) $8y + 96$ 3) $120 - 10x$ 4) $-3n - 33$

5) $-7y + 42$ 6) $5m - 40$ 7) $9x + 72$ 8) $-48 - 6y$

9) $-6n + 72$ 10) $12 - 2x$ 11) $15 + 3y$ 12) $8n + 23$

Order of Operations

1) 42 2) 14 3) 21 4) 49

5) 160 6) 9 7) 46

QUIZ – Properties and Order of Operations

1) E 2) D 3) C 4) A

5) A 6) B 7) E 8) B

9) $-2y - 30$ 10) $70n$ 11) $6x - 42$ 12) $4n + 32$

13) 55 14) 71 15) 33

KRYPTO

This is a game to test your skill in using the correct Order of Operations.

Directions

- 1) Five numbers are drawn randomly from a deck of cards.
- 2) A sixth number is drawn.
- 3) The six numbers are written on the board.
- 4) Working with paper and pencil, students will keep rearranging the first five numbers until a number sentence is formed that equals the sixth number.
- 5) Each number must be used once.
- 6) Addition, and/or subtraction, and/or multiplication, and/or division, are used, in any order. + - x ÷
- 7) Grouping symbols may be used. () []
- 8) The correct order of operations must be followed.
- 9) The first person who forms a correct number sentence, making the first five numbers (arranged in any order) equal to the 6th number, wins the game.

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PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.13 – Analyze and interpret the real-world data found in charts, graphs, and tables from newspapers or magazines.

CONNECTIONS: 5.01, 5.02, 5.03, 5.06, 5.07, 5.11, 5.14, 5.17

CLASSROOM PROCEDURE:

1. As a warm up exercise, review percentages with the class by having them work this problem: Out of 243,294 traffic crashes in Florida in the year 2003, 22,752 were alcohol related. What percentage of the traffic crashes involved alcohol? (**9.35%**)
2. **Statistics** are the mathematics of the collection, organization, and interpretation of numerical data. Newspapers and magazines will often present statistical information.
3. Tell the class that the best way to present statistics, such as the word problem in the warm up activity, is by using graphics – a picture representation of the data. Some of the ways that statistical data can be presented graphically is with pie graphs, tables, bar graphs, and line graphs. Students will be interpreting each of these examples in this lesson.
4. Review measures of central tendency with the class:
 The **median** is the middle number.
 The **mode** is the number that occurs the most often.
 The **range** is the difference between the least and the greatest number.
5. This lesson is well suited for group work and will probably take two class sessions. Each student should complete the four handouts individually, but working within a cooperative group.

VOCABULARY:

median
 mode
 range
 statistics
 data
 correlation

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Student Handouts:
 Florida Traffic Fatalities in 2003
 2003 Florida Traffic Crash Statistics
 Bar Graph
 Shark Attacks in Florida

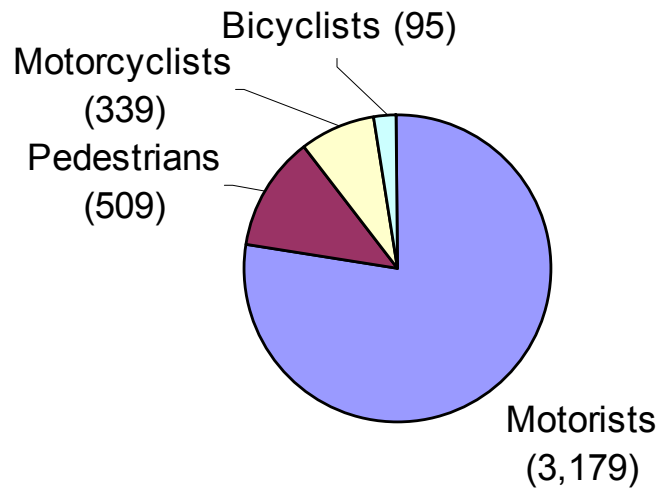
Teaching Aids:
 Answer Keys

SUPPLEMENTARY MATERIALS:

EVALUATION:

Students will interpret each of the four sample graphs, correctly answering the questions. Students will share their findings with the class.

Florida Traffic Fatalities in 2003



1. A **pie graph** gives an overall **picture** of how a whole is divided up. In this pie graph, what information is being presented?
2. By studying the pie graph, **ESTIMATE** the percent of motorist fatalities.
3. What is the total number of traffic related fatalities in Florida in 2003? (Add the numbers given in each category.)
4. Using your calculator, calculate the percent of motorist fatalities, rounded to the tenths place.
5. Calculate the percent of pedestrian fatalities, rounded to the tenths place.
6. Calculate the percent of motorcyclist fatalities, rounded to the tenths place.
7. Calculate the percent of bicyclist fatalities, rounded to the tenths place.
8. What conclusions can you make, based on the information given in this pie graph? Write your answer in complete sentences.

2003 FLORIDA TRAFFIC CRASH STATISTICS

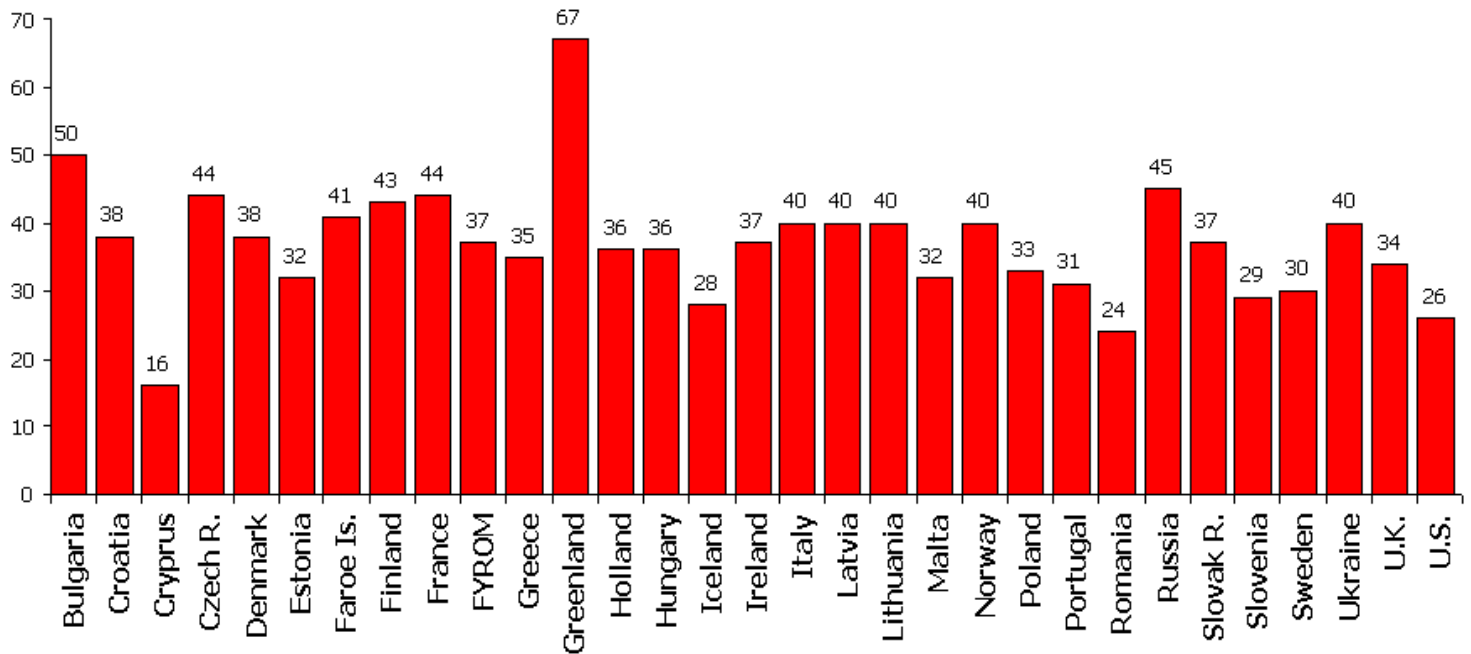
Traffic crashes	243,294
Drivers involved	362,024
Average crashes per day	667
Mileage Death Rate (per 100 million VM)	1.7
Fatalities	3,179
Fatal crashes	2,880
Injuries	221,639
Injury crashes	138,891
Property damage only crashes	101,523
Alcohol-related fatalities	1,096
Alcohol-related injuries	17,379
Alcohol-related crashes	22,752
Alcohol-related fatal crashes	997
Alcohol-related injury crashes	10,937
Pedestrians killed	509
Pedestrians injured	7,449
Pedestrian crashes	7,980
Bicyclists killed	95
Bicyclists injured	4,991
Bicycle crashes	5,393
Motorcyclists killed	339
Motorcyclists injured	5,973
Motorcycle crashes	6,635

Answer the questions below. Round your percentage answers to the hundredths place.

1. What information is presented in this table?
2. How many traffic crashes were there in Florida in 2003?
3. There were 2,880 fatal crashes. That means out of all the traffic crashes, 2,880 produced at least one death. What percent of the traffic crashes were fatal?
4. How many fatal crashes were alcohol related?
5. What percent of all fatal crashes were alcohol related?
6. How many motorcycles crashed in 2003?
7. How many motorcyclists were killed?
8. What percentage of the motorcycle crashes killed the motorcyclist?

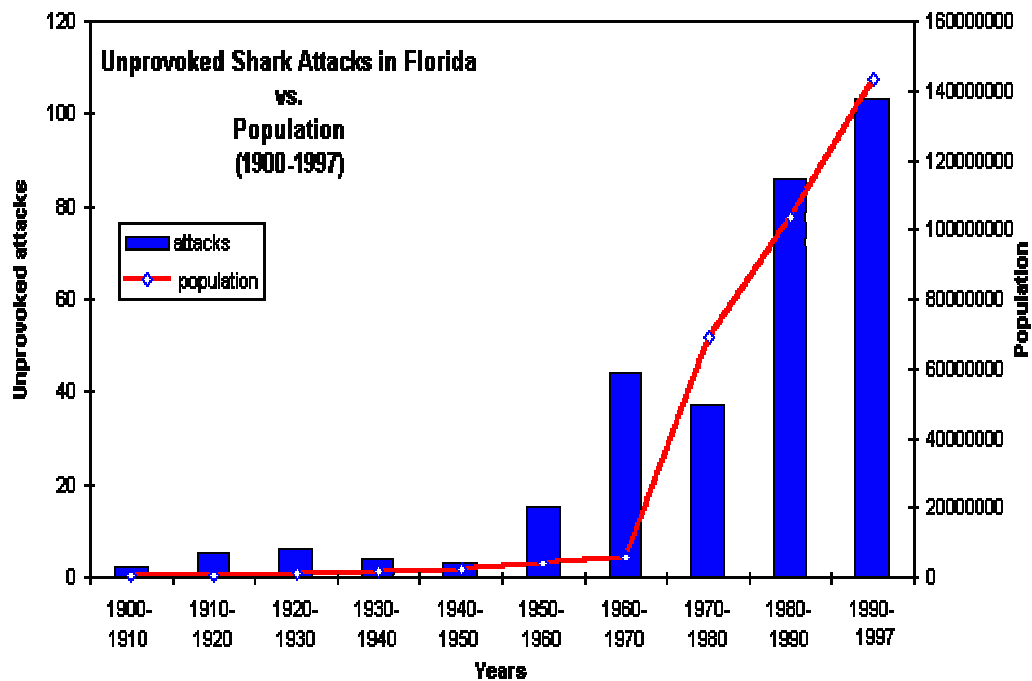
BAR GRAPH

Percent of 10th Grade Students Who Smoked Cigarettes in Past 30 Days



1. What information is presented in this graph?
2. What do the bars represent?
3. What percent of U. S. tenth graders smoked in the past 30 days?
4. Which country has the highest incidence of students who smoked in the past 30 days?
5. Which country has the lowest incidence of students who smoked in the past 30 days?
6. Arrange the data from least to greatest. What is the median?
7. What is the mode?
8. What is the range?
9. What can you conclude from the information presented in this graph? Write your answer in complete sentences.

SHARK ATTACKS in FLORIDA (N=305)



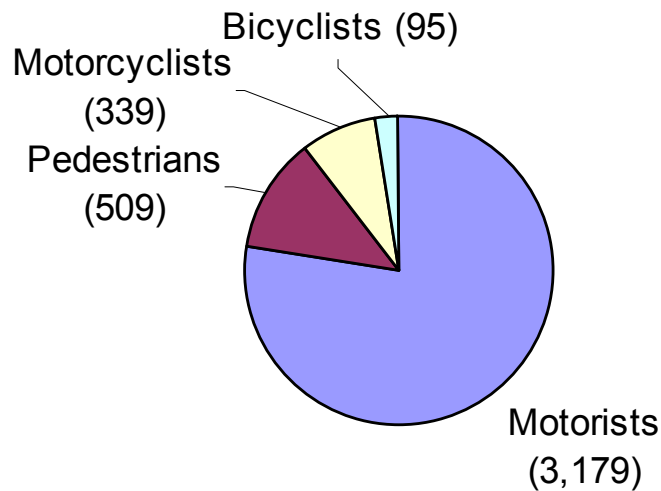
Copyright ©
International Shark Attack File

Last updated: May 29, 1997

1. What information is presented in this graph?
2. What do the bars represent?
3. What does the line represent?
4. What do the numbers on the left side of the graph represent?
5. Approximately how many unprovoked shark attacks were there in the 1970s?
6. Approximately how many unprovoked shark attacks were there in the 1990s?
7. Is there a correlation between the population growth in Florida and the number of shark attacks? Explain your answer.
8. What conclusions can you draw from the information presented in this graph? Write your answer in complete sentences.

