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| **PVREC COURSE ONE** |
| Unit TWO: SOLVE IT!!! |
| State Standards:  **Standard:** Students will understand algebraic concepts and applications.  **9-12 Benchmark**.**A.1**: Represent and analyze mathematical situations and structures using algebraic symbols.  **Performance Standards:**  **9-12.A.1.4** Explain that the distance between two numbers on the number line is the absolute value of their difference.  **9-12.A.1.6** Simplify numerical expressions using the order of operations, including integer exponents.  **9-12.A.1.12** Explain and use equivalent representations for algebraic expressions (e.g., simplify using the distributive property).  **9-12.A.1.14** Evaluate polynomial, *rational, radical, and absolute value expressions* for one or more variables.  **9-12.A.1.17** Solve linear equations and inequalities in one variable including those involving the absolute value of a linear function.  **9-12.A.1.19** Use the four basic operations (+, -, ×, ÷) in contextual situations with numbers in scientific notation, and express the results with the appropriate number of significant figures.  **Standard:** Students will understand geometric concepts and applications.  **9-12 Benchmark G.1:** Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.  **Performance Standards:**  **9-12.G.1.2** Find the area and perimeter of a geometric figure composed of a combination of two or more rectangles, triangles, and/or semicircles with just edges in common.  **Standard:** Students will understand how to formulate questions, analyze data, and determine probabilities.  **9-12 Benchmark D.2:** Select and use appropriate statistical methods to analyze data and make predictions.  **Performance Standards:**  **9-12.D.2.9** Use linear patterns in data to make predictions.  **9-12.D.2.10** Use technological tools to find the line of best fit. |

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| **Literacy Strategies**  (Check all that apply.) | **Habits of Success**  (Check one per unit.) | **Multiple Intelligence Areas** | |
| √ Admit/Exit slips   * Graphic organizer   √ Know/Want to Know/Learn chart (KWL)  √ Open-response questions  √ Double-entry/Two-column notes  √ Retelling  √ Reflection   * Jigsaw reading   √ Anticipation guide   * RAFT (Role/Audience/Format/Topic) * Interactive reading guide * Concept definition maps * Frayer model * Visual prediction guide * Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | √ Create relationships  √ Teamwork, responsibility, effective communication)  √ Study, manage time, organize  √ (Organization, time management, study skills)  √ Improve reading/writing skills  √ (Use reading and writing to learn strategies)  √ Improve mathematics skills  √ (Estimate, compute, solve, synthesize)   * Set goals/plan * (Set goals, plan, monitor progress) * Access resources * (Research, analyze, utilize)   √ USE OF TECHNOLOGY | √ Logical/Mathematical   * Spatial   √ Musical  √ Bodily—Kinesthetic   * Interpersonal * Intrapersonal   √ Naturalist   * Linguistic | |
| ASSESSMENTS: | | |
| Pre-Assessment: | | |
| Daily/Weekly: (Included on daily activities plans) | | |
| Post-Assessment: | | |

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| **Daily Lesson Plans—WEEK ONE** | | |
| **DAY ONE** | | |
| Benchmark:  **9-12.A.1.6** Simplify numerical expressions using the order of operations, including integer exponents.  **9-12.A.1.19** Use the four basic operations (+, -, ×, ÷) in contextual situations with numbers in scientific notation, and express the results with the appropriate number of significant figures  Learning Objective:  Given various expressions, the student will simplify them using the order of operations and complete 4 out of 5 real world application problems correctly.  Assessment:  **Card Sort** | | |
| **Strategy** | **Time** | **Activity** |
| Bell work | 5 | I’M SICK OF AUNT SALLY!! Come up with a different statement that will help you remember the order of operations (PEMDAS). |
| Introduction/Engage | 5 | Discuss bell work outcomes; chose an example that the class will use exclusively |
| Explore/Review | 20 | Card Sort with Card Sort sheet  Or different game using order of operations—teacher generated  Or use the Order of Operations Bingo game at NCTM Illuminations below:  <http://illuminations.nctm.org/LessonDetail.aspx?id=L730> |
| Assessment | 10 | 5 real world application problems that utilize basic operations and order of operations |
| Closure | 5 | Summarize lesson using 15 words |

