

## Capstone: Design a Scale Model

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

### LEARNING OBJECTIVE

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Students will apply exponents, scientific notation, and roots together to design and justify a scaled model of a real-world object.

### MATERIALS NEEDED

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- ruler or measuring tape
- poster board or large paper
- calculator
- markers
- string (optional)

### HANDS-ON ACTIVITY

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1. Choose a large real object, such as a school bus (about 12 meters) or a blue whale (about 24 meters), record its real length, and write this length in scientific notation.
2. Choose a scale factor, such as 1:50, and calculate the model's length in centimeters, showing your division/multiplication work and expressing the result in scientific notation where appropriate.
3. On poster board, draw or measure out your model's length to scale using a ruler, clearly labeling both the real and model measurements.
4. Calculate the model's area if it were a square with your scaled length as a side, expressing that area result in scientific notation.
5. Write a short caption explaining your scale factor, showing the full conversion math from real size to model size.

### QUESTIONS

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1. If a real object is  $1.2 \times 10^3$  cm long and your scale is 1:50, what is the model's length?
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2. Express your chosen object's real length in scientific notation.
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3. If your model's side length is  $s$ , what expression represents the area of a square model, and what is that area for your object?

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**4. Explain, using exponent rules, how scaling a length by  $\frac{1}{50}$  affects the area.**

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