Answer Key

Florida Traffic Fatalities in 2003



1. A **pie graph** gives an overall **picture** of how a whole is divided up. In this pie graph, what information is being presented? **The information presented is the number of people who died in traffic fatalities in Florida in 2003. The total number of deaths is divided into the following categories: motorists, pedestrians, motorcyclists, and bicyclists.** (Student answers will vary.)
2. By studying the pie graph, ESTIMATE the percent of motorist fatalities. **(answers will vary – about 76%)**
3. What is the total number of traffic related fatalities in Florida in 2003? (Add the numbers given in each category.) **4,122**
4. Using your calculator, calculate the percent of motorist fatalities, rounded to the tenths place. **77.1%**
5. Calculate the percent of pedestrian fatalities, rounded to the tenths place. **12.3%**
6. Calculate the percent of motorcyclist fatalities, rounded to the tenths place. **8.2%**
7. Calculate the percent of bicyclist fatalities, rounded to the tenths place. **2.3%**
8. What conclusions can you make, based on the information given in this pie graph? Write your answer in complete sentences. **(answers will vary)**

Answer Key

2003 FLORIDA TRAFFIC CRASH STATISTICS

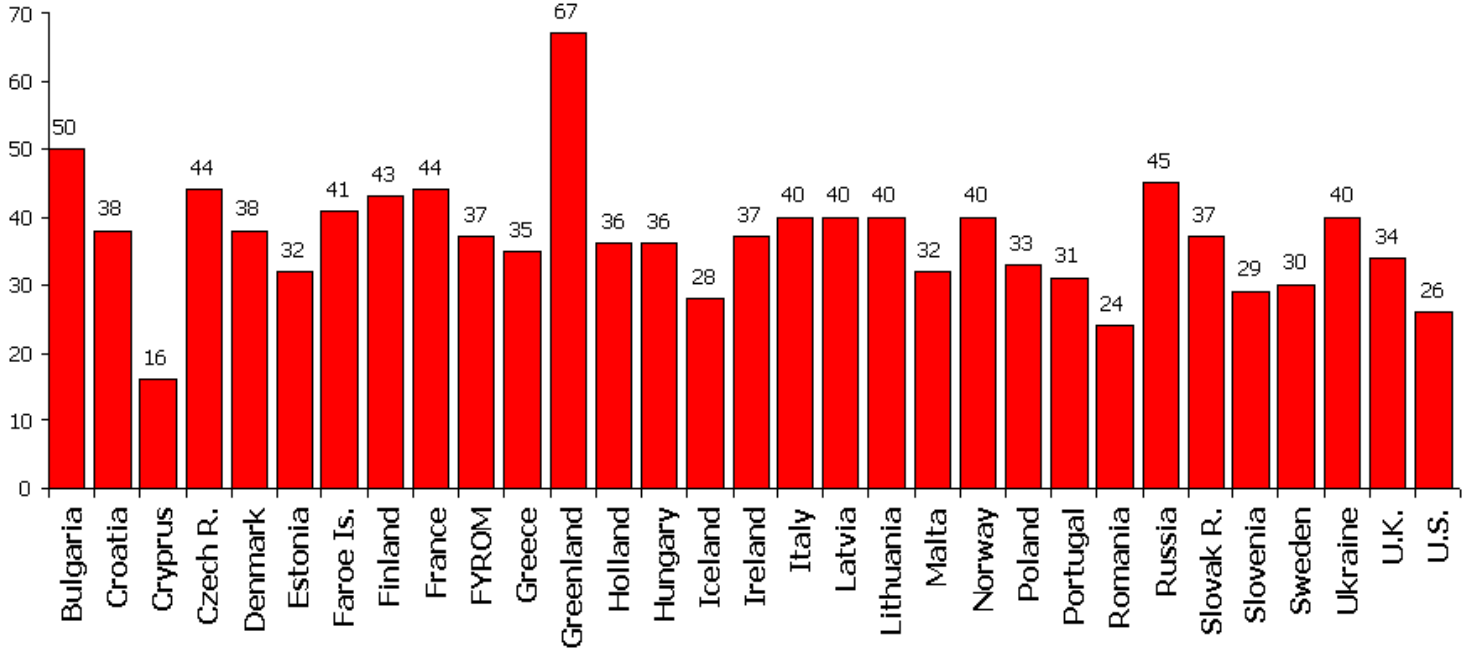
Traffic crashes	243,294
Drivers involved	362,024
Average crashes per day	667
Mileage Death Rate (per 100 million VM)	1.7
Fatalities	3,179
Fatal crashes	2,880
Injuries	221,639
Injury crashes	138,891
Property damage only crashes	101,523
Alcohol-related fatalities	1,096
Alcohol-related injuries	17,379
Alcohol-related crashes	22,752
Alcohol-related fatal crashes	997
Alcohol-related injury crashes	10,937
Pedestrians killed	509
Pedestrians injured	7,449
Pedestrian crashes	7,980
Bicyclists killed	95
Bicyclists injured	4,991
Bicycle crashes	5,393
Motorcyclists killed	339
Motorcyclists injured	5,973
Motorcycle crashes	6,635

Answer the questions below. Round your percentage answers to the hundredths place.

1. What information is presented in this table?
This table gives the 2003 statistics for traffic accidents in Florida: the numbers of crashes, injuries, and fatalities; and whether alcohol was involved. (Student answers will vary.)
2. How many traffic crashes were there in Florida in 2003? **243,294**
3. There were 2,880 fatal crashes. That means out of all the traffic crashes, 2,880 produced at least one death. What percent of the traffic crashes were fatal? **1.18%**
4. How many fatal crashes were alcohol related? **997**
5. What percent of all fatal crashes were alcohol related? **34.61%**
6. How many motorcycles crashed in 2003? **6,635**
7. How many motorcyclists were killed? **339**
8. What percentage of the motorcycle crashes killed the motorcyclist? **5.1%**

BAR GRAPH

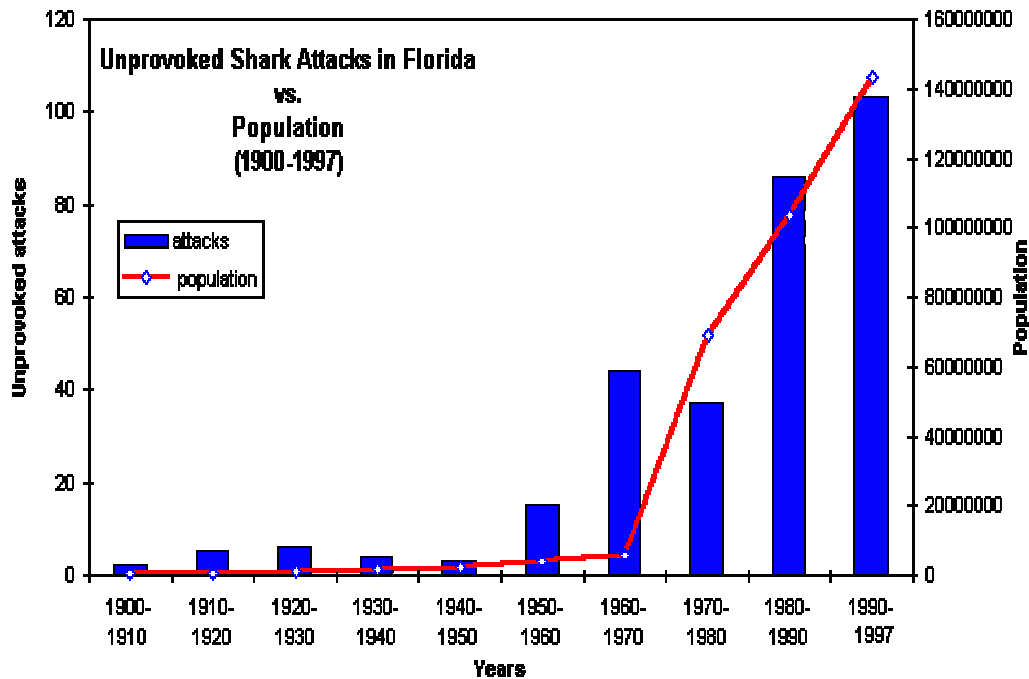
Percent of 10th Grade Students Who Smoked Cigarettes in Past 30 Days



1. What information is presented in this graph? **The graph lists the percentages of 10th graders who smoked cigarettes in the past 30 days in various countries.**
2. What do the bars represent? **The bars represent the percentage of students who smoked cigarettes in each country in the past 30 days.**
3. What percent of U. S. tenth graders smoked in the past 30 days? **26%**
4. Which country has the highest incidence of students who smoked in the past 30 days? **Greenland**
5. Which country has the lowest incidence of students who smoked in the past 30 days? **Cyprus**
6. Arrange the data from least to greatest. What is the median?
16, 24, 26, 28, 29, 30, 31, 32, 32, 33, 34, 35, 36, 36, 37, 37, 37, 38, 38, 40, 40, 40, 40, 40, 41, 43, 44, 44, 45, 67 Median – 37
7. What is the mode? **40**
8. What is the range? **51**
9. What can you conclude from the information presented from this graph? Write your answer in complete sentences. **(Answers will vary.)**

Answer Key

SHARK ATTACKS in FLORIDA (N=305)



Copyright ©
International Shark Attack File

Last updated: May 29, 1997

1. What information is presented in this graph?
The information presented in the graph is the number of unprovoked shark attacks in Florida, compared to Florida's growing population.
2. What do the bars represent? The bars represent the number of shark attacks.
3. What does the line represent? The line represents the population of Florida.
4. What do the numbers on the left side of the graph represent? the number of shark attacks
5. Approximately how many unprovoked shark attacks were there in the 1970s? 39
6. Approximately how many unprovoked shark attacks were there in the 1990s? 105
7. Is there a correlation between the population growth in Florida and the number of shark Bites? Explain your answer. Yes, as the population of Florida increased, the number of shark attacks increased as well.
8. What conclusions can you draw from the information presented in this graph? Write your answer in complete sentences. (Answers will vary.)

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.14 – Choose appropriate methods of computing, such as mental mathematics, paper and pencil or a scientific calculator to solve real-world problems.

CONNECTIONS: 5.01, 5.15, 5.17

CLASSROOM PROCEDURE:

1. As a warm-up exercise, review adding percentages. Tell students to add 6% sales tax to the following amounts by multiplying the amount by 1.06.
 1) \$25 2) \$195 3) \$19,500
2. Review estimation with the class. Write these figures on the board: 295, 450, 195, 175, and 665. Explain to students that when they use mental math to estimate, they should round to numbers that are easy to add mentally. For example, round 295 to 300, 450 to 400, 195 to 200, 175 to 200, and 665 to 700. You can explain the reason 450 was rounded down to 400 was to compensate for the fact that the other figures were rounded up. Explain to students that they could have also rounded to the nearest 50 (instead of 100) in order to be more accurate.
3. Tell students that they will be pretending to purchase a car in today’s lesson. Give each student a copy of **Purchasing a Car** handout. This activity is well suited to small group work. However, each student should fill out their own handout, using their own ideas for car options, and doing all the calculations on their own, checking and comparing their answers and choices with the rest of the group.
4. The students should share their results with the class, and discuss the reasons why they chose their options.

VOCABULARY:

base price
destination fee

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

scientific calculators

Student Handout – **Purchasing a Car**

Answer Key

SUPPLEMENTARY MATERIALS:

EVALUATION:

As a lesson quiz, have students give the total price of the car with the three most expensive options added on. They should also include the destination fee and the 6% sales tax. **(Answer: \$23,569.10)**



Purchasing a Car

2005 Mustang Coupe V6

Base Price: \$19,145.00

Destination fee: \$ 625.00

[Exterior Sport Appearance Package](#) \$295.00

- Rear Spoiler
- Lower Bodyside Sport Tape Stripe in White, Black or Pearl Gold

[Interior Upgrade Package](#) \$450.00

- Satin Aluminum Finish Instrument Panel Appliqué - Ribbed Pattern
- Special New Bright Polished Six-Gauge Cluster with MyColor Feature and Message Center
- Leather-Wrapped Steering Wheel with Satin Aluminum Spokes
- Satin Aluminum-Plated Shift Lever with Automatic Transmission
- Bright Polished Register Rings and Leather-Wrapped Sport Shift Knob for Manual Transmission
- Satin Aluminum-Plated Door Handles
- Satin Aluminum Door Sill Scuff Plate with Bright MUSTANG Lettering Insert
- Dark Charcoal Aberdeen Pattern Front Door Panel Inserts

[Interior Sport Appearance Package](#) \$195.00

- Leather-Wrapped Steering Wheel with Satin Aluminum Spokes
- Satin Aluminum-Plated Shifter Lever with Automatic Transmission or Leather-Wrapped Sport Shift Knob with Manual Transmission

[Interior Color Accent Package](#) \$175.00

- Dark Charcoal Interior Environment with Dark Charcoal Carpet
- Red Sport Bucket Leather Front and Rear Seating Surfaces with Red Front Door Trim Inserts and Red Floor Mats

Options/Upgrades

[Shaker 500 Audio System - AM/FM Stereo w/In-Dash CDx6, MP3 & 8-Speakers](#) \$665.00

<input type="checkbox"/> 16" Bright Machined Cast Aluminum Wheels w/Chrome Spinner	\$150.00
<input type="checkbox"/> Aberdeen Embossed Leather-Trimmed Sport Bucket Seats	\$695.00
<input type="checkbox"/> Wheel Locking Kits	\$50.00
<input type="checkbox"/> Active Anti-Theft System	\$255.00
<input type="checkbox"/> Anti-Lock Brakes w/Traction Control	\$775.00
<input type="checkbox"/> Front Seat Side-Mounted Air Bags	\$370.00
<input type="checkbox"/> 6-Way Power Adjustable Driver Seat w/2-Way Adjustable Head Restraint & Power Lumbar	\$365.00
<input type="checkbox"/> 5R55S 5-Speed Automatic Transmission	\$995.00

PROBLEMS

1. What is the **base price** of a 2005 Mustang Coupe V6?
2. The destination fee is the cost of transporting the vehicle from the manufacturer to the dealership. The car buyer is required to pay this fee. How much is the **destination fee**?
3. What is the cost of the car, with no added options?
4. What is the **total cost** of the car, adding 6% Florida sales tax?
5. Use MENTAL MATH to estimate the total cost of all the options available for this car.
6. Use a CALCULATOR to add the exact cost of all the options available for this car.
7. What would the cost be if you purchased all the options available for this car?
8. What would be your **total cost**, including sales tax?
9. Suppose you were able to secure a car loan for \$24,500. List all the options below that you would add to the car so that the total cost would be \leq \$24,500. Don't forget to include sales tax.