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| Order of Operations Bingo | |  |  |  | | --- | --- | --- | |  | http://illuminations.nctm.org/Images/icons/email.gif | http://illuminations.nctm.org/Images/icons/comment.gif  [Share](http://www.addthis.com/bookmark.php?v=250&pub=xa-4b1e9b1356fb208f) | | |

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| |  | | --- | | Instead of calling numbers to play Bingo, you call (and write) expressions to be evaluated for the numbers on the Bingo cards. The operations in this lesson are addition, subtraction, multiplication, and division. None of the expressions contain exponents. |      |  |  | | --- | --- | | http://illuminations.nctm.org/Images/plus.gif | Learning Objectives |  |  |  | | --- | --- | |  | Students will:   * Evaluate expressions using the order of operations on +, –, ×, and ÷ * Use mental arithmetic to evaluate expressions. |      |  |  | | --- | --- | | http://illuminations.nctm.org/Images/plus.gif | Materials |  |  |  | | --- | --- | |  | * [Order of Ops Bingo Sheet](http://illuminations.nctm.org/Lessons/OrderOfOpBingo/OrderOfOpBingo-AS-numbersAndCards.pdf) * Bowl, jar, or hat * Chips for marking spaces on the Bingo cards |      |  | | --- | | Instructional Plan |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Students can often rattle off the acronym PEMDAS or "Please Excuse My Dear Aunt Sally" as being associated with the *order of operations*. Putting this memory into practice can be more of a challenge. By practicing the correct order with a motivating game of Bingo, students will be more eager to be accurate in their calculations.   |  | | --- | | **P**arentheses  **E**xponents  **M**ultiplication / **D**ivision  **A**ddition / **S**ubtraction |     One misconception by students is that all multiplication should happen before all division because the *multiplication* comes before *division* in the acronym. In fact, multiplication and division have the same precedence and should be evaluated as they appear from left to right.   |  |  |  |  | | --- | --- | --- | --- | |  | Incorrect  http://illuminations.nctm.org/Lessons/OrderOfOpBingo/MultThenDiv-Incorrect.gif |  | Correct  http://illuminations.nctm.org/Lessons/OrderOfOpBingo/MultThenDiv-Correct.gif |   Similarly, *addition* comes before *subtraction* in the acronym, yet they have the same precedence.   |  |  |  |  | | --- | --- | --- | --- | |  | Incorrect  http://illuminations.nctm.org/Lessons/OrderOfOpBingo/AddThenSub-Incorrect.gif |  | Correct  http://illuminations.nctm.org/Lessons/OrderOfOpBingo/AddThenSub-Correct.gif |   Try giving students an additional example before starting the game.   |  |  | | --- | --- | |  | http://illuminations.nctm.org/Lessons/OrderOfOpBingo/LongExample.gif |     **Playing Order of Operations Bingo**  To prepare the materials for the game, you will need to print the [Order of Ops Bingo Sheet](http://illuminations.nctm.org/Lessons/OrderOfOpBingo/OrderOfOpBingo-AS-NumbersAndCards.pdf). The first two pages contain 50 expression strips, which you will need to cut out and place in a bowl, jar, or hat. The third page contains two bingo cards; you will need to photocopy this sheet, cut the copies in half, and distribute a sheet to each student.   |  |  | | --- | --- | | [http://illuminations.nctm.org/lessons/images/pdficon.jpg](http://illuminations.nctm.org/Lessons/OrderOfOpBingo/OrderOfOpBingo-AS-NumbersAndCards.pdf) | [Order of Ops Bingo Sheet](http://illuminations.nctm.org/Lessons/OrderOfOpBingo/OrderOfOpBingo-AS-NumbersAndCards.pdf) |   The object of the game is to get five numbers in a row, vertically, horizontally, or diagonally, just as in the regular game of bingo.  NOTE: The operations used for this lesson are addition, subtraction, multiplication, and division. None of the expressions contain exponents or parentheses.  Distribute a Bingo card to each student before starting the game. Give students the following instructions:   * Choose one space on the board as the "free" space and write the word FREE. * Choose numbers to write into the other 24 boxes on your Bingo card. Make sure you choose numbers in the ranges given at the top of each column. That is, numbers in the first column ("B") must be in the range 1‑10, numbers in the second column ("I") must be in the range 11‑20, and so on. [This ensures better distribution of the numbers.] * You are not allowed to repeat any numbers.   Place all of the expression strips in a bowl, jar, or hat, and choose them one at a time. After each selection, write the expression on the board or overhead so students can evaluate it. Students should copy down and evaluate the expression on their own paper. For the first few turns, you may want to model how the numerical value is determined for the expression by writing in any applicable parentheses and going through the steps of evaluation. Make sure you write out the steps, just as you'd like to see the students do themselves. Once the number is determined, students can look for the number on their Bingo card and mark it with a pencil or a chip.  The value (i.e., the "answer") for each expression follows the expression on each strip, so be sure to share only the *expression*, saving the *answer* to verify a winner.   |  |  | | --- | --- | |  | http://illuminations.nctm.org/Lessons/OrderOfOpBingo/ExampleStrip.jpg |   Keep picking expressions. Students should calculate the value for each expression, and then mark the square with that number on their card (if that number appears on their card, of course). When a student believes that she has correctly completed a column, row or diagonal on her card, she should yell, "Bingo!"  When the game has a potential winner, ask the student to call out the numbers that make the winning row, column, or diagonal. With the class, determine if the numbers that the winning student calls are indeed values from expressions that have been called out to check the math and verify the win.  To extend the game for another winner, change the rules to require 2 runs of 5 chips, or framing the exterior square of the board (16 pieces).  If students use chips instead of crossing off numbers with a pen or pencil, then they can exchange cards and play again. In order to start a second or subsequent game, all expressions used in the previous game are returned to the bowl, jar, or hat for a fresh start. | |

