

DOK Coding Practice for Secondary Science

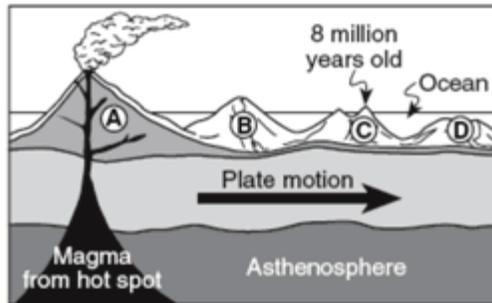


1. The rotation of a windmill **best** represents which type of energy?
 - A. Potential
 - B. Kinetic
 - C. Thermal
 - D. Electrical
2. A girl riding on a skateboard at 3 m/s suddenly hits the curb. The girl will fall
 - A. backward with a greater speed than 3 m/s.
 - B. forward at a greater speed than 3 m/s.
 - C. backward at a speed of 3m/s.
 - D. forward at a speed of 3m/s.
3. Which of the following is a renewable energy resource?
 - A. Nuclear power
 - B. Hydropower
 - C. Natural Gas
 - D. Petroleum
4. Which of the following is the correct order of organization of structures in living things, from simplest to most complex?
 - A. organ systems, organs, tissues, cells
 - B. tissues, cells, organs, organ system
 - C. cells, tissues, organ systems, organs
 - D. cells, tissues, organs, organ systems
5. Fossils of shellfish and snails are commonly found in the Las Vegas valley. What can you infer about the environmental conditions in the Las Vegas valley millions of years ago? The Las Vegas Valley
 - A. was always a desert.
 - B. once contained a shallow sea.
 - C. was once a forest.
 - D. once contained a glacier.

DOK Coding Practice for Secondary Science



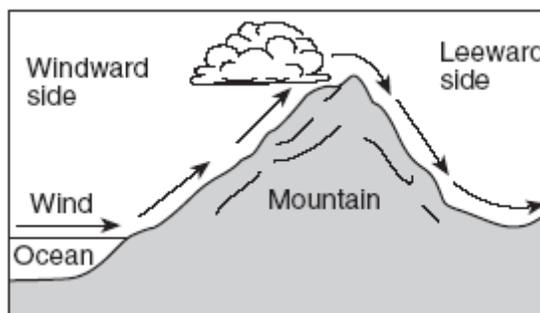
6. The cross section below shows the direction of movement of an oceanic plate over a mantle hot spot, resulting in the formation of a chain of volcanoes labeled A, B, C, and D. The geologic age of volcano C is shown.



(From <http://www.nysedregents.org/testing/scire/es806.pdf>)

What are the approximate geologic ages of volcanoes B and D?

- A. B is 5 million years old and D is 12 million years old.
 - B. B is 2 million years old and D is 6 million years old.
 - C. B is 9 million years old and D is 9 million years old.
 - D. B is 10 million years old and D is 4 million years old.
7. What is the total number of different elements present in NH_4NO_3 ?
- A. 7
 - B. 3
 - C. 4
 - D. 9
8. The diagram below shows how prevailing winds cause different weather conditions on the windward and leeward sides of mountain ranges.



Clouds usually form on the windward side of the mountain because this is where air

- A. rises and cools.
- B. rises and warms.
- C. sinks and cools.
- D. sinks and warms.

DOK Coding Practice for Secondary Science



9. In an experiment, you were instructed to heat a sample of soil and a sample of water with heat lamps and then measure the temperature of each sample once a minute, for ten minutes.

Suppose that the experiment yielded the partial results shown in the table below.*

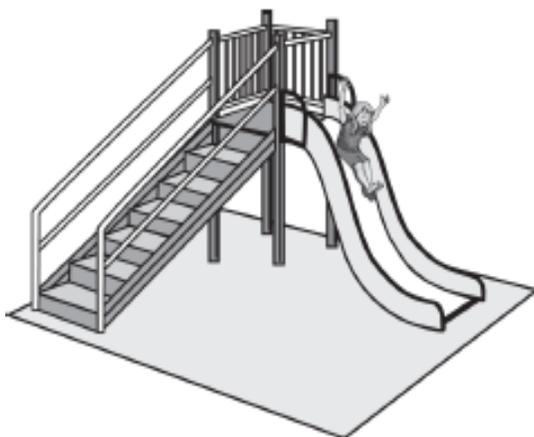
Time (min)	0	1	2	3	4	5	6	7	8
Soil Temp (°C)	20	21	22.5	24	26	27.5	29.5	31	33
Water Temp (°C)	20	20.5	21.5	22	22.5	23	24	24.5	25

Use the information in the data table to predict the temperature of the soil and water samples at 10 minutes. Analyze the results to determine which prediction is supported by the data collected. Select the **best** prediction and explanation listed below.

