

Core Content

<p>Cluster Title: Solve problems involving the four operations, and identify and explain patterns in arithmetic.</p>
<p>Standard 9: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.</p>
<p>MASTERY Patterns of Reasoning:</p>
<p>Conceptual:</p> <ul style="list-style-type: none"> Students will recognize arithmetic patterns that can be found on a hundreds chart, a number line, an addition and a multiplication table. Students will recognize multiplication patterns that can be found on a hundreds chart and a multiplication table. Students will know that multiplication by an even number results in an even number. Students will know that multiplication of an odd number by another odd number results in an odd number. Students will know that multiplication of an odd number by an even number results in an even number. Students will explain arithmetic patterns using properties of operations. <p>Procedural:</p> <ul style="list-style-type: none"> Find the skip counting patterns on a hundreds chart 2-12 Find the products of the commutative property on the multiplication chart. Find patterns on the multiplication chart for 0-12. <p>Representational:</p> <ul style="list-style-type: none"> Model addition and multiplication patterns with a number line. Model addition and multiplication patterns with the hundreds chart and the multiplication chart.

Supports for Teachers

<p>Critical Background Knowledge</p>
<p>Conceptual:</p> <ul style="list-style-type: none"> Students will know the difference between an even number and odd number. Students will know that an even number plus another even number equals an even number. Students will know that an even number plus another odd number equals an odd number.

Students will know that an odd number plus another odd number equals an even number.
 Students will understand what a pattern is.
 Students will know multiplication facts.

Procedural:

Students will be able to skip count.
 Students can use a number line, hundred chart, addition chart, and multiplication chart.

Representational:

Students can highlight numbers on number lines, hundred chart, addition chart, and multiplication chart.

Academic Vocabulary and Notation

compare, digits, addends, sum, multiplication, multiples, factors, product, sequence, pattern, row, column, input-output table, commutative property

Instructional Strategies Used

Use input and output tables.

 Color the pattern on a multiplication and addition table.

 Start by giving students base ten blocks or cubes and have them build groups of tens. Discuss findings about what happens as they multiply a factor by ten. Then explore other skip counting patterns.

Resources Used

<http://www.321know.com/patra10.htm#section2>
<http://pbskids.org/cyberchase/math-games/crack-hackers-safe/>
<http://www.funbrain.com/cracker/index.html>
<http://math.pppst.com/multiplication.html>
 (use the fourth PowerPoint)
http://multiplication.com/classroom_games.htm
<http://www.mathplayground.com/functionmachine.html>
http://teams.lacoe.edu/documentation/classrooms/amy/algebra/3-4/activities/functionmachine/functionmachine3_4.html
<http://www.mathwire.com/games/algebragames.html>

 Hutchins, Pat. *The Doorbell Rang*. Greenwillow, 1989.

School House Rock: Multiplication [DVD]. Disney, 2007.

Assessment Tasks Used																					
<p>Skill-Based Task:</p> <table border="1"> <thead> <tr> <th>Input</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>12</td> </tr> <tr> <td>9</td> <td>16</td> </tr> <tr> <td>13</td> <td>20</td> </tr> <tr> <td>15</td> <td>?</td> </tr> </tbody> </table> <p>What is the missing number?</p> <table border="1"> <thead> <tr> <th>Input</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>30</td> </tr> <tr> <td>7</td> <td>42</td> </tr> <tr> <td>8</td> <td>48</td> </tr> <tr> <td>9</td> <td>?</td> </tr> </tbody> </table> <p>What is the missing number?</p>	Input	Output	5	12	9	16	13	20	15	?	Input	Output	5	30	7	42	8	48	9	?	<p>Problem Task:</p> <p>If Bailey receives \$5.00 a week for mowing a lawn, how much money does he have after 7 weeks? Show the pattern. Explain your thinking using pictures, words, or numbers.</p>
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