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| **DAY TWO** | | |
| Benchmark:  **9-12.A.1.4** Explain that the distance between two numbers on the number line is the absolute value of their difference.    Learning Objective:  Given sets of numbers, students will express their distance on the number line as an absolute value expression in 8 out of 10 examples. | | |
| **Strategy** | **Time** | **Activity** |
| Bell work | 5 | Construct a number line; place various integer examples |
| Introduction/Engage | 5 | Discuss finding the distance between these integers |
| Explore/Review | 20 | Discuss absolute value and distance |
| Assessment | 10 | Use absolute value to find the distance between integers in 8 out of 10 examples correctly |
| Closure | 5 | 3 things you learned  2 things you likes  1 thing you don’t understand |

Absolute value problems:

Evaluate the following.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| a) | |6| = 6 |  | b) | |−6| = **6** |  | c) | |0| = 0 |  | d) | |2 − 7| =  5 |
|  | | | | | | | | | | |
| e) | |8| + |−4| = 8 + 4 = 12 | | | |  | f) | |−3| − |−2| = 3 − 2 = 1 | | | |
|  | | | | | | | | | | |
| g) | 1 − |−1| = 1 − 1 = 0 | | | |  | h) | −8 + |−7| = −8 + 7 = −1 | | | |

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| --- | --- | --- | --- | --- | --- | --- |
| i) | −4  |−4| | = | −4  4 | = −1 |  | j)  (−4)|−4|= **(−4)· 4 = −16** |

