

## COURSE OF STUDY

**SUBJECT:** Mathematics

**GRADE LEVEL:** 7th

PROCEDURES	ACTIVITIES	EVALUATION
<p><b>The teacher will:</b></p> <p>I.1 review basic geometric terms and their definitions and their relationship to each other. TE 362-364</p> <p>I.2 use a protractor to demonstrate angle measure and classifications of angles. TE 365-368</p> <p>I.3 use a Venn diagram to show the relationship between quadrilaterals, squares, parallelograms, trapezoids, rhombuses and rectangles. TE 370-372</p> <p>I.4 outline classifications of triangles by sides and by angles. TE 374-376</p> <p>I.5 draw a circle on the board and show diameter, radius, chord and central angle. TE 377-379</p> <p>I.6 use cut out shapes to demonstrate congruence and symmetry. TE 380-383</p> <p>I.7 use cut out shapes and proportions to show how to find missing sides of similar figures. TE 384-387</p> <p>I.8 draw a circle on the board and using a length of wire, show how the circumference and diameter are related to pi. TE 390-393</p> <p>I.9 demonstrate how to use a diagram to solve geometric word problems. TE 394-395</p> <p>I.10 use the computer program “Tessellemania” to introduce the concept of tessellations. TE 397-399</p> <p><b>The teacher will:</b></p>	<p><b>The student will:</b></p> <p>I.1 find items around the classroom that are examples of geometric terms and concepts.</p> <p>I.2 use street maps to find intersections that form angles and identify those angles.</p> <p>I.3 sort collections of quadrilaterals according to the number of lines of symmetry that each has.</p> <p>I.4 use toothpicks to construct as many different types of triangles as possible.</p> <p>I.5 use compasses to draw overlapping circles and form a variety of shapes, then color the designs for display.</p> <p>I.6 identify which letters of the alphabet contain at least one line of symmetry.</p> <p>I.7 write in their math journals as many true statements as they can about polygons that are similar.</p> <p>I.8 measure various round items to prove the circumference formula.</p> <p>I.9 write a problem that can be solved by drawing a picture and then exchange with another student to solve.</p> <p>I.10 use shape tracers to make their own tessellations.<b>(required)</b></p>	<p>The following options are available for all activities:</p> <ol style="list-style-type: none"> <li>1. Formal Assessment               <ol style="list-style-type: none"> <li>a. Teacher made tests</li> <li>b. Standardized tests</li> <li>c. Quizzes</li> </ol> </li> <li>2. Informal Assessment               <ol style="list-style-type: none"> <li>a. Cooperative group projects</li> <li>b. Portfolios</li> <li>c. Oral presentations</li> <li>d. Student work</li> <li>e. Discussion</li> <li>f. Rubric evaluation</li> <li>g. Teacher observation</li> </ol> </li> </ol> <p>The following options are available for all activities:</p>

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<p>II.1 use a geoboard to demonstrate areas of rectangles and parallelograms. TE 406-409</p> <p>II.2 use “cut out shapes” to relate how areas of triangles and trapezoids are related to rectangles. TE 410-413</p> <p>II.3 explain how the area of a circle is derived from its circumference. TE 414-417</p> <p>II.4 show examples of space figures and discuss their properties. TE 420-423</p> <p>II.5 explain that performing the action in a problem using other materials is called modeling. TE 425-426</p> <p>II.6 demonstrate with a cardboard box and a can, how to find the surface area. TE427-429</p> <p>II.7 explain how to use formulas to find surface areas of pyramids, cones and spheres. TE 430-432</p> <p>II.8 review area formulas and apply them to real situations. TE 433-435</p> <p>II.9 discuss the concept of volume and ask students to give real world examples of volume. TE 437-440</p> <p>II.10 demonstrate how the volume of a cone is <math>\frac{1}{3}</math> the volume of a cylinder with the same base and height. TE 441-444</p> <p><b>The teacher will:</b></p>	<p><b>The student will:</b></p> <p>II.1 use a parallelogram-shaped piece of oak-tag, cut it apart and arrange the parts so that it is easy to find its area.</p> <p>II.2 estimate the areas of triangles and trapezoids, then measure and calculate their areas.</p> <p>II.3 use a computer spreadsheet to compare the radius, circumference and area of different circles.</p> <p>II.4 draw side and top views of different space figures and describe what they see in their math journals.</p> <p>II.5 work with a partner and have students construct paper models to solve word problems.</p> <p>II.6 predict if the surface area of a cylinder doubles if its height is doubled and test predictions. <b>(Required project)</b></p> <p>II.7 research the radius of both the Earth and the moon and calculate the surface area of each.</p> <p>II.8 design floats and determine the number of flowers needed to cover the float.</p> <p>II.9 bring cans from home and arrange them from smallest to largest by volume.</p> <p>II.10 find the volume of a cone filled with ice cream.</p> <p><b>The student will:</b></p>	<ol style="list-style-type: none"> <li>1. Formal Assessment <ol style="list-style-type: none"> <li>a. Teacher made tests</li> <li>b. Standardized tests</li> <li>c. Quizzes</li> </ol> </li> <li>2. Informal Assessment <ol style="list-style-type: none"> <li>a. Cooperative group projects</li> <li>b. Portfolios</li> <li>c. Oral presentations</li> <li>d. Student work</li> <li>e. Discussion</li> <li>f. Rubric evaluation</li> <li>g. Teacher observation</li> </ol> </li> </ol> <p>The following options are available for all activities:</p> <ol style="list-style-type: none"> <li>1. Formal Assessment <ol style="list-style-type: none"> <li>a. Teacher made tests</li> </ol> </li> </ol>