- A. The temperature of the soil and the temperature of the water would rise at the same rate because the calculated average rate of the water and soil temperatures proves it.
- B. The temperature of the soil and the water would not rise at all after 8 minutes because the information is not provided in the data table.
- C. The temperature of the soil would rise at a faster average rate than the rate that the temperature of the water would rise because water requires more energy to raise its temperature compared to soil.
- D. The temperature of the water would rise at a faster average rate than the average rate that the temperature of the soil would rise because soil requires more energy to raise its temperature compared to water.

**Modified from Karen Hess, Center for Assessment*

10. Use the following picture and information to answer the question.



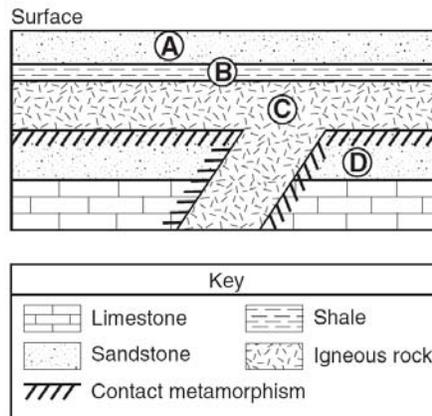
A child at a playground slides down a slide on a windless day.

- A. List two forces that act upon the child.
- B. Describe how the forces affect the motion of the child as she moves down the slide.

DOK Coding Practice for Secondary Science



11. Uranium-238 has 92 protons and 146 neutrons. It undergoes radioactive decay by emitting an alpha particle. What element is the product of this decay?
- A. An isotope of uranium having 92 protons and 144 neutrons.
 - B. An ion of uranium having 92 protons and 91 electrons.
 - C. The element of neptunium, which has 93 protons and 144 neutrons.
 - D. The element of thorium, which has 90 protons and 144 neutrons.
12. What is the name given to a star as it is initially forming?
- A. Protostar
 - B. Nebula
 - C. Star cluster
 - D. White dwarf
13. Which of the following is present in a typical plant cell but **NOT** in an animal cell?
- A. Mitochondria
 - B. Cell Wall
 - C. Ribosome
 - D. Golgi Apparatus
14. The diagram below shows a geologic cross section. Letters A through D represent different rock units.



(From <http://www.nysedregents.org/testing/scire/es805.pdf>)

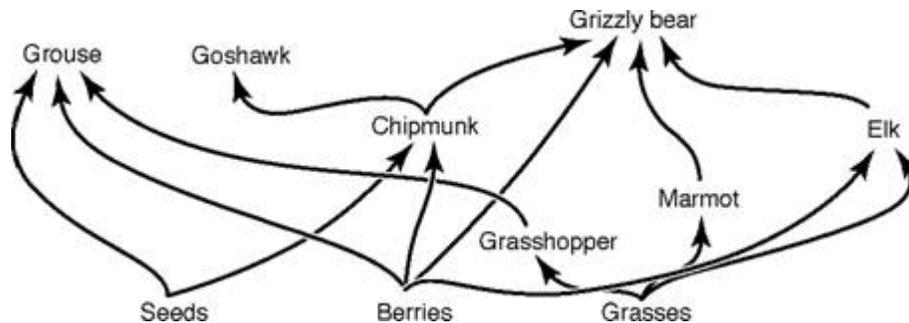
Which sequence correctly shows the age of the lettered rock units, from **OLDEST** to **YOUNGEST**?

- A. A → B → C → D
- B. B → A → D → C
- C. C → D → A → B
- D. D → C → B → A

DOK Coding Practice for Secondary Science



15. A sodium ion has 11 protons, 12, neutrons, and 10 electrons. How many electrons does the sodium ion need to gain to have a neutral charge?
- 0
 - 1
 - 2
 - 11
16. A student has a mixture of sand, water, salt and iron pieces. Which procedure would separate the mixture?
- Evaporate the water, use a magnet to remove the iron.
 - Filter the water to separate the sand, use a magnet to remove the iron.
 - Filter the sand and iron from the water, use a magnet to remove the iron from the sand, evaporate the water to separate the salt.
 - Filter the sand and iron from the water; evaporate the water to separate the salt.
17. In certain rats, black fur is the dominant trait while white fur is the recessive trait. If two heterozygous rats are mated, their offspring would be expected to have
- three different genotypes and three different phenotypes.
 - four different genotypes and two different phenotypes.
 - two different genotypes and three different phenotypes.
 - three different genotypes and two different phenotypes.
18. Carefully examine the food web in the figure below.