Answer Key

PROBLEMS

1. What is the **base price** of a 2005 Mustang Coupe V6? **\$19,145.00**
2. The destination fee is the cost of transporting the vehicle from the manufacturer to the dealership. The car buyer is required to pay this fee. How much is the **destination fee**?
\$625.00
3. What is the cost of the car, with no added options? **\$19,770.00**
4. What is the **total cost** of the car, adding 6% Florida sales tax? **\$20,956.20**
5. Use MENTAL MATH to estimate the total cost of all the options available for this car.
(answers will vary)
6. Use a CALCULATOR to add the exact cost of all the options available for this car.
\$5,435.00
7. What would be the cost of the car if you purchased all the options available?
\$25,205.00
8. What would be your **total cost**, including sales tax? **\$26,717.30**
9. Suppose you were able to secure a car loan for \$24,500. List all the options below that you would add to the car so that the total cost would be \leq \$24,500. Don't forget to include sales tax.
(answers will vary)

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.15 – Recognize effects of operations on numbers and select the appropriate operation for solving a problem.

CONNECTIONS: 5.01, 5.02, 5.06, 5.14

CLASSROOM PROCEDURE:

1. A word problem tells a story, with numbers, and asks the reader to find another number. Word problems are solved with addition, subtraction, multiplication, and/or division. Once you determine what question the word problem is asking, you have to decide what arithmetic operation to use. In the first activity, students will determine which two operations will be used to solve each word problem.
2. Pass out **Solving Word Problems – Using the Correct Operation** to the class. Students can work with a partner in completing this worksheet.
3. Whenever possible, diagrams or pictures can be drawn to illustrate a word problem. Pass out **Solving Word Problems – Drawing a Diagram** to the class. Students can complete this worksheet with a partner. After the class has completed the worksheets, have each group share one solution with the class on the board.
4. Many word problems can be solved by writing a proportion. A ratio compares two numbers and is written as a fraction. A proportion is an equality of two ratios. Pass out **Solving Word Problems – Using Proportions** to the class. Go over the two examples together, then have the class complete the worksheet with a partner.
5. Students will complete the **Word Problems Quiz** (individually) as an assessment.

VOCABULARY:

ratio
proportion
perimeter

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Student Handouts:
Solving Word Problems–Using the Correct Operation
Solving Word Problems – Drawing a Diagram
Solving Word Problems – Using Proportions
Word Problems Quiz

Teaching Aids:
Answer Keys

SUPPLEMENTARY MATERIALS:

EVALUATION:

Word Problems Quiz can be used as an assessment of this lesson.

Solving Word Problems – Choosing the Correct Operation

Directions: Each of the following word problems require two steps and two operations to solve. Read each problem and **circle the correct operation**. Then **solve**.

1. Cameron's purchases were \$4.79, \$3.29, and \$.79. How much change will he receive if he pays with a \$10 bill?

First: *add / subtract*

Second: *add / subtract*

2. Quinton's car uses about 800 gallons of gasoline each year. If premium gasoline costs \$2.59 and regular gasoline costs \$2.39 per gallon, how much could Quinton save in one year if he switches from premium gasoline to regular gasoline?

First: *add / subtract*

Second: *multiply / divide*

3. There are 100 capsules in a bottle of vitamins, and five bottles per case. If each of the six members of the Martinez family takes one vitamin each day, how many days will a case of vitamins last the family? (Round your answer to a whole number.)

First: *multiply / divide*

Second: *multiply / divide*

4. Robert is paid \$.59 per mile that he travels for his job. On Monday, he traveled 320 miles; on Tuesday, he traveled 419 miles; on Wednesday, he traveled 51 miles; on Thursday, he traveled 276 miles; and on Friday, he traveled 47 miles. How much will Robert be paid for his mileage?

First: *add / subtract*

Second: *multiply / divide*

5. There are 22, 27, and 31 students in Ms. Weber's history classes. If she brings in 400 chocolate chip cookies, how many cookies can she pass out to each student?

First: *add / subtract*

Second: *multiply / divide*

6. Erin spent \$1880 on new furniture. She paid a \$200 deposit. If she pays off the furniture in 24 months, she will not have to pay interest. How much should she pay each month to avoid paying interest?

First: *add / subtract*

Second: *multiply / divide*

Solving Word Problems – Drawing a Diagram

One of the best ways to understand a word problem is to draw a diagram. If you draw a picture of the problem, you will have a better understanding of the situation and will be on your way to a solution.

Directions: Solve each problem below by drawing a diagram.

1. It is 480 miles from Jacksonville to Key West. Joshua started at Jacksonville and drove south at 70 miles per hour while Juliet started at Key West and drove north at 55 miles per hour. After two hours, how far apart were they?

2. A ball is dropped from the top of a wall that is 24 feet high. Each time it hits the ground it bounces half as high as its previous bounce. If the ball is caught just as it bounces 3 feet high, how many feet has the ball traveled?

3. How many fence posts would you need to buy for a garden that is 20 feet wide and 35 feet long if you plan to put the fence posts five feet apart?

4. Latisha has to take antibiotics every 8 hours until she takes all ten tablets. If she starts on Wednesday at 8 A. M., what day and time will she take her last tablet?

5. A picture is 46 cm long and 30 cm wide and is going to be framed in a picture frame that is 2 cm wide. What is the perimeter of the completed picture frame?

Solving Word Problems – Using Proportions

A proportion is an equality between two ratios. Many word problems can be solved by using proportions.

Example 1: The ratio of men to women working at an auto repair shop is 5 to 2. If there are 15 men working at the shop, how many women work there?

$$\frac{5 \text{ men}}{2 \text{ women}} = \frac{15 \text{ men}}{n \text{ women}}$$
$$5n = 30 \quad \leftarrow \text{cross multiply}$$
$$n = 6 \text{ women} \quad \leftarrow \text{divide}$$

Example 2: Samuel read that he should cook a roast 20 minutes for each half pound. How large a roast could he cook in 90 minutes?

$$\frac{.5 \text{ pound}}{20 \text{ min.}} = \frac{n \text{ pounds}}{90 \text{ min.}}$$
$$20n = 45 \quad \leftarrow \text{cross multiply}$$
$$n = 2.25 \text{ pounds} \quad \leftarrow \text{divide}$$

Directions: Write and solve a proportion for each of the following word problems.

1. Lee has seen 6 movies in the past nine months. At this rate, how many movies will he see in 12 months?
2. If it costs \$17.85 for three tee-shirts, how much does it cost for ten shirts?
3. If a veterinarian is supposed to give 5 milligrams of antibiotic to a 15 pound dog, how many milligrams would be given to a 51 pound dog?
4. Antonio used 20 gallons of gas for a 710 mile trip. At that rate, how many gallons of gas would he use for a 500 mile trip?
5. A $\frac{3}{4}$ pound steak costs \$8.75. How much does a 3 pound steak cost?

Word Problems – QUIZ

Directions: Solve each word problem using any method.

1. Shaundra, Ashley, Brittany, and Shannon opened up a hot dog stand. The first year they earned \$36,490 and had expenses of \$18,910. If they split the profits evenly, how much money did each person make?
2. 1.23 cubic yards of concrete are needed to cover 100 square feet with 4 inches of concrete. How many cubic yards are needed to cover 750 square feet with 4 inches of concrete?
3. Two people on motorcycles leave cities that are 600 miles apart and travel toward each other. One motorcycle averages 55 miles per hour and the other motorcycle averages 45 miles per hour. How far apart will they be after three hours?
4. A swimming pool is 15 feet wide and 30 feet long. If a two foot walkway is built all around the pool, what is the perimeter of the completed pool and walkway?
5. A recipe calls for $4\frac{1}{2}$ cups of flour for 72 cookies. How many cups of flour would be needed for 48 cookies?
6. In order to put up a large rectangular tent, stakes are placed every three feet. If the tent is 15 feet wide and 24 feet long, how many stakes are needed?

Answer Key

Solving Word Problems – Choosing the Correct Operation

- 1) First: add \$8.87
Second: subtract \$1.13
- 2) First: subtract \$.20
Second: multiply \$160.00
- 3) First: multiply 500 capsules total
Second: divide 83 days
- 4) First: add 1,113 miles
Second: multiply \$656.67
- 5) First: add 80 students total
Second: divide 5 cookies per student
- 6) First: subtract \$1,680 balance
Second: divide \$70.00 per month

Answer Key

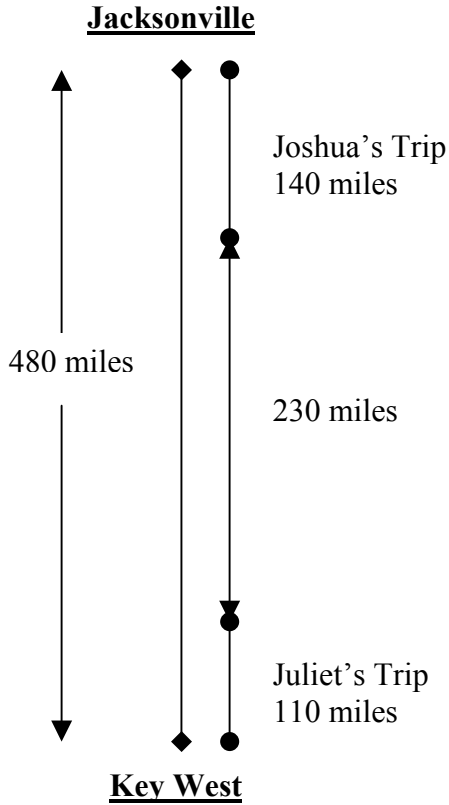
Solving Word Problems – Drawing a Diagram

1) 230 miles

Joshua's trip: $70 \text{ mph} \times 2 \text{ hours} = 140 \text{ miles}$

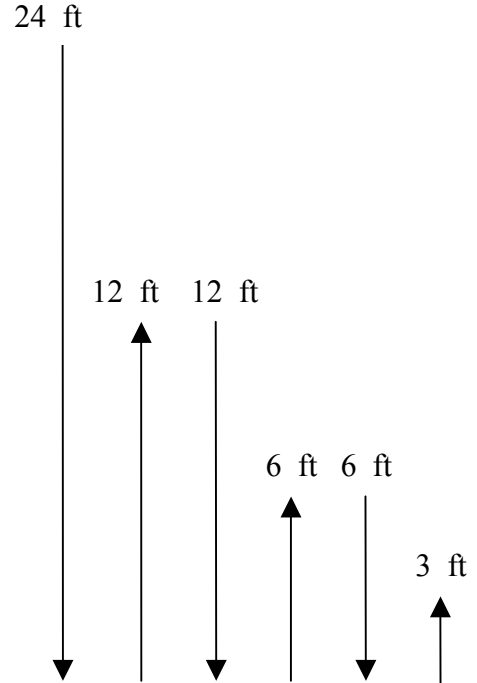
Juliet's trip: $55 \text{ mph} \times 2 \text{ hours} = 110 \text{ miles}$

$480 - 140 - 110 = 230 \text{ miles}$

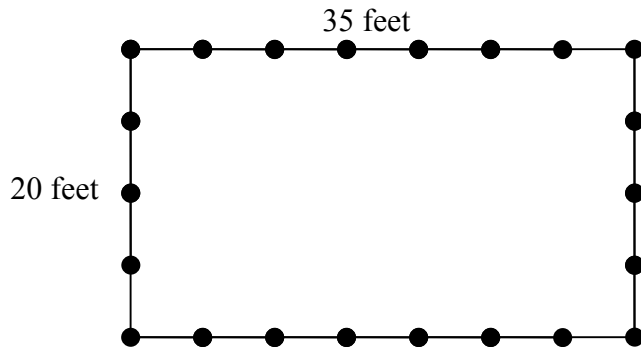


2) 63 feet

$24 + 12 + 12 + 6 + 6 + 3 = 63 \text{ ft}$



3) 22 fence posts



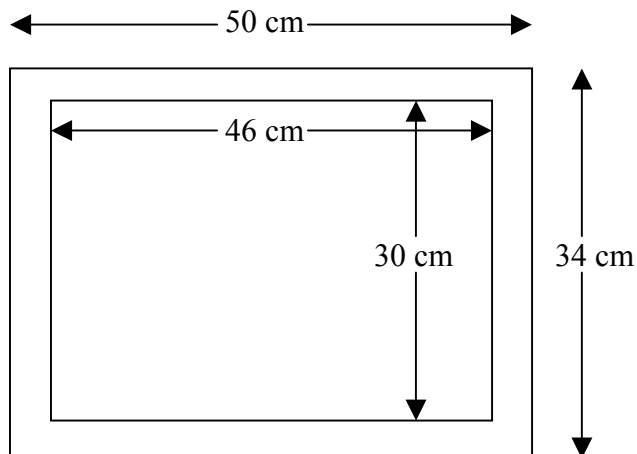
Answer Key

Solving Word Problems – Drawing a Diagram (continued)

4) Saturday at 8 AM

Wednesday	Thursday	Friday	Saturday
8 AM	8 AM	8 AM	8 AM
4 PM	4 PM	4 PM	
Midnight	Midnight	Midnight	

5) 168 cm



Answer Keys

Solving Word Problems – Using Proportions

- 1) $n = 8$ movies
- 2) $n = \$59.50$
- 3) $n = 17$ milligrams
- 4) $n = 14$ gallons
- 5) $n = \$35.00$

Word Problems – Quiz

- 1) \$4,395 profit per person
- 2) 9.225 cubic yards
- 3) 300 miles
- 4) 106 feet
- 5) 3 cups
- 6) 26 stakes

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.16 – Use alternative response formats for displaying numerical and graphic solutions in grids and plots.

CONNECTIONS: 5.01, 5.02, 5.06, 5.09, 5.14, 5.15

CLASSROOM PROCEDURE:

Students will practice solving GED type word problems, writing their answers in GED style answer grids.

