GRADE 6 SCIENCE

Earth's Layers

Name: Date:

INQUIRY

If you could dig straight down from Nanjing, what would you find at 10 km? 100 km? 1,000 km?

Discuss with your partner. Write your initial ideas below:

Key Vocabulary

Term	Definition
Crust	Thin, solid outer layer (5–70 km). We live on this.
Mantle	Thickest layer. Semi-solid rock. Convection currents here.
Outer Core	Liquid iron and nickel. Creates Earth's magnetic field.
Inner Core	Solid iron and nickel. ~6,000°C.
Seismic waves	Vibrations from earthquakes through Earth's layers.

Part A — Knowledge

1. List Earth's four layers in order from the surface to the centre. [4 marks]

2. What is the difference between continental crust and oceanic crust? Nanjing sits on the Yangtze Craton — which type is this? [3 marks]

3. Explain why the inner core is solid even though it is hotter than the outer core. [2 marks]

4. How do scientists know about Earth's layers if nobody has ever been deeper than 12.3 km? [3 marks]

Part B — Application

5. The 2008 Sichuan earthquake (M 8.0) provided scientists with huge amounts of seismic data. Explain how P-waves and S-waves help scientists map the layers of the Earth. [4 marks]

6. Germany experiences very few earthquakes compared to Japan or China. Using your knowledge of plate boundaries and Earth's structure, explain why. [3 marks]

7. The mantle makes up 84% of Earth's volume. If Earth's total volume is approximately 1,083,000,000,000 km³, calculate the volume of the mantle. [2 marks]

Show your working:

Part C — Inquiry Extension

8. Imagine you are designing a probe that could travel to Earth's core. What challenges would it face at each layer? Think about temperature, pressure, and state of matter. [5 marks]