

Bear Time Remediation: Soil Unit 5**Multiple Choice**

Identify the choice that best completes the statement or answers the question.

- _____ 1. A student group is involved in a restoration study of a nearby disturbed area. They decide to collect six soil samples and analyze them for carbon (C) and nitrogen (N). Two of the samples are found to be very high in C and N, but the other four samples are low in both. The students also notice that the color of the two soil samples that are high in C and N is very dark. Which of the following is the most likely explanation of the data?
- Two of the samples were collected from an A horizon, and the others were collected from a B horizon.
 - Two of the samples had more sand and gravel than the other four.
 - Four of the samples were collected from an area that had been restored previously and now has thick vegetation.
 - Four of the samples were collected from an area that had been mulched.
- _____ 2. Students want to determine the impact of soil erosion from the development of new housing. They plan to measure the density of a species of algae growing along the bottom of a river that flows through their town. The town is built in a heavily forested area, but a large area of trees along the river was recently clear-cut to allow for the construction of a new housing development, which has caused exposed soil to wash into the river. The river flows north to south through the town and is still forested both up- and downstream of the town.
- Which of the following is the dependent variable in the study?
- The tract of land that was clear-cut for the housing development
 - A tract of land in a heavily forested area outside of town
 - The density of a species of algae growing along the bottom of the river
 - The flow rate of the river from north to south
- _____ 3. Agricultural practices, where the members of a farming family produce only enough food for themselves and do not make use of large-scale irrigation, chemical fertilizer, or machinery and technology, is called _____.
- intensive traditional agriculture
 - advanced organic farming
 - subsistence agriculture
 - reduced tillage agriculture
- _____ 4. Which of the following is the most accurate example of secondary succession?
- In 1962, a volcanic eruption off the coast of Iceland resulted in a formation of a new island "Surtsey" from ocean bedrock
 - Following the Dust Bowl of the 1930's, prairie grasses reestablished themselves in areas that had lost almost all of their fertile soil to wind erosion
 - Twenty years after the Mount St. Helens eruption, small trees and grasses have begun to regrow near the top of the peak, where the eruption occurred
 - A forest first burns down crowded understory grasses and shrubs as well as some ponderosa pine stands in the Black Hills of South Dakota

_____ 5. Which of the following best describes the independent variable in this research design?

An environmental engineer wants to examine the permeability of different soils to determine the best natural containment system to protect groundwater from pollutants. The engineer tests four different soil samples, places them into a wet column, and pours 50mL of water over each sample. The engineer records the total amount of water that moves through the column as well as the total amount of time for the water to fully percolate through the soil. The data from the study are shown below.

Sample	Flow Time	Total Volume of Water Recovered	Permeability of Soil Sample
1	2.7 seconds	48.5 mL	17.96 $\frac{\text{mL}}{\text{sec}}$
2	2.2 seconds	27.9 mL	12.68 $\frac{\text{mL}}{\text{sec}}$
3	15.8 seconds	14.7 mL	0.93 $\frac{\text{mL}}{\text{sec}}$
4	20.6 seconds	1.9 mL	0.09 $\frac{\text{mL}}{\text{sec}}$

- The flow time, which is related to the porosity of each sample, is the variable that is measured, so it is the independent variable.
- The total volume of water recovered is most likely to be affected by human error and is the variable with the largest range of values, so it is the independent variable.
- The sample of material chosen as the potential container material is the variable being tested, so it is the independent variable.
- The permeability of each soil sample, which is determined by dividing the total volume of water recovered by the flow time, is the variable that is calculated, so it is the independent variable.

**Bear Time Remediation: Soil Unit 5
Answer Section**

MULTIPLE CHOICE

1. ANS: A PTS: 1

2. ANS: C

The students are measuring the density of algae. This is the dependent variable.

PTS: 1

3. ANS: C PTS: 1

4. ANS: D PTS: 1

5. ANS: C PTS: 1