

READING QUESTIONS - ENVIRONMENTAL EDUCATION - SPRING TERM 2008

Due Wednesday April 09 - Weather and Climate

For the questions on **WEATHER AND CLIMATE** itemized below, consult the course text AND the following pdf documents: *Weather Basics* and the *Influence of Topography and Climate on Tree Growth*.

1. Identify the 5 main "physiogeographic provinces" of the Cascades and Olympics? Identify the CHIEF factor or factors responsible for shaping each of these provinces. No need to elaborate on how each factor has been responsible. Format your response into five separate sections with a space between each section. Name and underline the province at the start of each section.
2. What is a microclimate?
3. Provide 5 examples of how various environmental factors (e.g. heating from the sun, air temperature, terrain, vegetation, soil type, rain, fog, snow, shade, etc.) produce microclimates. Start your discussion of the influence of a specific factor (e.g. terrain) on a separate line. Underline the factor (e.g. terrain). An environmental factor can be used as a specific example only once. If, for example, you describe how a slope's southerly orientation to the sun at midday produces a specific microclimate, do not (in a separate example) describe how a slope's westerly orientation to the sun influences microclimate. You are welcome, however, to describe the sun's influence on microclimates on various slope aspects over the course of the day in the same example.
4. Why are Oregon winters wet and the summers relatively dry and sunny? Respond by addressing the influence of global circulation patterns on the seasonal components of Pacific Northwest weather.
5. Discuss why deserts are, for the most part, located across a zone that extends slightly north and south of 30 N and S latitude.

Due Wednesday April 16 - Geology

For the questions on **GEOLOGY** itemized below:

- Consult the course text AND the following pdf documents: *Formation of Igneous Rock and Cascade Volcanoes*.
- When responding to the following questions, identify each answer by its number, letter, and Roman numeral, where appropriate.

1. What is the difference between intrusive vs. extrusive igneous rocks? Provide an example of each type.
2. The volcanic peaks of Oregon's high Cascades have been formed largely due to the action of plate tectonics, whereby segments or "plates" of the earth's crust move slowly along, driven by underlying currents in the earth's interior. As the plates move, many actions are possible. For example, when two oceanic plates move away from each other, a gap forms in the earth's crust and volcanic rock flows out. Ocean plates are built via this process. Plates can also collide.
 - a) what rock (for the most part) constitutes oceanic plates? Why? Explain in terms of the concept of differential melting.
 - b) what rock (for the most part) constitutes continental plates? Why? Explain in terms of the concept of differential melting.
 - c) what happens (geologically) when two continental plates collide? Provide an example of a major geologic feature that has been formed as the result of this process.
 - d) the volcanic Cascades of Oregon and Washington owe their present form to the action of an oceanic plate meeting a continental plate. Describe:
 - i) how the coast range was formed; and

- ii) how the volcanic peaks of the OR/WA Cascades were formed. In your response be sure to include why these peaks are in their present positions.
3. a) Lava viscosity increases with increased _____ content (when responding type out the full question).
b) List, in order of viscosity, the following volcanic rocks (most viscous first): basalt, andesite, rhyolite.
4. a) Why are shield volcanoes (e.g. Belknap Crater) generally low in height, with gently sloped sides?
b) Why are stratovolcanoes (e.g. Hood, Jefferson, Washington) steeper than shield volcanoes?

Wednesday April 23 - no reading assignment - plant taxonomy worksheet due!

Due Wednesday April 30 – Forest Ecology

1. What is "succession"? Distinguish between primary and secondary succession.
2. During succession, the physical conditions of the forest change over time (generally speaking, the physical environment becomes less extreme). Other changes also occur. Name three.
3. The article "The Keys to Understanding" describes the seral and climax trees of 4 biogeographic regions: the lower elevation west side forests of OR/WA, the high elevation forests of OR/WA, the forests of the Siskiyou and Klamath mountains and the coastal forests of OR/WA.
 - a) for each of the 4 regions, what is the climax tree species?
 - b) what is a common seral tree for each region?
4. What is a keystone species? Provide an example of a keystone species and how it is significant in promoting the health of its environment.
5. What is an indicator species? Describe how the spotted owl serves as an indicator species.
6. Describe 3 benefits of snags to forest health.
7. Describe 4 benefits of downed trees to forest health.
8. Describe 3 ways litterfall contributes valuable nutrients to the forest floor.
9. What is an old growth forest? Be sure to identify ALL of the components.

Due Sunday May 4 – The Oak Savannah

1. Describe, IN DETAIL, the benefits the Kalapuyas gained from the annual burning of the valley floor. Include the role of ecotones in your response.

Due Wednesday May 14 - Fire Ecology

1. Define the following terms: paludification, fire-dependent species, fire cycle, and intolerance.
2. Identify 5 benefits of fire to forest health.

3. Describe the 3 kinds of wildfires and the general effects of each on the forest.
4. What is the average fire cycle for:
 - a) the forests on the western side of the Oregon Cascades;
 - b) the drier lodgepole pine forests of Central Oregon?
5. What is a "dog-hair" stand? Describe how one develops.

Due Wednesday May 21 - Regional Ecology

1. Describe how *soil make-up*, *sunlight* and *water* influence the types of *plants that grow* on the hills, valley floors and flood plains of our area. Segment your response by geographic feature (e.g. hills, valley floor and flood plain), with a space between each response:
 - A. Hills: *soil make-up*
sunlight
water
most common types of plants
 - B. Valley floor: *same categories as for hills, etc.*
 - C. Flood plain: *etc.*

Due Wednesday May 28 - Plants in Extreme Environments

Alpine Plant Adaptations

1. Describe two factors that produce an "inverted timberline".
2. Distinguish between forest line, tree line and shrub line.
3. Define the following terms (start each definition on a separate line): layering, flagging, wind training, dessication, krummholz and kruppelholz, chlorosis, 50° isotherm.
4. Distinguish runners from rhizomes.
5. What are anthocyanins? What role do anthocyanins play in protecting an alpine plant and promoting its health?

Desert Plant Adaptations

1. Define the term water indicator. Provide an example of a water indicator.
2. Describe the main differences between summer and winter annuals.
3. Describe four moisture conservation mechanisms of water savers.
4. Describe three adaptations that water spenders have made to their environment.
5. Describe, in general terms, the main difference between drought tolerators and other desert plants in handling water stress.