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| **DAY THREE** | | | | |
| Benchmark:  **9-12.A.1.12** Explain and use equivalent representations for algebraic expressions (e.g., simplify using the distributive property).  Learning Objective:  The student will be able to simplify algebraic equations by using the distributive property in 8 out of 10 problems.  Assessment:  <http://www.kutasoftware.com/FreeWorksheets/Alg1Worksheets/Distributive%20Property.pdf>  Materials:  Algebra Tiles  <http://www.kutasoftware.com/FreeWorksheets/Alg1Worksheets/Distributive%20Property.pdf> | | | | |
| **Strategy** | **Time** | **Activity** | | |
| Bell work | 5 | Baking cookies for a bigger bunch. The following recipe makes 2 dozen cookies, but that isn’t enough for your birthday party, you need 4 dozen. How much of each ingredient will you need?  **Ingredients:**   |  |  | | --- | --- | | 1 cup butter, softened  1 cup white sugar  1 cup packed brown sugar  2 eggs  2 teaspoons vanilla extract  3 cups all-purpose flour | 1 teaspoon baking soda  2 teaspoons hot water  1/2 teaspoon salt  2 cups semisweet chocolate chips  1 cup chopped walnuts | | | |
| Introduction/  Engage | 5 | What you’ve just done is the distributive property. Share your results. In algebra, we often have to use the distributive property even though some amounts will be unknown. | | |
| Cooperative Learning | 10 | Use algebra tiles to model the distributive property, have groups work together. | | |
| Guided & Independent Practice | 10 | Give students a written example, show them how to work it, give them some problems to practice and check. | | |
| Assessment | 10 | <http://www.kutasoftware.com/FreeWorksheets/Alg1Worksheets/Distributive%20Property.pdf>  Have students complete 10 problems with 80% or more correct. | | |
| Close | 5 | plus/delta on a notecard as exit pass. Bonus: when else might you use the distributive property? | | |
| **DAY FOUR** | | | | |
| Benchmark:  **9-12.A.1.14** Evaluate polynomial, *rational, radical, and absolute value expressions* for one or more variables.  Learning Objective:  Given a formula, the student will substitute given values for the variables and evaluate the expression accurately in 8 out of 10 problems.  Assessment:  Materials:  Skidmark formula <http://www.harristechnical.com/articles/skidmarks.pdf> | | | | |
| **Strategy** | | | **Time** | **Activity** |
| Bell work | | | 5 | 5 review questions about equivalent expressions |
| Introduction/Engage | | | 5 | Discuss different formulas used in life – yesterday we worked with distance (absolute value). Today we will calculate the speed of a car based on the length of skid marks. |
| Explore/Cooperative Learning | | | 10 | Introduce skid mark formula. Discuss variables. Have students choose random numbers for skid mark distance. Roll a dice to determine type of surface. Calculate speed of vehicle. Have students share results. |
| Guided & Independent Practice | | | 10 | Introduce other formulas they may use in life (interest rate, area, Pythagorean theorem) and practice with each one.  <http://www.learner.org/interactives/dailymath/decorating.html> |
| Assessment | | | 10 | Give students 10 problems using various formulas introduced. Students should complete at least 8 successfully |
| Close | | | 5 | Exit pass  3 new things you liked (+)  2 things you would change (delta)  1 new thing you learned |
| **DAY FIVE** | | | | |
| Benchmark:  **9-12.A.1.17** Solve linear equations and inequalities in one variable including those involving the absolute value of a linear function.  Learning Objective:  Given a linear equation/inequality with one variable, the student will solve it using the order of operations for solving equations in 8 out of 10 real world scenarios.  Assessment:  Materials:  Algebra Tiles  Absolute Value review: <http://www.purplemath.com/modules/solveabs.htm> | | | | |
| **Strategy** | | | **Time** | **Activity** |
| Bell work | | | 5 | Read real world examples of linear equations article (next page)  Be able to share 2 examples with your neighbor and discuss. |
| Introduction/Engage | | | 5 | Discuss linear functions. Brainstorm other activities in real life that are linear. |
| Explore/Review | | | 10 | Using algebra tiles, explore solving linear equations. Review Order of Operations when solving linear equations. Review absolute value:  <http://www.purplemath.com/modules/solveabs.htm>  And remind them of the distributive property when you split the equations into two, the negative must be distributed into the parenthesis. |
| Independent Practice/ Cooperative Learning | | | 10 | Using the equations from the article, practice solving linear equations, check your answers with a partner |
| Assessment | | | 10 | Have students complete 10 real world problems |
| Closure | | | 5 | Review real world applications of linear equations.  Exit pass: write a problem that involves solving a linear equation. |

**Real Life Examples of Linear Equations**

**Real World Examples of Linear Equations Are All Around Us**

By **BN Heard**

I have taught Algebra for many years and have always found that students understand everything a lot better with real-life applications. Many students just don't realize that linear functions are all around them. I always ask them what they do during the day, how do they get to work or school, what type of communication do they use etc. I can find multiple examples of linear functions in their everyday life. First let's take a look at a couple of the textbook examples of real-life/ real world examples of linear functions.

**Temperature Conversion**

In the United States, we use Fahrenheit to measure temperature while in the rest of the world Celsius is used. With the Fahrenheit system, water freezes at 32 degrees and water boils at 212 degrees. With the Celsius system, water freezes at 0 degrees and water boils at 100 degrees.

