



Rescue Near the Center of the Earth

Mission Control has lost contact with its expedition! Dr. Julie Verne and her students are on a mission to explore the center of the Earth. Their last progress report was due on Day 17, and it is now 2 days overdue. You fear the team is in trouble. You must plan a rescue mission, but first you need to pinpoint the team's last reported location. The following are the progress reports you've received:

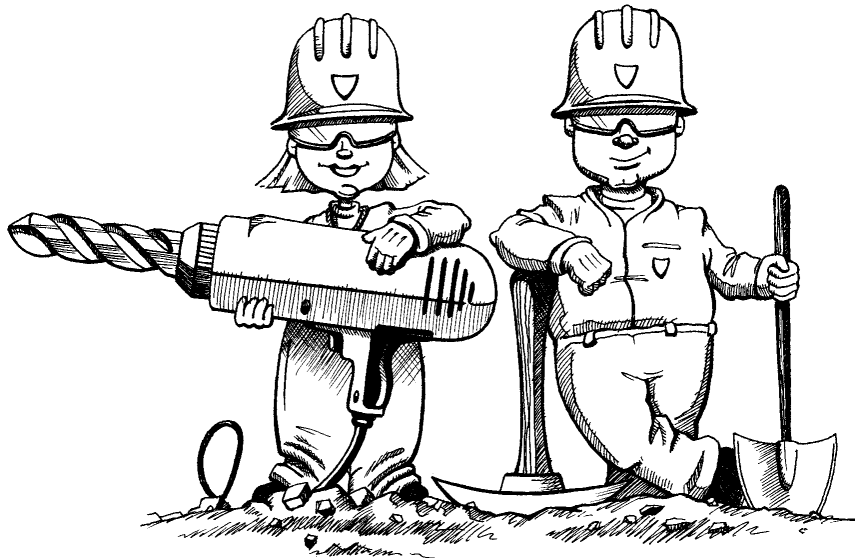
Day 1: Today we began our adventure by drilling with rock hammers at a constant rate of 12.5 km/h. Weather conditions were perfect at a mild and sunny 20°C. By late morning, we switched to the steam shovels to dig into less rocky, softer material. The team was forced to put on cooling suits as the heat became unbearable. The last recorded temperature today was 1,400°C. All is well.

Day 5: We're still digging with the steam shovels, but it's getting hotter. Today the temperature of the surrounding rock reached 3,000°C. The material is similar to clay, and as we pushed through we saw the rocks slowly flow back and obscure our trail.

Day 9: Wow! It is getting very hot down here. The temperature is 3,500°C. We're still using the steam shovels, but we're very glad our special cooling suits are working. The pressure-resistant coils in the suits are working overtime.

Day 10: Yesterday we stopped using the steam shovels and climbed into our mini-submarine. The heat is incredible—almost 6,000°C. Everything around us is liquid, but in our super heat-resistant, specially pressurized submarine we are going full speed ahead.

Your mission: build a model of the Earth. Then look for clues in the model and use the progress reports to find team members and bring them back safely.



Rescue Near the Center of the Earth, continued

MATERIALS

- set of metric measuring cups
- 125 mL of creamy peanut butter
- 65 mL of powdered milk
- bowl
- mixing spoon
- 65 mL of honey
- metal spoon
- sheet of wax paper
- plastic knife
- 125 mL of jelly
- 4–6 chocolate chips
- 125 mL of graham cracker crumbs



HELPFUL HINT

Avoid handling the mixture too much, or it could soften into a goopy mess.

USEFUL TERMS

- crust**
the thin outermost layer of the Earth
- mantle**
the thick layer of rock between the Earth's crust and core
- outer core**
the layer immediately surrounding the inner core of the Earth
- inner core**
the center of the Earth



Ask a Question

What is the interior structure of the Earth like?

Make a Model

1. Wash your hands thoroughly.
2. Put 125 mL of peanut butter and 65 mL of powdered milk in the bowl. Mix them with a spoon. Add about one third of the honey to the mixture. Keep adding honey or powdered milk a little at a time until the dough feels like stiff clay.
3. Gather a rounded spoonful of dough approximately 5 cm in diameter (about a thumb's length), and roll it into a ball.
4. Place the ball on a piece of waxed paper, and carefully cut the ball in half. Be careful not to squash the ball when you cut it.
5. Using the tip of the spoon or your finger, scoop out a small hole in the center of each half of the ball. The holes should be about the size of the tip of your index finger.
6. Spoon a small amount of jelly into the holes you have scooped out. Place a chocolate chip in the middle of the jelly in one of the halves of the ball.
7. Place the two halves of the ball together, and roll the ball on the wax paper to seal the seam.
8. Pour the graham-cracker crumbs on the piece of wax paper. Roll the ball in the crumbs to thoroughly coat it. You now have a model of the Earth!
9. Place your model Earth on a paper plate. Carefully cut the ball in half again to see the interior of your model Earth. Each of the layers in your model has a texture similar to the texture of the corresponding layer in the Earth.

Using the model you've created and Dr. Verne's progress reports, you are now ready to report to Mission Control.

Collect Data

Begin your rescue plan by organizing what you know.

10. Fill in the second column of the chart on page 64 with the name of the corresponding Earth layer.
11. Fill in the third column of the chart on page 64 using one piece of information from your model and one piece of information from the story.

Rescue Near the Center of the Earth, continued

Model Analysis Chart

Model layer	Earth layer	Description of Earth layer
Graham-cracker crumbs		
Peanut butter mixture		
Jelly		
Chocolate chip		

Analyze the Results

12. Which layer of the Earth did the team reach by the end of Day 1?

13. Which part of your model represents this layer?

14. On Day 10, the team members continued their journey in the mini-submarine. Describe the layer of the Earth they must have entered in the submarine. How is this layer represented in your model?

Rescue Near the Center of the Earth, continued

Draw Conclusions

- 15.** Where will you send the rescue team to look for Dr. Verne and her students? Explain your answer.

- 16.** Assume the team is at the place of their last transmission. Was there a layer that the team did not reach? If so, how was it represented on the model? Explain your answer.

Going Further

Did you know that the interiors of some other planets in our solar system have a layered structure similar to Earth's? Choose a planet, and find out about its interior structure. Then make a sketch of the planet's structure. Be sure to identify similarities and differences between the planet you chose and Earth.