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<p>III.1 list pairs of opposite integers, place zero as a reference point and using the number line transparency, graph integers. TE 4 – 9</p> <p>III.2 using a number line, demonstrate addition of signed integers and have students develop their own rules for addition. TE 10 - 13</p> <p>III.3 compare a number line to an elevator, and show how descent relates to subtraction of integers. TE 14 – 18</p> <p>III.4 present the “gossip” problem, have students act it out, and then draw a diagram to represent their results. TE 19 – 21</p> <p>III.5 demonstrate a pattern of products of integers, and have students continue the pattern and discover the product of any two integers. TE 22 – 25</p> <p>III.6 have the students use tiles to model the change in temperature. Ask them to explain what an average change of <math>-7</math> degrees per hour means. TE 26 – 29</p> <p>III.7 display a calorie chart from p. 31 and ask students to find out the number of calories in their favorite foods. TE 31 – 33</p> <p>III.8 ask students to write numerical expression for various situations then use algebra tiles to represent these situations. TE 34 - 37</p> <p><b>The teacher will:</b></p>	<p>III.1 form groups of 3 or 4 and use tiles to demonstrate how to model a positive and negative number. <b>(Required Project)</b></p> <p>III.2 use different color number cubes, one for positive, one for negative; tossing the cubes students will determine if the sum is positive, negative or zero.</p> <p>III.3 use positive and negative integers and find two numbers that, when subtracted, give the greatest difference and least difference.</p> <p>III.4 formulate a description of the nth row of Pascal’s triangle.</p> <p>III.5 watch a video tape of students walking forward and backward and find the product of running the tape forward (+) and walking forward (+) is positive, etc.</p> <p>III.6 for a given set of division exercises, write the sign of the integer under each number, read aloud the sign of each number and the sign of the quotient.</p> <p>III.7 find the total number of calories in a lunch that they will most likely eat that day. (Calories found in almanac)</p> <p>III.8 write or draw related sets of variable expressions, word phrases, and pictures of algebra tile models on index cards. Students will find the related sets.</p> <p><b>The student will:</b></p>	<p>b. Standardized tests</p> <p>c. Quizzes</p> <p>2. Informal Assessment</p> <p>a. Cooperative group projects</p> <p>b. Portfolios</p> <p>c. Oral presentations</p> <p>d. Student work</p> <p>e. Discussion</p> <p>f. Rubric evaluation</p> <p>g. Teacher observation</p> <p>The following options are available for all activities:</p> <p>1. Formal Assessment</p> <p>a. Teacher made tests</p> <p>b. Standardized tests</p>