An equation of a function, *C,* which converts degrees Fahrenheit into degrees Celsius is an example of a linear function.

C = (5/9) (F-32)

where F is the temperature in degrees Fahrenheit and C is the temperature in degrees Celsius.

You will also see this same conversion equation written as

C=(F-32)/1.8

The two equations are mathematically the same.

**Exchange Rates**

You may travel outside the United States and should be familiar with currency conversion rates since currencies other than U.S. dollars are used in most other countries. As of February 13, 2009, one US dollar was equivalent to 0.7749 Euros.

A linear equation of a function, *E,* which converts US dollars (D) to Euros (E) would be

E = 0.7749D

You would just put the number of dollars in for "D" and multiply by 0.7749 and this will give you the number of Euros you would get for your US dollars. This is a "real world application" of a linear function.

Now let's take a look a couple that you probably didn't think about being real-life examples of linear equations.

**Cell Phones**

Just about everyone has a cell phone, and most rate plans are a linear function of some kind. Let's take a look at a basic example that is a real-life application of a linear equation. If you pay 20 dollars a month for your cell phone and 5 cents per minute of usage the monthly cost of using your cell phone would be a linear equation of a function, *C,* the monthly cost based on the number of minutes you use monthly.

C = 0.05m + 20

You can see that your cost is 20 dollars plus five cents times the number of minutes you use your cell phone.

**Travel**

Let's say we are going on a trip where we are averaging 60 miles per hour, this is a linear function. The equation would be

D = 60t

where D is the distance covered in t hours. You would just put a time in hours in for t to see how far you get (D miles).

You can see you don't have to look far for real-life examples of linear functions.

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| **Daily Lesson Plans—WEEK TWO** | | | |
| **DAY ONE** | | | |
| Benchmark:  **9-12.D.2.9** Use linear patterns in data to make predictions.  Learning Objective:  Given a set of data, the student will plot the data and use the pattern to make predictions in real world cases accurately in 4 out of 5 problems.  Assessment:  Materials:  <http://mathforum.org/workshops/sum96/data.collections/datalibrary/data.set6.html> | | | |
| **Strategy** | **Time** | **Activity** |
| Bell work | 5 | Redistribute Exit passes from yesterday and have students solve and evaluate the problem they were given. |
| Introduction/  Engage | 5 | Introduce different real world cases that involve data collection and how data analysts make predictions to help the markets adjust.  <http://mathforum.org/workshops/sum96/data.collections/datalibrary/data.set6.html> |
| Explore/Review | 20 | Divide class into groups. Assign each group a separate month to plot gasoline prices for from the above link (or on next page). Have each group graph data set (either using technology or by hand, their choice) and make predictions. Share with other groups at end of time. |
| Assessment | 10 | Given 5 simple problems, students complete independently to demonstrate proficiency in plotting and making predictions. |
| Closure | 5 | Exit pass of 4 sentences that summarizes the days lesson, what you did, what you learned, what you liked and when you might use this in life. |

