Year 12 Science: Density, pressure and convection in the Earth system

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. A 54 g rock has a volume of 20 cm^3. Find its density.

2. Find the pressure from seawater ($\rho = 1025\ kg\ m^{-3}$) 200 m below the surface, ignoring the air. Use $g = 9.8\ N\ kg^{-1}$.

3. Explain why water under forming sea ice sinks.

4. Which kind of heat transfer carries most heat through the outer core, and which through the crust?

5. Does rising air or sinking air bring cloud, and why?

Exam-style question: hot pools in the Taupō Volcanic Zone

Hot pools in the Taupō Volcanic Zone are fed by rainwater that soaks down through cracks in the rock, is heated deep underground, and returns to the surface.

6. Describe two sources of the heat inside the Earth.

7. Explain how heat is carried from the outer core up through the mantle.

8. Discuss how the rainwater is heated and why it returns to the surface, linking heat transfer, density and pressure.

Fix the mistake

9. Correct this statement: "Hot air rises because heating makes its particles lighter."

10. Correct this statement: "The mantle is a sea of liquid magma, so it convects like water in a pot."

11. Correct this statement: "Heat rises."

12. Correct this statement: "The core stays hot because the Sun's heat soaks down into the Earth."