

BHS Grade 10 Experimental Design Common Assessment



Fall

Directions: Read the passage below. Then answer questions 1-8 using the information from the passage and your knowledge of Experimental Design.

Walter is studying heat transfer through the ground in various ecosystems. During his studies, Walter placed random amounts of sand (S), potting soil, (P), and a mixture of sand and soil (M) into separate containers of different sizes. In each of the containers he placed a thermometer so that the bulb of each thermometer was below the surface at different depths. He placed each of the 3 containers under identical heat lamps. He left the containers under the lamps between 50 and 60 minutes depending on when he remembered to check them. The original temperature of each container was 15°C. After heating the containers in three separate trials, the temperatures of the containers were listed below.

S = 28°C, 27°C, 26°C

P = 33°C, 29°C, 31°C

M = 29°C, 29°C, 22.5°C

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1. What is a possible problem statement/question for the experiment described above?
 2. Write a hypothesis for this scenario.
 3. Identify variables and control(s).
 4. Construct a data table for this collection of data. Include the mean and range.
 5. Graph the mean for this set of data.
 6. Write a conclusion for this scenario based on the data provided.
 7. Identify two experimental flaws.
 8. Redesign this experiment as necessary.

*Include illustrations and diagrams to support your answer if appropriate.

Spring

Directions: Read the passage below. Then answer questions 1-8 using the information from the passage and your knowledge of Experimental Design.

Alisha is studying heat transfer through the ground in various ecosystems. During her studies, Alisha worked with her friends around the world who placed thermometers so that the bulb of each thermometer was 5cm below the surface. Alisha and her friends checked the original temperatures and then between 50 and 60 minutes later depending on when they had the opportunity to check them. There were three trials in each ecosystem. The changes in temperature are shown below:

Ecosystem 1: 3.2°C, 2.9°C, 3.4°C

Ecosystem 2: 5.7°C, 9.9°C, 5.8°C

Ecosystem 3: -1.2°C, -2.0°C, -1.7°C

Ecosystem 4: 1.8°C, 1.1°C, 1.4°C

Ecosystem 5: 3.6°C, 3.7°C, 3.6°C

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1. What is a possible problem statement/question for the experiment described above?
 2. Write a hypothesis for this scenario.
 3. Identify variables and control(s).
 4. Construct a data table for this collection of data. Include the mean and range.
 5. Graph the mean for this set of data.
 6. Write a conclusion for this scenario based on the data provided.
 7. Identify two experimental flaws.
 8. Redesign this experiment as necessary.

*Include illustrations and diagrams to support your answer if appropriate.