### 5.2d Scale Factors and Area

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| 1. Mouse’s house is very small. His living room measures 2 feet by 4 feet. Draw his living room on the grid. Label the dimensions and the area. 2. Double-Dog’s living room dimensions are double Mouse’s living room. Draw his living room on the grid. Label the dimensions and the area. 3. Triple-Threat-Tiger’s living room is triple the dimensions of Double-Dog’s. Draw Tiger’s living room on the grid. Label the dimensions and the area. |  |

1. Fill in the table below with the dimensions and areas of the living rooms from the sketches above.

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| --- | --- | --- | --- |
| Homeowner | Living Room Dimensions  (Length and Width) | | Living Room Area |
| Mouse |  |  |  |
| Double-Dog |  |  |  |
| Triple-Threat-Tiger |  |  |  |

1. Compare measurements for Mouse and Double-Dog’s living rooms. Use scale factor in the comparison.
   1. the dimensions b. the area

1. Compare measurements for Double-Dog and Triple-Threat-Tiger’s living rooms. Use scale factor.
   1. the dimensions b. the area
2. Compare Mouse and Triple-Threat-Tiger’s living rooms. Use scale factor in the comparison.
   1. The dimensions b. the area

1. Generalize a rule related to the scale factors of dimensions and area. You might use “if…., then….”

For example: “If the dimensions of an object are multiplied by \_\_\_\_\_, the area will be multiplied by \_\_\_\_\_.”

1. If the area of Mouse’s **kitchen** is 12 square feet, and the dimensions of Double-Dog’s kitchen are twice as big as the dimensions of Mouse’s, what will the area of Double-Dog’s kitchen be?
2. If the dimensions of Triple-Threat-Tiger’s kitchen are three times the dimensions of Double-Dog’s, what will the area of Triple-Threat-Tiger’s kitchen be?
3. If the area of Mouse’s bathroom is 5 square feet, the dimensions of Double-Dog’s bathroom are twice Mouse’s, and Triple-Tiger’s are three times Double-Dog’s, what will the area of Triple-Threat-Tiger’s bathroom be? Is there a shortcut?
4. Ms. Herrera decided to shrink a picture so that it would fit on a page with some text. She went to the copy machine and pushed the 50% button, meaning that the **dimensions** of the paper would be **half** as big as normal.

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| 1. If the original dimensions of the picture were 8.5 in. X 11 in., what will be the dimensions of the new picture? 2. Draw the original and new picture on the grid. Label the dimensions. 3. If you know the area of the original picture, how might you figure out the area of the smaller picture (besides multiplying length and width)? |  |

1. Let’s say that Mouse, Double-Dog and Triple-Threat-Tiger all have swimming pools. What would you predict about the scale factor of the volume as related to double or triple dimensions? Prove or adjust your prediction—say that Mouse has a pool which is 1 foot deep and 2 feet by 3 feet.