Important Concepts

<table>
<thead>
<tr>
<th>Corresponding</th>
<th>Corresponding Sides</th>
<th>Corresponding angles</th>
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<tbody>
<tr>
<td>Corresponding sides or angles have the same relative position in similar figures.</td>
<td>AC and DF</td>
<td>A and D</td>
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<td>AB and DE</td>
<td>B and E</td>
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<tr>
<td></td>
<td>BC and EF</td>
<td>C and F</td>
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**Similarity**
Two figures are similar if:
(1) the measures of their corresponding angles are equal and
(2) the lengths of their corresponding sides increase by the same factor, called the scale factor.

The two figures at the right are similar.
The corresponding angle measures are equal.
The side lengths in Figure B are 1.5 times as long as those in Figure A.
So, the scale factor from Figure A to Figure B is 1.5. (Figure A stretches or is enlarged by a factor of 1.5, resulting in Figure B.)

We also say that the scale factor from Figure B to Figure A is \( \frac{1}{1.5} \) or \( \frac{2}{3} \).
(Figure B shrinks by a factor of \( \frac{2}{3} \), resulting in figure A.)

**Scale Factor**
The number used to multiply the lengths of a figure to stretch or shrink it into a similar image.

A scale factor larger than 1 will enlarge a figure. A scale factor between 0 and 1 will reduce a figure.

The scale factor of two similar figures is given by a ratio that compares the corresponding sides:

\[
\text{length of a side on the image} \div \text{length of a side on the original}
\]

If we use a scale factor of \( \frac{1}{2} \), all lengths in the image are \( \frac{1}{2} \) as long as the corresponding lengths in the original.

The base of the original triangle is 3 units.
The base of the image is 1.5 units.

The scale factor is \( \frac{1.5}{3} \div \frac{3}{6} = \frac{1}{2} \).

**Area and Scale Factor**
Lengths of similar figures will stretch (or shrink) by a scale factor. Areas of the figures will not change in the same way.

Applying a scale factor of 2 to a figure increases the area by a factor of 4.

Applying a scale factor of 3 to a figure, increases the area by a factor of 9. The original area is 6 cm\(^2\). The area of the image is 9 times as large (54 cm\(^2\)).

On the CMP Parent Web Site, you can learn more about the mathematical goals of each unit. See the glossary, and examine worked-out examples of ACE problems.
http://www.math.msu.edu/cmp/parents/home