**Sample Data**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Price of Gasoline | | |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| 1984 | 1.216 | 1.209 | 1.210 | 1.227 | 1.236 | 1.229 | 1.212 | 1.196 | 1.203 | 1.209 | 1.207 | 1.193 |
| 1985 | 1.148 | 1.131 | 1.159 | 1.205 | 1.231 | 1.241 | 1.242 | 1.229 | 1.216 | 1.204 | 1.207 | 1.208 |
| 1986 | 1.194 | 1.120 | 0.981 | 0.888 | 0.923 | 0.955 | 0.890 | 0.843 | 0.860 | 0.831 | 0.821 | 0.823 |
| 1987 | 0.862 | 0.905 | 0.912 | 0.934 | 0.941 | 0.958 | 0.971 | 0.995 | 0.990 | 0.976 | 0.976 | 0.961 |
| 1988 | 0.933 | 0.913 | 0.904 | 0.930 | 0.955 | 0.955 | 0.967 | 0.987 | 0.974 | 0.957 | 0.949 | 0.930 |
| 1989 | 0.918 | 0.926 | 0.940 | 1.065 | 1.119 | 1.114 | 1.092 | 1.057 | 1.029 | 1.027 | 0.999 | 0.980 |
| 1990 | 1.042 | 1.037 | 1.023 | 1.044 | 1.061 | 1.088 | 1.084 | 1.190 | 1.294 | 1.378 | 1.377 | 1.354 |
| 1991 | 1.247 | 1.143 | 1.082 | 1.104 | 1.156 | 1.160 | 1.127 | 1.140 | 1.143 | 1.122 | 1.134 | 1.123 |
| 1992 | 1.073 | 1.054 | 1.058 | 1.079 | 1.136 | 1.179 | 1.174 | 1.158 | 1.158 | 1.154 | 1.159 | 1.136 |
| 1993 | 1.117 | 1.108 | 1.098 | 1.112 | 1.129 | 1.130 | 1.109 | 1.097 | 1.085 | 1.127 | 1.113 | 1.070 |
| 1994 | 1.043 | 1.051 | 1.045 | 1.064 | 1.080 | 1.106 | 1.136 | 1.182 | 1.177 | 1.152 | 1.163 | 1.143 |
| 1995 | 1.129 | 1.120 | 1.115 | 1.140 | 1.200 | 1.226 | 1.195 | 1.164 | 1.148 | 1.127 | 1.101 | 1.101 |
| 1996 | 1.129 | 1.124 | 1.162 | 1.251 | 1.323 | 1.299 | 1.272 | 1.240 | 1.234 | 1.227 | 1.250 | 1.260 |
| 1997 | 1.261 | 1.255 | 1.235 | 1.231 | 1.226 | 1.229 | 1.205 | 1.253 | 1.277 | 1.242 | 1.213 | 1.177 |
| 1998 | 1.131 | 1.082 | 1.041 | 1.052 | 1.092 | 1.094 | 1.079 | 1.052 | 1.033 | 1.042 | 1.028 | 0.986 |
| 1999 | 0.972 | 0.955 | 0.991 | 1.177 | 1.178 | 1.148 | 1.189 | 1.255 | 1.280 | 1.274 | 1.264 | 1.298 |
| 2000 | 1.301 | 1.369 | 1.541 | 1.506 | 1.498 | 1.617 | 1.593 | 1.51 | 1.582 | 1.559 | 1.555 | 1.489 |
| 2001 | 1.472 | 1.484 | 1.447 | 1.564 | 1.729 | 1.64 | 1.482 | 1.427 | 1.531 | 1.362 | 1.263 | 1.131 |
| 2002 | 1.139 | 1.13 | 1.241 | 1.407 | 1.421 | 1.404 | 1.412 | 1.423 | 1.422 | 1.449 | 1.448 | 1.394 |
| 2003 | 1.473 | 1.641 | 1.748 | 1.659 | 1.542 | 1.514 | 1.524 | 1.628 | 1.728 | 1.603 | 1.535 | 1.494 |
| 2004 | 1.592 | 1.672 | 1.766 | 1.833 | 2.009 | 2.041 | 1.939 | 1.898 | 1.891 | 1.885 |  |  |

**Assessment Examples**

1. **The following table illustrates the cost per square foot of building a deck, how much would it cost if you want a 30 sq. ft. deck?**

|  |  |
| --- | --- |
| **Sq. ft.** | **Cost** |
| **2** | **$4.70** |
| **5** | **$11.75** |
| **10** | **$23.50** |
| **15** | **$35.25** |

**(Answer: The cost is $2.35 per sq. foot, based on that, the cost for 30 sq. ft would be $70.50)**

1. **The following table illustrates the cost of food per student at the school cafeteria. Graph the data and predict the amount of money that will be spent if the school feeds 56 students.**

|  |  |
| --- | --- |
| **Number of Students** | **Cost to school** |
| **13** | **$42.25** |
| **5** | **$16.25** |
| **24** | **$78.00** |
| **36** | **$117.00** |
| **50** | **$162.50** |

