Lesson Objective: Evaluate numerical expressions, using the order of operations.

Vocabulary Box

exponent – A number that indicates the operation of repeated multiplication. Example: In $4^3 = 4 \times 4 \times 4 = 64$, 3 is the exponent.

base – A number multiplied by itself the number of times shown by an exponent. Example: In $4^3 = 4 \times 4 \times 4 = 64$, 4 is the base.

power – A number produced by raising a base to an exponent. Example: In $4^3 = 4 \times 4 \times 4 = 64$, 64 is the third power of 4.

Independent Practice

Directions: Complete the following practice problems on your own. Your teacher will review the answers. Make sure you show all your work.

I. Write each operation in the order it should be performed.

1. $23 + (7 - 5) \div 3$

2. $8 + 9 \times 4$

3. $3 + 7^5 \times 6$

II. Evaluate each expression.

1. $10 - 3 \times 2$

2. $25 - (2 + 3)$

3. $4^3 - 16$

4. $6^2 - (5 + 8) \times 2$

5. $50 + 4 \times (8 - 1)$

6. $9^2 - 3^3 \div 9 + 2$

BONUS?

Directions: Insert operation symbols to make each statement true: +, -, x, ÷

1. 7_____4_____6 = 22

2. 15_____3_____9 = 42

3. 16_____18_____6_____3 = 16

Problem Solving

Directions: Use problem-solving strategies to solve the word problems. Make sure you show all your work, and write your answers in complete sentences using words from the problems.

A company that makes bicycles is creating a guide for its workers. The guide says the length of the streamers on the handlebar is 2 inches longer than the length of a handlebar divided by 2. The expression 2 + h ÷ 2 , where h is the length of the handlebar, can be used to find the length of the streamers.

1. If the handlebars are 24 inches long, how long should the streamers be?

The size of the shipping container is determined by the width of the largest bicycle part when unassembled. Refer to the chart below.

Bicycle Size (inches)	0–24	24–36	36–42	42–54
Box Size	A	B	C	D

2. Which box is needed for a bicycle if its largest part has a width given by the expression $16 + 12 \times 3$?

3. Which box is needed for a bicycle if its largest part has a width given by the expression $100 - \left(5 + 8^2\right)$?

Directions: Use what you know about the order of operations to answer each question.

1. The E in PEMDAS stands for _____.

2. $4 \times 15 + 5 \div 5 =$

3. $20 - 4^2 =$

Lesson Objective: Determine the probability of independent events.

Vocabulary Box

probability – The number of possible successful events divided by the total number of possible outcomes. Example: The probability of flipping heads on one try or event using one quarter is $\frac{1}{2}$.

independent events – Two events in which the outcome of the second is not affected by the outcome of the first. Example: The outcome of flipping heads on a quarter and heads on a penny are independent events. One event does not affect the outcome of the other event.

Guided Practice

Directions: Complete the following practice problems. Your teacher will review the answers. Make sure you show your work where appropriate.

I. Refer to the spinner to find the probability of each event. Write your answers in simplest form. You may work with a partner.

   1. Spinning a 2.

   2. Spinning a 3.

   3. Spinning an even number.

   4. Spinning a 1 or a 2.

   5. Spinning a 3 and then a 4.
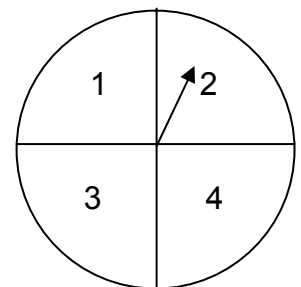
II. Observe a six-sided number cube to find each probability. Please work independently, and write your answers in simplest form.

1. Rolling a 2.

2. Rolling an odd number.

3. Rolling a 3 or a 4.

4. Rolling a 5 and then a 2.

Summary/Closure

A. Vocabulary Words

Define each vocabulary term, using your own words, or give an example that will illustrate the meaning.

probability –

independent events –

B. Summarize What We Learned Today

Draw a four-color spinner, and label it with four colors of your choice. Then write and answer three probability questions related to using the spinner.

Lesson Objective: Determine the probability of independent events.

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independent events – Two events in which the outcome of the second is not affected by the outcome of the first. Example: The outcome of flipping heads on a quarter and heads on a penny are independent events. One event does not affect the outcome of the other event.

Independent Practice

Directions: Complete the following practice problems on your own. Your teacher will review the answers. Make sure you show all your work and write your answers in simplest form.

I. A bag contains 10 yellow cards, 15 purple cards, and 5 red cards. Find the probability of each event.

1. Pulling out a red card.

2. Pulling out a purple card.

3. Pulling out a yellow card.

4. Pulling out a red or purple card.

5. Pulling out a yellow card, putting it back, and then pulling out a red card.

6. Pulling out a red or yellow or purple card.

II. State the probability of each event.

1. Flipping a coin 3 times and getting heads all 3 times. <u>Hint</u>: Getting heads and getting heads and getting heads.

2. Flipping a coin 3 times and getting tails all 3 times.

3. Flipping a coin once and getting heads or tails.

4. Flipping a coin twice and getting tails, then getting heads.

BONUS?

<u>Directions</u>: Find each probability.

A standard deck of cards has 52 cards. There are 4 suits: clubs and spades, which are black; and hearts and diamonds, which are red. There are 4 cards for each value: 1 of each suit for 2 through 10, and for jack, queen, king, and ace. Find the probability of each of the following events.

1. Drawing a queen from the deck.

2. Drawing a red queen from the deck.

3. Drawing a queen or drawing a 6 of any suit from the deck.

4. Drawing a queen, replacing it in the deck, and then drawing a queen again.

Problem
Solving

Directions: Use problem-solving strategies to solve each word problem. Make sure you show all your work, write the probability in simplest form, and write your final answer in a complete sentence using words from the problem.

A town has decided to place a new traffic light at a busy intersection. The light will cycle through green, yellow, and red in 1 minute. The timing of the light is as follows: 30 seconds on green, 5 seconds on yellow, and 25 seconds on red.

1. What is the probability that, at any given second, a car will pull up to a red light?

2. What is the probability that the light will be green?

3. What is the probability that the light will be yellow?

4. What is the probability that the light will be yellow or red?

Directions: Use what you know about probability to answer each question.

1. Tossing a nickel and tossing a dime are _____ because the outcome of one does not affect the outcome of the other.

2. What is the probability of guessing correctly on a question that has 5 answer choices?

3. If there are 4 questions on a test, each with 5 answer choices, what is the probability of guessing correctly on every question?