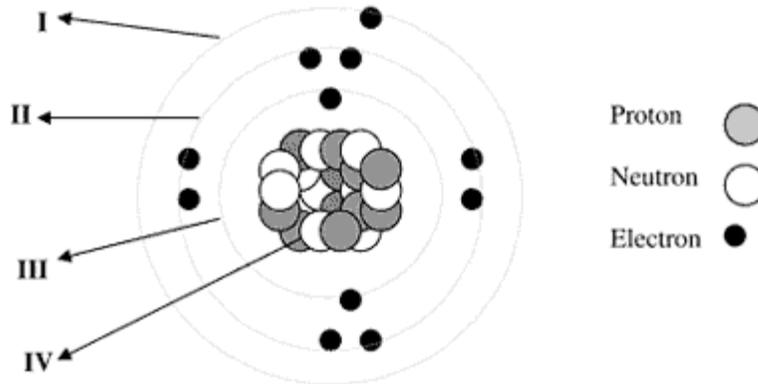
From ExamView test Generator for Modern Biology, Holt, Rinehart, and Winston, 2006.

- A drought has caused the producer populations to significantly decrease. Which statement describes an immediate effect caused by the decrease of producers?
- The grouse population would increase.
 - The grasshopper population would decrease.
 - The seed populations would increase.
 - The grizzly bear populations would decrease.

DOK Coding Practice for Secondary Science



19. Analyze the model of an atom below.



Which of the above numbers indicates the orbit of the electrons that could bond with electrons of other atoms to make molecules?

- A. I
 - B. II
 - C. III
 - D. IV
20. The Colorado River runs 1,450 miles from the headwaters of the Rocky Mountains to the Gulf of California. The river has many dams, aqueducts, and canals that divert water in order to supply water for electricity, irrigation, recreation, and domestic use.
- A. Describe and discuss two environmental problems that are associated with water diversion.
 - B. If there is a shortage of water, choices will have to be made as to whether water should be diverted to urban areas, agricultural area, or natural ecosystems. Make an argument for diverting water for urban consumption and an argument for permitting the flow of water to natural areas.

DOK Coding Practice for Secondary Science



Item Number	Standard	DOK Level	Annotation
1	P.8.C.4	1	Recall the definition of energy types
2	P.8.B.1	2	Predict outcomes based upon the application of Newton's laws
3	E.8.C.7	1	Identify renewable and nonrenewable resources
4	L.8.B.4	1	Recall the levels of organization within organisms
5	L.8.D.2	2	Infer from fossil evidence how environments have changed over time
6	E.8.C.4	2	Predict geological events that result from plate movement
7	P.8.A.4	1	Simple Calculation- Add the number of atoms in a molecule
8	E.8.A.6	2	Use the diagram to determine how topography influences cloud formation
9	N.8.A.1	3	DOK 1- Calculate and use data from a graph (routine operation) DOK 2- Analyze data to recognize patterns DOK 3- Make predictions with justifications
10	P.8.B.1	2	DOK 1- Recall the forces DOK 2- Explain how the forces relate to the movement of an object
11	P.12.A.2	2	Apply the concept of radioactive decay
12	E.12.B.4	1	Recall the stages of stellar evolution
13	L.12.B.1	1	Identify the differences between plant and animal cells
14	E.12.C.1	2	Apply the principle of superposition to the relative dating of rocks
15	P.12.A.9	1	Calculate the charge of an ion given the number of protons and electrons
16	P.12.A.3	2	Determine separation procedures based upon the properties of the substances
17	L.12.A.5	2	Predict patterns of specific genetic traits in offspring
18	L.12.C.2	2	Predict the consequences of environmental change
19	P.12.A.4	1	Recognize that bonding electrons are the outer electrons
20	E.12.C.4 N.12.B.2	3	DOK 2- Describe the impact of the depletion of a natural resource (water) on the environment. DOK 3- Develop an argument for diverting water and the environmental impact.