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<p>IV.1 present a problem and discuss how to find the mean, median, mode and range. TE 488-491</p> <p>IV.2 review how to organize data in line plots and frequency tables. TE 492-495</p> <p>IV.3 demonstrate how to organize data using a stem and leaf plot. TE 498-501</p> <p>IV.4 demonstrate how to construct box and whisker plots and discuss their value. TE 502-505</p> <p>IV.5 make a tree diagram to introduce the counting principle. TE 508-511</p> <p>IV.6 using dice and a spinner, introduce the concept of probability. TE 512-515</p> <p>IV.7 explain the difference between dependent and independent events. TE 522-525</p> <p><b>The teacher will:</b></p>	<p>IV.1 find statements using the term average in newspapers, then determine which measure of central tendency is used.</p> <p>IV.2 spin a spinner and arrange the numbers in frequency distribution, then find the mean, median, and mode of the data. <b>(required project)</b></p> <p>IV.3 find medians and modes from constructed stem and leaf plots.</p> <p>IV.4 find scores for 2 favorite teams for the past season and use the scores to construct a box and whisker plot.</p> <p>IV.5 write a paragraph defining the counting principle and give an example of a situation that uses the principle to solve the problem.</p> <p>IV.6 with a partner, flip a coin 20 times to find the probability of getting a head.</p> <p>IV.7 act out problems using objects where appropriate.</p> <p><b>The student will:</b></p>	<p>c. Quizzes</p> <p>2. Informal Assessment</p> <ol style="list-style-type: none"> <li>Cooperative group projects</li> <li>Portfolios</li> <li>Oral presentations</li> <li>Student work</li> <li>Discussion</li> <li>Rubric evaluation</li> <li>Teacher observation</li> </ol> <p>The following options are available for all activities:</p> <p>1. Formal Assessment</p> <ol style="list-style-type: none"> <li>Teacher made tests</li> <li>Standardized tests</li> <li>Quizzes</li> </ol>
<p>V.1 explain the difference between an expression and an equation. Ask students to give examples of true, false and open equations.</p>		

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<p>TE 54 – 57</p> <p>V.2 point out that grouping numbers differently sometimes simplifies computation and will be very useful when students evaluate complex equations. TE 58 – 61</p> <p>V.3 using area of a rectangle, demonstrate the distributive property. TE 62 – 65</p> <p>V.4 put several terms on the board and discuss similarities and differences and explain that like terms have the same variable and exponent. TE 66 – 69</p> <p>V.5 use a balance scale to demonstrate how to solve one-step equations. TE 72 – 75</p> <p>V.6 have students use a calculator to solve a pattern of multiplication and division equations. TE 76 – 79</p> <p>V.7 discuss how formulas and equations are related. TE 80 – 82</p> <p>V.8 ask questions that motivate students to analyze their problem solving strategies and ask them to describe their solution process. TE 85 – 86</p> <p>V.9 relate ecology to equations presented in the text. TE 87 – 89</p> <p><b>The teacher will:</b></p> <p>VI.1 ask students which place value was used to name the decimal and use a number line to compare and order decimals. TE 100 –</p>	<p>V.1 make two sets of cards, one with equations and the other with solutions. Have students match the cards.</p> <p>V.2 stand in groups modeling how the order and grouping of their position will not change the results in addition and multiplication.</p> <p>V.3 use arrows when multiplying using the distributive property. <b>(required project)</b></p> <p>V.4 work in groups to describe why various unlike terms are not alike.</p> <p>V.5 use algebra tiles to model solving equations.</p> <p>V.6 solve multiplication and division equations using Data File information.</p> <p>V.7 work with a partner where one will make up a problem and the other writes an equation for it.</p> <p>V.8 organize their guesses in table form so they do not overlook correct answers.</p> <p>V.9 collect data on how much waste the school produces each week.</p> <p><b>The student will:</b></p>	<p>2. Informal Assessment</p> <ol style="list-style-type: none"> <li>Cooperative group projects</li> <li>Portfolios</li> <li>Oral presentations</li> <li>Student work</li> <li>Discussion</li> <li>Rubric evaluation</li> <li>Teacher observation</li> </ol> <p>The following options are available for all activities:</p> <ol style="list-style-type: none"> <li>Formal Assessment <ol style="list-style-type: none"> <li>Teacher made tests</li> <li>Standardized tests</li> <li>Quizzes</li> </ol> </li> <li>Informal Assessment <ol style="list-style-type: none"> <li>Cooperative group projects</li> </ol> </li> </ol>