1. Write the vocabulary words and definitions on the board:
gross – the total amount **net** – what remains after all deductions have been made
deduction – an amount that is subtracted
2. As a warm-up activity write these problems on the board for students to solve:
 (1) Your gross weekly paycheck is \$480.00. After deductions, your net pay is \$340.80. What percent of your paycheck do you keep? (**71%**)
 (2) If that paycheck is for 40 hours of work, what is your hourly rate? (**\$12.00 per hour**)
3. Put the **GED Number Grid Transparency** on the overhead projector. Explain to the class how the number grid is filled out on the GED exam. Give each student a **Number Grid Practice** and have them mark these numbers on the grid: (1) 5 (2) 2,500 (3) $\frac{3}{100}$ (4) 0.75 (5) \$5.75. (6) $1\frac{1}{2}$

 Explain to students that mixed numbers, such as $1\frac{1}{2}$ have to be marked as improper fractions, $\frac{3}{2}$, or changed into decimals, 1.5
4. Pass out the **GED Practice Word Problems** and another copy of the **Number Grid Practice** to each student. Each student will solve the six problems, writing their answers on the number grids.
5. Pass out the **Point Plotting Practice** handout to students. Each student will solve the three problems, marking their answers on the coordinate planes.

VOCABULARY:

gross
net
deduction

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Student Handouts:
 GED Practice Word Problems
 Number Grid Practice (2 copies per student)
 Point Plotting Practice

Teaching Aids:
 GED Number Grid Transparency
 Answer Key

SUPPLEMENTARY MATERIALS:

EVALUATION:

Students will correctly use the **Number Grid Practice** to record their answers to the **GED Practice Word Problems**.
 Students will also correctly complete the **Point Plotting Practice** handout.

GED Number Grid Transparency

Top row of boxes is where the answer is written, one digit in each box.

Second row contains fraction bars, only in 3 positions

Third row contains decimal points.

Lower rows contain digits 0-9.

	/	/	/	
•	•	•	•	•
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

Number Grid Practice

1.

	/	/	/	
●	●	●	●	●
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

4.

	/	/	/	
●	●	●	●	●
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

2.

	/	/	/	
●	●	●	●	●
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

5.

	/	/	/	
●	●	●	●	●
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

3.

	/	/	/	
●	●	●	●	●
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

6.

	/	/	/	
●	●	●	●	●
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

GED Practice Word Problems

Use the sample pay stub to solve the word problems below. Show your work in the space provided, and then transfer your answers to the number grids.

Marcus's Pay Stub

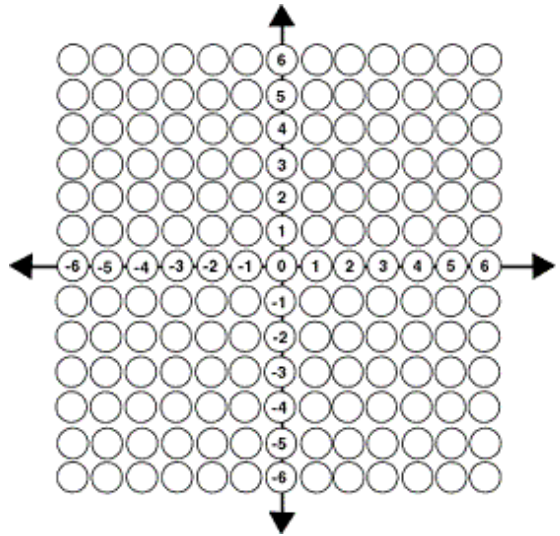
Gross Pay	\$840.00
Federal Tax	\$126.00
F.I.C.A	\$67.00
Insurance	\$52.75
United Way	\$8.40
Net Pay	\$585.65

1. Marcus receives a paycheck every two weeks. He works 80 hours each pay period. What is Marcus's hourly rate?
2. How much money is deducted from Marcus's paycheck each pay period?
3. What percent of Marcus's income is deducted for federal tax?
4. Marcus donates \$8.40 per pay period for United Way. What percent of Marcus's income is donated to United Way? Write your answer as a fraction.
5. What percent of Marcus's paycheck does he net each pay period? Write your answer as a percent, rounded to the tenths place.
6. If Marcus receives 26 paychecks per year, what is his yearly income?

Point Plotting Practice

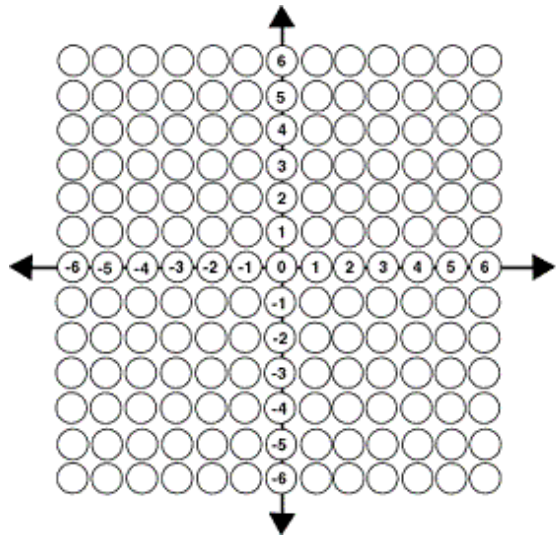
- 1) Place the point whose coordinates are $(3, -4)$ on the coordinate grid.

1)

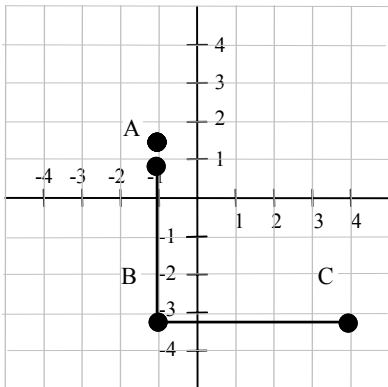


- 2) Place the point whose coordinates are $(-2, 5)$ on the coordinate grid.

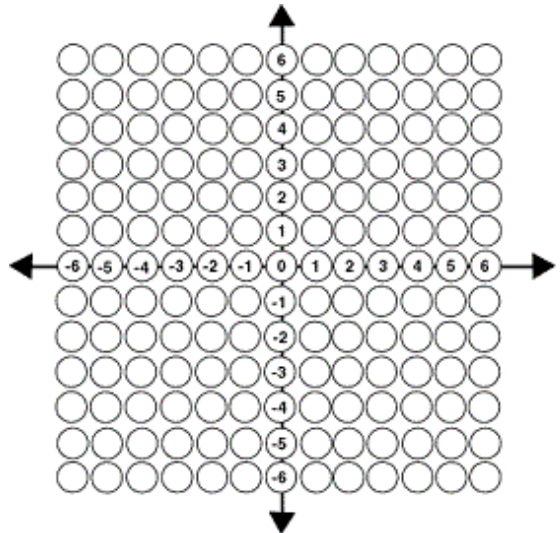
2)



- 3) In the diagram below, points A, B, and C are the vertices of a rectangle. What are the coordinates of a point D, which would complete the rectangle? (Place your answer on the coordinate grid.)



3)



Answer Sheet

GED Practice Word Problems

1) \$10.50

2) \$254.15

3) 15%

4) $\frac{1}{100}$

5) 69.7%

6) \$21,840

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.17 – Use estimation to predict results of a calculation and check the reasonableness of the solution.

CONNECTIONS: 5.01

CLASSROOM PROCEDURE:

1. Tell the class that it's useful to estimate to find an approximate answer to a problem. In everyday life, we use estimation when we shop.
2. As a warm-up activity, have students use mental math and estimation to add these prices: \$1.99, \$3.39, \$3.49, \$.59, \$1.79, \$2.39 and \$1.89. Tell students that in this situation, it is probably best to round to the nearest \$.50 so the numbers can be added mentally. (Solution: $2 + 3.50 + 3.50 + .50 + 2 + 2.50 + 2 = \mathbf{\$16}$)
Next, have students add the figures with a calculator to get the exact answer. (**\$15.53**)
The difference between the estimated answer and the exact answer is \$.47.
Tell students that their goal is to come within \$.50 of the actual answer.
3. Divide the class into groups of two. Give each group a **Grocery Ad** and each person in the group a certain number of shopping lists (depending on the amount of class time). Each person will mentally add their shopping list and write down their estimate. Their partner will then add the actual prices with their calculator. The goal is to come within \$.50 of the actual amount. The partners should take turns doing this activity until all the shopping lists have been completed.

VOCABULARY:

mental math
estimate

**TEACHER-MADE OR
ALTERNATIVE MATERIALS:**

MATERIALS NEEDED:

Grocery Ads for each group
Shopping Lists copied and cut apart

calculators

SUPPLEMENTARY MATERIALS:

EVALUATION:

Students will use mental math to estimate the total cost of a list of groceries. They will come within \$.50 of the actual answer.

Grocery Ad



red
seedless
grapes

**\$1.99
lb.**



Texas 1015
sweet
onions

\$2.99 ea.



Hillshire
Farm Deli
Select
meats

**3 for
\$5.00**



fresh
ground
round
patties

\$3.39 lb.



Hickory
Sweet
bacon

**2 for
\$5.00**



Dole
golden
pineapple

**\$3.49
ea.**

Gallon of milk \$2.39
Florida orange juice 2 for \$5.00
Grade A large eggs \$.99/dozen

Tub of margarine \$.59
Gallon of ice cream \$1.79
Whole wheat bread \$1.89

Shopping Lists 1 – 4

Shopping List 1

1 gallon of milk
1 gallon of ice cream
2 loaves of bread
2 pkgs. bacon
2 lbs. ground patties
2 lbs. grapes
1 tub of margarine

ESTIMATE _____

EXACT TOTAL _____

Difference _____

Shopping List 2

3 gallons of orange juice
1 loaf of bread
1 bag of onions
3 pkgs. deli meats
2 pineapples
2 dozen eggs
1 lb. grapes

ESTIMATE _____

EXACT TOTAL _____

Difference _____

Shopping List 3

2 gallons of milk
1 gallon of ice cream
1 bag of onions
2 lbs. ground patties
2 lbs. grapes
1 tub of margarine
1 loaf of bread

ESTIMATE _____

EXACT TOTAL _____

Difference _____

Shopping List 4

1 gallon of milk
2 dozen eggs
2 pkgs. bacon
2 lbs. grapes
1 tub of margarine
2 loaves of bread
1 pineapple

ESTIMATE _____

EXACT TOTAL _____

Difference _____

Shopping Lists 5 – 8

Shopping List 5

2 gallons of milk
2 gallons of orange juice
1 loaf of bread
1 pineapple
2 lbs. grapes
1 tub of margarine
1 dozen eggs

ESTIMATE _____

EXACT TOTAL _____

Difference _____

Shopping List 6

2 gallons of orange juice
2 loaves of bread
2 pineapples
1 dozen eggs
3 pkgs. of bacon
1 lb. ground patties
1 tub of margarine

ESTIMATE _____

EXACT TOTAL _____

Difference _____

Shopping List 7

1 gallons of milk
2 gallons of ice cream
2 bags of onions
2 lbs. ground patties
1 lb. grapes
1 pineapple
1 loaf of bread

ESTIMATE _____

EXACT TOTAL _____

Difference _____

Shopping List 8

1 gallon of milk
2 dozen eggs
2 pkgs. bacon
2 lbs. grapes
1 tub of margarine
2 loaves of bread
1 gallon of ice cream

ESTIMATE _____

EXACT TOTAL _____

Difference _____

Shopping Lists 9 – 12

Shopping List 9

2 loaves of bread
2 tubs of margarine
1 dozen eggs
3 pkgs. deli meat
1 lb. grapes
1 gallon of ice cream
1 pineapple
1 gallon of milk

ESTIMATE _____

EXACT TOTAL _____

Difference _____

Shopping List 10

1 gallon of orange juice
1 loaf of bread
1 bag of onions
2 pineapples
2 dozen eggs
1 lb. ground patties
2 pkgs. bacon
1 tub of margarine

ESTIMATE _____

EXACT TOTAL _____

Difference _____

Shopping List 11

2 gallons of milk
1 gallon of ice cream
2 bags of onions
2 lbs. ground patties
1 tub of margarine
1 loaf of bread
1 lb. ground patties

ESTIMATE _____

EXACT TOTAL _____

Difference _____

Shopping List 12

2 dozen eggs
2 pkgs. bacon
2 lbs. grapes
1 tub of margarine
2 loaves of bread
1 pineapple
1 gallon of ice cream

ESTIMATE _____

EXACT TOTAL _____

Difference _____

Answer Key

Shopping lists (exact totals):

- 1) \$24.31
- 2) \$28.33
- 3) \$22.80
- 4) \$21.21
- 5) \$20.72
- 6) \$28.23
- 7) \$26.10
- 8) \$19.51
- 9) \$20.61
- 10) \$25.32
- 11) \$25.20
- 12) \$20.61

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.18 – Construct scales drawings and interpret diagrams and maps in real-life and workplace situations.

CONNECTIONS: 5.06 and 5.08

CLASSROOM PROCEDURE:

1. Pass out 6 or 12 inch rulers to students. Ask the students how many parts an inch is divided into. **(16)**
 Tell the class they will be measuring distance to the nearest $\frac{1}{8}$ inch. Ask students to find $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, and $\frac{7}{8}$ on their rulers. Next, have the students write down these fractions, then change the fractions into decimals using their calculators to divide the fractions.
2. Remind students that a proportion is an equality between two ratios and is solved by cross-multiplying.
 Practice: Solve each proportion for x: (1) $\frac{5}{2} = \frac{1}{x}$ (2) $\frac{5}{2} = \frac{6.5}{x}$ (Answers: (1) **.4** (2) **2.6**)
3. Pass out **Scale Drawings** handouts to students. Go over the directions and example with the students. Students may complete this activity in cooperative groups or individually.
4. Pass out the U. S. map and **Finding Distance on a Map** handouts to students. Have students practice measuring the distance between cities on the map, rounded to the nearest eighth inch. Go over the directions of the activity and the example with the students. Students may complete this activity in cooperative groups or individually.