**(Answer: The cost is $3.25 per student, for 56 students, it will cost the school $182.00)**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DAY TWO** | | | | | | | | |
| Benchmark:  **9-12.D.2.10** Use technological tools to find the line of best fit.  Learning Objective:  Given a set of data, the student will use technology to analyze the data and find the line of best fit in a real world scenarios.  Assessment:  Materials:  Forensics Case File: <http://education.ti.com/educationportal/activityexchange/Activity.do?cid=US&aId=6369>  Tape measure  Butcher Paper  Poster Board  TI Learning Check: <http://education.ti.com/educationportal/activityexchange/Activity.do?cid=US&aId=1928> | | | | | | | | |
| **Strategy** | **Time** | **Activity** | | | | | | |
| Bell work | 5 | Problem of the Day #77, making predictions from data  <http://www.risd.k12.nm.us/problems/Problem77.pdf> | | | | | | |
| Introduction | 5 | Overview of Forensics Activity  <http://education.ti.com/educationportal/activityexchange/Activity.do?cid=US&aId=6369> | | | | | | |
| Explore/Review | 20 | Forensics Activity in groups. Rotate through different stations. Groups analyze data together and display results (written analysis) on poster board to share at end of class. | | | | | | |
| Assessment | 10 | TI Learning Check for line of best fit: <http://education.ti.com/educationportal/activityexchange/Activity.do?cid=US&aId=1928>  Download to each student’s calculator while they are completing written analysis. | | | | | | |
| Closure | 5 | Plus/delta of activity on post it paper. Minimum of one thing you liked and one thing you would change. | | | | | | |
| **DAY THREE** | | | | | | | | |
| Benchmark:  **9-12.G.1.2** Find the area and perimeter of a geometric figure composed of a combination of two or more rectangles, triangles, and/or semicircles with just edges in common. **Area/per formula**  Learning Objective:  Given the formulas for circumference of a circle and perimeter of different shapes, students will calculate missing information and recognize that the relationship is linear in order to predict missing values.  Assessment:  Materials:  dice | | | | | | | | |
| **Strategy** | | | | | **Time** | | | **Activity** |
| Bell work | | | | | 5 | | | Brainstorm all the formulas for perimeter you can think of. Share with your neighbor, class leader can list them on the board for reference. |
| Introduction/Engage | | | | | 5 | | | Yesterday we graphed linear functions, the relationship between radius & circumference of a circle is a linear function as well. As well as the length of a side and perimeter of any regular polygon. |
| Cooperative Learning | | | | | 10 | | | Have a group pick a shape and make a table on large easel pad listing the shape, formula for perimeter, and a two column, 6 row table with side length and perimeter. Complete first row of table for a side length of 1. Hang paper on wall when done. Have groups rotate and complete one row on paper. Keep rotating until all papers are completed. Go back to original paper and use technology to verify the relationship is linear. SAVE THESE TABLES TO ADD TO DURING TOMORROWS ACTIVITY! |
| Guided/Independent Practice | | | | | 10 | | | Independently, students roll a die two times to determine the two shapes they will combine and a third time (and 4th for rectangle) to determine the side length to find the combined perimeter. Draw the new combined shape, label the side lengths and calculate the perimeter. Record on paper. Model first one together. Students complete 3 problems on their own. |
| Closure | | | | | 5 | | | Brainstorm and write when you might need to calculate the perimeter of a shape. (Building a fence, roping off an area, stringing Christmas lights, etc.) |
| **DAY FOUR** | | | | | | | | |
| Benchmark:  **9-12.G.1.2** Find the area and perimeter of a geometric figure composed of a combination of two or more rectangles, triangles, and/or semicircles with just edges in common. **Area/per formula**  Learning Objective:  Given a geometric figure composed of two or more shapes and seen in real life (basketball court, area of a house wall for paint, etc.) the student will calculate the area for 2 miniature golf course holes.  Assessment:  Materials:  TI-84+  easel paper  construction/white printer paper  rulers | | | | | | | | |
| **Strategy** | | | | **Time** | | | **Activity** | |
| Bell work | | | | 5 | | | Using your TI-84+, enter APPS, AREAFORM, and find the definition and formula for the areas of different shapes. Write these down for future reference. | |
| Introduction/Engage | | | | 5 | | | Yesterday we explored the relationship between side length and perimeter of different figures. Today we will explore area. The relationship between side length and area is quadratic, which will be explored more in-depth in future weeks. | |
| Cooperative Learning | | | | 10 | | | In different groups than yesterday, group and choose an easel paper to start at. Add the formula for area below the perimeter formula. Add a third column to the table and calculate the area for the shape with a side length of 1. Rotate through the different papers until chart is complete. | |
| Independent practice | | | | 10 | | | You are designing a miniature golf course. Design the outline for at least 2 different holes. Calculate the area of each hole. You must use at least 2 different shapes for each hole. Include the dimensions. Submit each one on a different sheet of paper. Hang up your work when you are completed | |
| Closure | | | | 5 | | | Do a “gallery walk” of all the different designs. Choose your favorite 5 and write down on a sheet of paper. | |
| **DAY FIVE** | | | | | | | | |
| Benchmark:  All  Learning Objective:  Given an assessment over unit concepts, the student will complete the assessment with at least an 80% or better score as determined by a standard grading scale.  Assessment:  Materials: | | | | | | | | |
| **Strategy** | | | **Time** | | | **Activity** | | |
| Bell work | | | 5 | | | Gather tools and supplies | | |
| Introduction/Engage | | | 5 | | | Describe the assessment and preview it with students | | |
| Assessment | | | 30 | | | Teacher created assessment | | |
| Closure | | | 5 | | | plus/delta for SolveIT unit | | |