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<p>103</p> <p>VI.2 ask students how they would describe the shaded area of a square. Place a tenth square over each shaded square and find the best description. TE 104 – 107</p> <p>VI.3 explain that evaluating decimal expressions is the same as evaluating integer expressions. TE 108 – 110</p> <p>VI.4 help students understand that they use the same properties for equations with decimals as they do for equations with integers. TE 111 – 114</p> <p>VI.5 review how to solve multiplication and division equations and have students use the same process with decimals. TE 115 – 118</p> <p>VI.6 explore the steps students normally use to solve problems using formulas. TE 128 – 131</p> <p>VI.7 present the handshake problem. TE 132 - 133</p> <p><b>The teacher will:</b></p> <p>VII.1 explain that an exponent can be used any time a number is</p>	<p>VI.1 give a decimal one-tenth less and one-tenth more than certain decimals presented by the teacher.</p> <p>VI.2 work in small groups to decide if an estimated answer is reasonable.</p> <p>VI.3 write four expressions and exchange and evaluate other students' expressions. <b>(required project)</b></p> <p>VI.4 roll a die twice to fill in two digits in an equation and then solve the equation.</p> <p>VI.5 fill in a computer spreadsheet for purchases under \$3000.</p> <p>VI.6 work in small groups to create their own formulas and explain the definition of each variable.</p> <p>VI.7 stand up in a group of 6 and model the handshake problem and make a graph of the solution.</p> <p><b>The student will:</b></p> <p>VII.1 use a spreadsheet to create a bar graph for the powers of two.</p>	<p>b. Portfolios</p> <p>c. Oral presentations</p> <p>d. Student work</p> <p>e. Discussion</p> <p>f. Rubric evaluation</p> <p>g. Teacher observation</p> <p>The following options are available for all activities:</p> <ol style="list-style-type: none"> <li>1. Formal Assessment <ol style="list-style-type: none"> <li>a. Teacher made tests</li> <li>b. Standardized tests</li> <li>c. Quizzes</li> </ol> </li> <li>2. Informal Assessment <ol style="list-style-type: none"> <li>a. Cooperative group projects</li> <li>b. Portfolios</li> <li>c. Oral presentations</li> </ol> </li> </ol>

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<p>multiplied by itself a given number of times. TE 141 – 144</p> <p>VII.2 have the students observe that when multiplying the exponents and not the bases are added. TE 145 – 148</p> <p>VII.3 ask students to give examples of data that are expressed in large numbers and to demonstrate scientific notation. TE 149 – 152</p> <p>VII.4 have students recall what they have already learned about factors and multiples and then name all the factors and multiples of 36. TE 159 – 162</p> <p>VII.5 explain how to complete a factor tree and write the prime factorization. TE 163 – 166</p> <p>VII.6 present various methods of finding the GCF and LCM with integers and variables. TE 167 – 170</p> <p>VII.7 show how diagrams can be used to solve problems. TE 172 - 174</p> <p><b>The teacher will:</b></p> <p>VIII. 1 explain the difference between finding the square root and finding the principal square root. TE 454-457</p>	<p>VII.2 write the rules for multiplying expressions with exponents.</p> <p>VII.3 work in pairs and write five numbers in standard notation, exchange, and write the numbers in scientific notation.</p> <p>VII.4 list the rules of divisibility in their journals. <b>(required project)</b></p> <p>VII.5 use graph paper to draw as many rectangular regions as possible with 7, 11 and 13 squares.</p> <p>VII.6 with a partner, one student writes a number and the other writes two numbers that have the given number as the GCF.</p> <p>VII.7 summarize solutions to problems in their math journals.</p> <p><b>The student will:</b></p> <p>VIII.1 use the relationship between the area of a square and the length of one of its sides to study roots. <b>(required project)</b></p>	<p>d. Student work e. Discussion f. Rubric evaluation g. Teacher observation</p> <p>The following options are available for all activities:</p> <ol style="list-style-type: none"> <li>1. Formal Assessment <ol style="list-style-type: none"> <li>a. Teacher made tests</li> <li>b. Standardized tests</li> <li>c. Quizzes</li> </ol> </li> <li>2. Informal Assessment <ol style="list-style-type: none"> <li>a. Cooperative group projects</li> <li>b. Portfolios</li> <li>c. Oral presentations</li> <li>d. Student work</li> <li>e. Discussion</li> </ol> </li> </ol>

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<p>VIII.2 use an overhead geoboard to show the relationship between the areas of the squares formed by the sides of a right triangle. TE 461-464</p> <p><b>The teacher will:</b></p> <p>IX.1 use fraction bars to model equivalent fractions and fractions in lowest terms. TE 184-187</p>	<p>VIII.2 use tangram pieces to build squares on each side of the middle triangular tangram piece and describe the areas of the squares.</p> <p><b>The student will:</b></p> <p>IX.1 use sets of index cards to display pairs of equivalent fractions.</p>	<p>f. Rubric evaluation g. Teacher observation</p> <p>The following options are available for all activities:</p> <ol style="list-style-type: none"> <li>1. Formal Assessment <ol style="list-style-type: none"> <li>a. Teacher made tests</li> <li>b. Standardized tests</li> <li>c. Quizzes</li> </ol> </li> <li>2. Informal Assessment <ol style="list-style-type: none"> <li>a. Cooperative group projects</li> <li>b. Portfolios</li> <li>c. Oral presentations</li> <li>d. Student work</li> <li>e. Discussion</li> <li>f. Rubric evaluation</li> </ol> </li> </ol>



