Year 13 Science: Ocean heat, tides, waves and El Niño

Name: _____ Date: _____

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

Practice

1. A swell has a period of 10 s in deep water. Find its speed.

2. Find its wavelength in deep water.

3. Find its speed in water 5.0 m deep.

4. A wave's height grows from 1.0 m to 2.0 m. By what factor does its energy increase?

5. High tide at Tauranga is at 3:40 am. About when is the next high tide?

6. During an El Niño, which way does warm surface water move, and what happens to upwelling off Peru?

Exam-style question: El Niño and a Hawke's Bay farm

NIWA has announced that an El Niño is developing. A Hawke's Bay sheep farmer wants to know what it might mean for the coming summer.

7. Describe what happens to the trade winds and the warm water of the equatorial Pacific during an El Niño.

8. Explain how these changes affect the Walker circulation and rainfall across the Pacific.

9. Explain why Hawke's Bay is more likely to be dry during an El Niño summer.

10. Explain why the farmer should treat the El Niño as a raised risk, not a certainty.

Fix the mistake

11. Correct this statement: "Waves carry water across the ocean to the beach."

12. Correct this statement: "El Niño means the trade winds get stronger."

13. Correct this statement: "Doubling a wave's height doubles its energy."

14. Correct this statement: "Spring tides happen only in spring."