STUDY GUIDE: Earth Science Benchmark 3

Standard 4.c – Know the different atmospheric gases that absorb the Earth’s thermal (infrared) radiation, and the mechanism and significance of the greenhouse effect.

1) In the greenhouse effect, what kind of radiation from the earth (the ground) is absorbed by the atmosphere?

2) The early atmosphere had very little carbon, what effect did this have on its average temperature, was it hotter or colder?

3) What would an increase in the amount of CO$_2$ in the atmosphere cause?

4) What 2 gasses have the greatest influence on the greenhouse effect?

Standard 5.a – Know how differential heating of the Earth results in circulation patterns in the atmosphere and ocean that globally distribute the heat.

5) Which absorbs and releases heat more quickly, land or water?

6) What 2 things would cause an air mass (or water for that matter) to sink?

7) What kind of heat transfer (or current) moves heat from the equator to the poles?

8) What primary energy source evaporates water and drives the water cycle?

Standard 5.b – Know the relationship between the rotation of the Earth and the circular motion of ocean currents and air in pressure centers.

9) Why do hurricanes move in a circular direction?

10) In what direction do winds blowing toward the equator turn, because of the Earth’s rotation?

11) How are currents in the northern hemisphere different than those in the southern hemisphere?

12) Are higher speed winds deflected more, or less, than low speed winds by the Coriolis effect?

Standard 5.d – Know that properties of ocean water such as temperature and salinity (density) can be used to explain the layered structure of the oceans, generation of horizontal and vertical ocean currents, and the geographic distribution of marine organisms.

13) In what layer of the ocean would you expect to find phytoplankton?

14) Where does “upwelling” normally occur?

15) What forces cause horizontal and vertical ocean currents?
16) Why does water warm more slowly than land?

Standard 7.a – Know the carbon cycle of photosynthesis and respiration, and the nitrogen cycle.

17) In the nitrogen cycle, what does the nitrogen get changed into?

18) What process increases both carbon (C) and nitrogen (N) in the atmosphere?

19) What is one benefit that a fish would have by having a plant in its fishbowl?

Standard 7.b – Know the global carbon cycle in terms of the different physical and chemical forms of carbon

20) Where does the calcium carbonate shell of some sea animals come from?

21) In photosynthesis, where is the carbon transferred to (from where to where)?

22) What do we call the process that returns carbon dioxide in fossil fuels to the atmosphere?

Standard 8.a – Know the thermal structure and chemical composition of the atmosphere.

23) What are the 2 most abundant gases in the atmosphere?

24) In what layer of the atmosphere would you find strong, steady winds and fairly constant weather conditions?

25) What is the lowest layer of the atmosphere?

Standard 8.c – Know the location of the ozone layer in the upper atmosphere, its role in absorbing ultraviolet (UV) radiation and how it varies both naturally and in response to human activity.

26) What does the Earth’s ozone layer absorb?

27) What is the primary source of ozone depletion in the atmosphere?

28) If ozone in the atmosphere decreases, why would people get more sunburns?

Standard 9.a – Know the resources of major economic importance in California and their relation to California’s geology.

29) What resources are formed by large intrusions of molten igneous rock into older rocks?
30) What were the fertile farmland soils of California’s Central Valley formed from?