Teacher Reflections on the Unit:

Summative Assessment

1. Analyze each of the following student works and explain who is correct and why.

Problem: 2+4\*(7-3)+4/2-32

Sally’s Work:

2+4\*(7-3)+4/2-32

2+4\*(4)+4/2-32

2+4\*(4)+4/2-9

2+16+4/2-9

2+20/2-9

2+10-9

3

ANSWER: 3

Johnny’s Work:

2+4\*(7-3)+4/2-32

2+4\*(4)+4/2-32

2+4\*(4)+4/2-9

2+16+4/2-9

2+16+2-9

11

ANSWER: 11

1. Determine the time it would take to travel to each destination by the given means of transportation:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Destination** | **Distance from Earth (meters)** | **Mode of Transportation**  **(Meters/second)** | **Travel Time**  **(Seconds)** | **Travel Time**  **(years)** |
| **Moon** | 3.84 x 108  meters | walking  2 meters/sec |  |  |
| **Mars** | 5.6 x 1010 meters | bicycle  8 meters/sec |  |  |
| **Jupiter** | 5.9 x 1011  meters | automobile  30 meters/sec |  |  |

1. You are traveling to Mars on bicycle. You get to the moon and discover you forgot something and have to go back. When you head out again, you decide to take your automobile because of the time you lost having to come back. What is your total travel time to get to Mars on this trip? Is this faster or slower than when you went straight there the first time? Show your work.
2. How much extra distance did you travel on the last trip? Label the diagram that shows the additional distance traveled and explain how you calculated this distance. When you “backtrack” while traveling, why don’t the distances traveled combine to zero?
3. If there are three of you traveling on the above trip, what is the total distance traveled as a group? Write an equation that models this situation and involves using the distributive property. Use your calculation to answer the question.
4. You are working for the police department and have been called out to the scene of an accident. You have been told the crime scene is rectangular in shape and is 40 ft long and 12 ft. wide. How much crime scene tape will you need to bring?
5. When you get to the scene, there are skid marks on the asphalt. The coefficient of asphalt is 0.70 and the length of the skid is 30 ft. You see the car at the end and it is a 2010 Mustang, so the braking efficiency should be 100%. How fast was the car going?
6. When you interrogate the driver and passenger of the car, you discover the reason the driver locked up the breaks is that his fiancé threw her engagement ring out the window because they were arguing. If she threw it out at the beginning of the skid, and you estimate it wouldn’t bounce further than 15 feet from the point it was tossed out, how much of an area must be searched in order to find said ring?
7. If the ring cost $1576.00, and each policeman makes $21.15 per hour on the job, how many policemen should you assign to the search, for how long, and how much will it cost the department. Create a linear plot for 2, 5, and 7 policemen searching for 1 to 12 hours.
8. You are a dairy owner in Dexter, NM. You are planning to purchase 200 new head of cattle. Each cow requires 400 square feet of grazing area. How much land do you need to purchase to accommodate the new cattle? Draw a picture of your lot, and calculate how many feet of fencing you will need to enclose your cattle.