VOCABULARY:

scale
ratio
proportion

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

scientific calculators
centimeter and inch rulers
Student Handouts:
Scale Drawings
U. S. Map
Finding Distance on a Map
Answer Keys

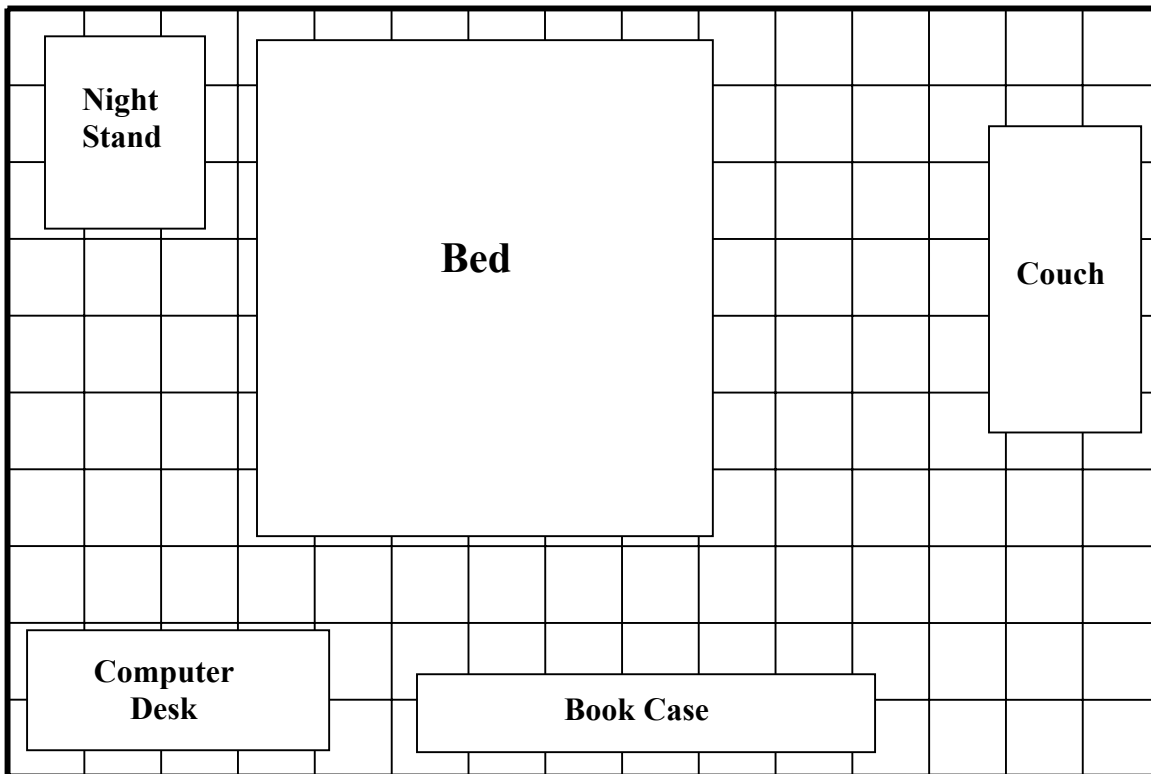
SUPPLEMENTARY MATERIALS:

EVALUATION:

Students will successfully complete the activity measuring scale drawings and using proportions to find the actual measurements.

Students will measure distance on a map and find the actual distance in miles between cities.

SCALE DRAWINGS



The scale for this drawing is 5 cm to 2 m. That means that an object that has a length of 5 centimeters in the drawing has an actual length of 2 meters.

Directions: Use a ruler to measure each piece of furniture in the drawing. Use the scale in the drawing to write a proportion to find the actual dimensions of each object. The bookcase is done for you. Use the back of this paper to find the actual dimensions of the couch, bed, night stand and computer desk.

book case length = 6 cm; width = 1 cm

$$\frac{5}{2} = \frac{6}{L}$$

$$5L = 12$$

Length = 2.4 meters

$$\frac{5}{2} = \frac{1}{W}$$

$$5W = 2$$

Width = .4 meters

The dimensions of the book case is 2.4 m x .4 m



Map used with permission from [World Sites Atlas](http://www.sitesatlas.com), using the link <http://www.sitesatlas.com>.

Finding Distance on a Map

Directions: Use a ruler to measure the distances between cities on the U. S. map to find the actual distance in miles. Measure the shortest distance between each pair of cities. (How the plane would fly.) Write a proportion to find the distance.

The scale for the map is 1 inch = 400 miles. That means for every inch measured on the map the actual distance is equal to 400 miles.

EXAMPLE: What is the distance from Miami, Florida to Atlanta, Georgia?

STEP 1: Measure the distance between the cities to the nearest eighth inch: ($1\frac{5}{8}$ in)

STEP 2: Convert $1\frac{5}{8}$ to a decimal: (**1.625**)

STEP 3: Set up your proportion. Let D = Distance in miles

$$\frac{1}{400} = \frac{1.625}{D}$$

Answer: **D = 650 miles**

- 1) Chicago to New York:
- 2) Los Angeles to San Antonio:
- 3) Kansas City to Seattle:
- 4) Orlando to Houston:
- 5) San Francisco to Kennedy Space Center:
- 6) Phoenix to Santa Fe:
- 7) Seattle to Miami:
- 8) Detroit to New York:

Answer Keys

Scale Drawings

Night Stand: .8m X 1m

Bed: 2.6m X 2.4m

Computer Desk: 1.6m X .6m

Couch: 1.6m X .8m

Finding Distance on a Map

- 1) Chicago to New York: 750 miles
- 2) Los Angeles to San Antonio: 1,250 miles
- 3) Kansas City to Seattle: 1,550 miles
- 4) Orlando to Houston: 875 miles
- 5) San Francisco to Kennedy Space Center: 2,600 miles
- 6) Phoenix to Santa Fe: 400 miles
- 7) Seattle to Miami: 2,850 miles
- 8) Detroit to New York: 500 miles

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.19 – Determine the mathematical probability of an event, use the probability to make a prediction, and compare experimental results to the mathematical probability.

CONNECTIONS: 5.01, 5.02, 5.06

CLASSROOM PROCEDURE:

1. As a warm-up exercise, review how to change a fraction into a decimal, and then a decimal into a percent (rounded to the tenths place). Have students practice with these fractions: (1) $\frac{1}{2}$ (2) $\frac{1}{6}$
 (3) $\frac{2}{3}$ (Answers: (1) **.5, 50%** (2) **.1667, 16.7%** (3) **.667, 66.7%**)
2. Tell students that probability is a ratio that measures the likelihood of an event to happen and is always a number between 0 and 1. Probability is written as a fraction, a decimal, or a percent.
 For example, if the weather forecaster says there is a 1 in 4 chance of rain, the probability of rain can be written as $\frac{1}{4}$, .25, or 25%.
3. Give each student a **Probability** handout. Have someone read aloud the definition of probability to the class. Give students a few minutes to complete the handout. Have students share their answers with the class.
4. Pass out **Experimental and Theoretical Probability** handouts and dice to all the students. Divide the class into cooperative groups to complete this activity. Each student will roll their die ten times and fill in the chart with the numbers rolled. Students should compare their results with the other students in the group.
5. The **Probability Quiz** can be used as an assessment of this lesson.

VOCABULARY:

theoretical probability
 experimental probability

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

one die for each student
Student Handouts:
 Probability
 Experimental and Theoretical Probability
 Probability Quiz
Answer Keys

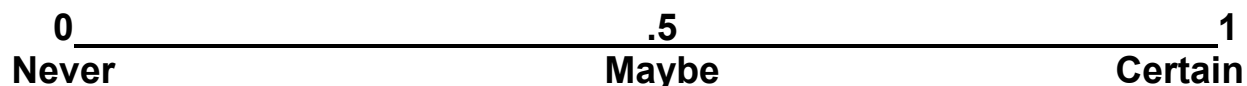
SUPPLEMENTARY MATERIALS:

EVALUATION:

Students will be evaluated by successfully completing the **Probability Quiz**.

PROBABILITY

PROBABILITY is a ratio that measures how likely an event is to happen. Probabilities are always between 0 and 1 and can be expressed as fractions, decimals, or percents. For example, the probability that a person will be involved in a lightning strike is about one in three thousand, which is .0003 or .03%.



The closer the probability is to 1, the more likely the event will happen.

(A) Estimate the probability of each event happening. Write your answer as a decimal, then as a percent.

1. You will talk to someone on your cell phone today.
2. School will be cancelled next week.
3. You will eat today.
4. It will rain today.
5. The next president of the U. S. will be a woman.
6. You will become a professional basketball player for the NBA.
7. Intelligent life will be found on another planet in your lifetime.

(B) Describe future events in your life that have the given probability to happen.

8. 0 chance
9. .25 or 25%
10. .5 or 50%
11. .75 or 75%
12. 1.0 or 100%

EXPERIMENTAL and THEORETICAL PROBABILITY

Experimental Probability is the ratio of the number of times an event actually occurs to the number of times the event is attempted. For example, if a basketball player is given 10 chances to shoot a free throw basket, and actually completes six baskets, the probability of making the basket is $\frac{6}{10}$, .6 or 60%.

Theoretical Probability is the ratio of the number of favorable outcomes to the total number of possible outcomes. For example, if you are flipping a coin, the theoretical probability of getting “heads” is $\frac{1}{2}$, .5 or 50%.

Give the **theoretical probability** of the event happening. Write each answer as a fraction, a decimal, and a percent.

1. Rolling a six on a die.
2. Rolling an odd number on a die.
3. Rolling a number greater than one on a die.

Conduct the probability experiment below by rolling a die 10 times. Fill in the second line of the chart with the outcome of each roll.

Roll #	1	2	3	4	5	6	7	8	9	10
Outcome										

Give the **experimental probability** for each. Write your answer as a fraction, a decimal and a percent.

4. Rolling a six.
5. Rolling an odd number.
6. Rolling a number greater than one.

PROBABILITY QUIZ

Directions – Write each answer as a percent, rounded to the tenths place.

1. A four occurs 7 times when a die is rolled 20 times. What is the experimental probability of rolling a four?
2. What is the theoretical probability of rolling a four on a die?
3. What is the theoretical probability of rolling a number less than four on a die?
4. The weather forecast indicates a 4 out of 5 chance of rain today. What is the probability that it will rain?
5. If there is a 25% chance of rain for tomorrow, what is the probability that it will not rain tomorrow?
6. What is the probability of spinning a seven or an eight on a spinner that is numbered 1 – 8?
7. A batting average is the ratio of the number of hits that a player gets to the number of times he's at bat. Sammy Sosa's batting average for 2004 was .253. What percent chance does he have to hit the ball when he is at bat?

Answer Keys

Experimental and Theoretical Probability

- | | | | |
|----|---------------|------|-------|
| 1) | $\frac{1}{6}$ | .167 | 16.7% |
| 2) | $\frac{1}{2}$ | .5 | 50% |
| 3) | $\frac{5}{6}$ | .833 | 83.3% |

Probability Quiz

- 1) 35%
- 2) 16.7%
- 3) 50%
- 4) 80%
- 5) 75%
- 6) 25%
- 7) 25.3%

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.20 – Identify flaws in statistical methods and data analysis including bias in sampling techniques, misinterpreting correlations, and use of misleading graphs.

CONNECTIONS: 5.07

CLASSROOM PROCEDURE:

1. Have students discuss times when they were misled by advertisements in newspapers or magazines, or on television or radio.
2. Tell students that you took a survey and found out that three out of four students said that math was their favorite subject. Have students discuss what could be misleading about your survey.
3. Ask students how data used in charts or graphs might also be misleading.
4. Tell students that using different scales on graphs can be used to make the data appear to support a particular point of view. That principle is going to be demonstrated in today’s activity.
5. Divide the class into groups of two. Have one person in the group use **U. S. Birth Rate Graph #1** and the other person use **U. S. Birth Rate Graph #2**.
6. Give all students the **Misleading Statistics – Follow-Up Questions** handout to answer the questions on the activity. Students should discuss the questions and answers with their partner. (Student answers to these questions will vary.)
7. Use the Teaching Transparency to discuss this activity, and the follow up questions with the class.

VOCABULARY:

statistics
 birth rate
 x-axis
 y-axis
 horizontal
 vertical
 line graph

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Student Handouts:
 U. S. Birthrate Graph #1
 U. S. Birthrate Graph #2
 Misleading Statistics – Follow-Up Questions

Teaching Aid:
 Teaching Transparency: U. S. Birth Rate

SUPPLEMENTARY MATERIALS:

EVALUATION:

Students will be able to find the flaws in a misleading graph.

