**6th grade Math Prime Time Unit**

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| **Stage 1 Desired Results** *What are your unit objectives and outcomes?* | | |
| BIG IDEAS  Factors and Multiples  With reviews in:  Odd and Even numbers  Distributive Property  Order of Operations | ***Transfer*** | |
| *Students will be able to independently use their learning to…*  Realize that some numbers are rich in factors, while others numbers have very few factors which is essential for effective problem solving.  [Factors](http://www.wyzant.com/resources/lessons/math/elementary_math/factors_and_multiples/factors) are parts of numbers that, multiplied together, give a larger number. Every number has at least two factors, one and the number itself. On the other hand, [multiples](http://www.wyzant.com/resources/lessons/math/elementary_math/factors_and_multiples/multiples) are numbers where the same number is repeated, as if you were counting by that number. For example, the multiples of 2 start with 2 and are: 2, 4, 6, 8, 10 . . . and so on. Each additional number is a multiple of 2.  Factors and multiples are especially important in working with expanding and reducing fractions, as well as finding patterns in numbers. Finding the [greatest common factor](http://www.wyzant.com/resources/lessons/math/elementary_math/factors_and_multiples/factors), [least common multiple](http://www.wyzant.com/resources/lessons/math/elementary_math/factors_and_multiples/multiples), and [prime factors](http://www.wyzant.com/resources/lessons/math/elementary_math/factors_and_multiples/prime_factorization) of a number are important skills | |
| ***Meaning*** | |
| UNDERSTANDINGS  *Students will understand that…*  There are several useful strategies for finding factors and multiples of whole numbers  Finding factors and multiples of numbers helps solve many mathematical problems. It is also very useful when working with fractions. | ESSENTIAL QUESTIONS   1. What are multiples and factors and how do we use them? 2. What are common multiples and common factors and how do we use them? |
| ***Acquisition*** | |
| *As a result of this unit, students will know…*   1. How to recognize situations that call for common factors and situations that call for common multiples. 2. Factors of a number occur in pairs 3. Strategies for finding factors and multiples. | *As a result of this unit, students will be be able to…*   1. Explain how factors and multiples of a number are related 2. Describe a situation where it is useful to know about factors and multiples 3. Describe strategies for finding factors or multiples of a number |
| COMMON CORE STATE STANDARDS  6.NS.B.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *Investigations 2, 3, and 4***Note:** The development of the Distributive Property with variables is continued in *Variables and Patterns*.  6.EE.A.1 Write and evaluate numerical expressions involving whole-number exponents. *Investigations 3 and 4*  6.EE.A.2a Write expressions that record operations with numbers and with letters standing for numbers. *Investigations 1, 2, 3, and 4***Note:** The development in this Unit is primarily with numerical expressions and is further developed with expressions containing variables in *Variables and Patterns*.  6.EE.A.2b Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *Investigations 1, 2, and 4***Note:** The words *term* and *coefficient* are developed in *Variables and Patterns*.  6.EE.A.2c Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *Investigation 4***Note:** Expressions with variables are further developed in *Variables and Patterns* and *Covering and Surrounding*.  6.EE.A.3 Apply the properties of operations to generate equivalent expressions. *Investigations 1, 3, and 4***Note:** The development in this Unit is primarily with numerical expressions and is further developed with expressions containing variables in *Variables and Patterns*.  6.EE.A.4 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *Investigations 1, 3, and 4***Note:** The development in this Unit is primarily with numerical expressions and is generalized to expressions containing variables in *Variables and Patterns*.  Facilitating the Mathematical Practices | | |

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| **Stage 2 – Evidence** *How will you assess student learning?* | |
| **Evaluative Criteria** | **Assessment Evidence** |
| 4+ Exemplary Response  Complete, with clear, coherent explanations  Shows understanding of the mathematical concepts and procedures  Satisfies all essential conditions of the problem and goes beyond what is asked for in some unique way  4 Complete Response  Complete, with clear, coherent explanations  Shows understanding of the mathematical concepts and procedures  Satisfies all essential conditions of the problem  3 Reasonably Complete Response  Reasonably complete; may lack detail in explanations  Shows understanding of most of the mathematical concepts and procedures  Satisfies most of the essential conditions of the problem  2 Partial Response  Gives response; explanation may be unclear or lack detail  Shows some understanding of some of the mathematical concepts and procedures  Satisfies some essential conditions of the problem  1 Inadequate Response  Incomplete; explanation is insufficient or not understandable  Shows little understanding of the mathematical concepts and procedures  Fails to address essential conditions of problem  0 No Attempt  Irrelevant response  Does not attempt a solution  Does not address conditions of the problem  All the above will be put into a rubric for the student to use as a guide. | SUMMATIVE PERFORMANCE TASK(S)  My Favorite Number is an integral part of the assessment in *Prime Time*. The project is introduced at the beginning of the Unit. Ask students to choose a number between 10 and 100 and to write several things about it. After each Investigation, remind students to use the concepts they learned to write more information about their favorite numbers.  At the end of *Prime Time*, each student should decide what form his or her project will take. They might choose a report, a poem, a story, or a poster. Suggest that students locate books about numbers in the library. Many books are available that could stimulate ideas. Stress that you expect them to use the vocabulary and concepts from the Unit to show everything they know about their favorite numbers and about what they have learned.  Although students should be encouraged to be clever and creative, the emphasis of the project should be on mathematical content.  Providing Additional Support  The Chart Summary technique is described in detail in *Implementing and Teaching Connected Mathematics*. This technique involves presenting information by condensing it in a pictorial chart with minimal words. For example, the student’s favorite number project could be organized in a chart with headings such as Prime (or Composite), Shape, Proper Factors, Abundant (or Deficient or Perfect), Common Factors, and Common Multiples. Under each of these headings, the student uses symbols and/or drawings to illustrate how his or her favorite number relates to each category. For example, if a student’s favorite number is 12, he or she could write the following under the Abundant heading:  Factors  of 12: 1, 2, 3, 4, 6 1+2+3+4+6=16  and 16>12 |
| Assessment Keys | FORMATIVE ASSESSMENT   Warm-Ups  Check up 1  Partner Quiz  Check up 2  Unit Test  Exit Tickets |

