### Core Content

<table>
<thead>
<tr>
<th>Cluster Title: Geometric measurement: understand concepts of area and relate area to multiplication and to addition.</th>
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</thead>
<tbody>
<tr>
<td><strong>Standard 7:</strong> Relate area to the operations of multiplication and addition.</td>
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<tr>
<td>a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.</td>
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<td>b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real-world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.</td>
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<tr>
<td>c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths $a$ and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.</td>
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<tr>
<td>d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real-world problems.</td>
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</table>

**MASTERY Patterns of Reasoning:**

**Conceptual:**
- Students will understand the relationship of multiplication and addition to area.
- Students will know the area algorithm to solve mathematical and real-world problems.
- Students will understand that rectilinear shapes can be broken down into rectangles.
- Students will know that area is additive.

**Procedural:**
- Students know that area equals length x width.
- Students can work backwards to find the possible lengths and widths when given the area of a rectangle.
- Students can divide a rectangle into two parts then using the distributive property find the area of the rectangle.
- Students can determine the lengths for each side, and find the area for each rectangle.
- Students can add the areas from each rectangle together to find the area of an original rectilinear shape.

**Representational:**
- Students can model the additive nature of area.
- Students can represent whole-number products as rectangular areas in mathematical reasoning.
- Students can represent the distributive property in mathematical reasoning.
Supports for Teachers

**Critical Background Knowledge**

**Conceptual:**
- Students will understand the distributive property
- Students will what is the best way to decompose a shape into rectangles or squares.
- Students will know multiplication facts.
- Students will know what area is.

**Procedural:**
- Students can use multiplication facts
- Students can solve addition problems.
- Students can apply the distributive property.

**Representational:**
- Students can model decomposing shapes
- Students can model finding lengths of sides not given.
- Students can model the distributive property.

**Academic Vocabulary and Notation**
- product, additive, distributive property, rectilinear, decompose

**Instructional Strategies Used**

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><a href="http://www.mathplayground.com/PartyDesigner/PartyDesigner.html">http://www.mathplayground.com/PartyDesigner/PartyDesigner.html</a></td>
<td>Students will need to use tiles to find the area, recognize the similarities to an array, and create the algorithm.</td>
</tr>
<tr>
<td><a href="http://pbskids.org/cyberchase/math-games/airlines-builder/">http://pbskids.org/cyberchase/math-games/airlines-builder/</a></td>
<td>Practice dividing a rectangle into two parts and finding the lengths of the sides. Then find the area of the whole rectangle using the distributive property.</td>
</tr>
<tr>
<td><a href="http://pbskids.org/cyberchase/videos/area-alert/">http://pbskids.org/cyberchase/videos/area-alert/</a></td>
<td>Decompose nonrectangular rectilinear shapes into rectangles, find the area of each part, then</td>
</tr>
<tr>
<td><a href="http://math.pppst.com/perimeter.html">http://math.pppst.com/perimeter.html</a></td>
<td></td>
</tr>
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</table>

**Resources Used**
add the areas of the various rectangles together.

**Assessment Tasks Used**

**Skill-Based Task:**
Multiply the side lengths to find the rectangle's area.

Multiply the side lengths and use the distributive property to find the rectangle's overall area.

**Problem Task:**
Susan and her friends were asked to design their ideal snow fort. After much thought, they came up with a u-shaped fort. Their fort is represented below. Find the total area of the wall of the fort. Then find the total area of the fort.