News from the Mathematics 7 Course

Dear Parents,

In Unit 3, students write and evaluate algebraic expressions to represent real life situations. Algebraic expressions include at least one variable and at least one operation. They apply the Properties of Mathematics in order to write equivalent expressions, and analyze expressions so they can determine equivalency. Initially, students use manipulatives to combine like terms and simplify expressions, followed by applying the Commutative and Associative Properties to reorder and group like terms. They also use manipulatives along with the area model and the Distributive Property to expand and factor expressions. Following work with expressions, students write two—step equations that represent real-world problems. They expand their conceptual understanding of solving one—step equations to solving two—step equations using manipulatives, tape diagrams/bar models and the balance, followed by the application of the algorithm for solving equations using inverse operations. Then students apply their knowledge of solving equations to solving inequalities. They focus on performing inverse operations to isolate the variable and find a valid set of solutions for the inequality.

In Unit 3, students will...

- Write and evaluate algebraic expressions.
- Use the Properties of Mathematics to simplify and write equivalent algebraic expressions.
- Expand and factor algebraic expressions.
- Write and solve two-step equations and inequalities.

In Unit 4, students review the concept of population and focus on how using a random sample can yield information about the entire population. They extend the concept of a random sample to understand that no two random samples will have the same members, nor will their distributions necessarily look the same. However, if the samples are large enough, they will represent the population. Students use different data displays, and their appropriate measures of center and spread, to compare populations.

In Unit 4, students also move from concentrating on the analysis of data to the production of data using tools such as spinners, number cubes or random number generators. In this introduction to probability, students view the probabilities of chance events as long-run relative frequencies of their occurrence, with many opportunities to develop the connection between theoretical models and empirical probability approximations. This connection forms the basis for higher level statistical inferences.

In Unit 4, students...

- Determine if a sample is representative of a population.
- Make inferences about a population from a sample data set.
- Compare populations using mean, media, range, interquartile range and mean absolute deviation.
- Determine the theoretical and experimental probability of events.
- Find all possible outcomes of compound events.
- Simulate compound events to approximate its probability.

We, in the Anne Arundel County middle school mathematics office, require effective teaching that engages students in meaningful learning through individual and collaborative experiences that promote their ability to make sense of the mathematical ideas and reason mathematically. All students can learn mathematics at high levels, and with your support at home, we hope to achieve that with your child. Thank you for your continued support.

The Middle School Mathematics Office
Important Concepts

Unit 3 Important Concepts

- Algebraic expressions can be used to represent and solve problems in real-world contexts.
- Re-arranging or combining like terms does not change the value of an expression.
- All like terms must be combined in order for expressions to be simplified.
- Expanded expressions represent an equivalent way to represent the original expression.
- The Distributive Property and common factors help with factoring expressions.
- One-step and two-step equations and inequalities can be solved using inverse operations while maintaining balance.

Unit 4 Important Concepts

- Representative samples must reflect the entire population and be randomly chosen.
- Data displays such as box plots, and measures of center and spread can be used to make comparisons between two populations.
- Probability is the likelihood an event will occur. The closer a probability is to 0, the less likely it is to occur. The closer the value is to 1 the more likely the event will occur.
- The theoretical probability of an event is the number of favorable outcomes divided by the number of possible outcomes, when all outcomes are equally likely.
- Experimental probability consists of the results of an actual experiment.
- A probability model can be used to evaluate a chance process and its outcomes. The model has a sample space, a list of events, and the probability of each event.
- A simple event is one outcome or a collection of outcomes while a compound event is made up of two or more simple

Vocabulary

Unit 3 Vocabulary

Algebraic expressions have at least one variable and at least one operation.
Equivalent expressions have the same value regardless of the number substituted for the same variables in the expressions.
Simplifying expressions means writing equivalent expressions that have no like terms and no parenthesis.
Equations are number sentences that use an equal sign to show two expressions are equal.
A solution of an equation is a value for a variable that makes the equation true.
Inverse operations undo each other.
An inequality is a mathematical sentence that contain <, >, ≤ or ≥.

Unit 4 Vocabulary

Representative samples accurately reflect the characteristics of the entire population.
Random samples give each member of the population an equal chance of being included.
Probability of an event describes the likelihood that an event will occur.
Theoretical probability of an event is the number of favorable outcomes divided by the total number of outcomes.
Experimental probability can also be called relative frequency or the number of times an event occurs to the total number of trials.
A Probability model consists of the sample space and events within the sample space and their probabilities.
Sample space is the set of all possible outcomes.
Compound event consists of two or more events.
Simulation is a model of a real-world situation that can be used to find probabilities.
Real World Connections

Tax and Tips –

Many states and cities collect hospitality taxes from restaurants and hotels. In the United States, it is common practice to leave a tip at a restaurant for good food and service. Tips typically range from 10% to 20%.

Last night, four friends went to dinner at a restaurant. They split the bill evenly. Each friend paid $12.75 for his meal and each left the same amount of tip, t. How much tip did each friend leave?

\[
4(12.75) + 4t = 61.00
\]

\[
51 + 4t = 61
\]

\[
51 - 51 + 4t = 61 - 51
\]

\[
4t = 10
\]

\[
\frac{4t}{4} = \frac{10}{4}
\]

\[
t = 2.5
\]

Each friend left $2.50 for a tip.

Sports –

At the beginning of a football game, the referee tosses the coin; each team has a 50/50 chance of winning the toss and electing to receive or kick off the football. In basketball, a coach can predict the probability of a player making a free throw when fouled.

The best player on a basketball team makes 75% of all free throws. The second–best player makes 70% of all free throws, and the third–best player makes 65% of all free throws. Based on their experimental probabilities, estimate the number of free throws each player will make in his next 40 attempts.

- Three quarters (75%) of 40 is 30.
- Ten percent of 40 is 4, so 70% of 40 is 28.
- Ten percent of 40 is 4; five percent of 40 is 2; so 6% of 40 is 26.