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| **Stage 3 – Learning Plan** *What lessons will you teach, and what skills will students master, as a result of this unit?* | | | | |
| **Topical EU/EQ**  **For Lesson** | **CCSS Alignment with Stage 1** | **Formative Assessment of Lesson** | **Unit Modifications** | **Activities to Support the Lesson** |
| 1. 1.1 Playing the Factor Game | 6.NS.B.4  6.EE.A.2a  6.EE.A.2b  6.EE.A.3 | Check up 1    Observing game play | Oral questioning to check for understanding    Student pairing adjustments    Seating preferences    Manipulatives    Provide needed vocabulary prior to lesson    Extra time    Visual aids    Encourage students to ask for clarification when needed   Use of calculators and multiplication charts.  Any other aids or help that may be required by and IEP of a student | Multiple chances to play the game with several partners |
| 1. 1.2 Playing to win: Prime and Composite Numbers | 6.NS.B.4  6.EE.A.2a  6.EE.A.2b  6.EE.A.3 | Check up 1    Observing game play | Multiple chances to play the game with several partners |
| 1. 1.3 The Product Game: Finding Multiples | 6.NS.B.4  6.EE.A.2a  6.EE.A.2b  6.EE.A.3 | Check up 1    Observing game play | Multiple chances to play the game with several partners |
| 1. 1.4 Rectangles and Factor Pairs | 6.NS.B.4  6.EE.A.2a  6.EE.A.2b  6.EE.A.3 | Check up 1 |  |
| 1. 2.1 Riding Ferris Wheels: Choosing Common Multiples or Common Factors | 6.NS.B.4  6.EE.A.2a  6.EE.A.2b | Partner Quiz    Review and discussion of Ace Problems | Launch Video    Prior Knowledge Conversation |
| 1. 2.2 Looking at Cicada Cycles: Choosing Common Multiples or Common Factors | 6.NS.B.4  6.EE.A.2a  6.EE.A.2b | Partner Quiz    Review and discussion of Ace Problems | Launch Video    Prior Knowledge Conversation |
| 1. 2.3 Bagging Snacks: Choosing Common Multiples or Common Factors | 6.NS.B.4  6.EE.A.2a  6.EE.A.2b | Partner Quiz    Review and discussion of Ace Problems | Launch Video    Prior Knowledge Conversation |
| 1. 3.1 The Product Puzzle: Finding Factor Strings | 6.NS.B.4  6.EE.A.1  6.EE.A.2b  6.EE.A.2a | Check up 2    Observation of Puzzle and how it was solved | Contest for the puzzle  Table to help record puzzle answers |
| 1. 3.2 Finding the Longest Factor String | 6.NS.B.4  6.EE.A.1  6.EE.A.2b  6.EE.A.2a | Check up 2    Observation of Puzzle and how it was solved | Contest for the puzzle  Table to help record puzzle answers |
| 1. 3.3 Using Prime Fractorizations | 6.NS.B.4  6.EE.A.1  6.EE.A.2b  6.EE.A.2a | Check up 2    Observation of Puzzle and how it was solved | Contest for the puzzle  Table to help record puzzle answers |
| 1. 4.1 Reasoning With Even and Odd Numbers | 6.NS.B.4  6.EE.A.1  6.EE.A.2b  6.EE.A.2  6.EE.A.2a  6.EE.A.2c  6.EE.A.3  6.EE.A.4 | Unit Test    Exit Ticket and Daily Warm-up |  | Prior knowledge discovery time |
| 1. 4.2 Using the Distributive Property | 6.NS.B.4  6.EE.A.1  6.EE.A.2b  6.EE.A.2  6.EE.A.2a  6.EE.A.2c  6.EE.A.3  6.EE.A.4 | Unit Test    Exit Ticket and Daily Warm-up |  | Prior knowledge discovery time |
| 1. 4.3 Ordering Operations | 6.NS.B.4  6.EE.A.1  6.EE.A.2b  6.EE.A.2  6.EE.A.2a  6.EE.A.2c  6.EE.A.3  6.EE.A.4 | Unit Test    Exit Ticket and Daily Warm-up |  | Prior knowledge discovery time |
| 1. 4.4 Choosing an Operation | 6.NS.B.4  6.EE.A.1  6.EE.A.2b  6.EE.A.2  6.EE.A.2a  6.EE.A.2c  6.EE.A.3  6.EE.A.4 | Unit Test    Exit Ticket and Daily Warm-up |  | Prior knowledge discovery time |