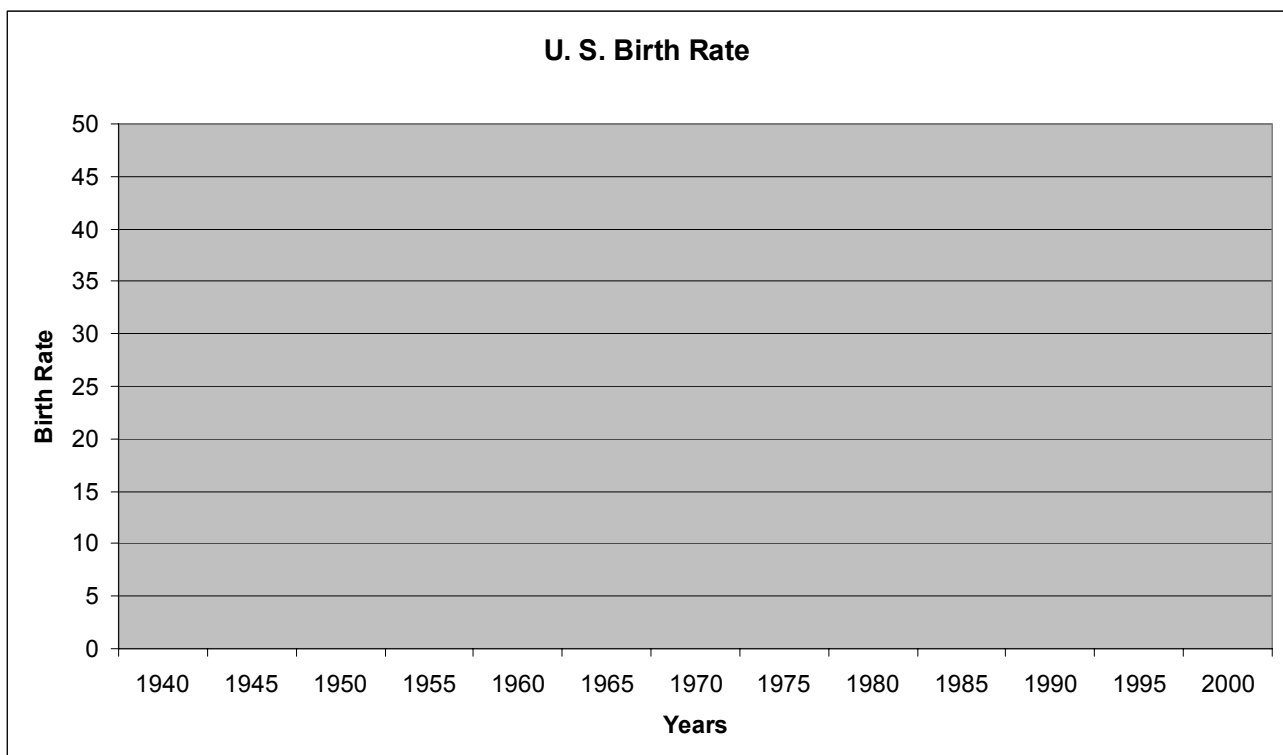
U. S. Birth Rate – Graph #1

The data below represents the United States birth rate from 1940 to 2000. The birth rate is the number of people born per thousand people in the population.

The data in the first column of the table is the x axis (the horizontal axis) and represents the years. The data in the second column is the y axis (the vertical axis) and represents the number of people born per thousand people in the U. S.

Use the data below to draw a line graph.

Years	Birth Rate
1940	19.4
1945	20.4
1950	24.1
1955	25.0
1960	23.7
1965	19.4
1970	18.4
1975	14.8
1980	15.9
1985	15.8
1990	16.7
1995	14.8
2000	14.7



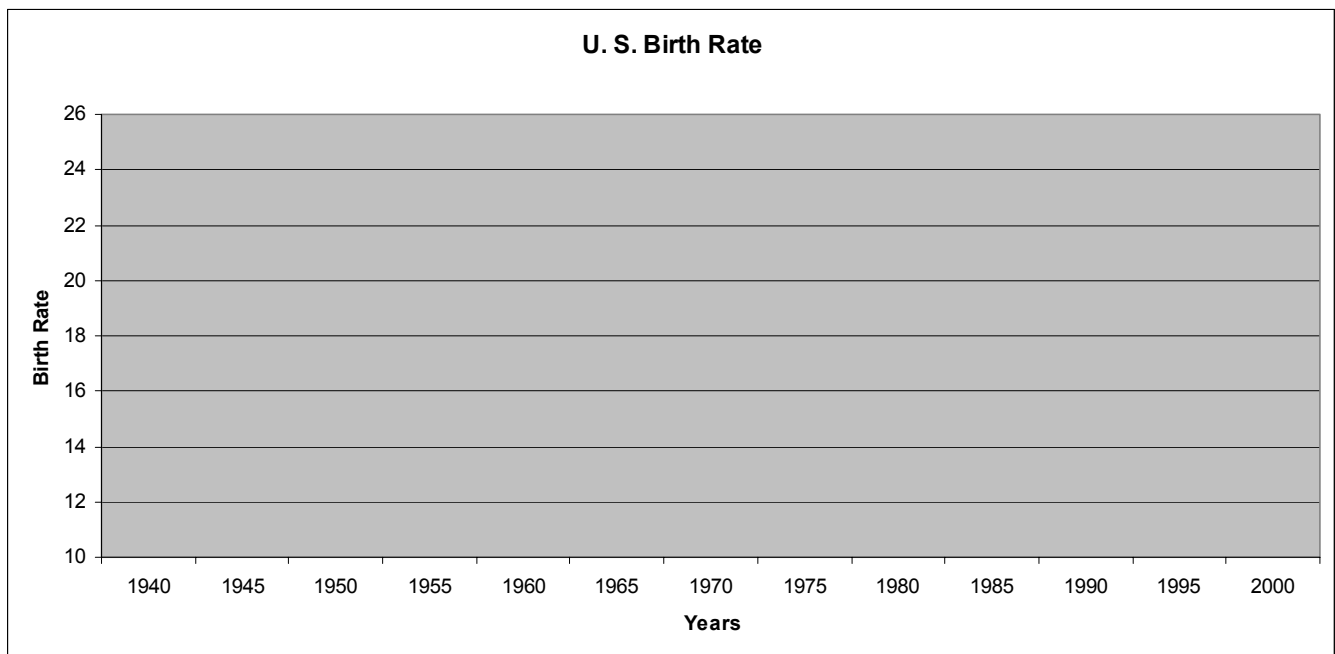
U. S. Birth Rate – Graph #2

The data below represents the United States birth rate from 1940 to 2000. The birth rate is the number of people born per thousand people in the population.

The data in the first column of the table is the x axis (the horizontal axis) and represents the years. The data in the second column is the y axis (the vertical axis) and represents the number of people born per thousand people in the U. S.

Use the data below to draw a line graph.

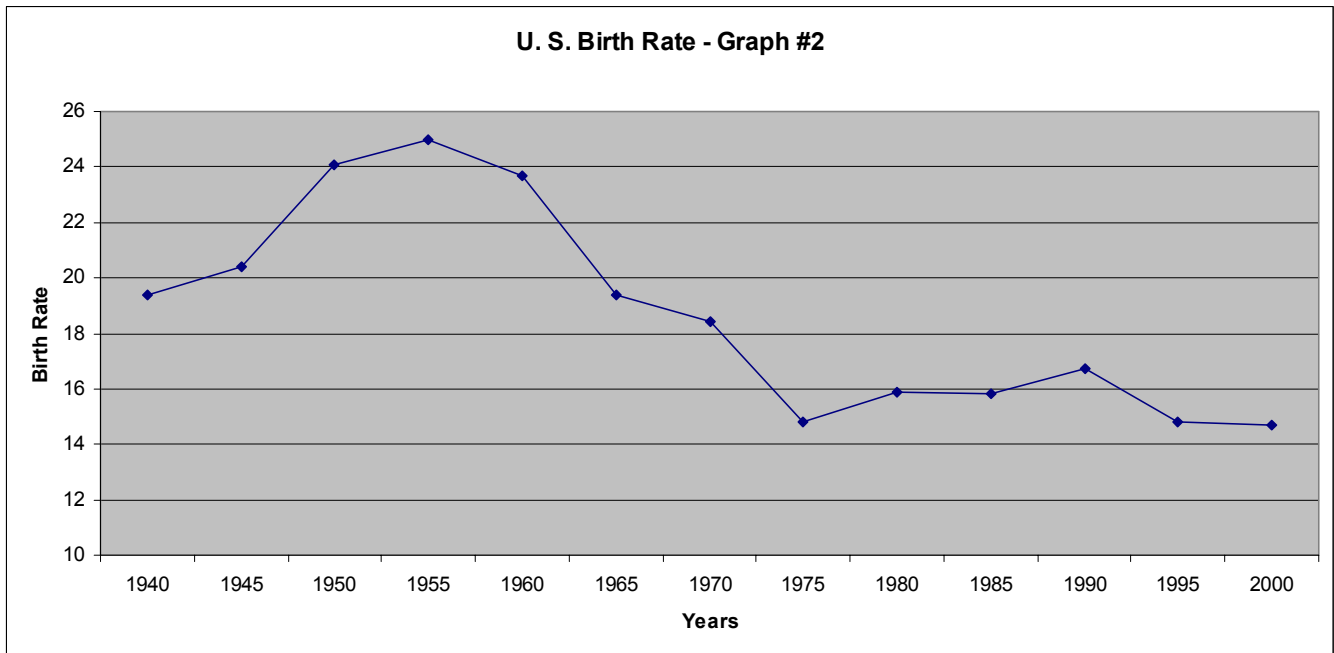
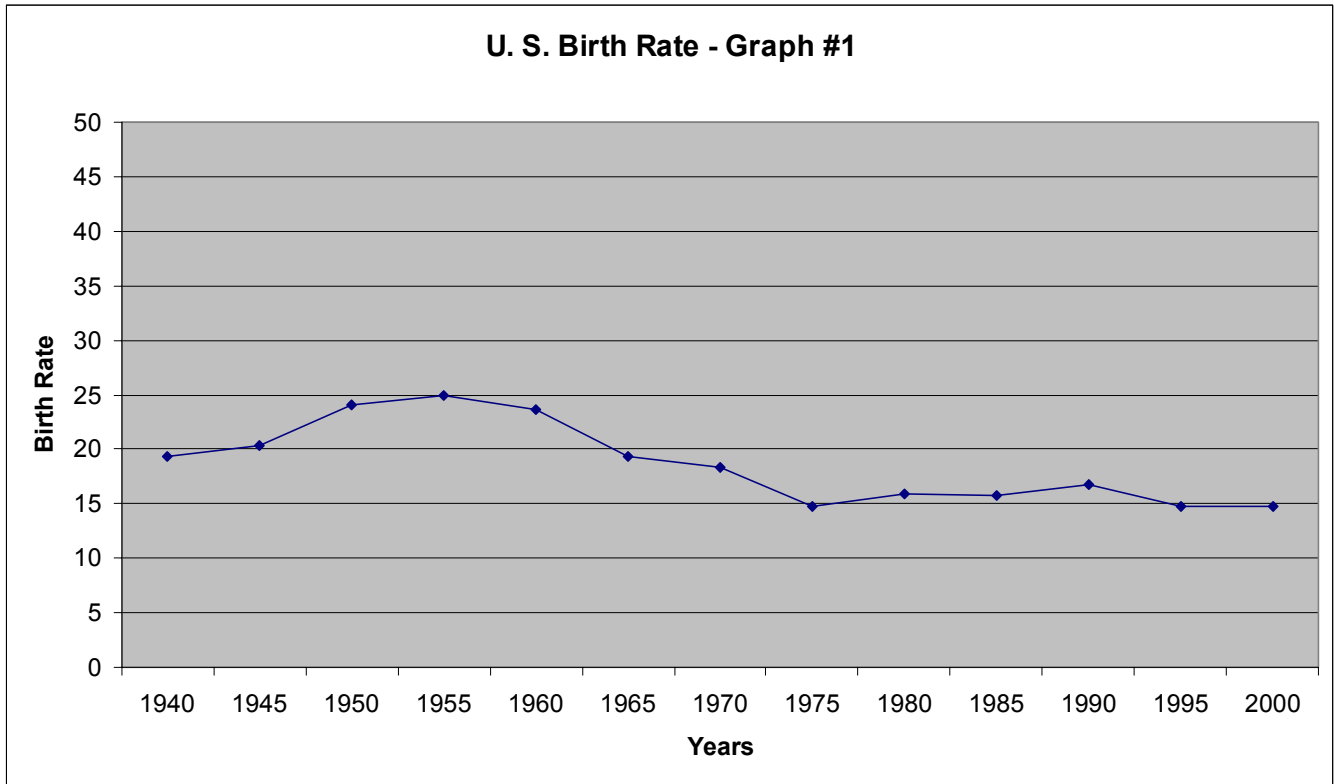
Years	Birth Rate
1940	19.4
1945	20.4
1950	24.1
1955	25.0
1960	23.7
1965	19.4
1970	18.4
1975	14.8
1980	15.9
1985	15.8
1990	16.7
1995	14.8
2000	14.7



Misleading Statistics – Follow-up Questions

1. Describe the information presented in both graphs.
2. Describe the differences in the scales between Graph #1 and Graph #2.
3. What point of view is being portrayed in Graph #1 about the U. S. birth rate?
4. Give Graph #1 a title that helps to persuade that point of view.
5. What point of view is being portrayed in Graph #2 about the U. S. birth rate?
6. Give Graph #2 a title that helps to persuade that point of view.
7. Which graph more accurately reflects the data? Support your answer.

Teaching Transparency



Data:

1940	19.4	1965	19.4	1990	16.7
1945	20.4	1970	18.4	1995	14.8
1950	24.1	1975	14.8	2000	14.7
1955	25	1980	15.9		
1960	23.7	1985	15.8		

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.21 Student will learn the use of calculating a checking account balance by use of deposits and withdrawals.

CONNECTIONS: 5.01, 5.03

CLASSROOM PROCEDURE:

This lesson will walk students through the steps of depositing paychecks, writing checks, and balancing a checking account.

4. Each student should have a copy of Handout #1 - Blank Checks, Handout #2 - Pay Checks, Handout #3 – Checking Account Register, and Handout #4 – Transactions.
5. Discuss the vocabulary and definitions with the class:
checking account – a bank or credit union that allows a customer to write checks or use a debit card to pay bills or get needed cash
deposit or credit – to add money to an account
payment or debit – to subtract money from an account
balance – the amount of money in an account at a given time
transactions – the account’s activities
overdrawn – if an account’s debits are greater than its credits
6. The teacher will demonstrate check writing by filing in the large blank check transparency on the overhead projector.
7. Using the blank checking account register transparency, the teacher will walk the class through the first three steps of the Transactions Handout.
5. With a partner, or individually, the students will complete steps 4 through 13 of the Transactions Handout.

VOCABULARY:

checking account
 deposit
 credit
 payment
 debit
 balance
 transactions
 overdrawn

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Student Handouts:
 Blank Checks
 Paychecks
 Checking Account Register
 Transactions
Teaching Transparencies:
 Blank Check
 Checking Account Register
 Transactions Key

SUPPLEMENTARY MATERIALS:

Educational materials available from local bank or credit union.

