Year 13 Science: Patterns of evolution: divergence, convergence and radiation

Name: _____ Date: _____

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

Practice

1. Sharks and dolphins have similar streamlined bodies. Which pattern of evolution is this?

2. Kea and kākā evolved from one ancestor into an alpine bird and a forest bird. Which pattern is this?

3. A fossil shell grows from 20.0 mm to 26.0 mm in 0.20 million years. Find the rate in mm per million years.

4. Pua o te reinga is pollinated by the short-tailed bat, which feeds on its nectar. Name the pattern.

5. Fossils show a species unchanged for 2 million years, then replaced quickly by a new form. Which model fits?

Exam-style question: the hebes

New Zealand has about a hundred species of hebe, from coastal trees to alpine cushions. DNA differences between species are small. Whipcord hebes of the high mountains have tiny scale-like leaves pressed against the stem, and look so like conifers that one species is named cupressoides, meaning cypress-like.

6. Define adaptive radiation and divergent evolution.

7. Explain two factors that allowed hebes to radiate rapidly in New Zealand.

8. Explain why the likeness of whipcord hebes to conifers is convergent evolution.

9. Discuss whether the hebe radiation better fits gradualism or punctuated equilibrium, using the evidence given.

Fix the mistake

10. Correct this statement: "Dolphins and sharks look alike, so they must share a recent common ancestor."

11. Correct this statement: "Adaptive radiation and divergent evolution are the same thing."

12. Correct this statement: "Co-evolution is when two species evolve at the same time."

13. Correct this statement: "Punctuated equilibrium means evolution happens overnight."