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STEM

Brownie at Home

Making Models

Part A Supplies

- Graph paper (print some here if you don't have any).
- A pencil.
- Measuring tool (ruler, yardstick, tape measure, etc.).
- A calculator (optional).
- Creative materials (whatever you have on hand) such as:
  - ◊ Paper and tape.
  - ◊ Clay.
  - ◊ Playdough (or, make some yourself).
  - ◊ Beads and pipe cleaners.
  - ◊ Sticks.
  - ◊ Blankets and chairs.
  - ◊ Anything else you can come up with!

Part B Scientific Concepts

Scale model: A smaller but otherwise exact copy of something. For example, in the drawing at right, the Earth is shrunk down to fit into someone's hands—but it's still recognizable as Earth.

Scale models are used many different sciences—forensics, astronomy, and engineering are just a few!

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Part C Instructions

1. Draw a simple object (like a building) on the graph paper, using the lines to help you. Stick to straight lines instead of curves, at least for your first try.
2. Decide what length each box on your graph paper represents. Is one box equal to 10 steps in length? Or, is one box equal to 1 foot? Whatever you choose, write it down on the paper next to the drawing (like “1 box = 1 foot”). You’ve just decided the scale of your model!
3. Next, measure out how big your object would be in real life. You might need to go outside. For example, if you decided that one box on your graph paper equals two steps in real life, and your object is 10 boxes long on the paper, it would then be 2x10 or 2+2+2+2+2+2+2+2+2+2 = 20 steps in real life.
4. Now, choose something to make a “real” model of. Do you want to model your house? Your room? An airplane?
5. Using whatever materials you have on hand, build your model! It’s okay to estimate the proportions of this model, but if you want a challenge, make a scale model instead. To do so, measure the real object first and then scale it down. It’s the opposite of what you did with the graph paper—with that, you started small and figured out how big it would be in real life, but with this, you’re starting with how big it is in real life and figuring out how small to make it. For example, if you’re modeling a building that is 30 feet wide, you could have one popsicle stick equal 10 feet. Then three popsicle sticks together would represent the width of the building!

Part D Virtual Troop Meeting Ideas

Photo share. Have your Girl Scouts take photos of their models to share!

Photo share and voice chat. Have your Girl Scouts find other examples of scale models and briefly present what they found.

Group watch and text or voice chat. After your Girl Scouts have completed the above activity, have them watch this 7-minute video and then discuss what they learned. What does this scale model show them about the size of the solar system?