EVALUATION:

Correct completion of check register

Blank Checks - Student Handout #1

<div style="text-align: right; font-weight: bold;">101</div> <p>Name Address & Phone#</p> <p>Pay to the Order of _____ \$ _____ _____ Dollars</p> <p>For _____</p>	<div style="text-align: right; font-weight: bold;">102</div> <p>Name Address & Phone#</p> <p>Pay to the Order of _____ \$ _____ _____ Dollars</p> <p>For _____</p>
<div style="text-align: right; font-weight: bold;">103</div> <p>Name Address & Phone#</p> <p>Pay to the Order of _____ \$ _____ _____ Dollars</p> <p>For _____</p>	<div style="text-align: right; font-weight: bold;">104</div> <p>Name Address & Phone#</p> <p>Pay to the Order of _____ \$ _____ _____ Dollars</p> <p>For _____</p>
<div style="text-align: right; font-weight: bold;">105</div> <p>Name Address & Phone#</p> <p>Pay to the Order of _____ \$ _____ _____ Dollars</p> <p>For _____</p>	<div style="text-align: right; font-weight: bold;">106</div> <p>Name Address & Phone#</p> <p>Pay to the Order of _____ \$ _____ _____ Dollars</p> <p>For _____</p>
<div style="text-align: right; font-weight: bold;">107</div> <p>Name Address & Phone#</p> <p>Pay to the Order of _____ \$ _____ _____ Dollars</p> <p>For _____</p>	<div style="text-align: right; font-weight: bold;">108</div> <p>Name Address & Phone#</p> <p>Pay to the Order of _____ \$ _____ _____ Dollars</p> <p>For _____</p>

Paychecks - Student Handout #2

PAYCHECK	
Company Name	February 2
Address & Phone#	
Paid to the	
Order of _____	\$ 309.75
Three hundred nine and -----	75/100 Dollars
	<i>Company Signature</i>
PAYCHECK	
Company Name	February 9
Address & Phone#	
Paid to the	
Order of _____	\$ 309.75
Three hundred nine and -----	75/100 Dollars
	<i>Company Signature</i>
PAYCHECK	
Company Name	February 16
Address & Phone#	
Paid to the	
Order of _____	\$ 309.75
Three hundred nine and -----	75/100 Dollars
	<i>Company Signature</i>
PAYCHECK	
Company Name	February 23
Address & Phone#	
Paid to the	
Order of _____	\$ 309.75
Three hundred nine and -----	75/100 Dollars
	<i>Company Signature</i>

Checking Account Transactions – Student Handout #4

Use your checks, your paychecks, and your checking account register to complete the following transactions:

1. On **line one** of the register, write 35.00 in the BALANCE column. This is the amount of money currently in your checking account.
2. Deposit your first paycheck, dated February 2. Record this transaction on **line 2** of your register. (Fill in the DATE, TRANSACTION DESCRIPTION, DEPOSIT, and BALANCE columns.)
3. Write check #101 payable to Winn Dixie for \$77.59 on February 3. Record this transaction on **line 3** of your register. (Fill in the DATE, TRANSACTION DESCRIPTION, PAYMENT and BALANCE columns.)
4. Your cable bill is due. Write check #102 for \$60.47, dated February 6, to Bright House Cable Company. Enter this transaction by filling in **line 4** of your register.
5. Deposit your second paycheck, dated February 9. Record this transaction on **line 5** of your register.
6. Write check #103 to Wal-mart for \$83.89 dated February 12. Record this transaction on **line 6** of your register.
7. Your car insurance is due on February 14. Write check #104 to State Farm Insurance for \$205.46. Enter this transaction on **line 7** of your register.
8. Your cell phone payment is due on February 15. Write check #105 to Verizon for \$55.34. Record this transaction on **line 8** of your register.
9. Deposit your third paycheck, dated February 16. Record this transaction on **line 9** of your register.
10. Write check #106 to Publix for \$72.89 on February 18. Record this transaction on **line 10** of your register.
11. Deposit your fourth paycheck, dated February 23. Record this transaction on **line 11** of your register.
12. Your Florida Power and Light electric bill is \$68.34 and is due on February 27. Fill in check #107 and record this transaction on **line 12** of your register.
13. Your rent is \$650 and is due on February 28. Write check #108 to Palm Apartments. Record this transaction on **line 13** of your register.
14. What is your final balance?

Blank Check – Transparency #1

Name Address & Phone#	101
Pay to the Order of _____	\$ _____
_____	Dollars
For _____	_____

Checking Account Register – Transparency #2

1	NUMBER OR CODE	DATE	TRANSACTION DESCRIPTION	PAYMENT, DEBIT		DEPOSIT, CREDIT		BALANCE \$	
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									

Checking Account Register Key

1	NUMBER OR CODE	DATE	TRANSACTION DESCRIPTION	PAYMENT, DEBIT		DEPOSIT, CREDIT		BALANCE \$ 35.00	
2		2/2	Paycheck			309	75	344	75
3	101	2/3	Winn Dixie	77	59			267	16
4	102	2/6	Bright House	60	47			206	69
5		2/9	Paycheck			309	75	516	44
6	103	2/12	Wal-Mart	83	89			432	55
7	104	2/14	State Farm	205	46			227	09
8	105	2/15	Verizon	55	34			171	75
9		2/16	Paycheck			309	75	481	50
10	106	2/18	Publix	72	89			408	61
11		2/23	Paycheck			309	75	718	36
12	107	2/27	Florida Power and Light	68	34			650	02
13	108	2/28	Palm Apartments	650	00				02

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.22 – Collect data, construct a scatter plot, and classify the correlations between variables.

CONNECTIONS: 5.09

CLASSROOM PROCEDURE:

1. Tell the class that Leonardo da Vinci (1452-1519) was an Italian painter, engineer, musician, and scientist. He studied human proportions in order to paint more accurately. He observed that the ratio of a person’s kneeling height to that person’s standing height is 3 to 4. That observation will be tested in today’s activity.
2. Tell the class that they will be making a scatter plot, comparing a person’s standing height with their kneeling height. A **scatter plot** is a graph that shows a relationship between two sets of data. If Leonardo da Vinci’s observation is correct, then the data will come close to forming a line on the graph.
3. Pass out **Creating a Scatter Plot – Data** to the class. Have the students in the class take turns measuring and recording the standing and kneeling height of each person in the class. In the fourth column, find the ratio of the kneeling height to the standing height for each person. Divide the ratio. If Leonardo da Vinci’s observation is correct, each divided ratio should be close to 0.75.
4. Pass out **Creating a Scatter Plot – Graph** to the class. Tell students to plot a point for each student on the graph. Do not connect the points. Ask students to describe any patterns that they see. Ask the class if they agree with Leonardo da Vinci’s observation.

VOCABULARY:

scatter plot
data
ratio

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

tape measure

Student Handouts:

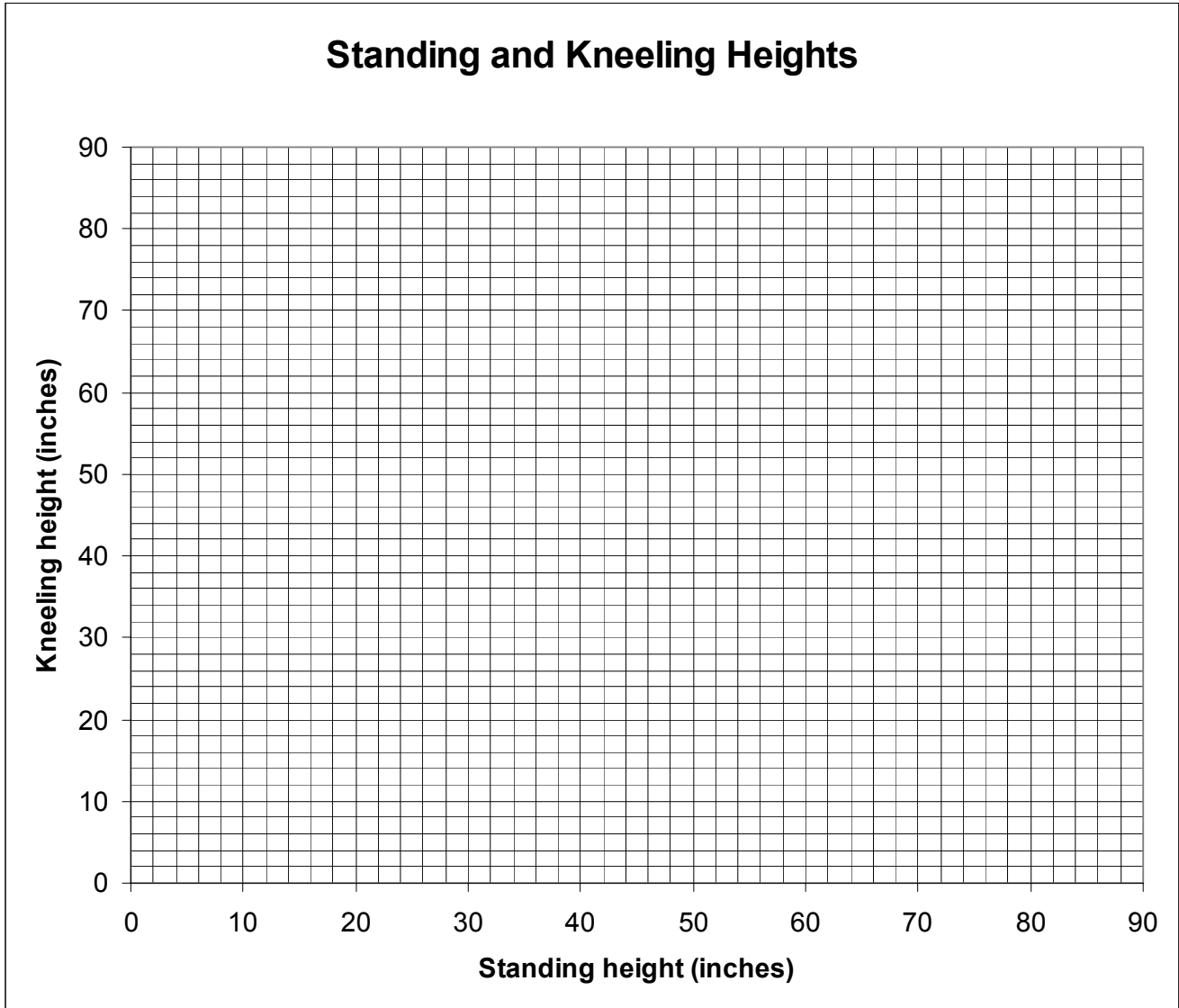
Creating a Scatter Plot – Data
Creating a Scatter Plot – Graph

SUPPLEMENTARY MATERIALS:

EVALUATION:

Students will successfully collect data, and graph the information on a scatter plot. The completed table and scatter plot can be used as an assessment of this lesson.

Creating a Scatter Plot – Graph



PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.23 – Calculate investment benefits using simple and compound-interest formulas and appropriate technology.

CONNECTIONS: 5.02, 5.06, 5.12

CLASSROOM PROCEDURE:

1. As a review and warm-up activity, have students write these percentages as decimals:
(1) 5% (2) 12% (3) 1.5% (4) 1.25% (Answers: (1) **.05** (2) **.12** (3) **.015** (4) **.0125**)
2. Review order of operations by having students simplify this expression using their scientific calculators:
 $20(2 + 12 \div 4)^3$ (Answer: **2500**)
3. Tell students that when they borrow or invest money, they will be dealing with interest. Interest is a charge for the use of the money. When you borrow money, you pay interest, and when you invest money, your money earns interest.
4. Have students copy the definitions and examples from **Finding Simple Interest – Teaching Transparency**.
5. Students will then complete the six problems on **Finding Simple Interest – Student Worksheet** with a partner, or in groups.
6. As an assessment of this lesson, have students solve the five word problems, individually, on **Finding Simple Interest – Word Problems** handout.
7. Tell students that compound interest earns more money than simple interest because the amount of interest earned is added to the principal and earns even more interest. Use the teaching Transparencies, **Compound Interest**, and **Compound Interest Formula** to explain this concept.

VOCABULARY:

interest
principal
rate
time
compound interest

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

Scientific calculators
Student Handouts:
Finding Simple Interest – Student Worksheet
Finding Simple Interest – Word Problems
Teaching Aids:
Finding Simple Interest – Teaching Transparency
Compound Interest – Teaching Transparency
Compound Interest Formula -Teaching Transparency
Answer Keys

SUPPLEMENTARY MATERIALS:

EVALUATION:

Students will complete six word problems to demonstrate their competency in using the interest formula.

Finding Simple Interest – Teaching Transparency

Interest (I) is a charge (or payment) for the use of money.

Principal (P) is the amount of money borrowed (or saved).

Rate (r) is the amount of interest that is charged (or earned).

Time (t) is how long the money is borrowed (or invested).

Hint: The rate and the time have to be the same unit. If the interest rate is per year, then the time has to be in years. If the interest rate is per month, then the time has to be in months.

Formula: $I = Prt$ (Interest = Principal x rate x time)

Example 1: Allie borrowed \$300 from her credit union for 6 months. She was charged an interest rate of 1.5% per month. Find the amount of interest charged and the total amount that she owed the credit union.

$$I = Prt$$

$$I = 300 \times .015 \times 6$$

$$I = 27 \text{ (She will pay \$27 interest.)}$$

Add \$27 to the \$300 principal to total \$327 that she will owe.

Example 2: Andrew invested \$250 for 3 years that earned 10% interest per year. How much interest will he earn?

$$I = Prt$$

$$I = 250 \times .10 \times 3$$

$$I = 75$$

He will earn \$75 interest.

Example 3: Marissa's bank charges an interest rate of 12% per year for a loan. How much interest rate would she pay to borrow \$600 for 6 months?

$$I = Prt$$

$$I = 600 \times .12 \times .5 \text{ (rate and time have to be for the same unit)}$$

$$I = \$36$$

She would pay \$36 interest.

Finding Simple Interest – Student Worksheet

(A) Find the interest earned and the total amount. Round to the nearest cent.