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<p>237-240</p> <p>X.3 display a 10x10 grid on the overhead and discuss how the ratio and percent are related (<math>35/100=35\%</math>) TE 245-248</p> <p>X.4 demonstrate how to set up a proportion related to parts and wholes in percent problems. TE 252-255</p> <p>X.5 demonstrate how to translate a percent problem into an equation using an = for” is” and the multiplication sign for “of”. TE 256-259</p> <p>X.6 introduce the concept that the percent of change equals the amount of change divided by the original amount. TE 260-263</p> <p><b>The teacher will:</b></p> <p>XI.1 have students use algebra tiles to model and solve equations. TE 275-278</p> <p>XI.2 review simplifying expressions and show the connection to</p>	<p>X.2 examine different statements involving proportions and discuss which ones make sense and which do not.</p> <p>X.3 on graph paper, outline 10x10 grids, make models of ratios and convert them to percents. <b>(required project)</b></p> <p>X.4 find a newspaper ad for a new car, identify the list price plus a 15% down payment.</p> <p>X.5 use a data file to write percent equations comparing households with VCR’s.</p> <p>X.6 take consumer price data from 10 and 25 years ago and figure out the percentage increase or decrease in the prices of various products over those time periods.</p> <p><b>The student will:</b></p> <p>XI.1 write in their math journals the steps they use to solve equations.</p>	<p>The following options are available for all activities:</p> <ol style="list-style-type: none"> <li>1. Formal Assessment <ol style="list-style-type: none"> <li>a. Teacher made tests</li> <li>b. Standardized tests</li> <li>c. Quizzes</li> </ol> </li> <li>2. Informal Assessment <ol style="list-style-type: none"> <li>a. Cooperative group projects</li> <li>b. Portfolios</li> <li>c. Oral presentations</li> <li>d. Student work</li> <li>e. Discussion</li> <li>f. Rubric evaluation</li> <li>g. Teacher observation</li> </ol> </li> </ol>

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<p>solving two-step equations. TE 279-286</p> <p>XI.3 review clue words to write equations for various word problems. TE 284-286</p> <p>XI.4 use a balance scale to demonstrate how to solve equations with variables on both sides. TE 287-290</p> <p>XI.5 use a number line to graph inequalities and explain their function. TE 292-295</p> <p>XI.6 demonstrate what happens in an equality when you multiply or divide by a negative number. TE 296-299</p> <p>XI.7 relate how solving an inequality relates to solving an equation. TE 300-303</p> <p><b>The teacher will:</b></p> <p>XII.1 present the coordinate plane on the overhead and discuss quadrants, coordinates, and axes. TE 316-319</p> <p>XII.2 demonstrate how to use substitution to solve equations with two variables. TE 320-323</p>	<p>XI.2 with a partner, find errors in the steps to solve two-step equations. <b>(required project)</b></p> <p>XI.3 solve word problems with a partner using equations.</p> <p>XI.4 use algebra tiles to demonstrate solving equations with variables on both sides.</p> <p>XI.5 write and graph inequalities for word phrases.</p> <p>XI.6 write in their math journal why the inequality sign reverses when multiplying or dividing by a negative number.</p> <p>XI.7 with a partner, make up 3 two-step inequalities which the partner will solve and check their work.</p> <p><b>The student will:</b></p> <p>XII.1 on graph paper, duplicate the coordinate plane and place points using ordered pairs.</p> <p>XII.2 toss a number cube twice which will be the x and y</p>	<p>The following options are available for all activities:</p> <ol style="list-style-type: none"> <li>1. Formal Assessment <ol style="list-style-type: none"> <li>a. Teacher made tests</li> <li>b. Standardized tests</li> <li>c. Quizzes</li> </ol> </li> <li>2. Informal Assessment <ol style="list-style-type: none"> <li>a. Cooperative group projects</li> <li>b. Portfolios</li> <li>c. Oral presentations</li> <li>d. Student work</li> <li>e. Discussion</li> <li>f. Rubric evaluation</li> <li>g. Teacher observation</li> </ol> </li> </ol>

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<p>XII.3 use an overhead graphing calculator to show the relationship between a linear equation and its graph. TE 324-327</p> <p>XII.4 demonstrate slope and y-intercept using the overhead graphing calculator. TE 330-333</p> <p>XII.5 help students identify where slope and y-intercept are contained in a word problem and then graph the information.</p>	<p>coordinates Determine if the ordered pair is a solution to the given equation. <b>(required project)</b></p> <p>XII.3 using graph paper, graph several linear equations on a coordinate plane using a table of values.</p> <p>XII.4 use a motion detector connected to a graphing calculator and walk to the detector to represent various slopes.</p> <p>XII.5 with a partner, record data from an event in the Olympics for several years, and then graph that data.</p>	