1. \$360 invested at 1% per month for 3 months
2. \$695 invested at 1.25% per month for 2 years (hint: change years to months)
3. \$900 invested at 8% per year for 30 months (hint: change months to years)

(B) Find the interest charged and the total. Round to the nearest cent.

4. \$6500 borrowed for 5 years at 6.25% per year.
5. \$1650 borrowed for 10 months at 1.75% per month.
6. \$22,500 borrowed for 7 years at 5.5% per year.

Finding Simple Interest – Word Problems

1. Renee borrowed \$800 from her bank for six months. The bank charges an interest rate of 1.5% per month. Find the interest charged and the total amount Renee will owe her bank.
2. Lara's savings account earns 1% interest per month. If she keeps a balance of \$2,500 in her bank for one year, how much money will she have at the end of that year?
3. William has \$5,500 invested in bonds that pay 8% interest per year. How much interest will he have after five years?
4. Jacob is taking out a five year car loan for \$12,500. He will be charged 1.25% per month for his loan. What is the total amount that Jacob will pay for his car at the end of five years?
5. Abraham has \$500 saved to buy a \$1,800 computer. He wants to borrow the rest at 1.75% per month interest. The loan is for one year. What is the total amount that Abraham will pay for the loan and interest at the end of the year?

COMPOUND INTEREST – Teaching Transparency

Compound Interest is when the amount of interest earned is added to the principal, earning even more interest.

The same formula $I = Prt$ can be used to find compound interest.

Example: Suppose you invest \$5000 at an interest rate of 8% per year, compounded semi-annually. What will your principal be after two years?

$$I = Prt$$

$$I = 5000 \times .08 \times .5$$

$$I = \underline{\$200 \text{ for the first half year}}$$

$$\$200 + \$5000 = \$5200$$

$$I = Prt$$

$$I = 5200 \times .08 \times .5$$

$$I = \underline{\$208 \text{ for the second half year}}$$

$$\$208 + \$5200 = \$5408$$

$$I = Prt$$

$$I = 5408 \times .08 \times .5$$

$$I = \underline{\$216.32 \text{ for the third half year}}$$

$$\$216.32 + \$5408 = \$5624.32$$

$$I = Prt$$

$$I = 5624.32 \times .08 \times .5$$

$$I = 224.9728$$

$$I = \underline{\$224.97 \text{ for the fourth half year}}$$

$$\$224.97 + \$5624.32 = \underline{\$5849.29 \text{ is the total amount earned after two years.}}$$

Practice: Suppose you invest \$7500 at an interest rate of 10% per year, compounded semi-annually. What will your principal be after two years?

COMPOUND INTEREST FORMULA

Teaching Transparency

To find the value of money earning compound interest, you can also use the compound interest formula below:

$$A = P \left(1 + \frac{R}{m} \right)^n$$

A = The total amount of money: original principal plus all interest

P = Original principal

R = Yearly percentage rate

m = Number of time periods per year that interest is paid

n = Total number of time periods that interest is actually paid

Example: If you invest \$5,000 in a savings bond and earning 6% interest compounded every four months, how much money will you have in two years?

$$P = \underline{5,000} \quad R = 6\% = \underline{.06} \quad m = \frac{12}{4} = \underline{3} \quad n = 3(2) = \underline{6}$$

$$A = 5000 \left(1 + \frac{.06}{3} \right)^6$$

$$A = 5000 (1 + .02)^6$$

$$A = 5000 (1.02)^6$$

$$\mathbf{A = \$5,630.81} \quad (\text{rounded to the 100ths place})$$

You will have \$5,630.81 in two years.

Practice: Suppose you invest \$12,500 at an interest rate of 5% per year, compounded semi-annually. What will your principal be after five years?

Answer Keys

Finding Simple Interest – Student Worksheet

- | | |
|-----------------------|----------------------------|
| 1) \$10.80; \$370.80 | 4) \$2,031.25; \$8,531.25 |
| 2) \$208.50; \$903.50 | 5) \$288.75; \$1,938.75 |
| 3) \$180; \$1,080 | 6) \$8,662.50; \$31,162.50 |

Finding Simple Interest – Word Problems

- | | |
|----------------|-------------|
| 1) \$72; \$872 | 4) \$21,875 |
| 2) \$2,800 | 5) \$1,573 |
| 3) \$2,200 | |

Compound Interest – Teaching Transparency Practice Problem

Principal after two years = \$9,116.30

Compound Interest Formula – Teaching Transparency Practice Problem

Principal after five years = \$16,001.06

PRE-GED LESSON PLAN – MATHEMATICS (Level 6.0 – 8.9)

COMPETENCY: 5.24 – Select appropriate units and instruments of measurement to achieve the degree of accuracy and precision required in a real-life or workplace situation.

CONNECTIONS: 5.01, 5.05, 5.06, 5.08, 5.14, 5.18,

CLASSROOM PROCEDURE:

1. Draw a rectangle on the board with the written dimensions of 3 feet x 6 feet. Ask students to find the area of the rectangle. (Answer: **18 square feet**) Have a student draw in the “square feet” so that students can have a visual understanding of area.
2. Ask the class how they would determine how many square yards the rectangle has? (Answer: **$18 \div (3 \times 3) = 2$ square yards**)
3. Pass out the **Room Measurement Exercise** to the class. Tell students that the diagram represents a room that has been added to a house. Ask students the following questions:
 - (1) What unit of measurement is usually used to measure the dimensions of a room?
 - (2) What tool do most people use to measure a room?
 - (3) When figuring out how much paint is needed to paint a room, what unit of measurement do they need?
 - (4) Most paint is bought in what size cans?
 - (5) When figuring out how much carpet is needed to carpet a room, what unit of measurement do they need?
 (Answers: (1) **feet** (2) **tape measure** (3) **square feet** (4) **gallon** (5) **square yards**)
4. Divide the class into cooperative groups to complete the **Room Measurement Exercise**.

VOCABULARY:

area
square feet
square yards

TEACHER-MADE OR ALTERNATIVE MATERIALS:

MATERIALS NEEDED:

scientific calculator

Student Handout:
Room Measurement Exercise

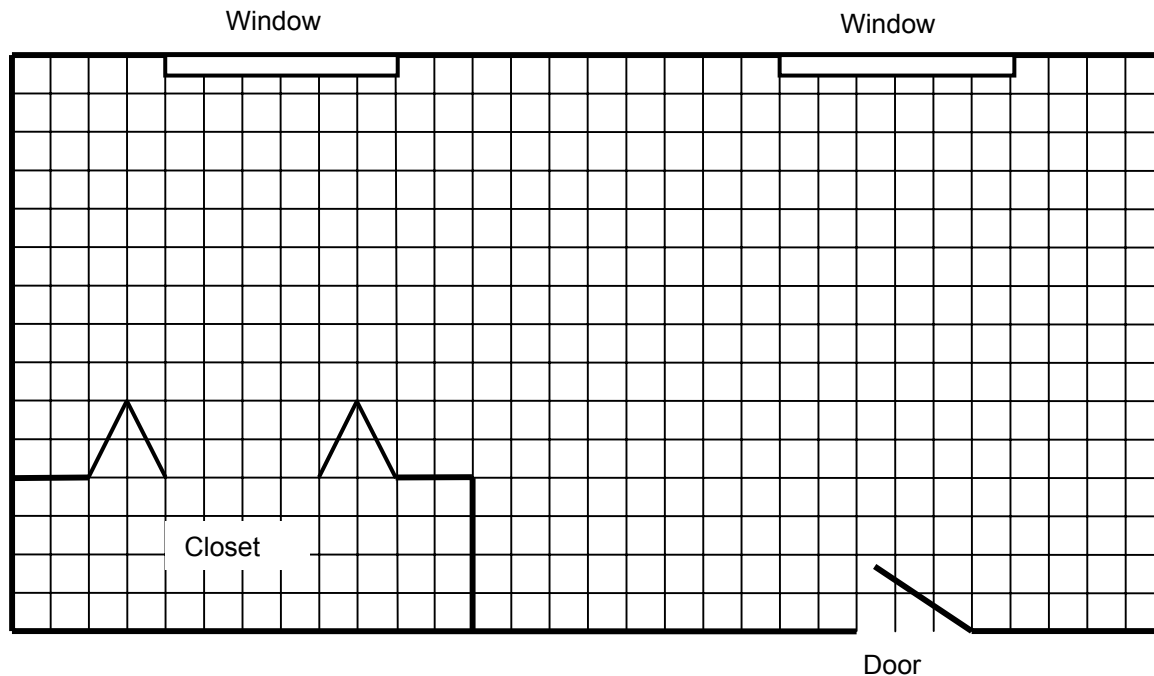
Answer Key

SUPPLEMENTARY MATERIALS:

EVALUATION:

Students will successfully complete the activity, figuring out the amount of materials needed to paint and carpet a room.

Room Measurement Exercise



Window measurements:

6 feet x 3 feet (each)

Door measurements:

3 feet x $6\frac{1}{2}$ feet

Closet door opening:

8 feet x $6\frac{1}{2}$ feet

Ceiling height:

8 feet

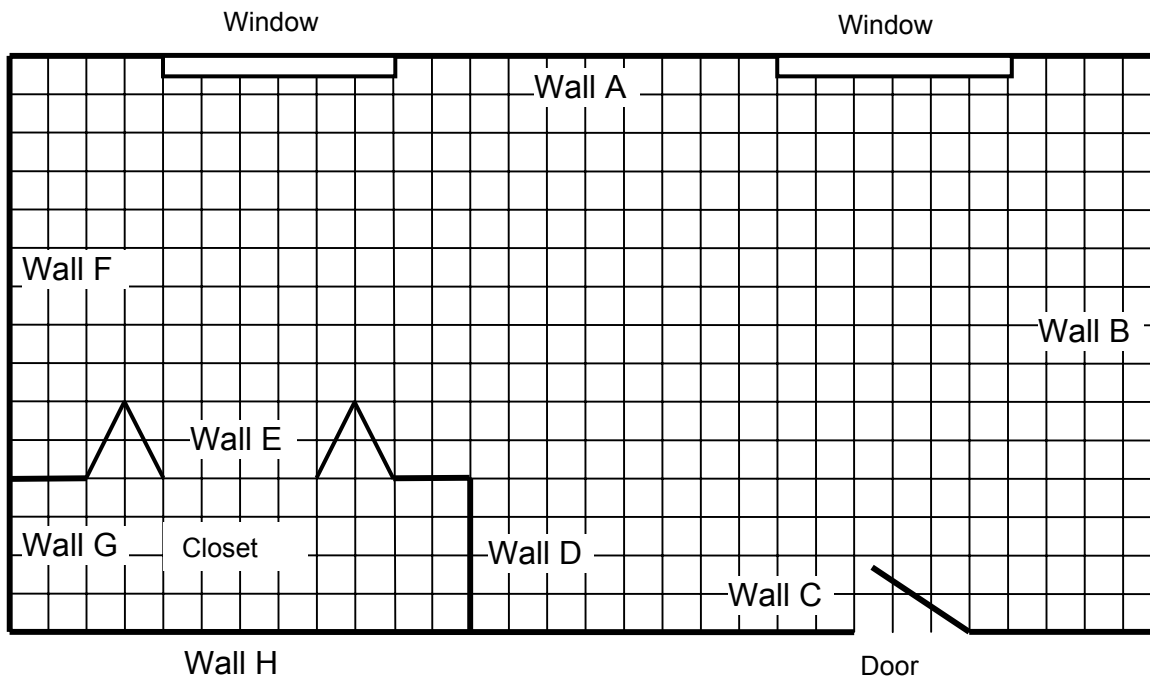
Floor:

Each square = 1 square foot

The room shown above has just been added to a home. The room still requires painting and carpeting. The following questions are asked to determine the quantity of materials needed to complete this project. Use the information above to answer the questions. (Round up all your answers to the next whole number.)

- 1) How many gallons of paint will be required to paint the walls of the room and the outside of the closet with two coats of paint? You will not be painting the closet doors or the door opening into the room. One gallon of paint covers 250 square feet.
- 2) A different color paint is used to paint the inside of the closet. How many quarts of paint are needed to paint the inside of the closet with two coats of paint? One quart covers 60 square feet.
- 3) How many gallons of paint will be required to paint the ceiling of the entire room with two coats of paint? One gallon of ceiling paint covers 225 square feet.
- 4) How much carpet is required (in square yards) to carpet the room (minus the closet)? (One square yard = nine square feet)

Room Measurement Exercise – Answer Key



1) Wall A:	$(30 \times 8) - 2(6 \times 3) =$	204 square feet
Wall B:	$15 \times 8 =$	120 square feet
Wall C:	$(18 \times 8) - (3 \times 6.5) =$	124.5 square feet
Wall D:	$4 \times 8 =$	32 square feet
Wall E:	$(12 \times 8) - (8 \times 6.5) =$	44 square feet
Wall F:	$11 \times 8 =$	<u>88 square feet</u>
TOTAL		612.5 square feet

$$\frac{612.5}{250} = 2.45 \text{ gallons}$$

$$2.45 \text{ gallons} \times 2 \text{ coats} = 4.9 \text{ gallons} = \underline{\underline{5 \text{ gallons}}}$$

2) Wall E:	$(12 \times 8) - (8 \times 6.5) =$	44 square feet
Wall D:	$4 \times 8 =$	32 square feet
Wall G:	$4 \times 8 =$	32 square feet
Wall H:	$12 \times 8 =$	<u>96 square feet</u>
TOTAL		204 square feet

$$\frac{204}{60} = 3.4 \text{ quarts}$$

$$3.4 \text{ quarts} \times 2 \text{ coats} = 6.8 \text{ quarts} = \underline{\underline{7 \text{ quarts}}}$$

Room Measurement Exercise – Answer Key – Page 2

3) Ceiling: $15 \times 30 =$ 450 square feet

$$\frac{450}{225} = 2 \text{ gallons}$$

2 gallons x 2 coats = **4 gallons**

4) Floor: $(15 \times 30) - (12 \times 4) =$ 402 square feet

9 square feet = 1 square yard

$$\frac{402}{9} = 44.6 \text{ square yards} = \textbf{45 square yards}$$