MINDS ON SCIENCE

Let's Learn with Mrs Watts



The Scientific Method & Fair Tests

A **Scientific Question** is a question which has one correct answer that can be found by doing an investigation, experiment or test; the answer is based on facts, NOT opinion.

Q1. Which of the following are **scientific questions**? (Hint: There may be more than one correct answer)

A. Which one of the fashion models on the stage is wearing the most beautiful dress?
B. Which brand of insect spray keeps away mosquitos best?
C. Which flavour ice-cream is tastes the best?
D. Will plants produce more fruits if they are exposed to loud music?
E. Will cactus plants grow bigger if they are given less water?
F. Which type of soil will hold/retain the most water?

Q2. Which one of the following correctly defines the term **VARIABLE** in an experiment?

A. All the conditions in an experiment which can be changed
B. Those conditions in an experiment which are kept the same
C. The one condition in an experiment that is kept the same
D. The one condition in an experiment which is change

Q3. Which one of the following is the **correct definition** of a **FAIR TEST**?

A. An experiment in which only one condition is different and all the other conditions are kept the same
B. A situation where everyone gets the same amount
C. An experiment in which everything is kept the same
D. An experiment in which only one condition is different and one is the same

Q4. The four men shown in the picture below are being tested to find out which man is the fastest runner.

Drag and drop each of the blue boxes below and place them in the green table under the correct heading.



SAME (CONTROLLED VARIBALE)	DIFFERENT (INDEPENDENT VARIABLE)	MEASURED (DEPENDENT VARIABLE)

Runners

Type of footwear

Start time of the race

Time taken to finish

Surface of the track

Distance each person runs

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Q5. The image below shows the experiment set up by Grade 6 students to answer a scientific question.

Which of the following is the question they are trying to answer?



A. Which plant will produce the most flowers?

B. Does the amount of sunlight given affect the growth of the plant?

C. Does the amount of water given affect the growth of the plant?

D. Does the type of fertilizer given affect the growth of the plant?

E. Does the type of water given affect the growth of the plant?

Q6. Examine the image below of the experiment set up by Grade 6 students. Then drag and drop each of the blue boxes below and place them in the table **under the correct heading**.



	SAME (CONTROLLED VARIBALE)	DIFFERENT (INDEPENDENT VARIABLE)	MEASURED (DEPENDENT VARIABLE)
Growth of plant			
Amount of water			
Type of water			

Height of plant at start | Type of plant | Amount of sunlight

Instructions: Read the following passage and answer the questions that follow.

Jayden sat in the classroom waiting patiently for the rain to stop falling. After an hour, the rain stopped and Jayden walked outside to look at the playing field. He noticed that one section of the playing field was covered with large puddles of water, another part had no water at all at the surface and another part of the playing-field was moist and muddy but there were no water puddles. Jayden remembered that the rain was falling heavily all over the playing field and began to wonder why some parts of the field were flooded and other parts were not. He was determined to find out why this happened and began to think about designing an experiment/test to find the answer.

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Q7. Which of the following is the most reasonable **Scientific Question** that Jayden should ask?

A. Is the amount of water on the playing field affected by the brightness of the sunlight?
B. When will the field be dry enough to play football?
C. Will it rain again soon?
D. Is the amount of rainwater on the playing field affected by the type of soil?

Q8. Which one is a **science attitude** shown/demonstrated by Jayden?

A. Open Minded
B. Curious
C. Patient
D. Inventive
E. Humility

Q9. Select ALL the **science process skills** that Jayden will need to develop to become a great scientist? (Hint: There are five (5) correct responses, the others are science attitudes)

A. Persistence
B. Classifying
C. Predicting
D. Measuring
E. Communicating
F. Observing
G. Curiosity

Q10. The following is an experiment carried out by a group of students who followed the steps of the Scientific Method. They completed the experiment and below is their **Science Lab Report**.

SCIENTIFIC QUESTION: Which of the three soils will hold or retain the most water?

AIM: To find out which of the three soils will trap or hold the most water.

HYPOTHESIS: The student did some research and used their previous knowledge to form this hypothesis:-

The sandy soil will trap the most water because it is very dry and has large spaces between the sand grains that will absorb and trap the most water.

OBSERVATION/RESULTS: After doing the experiment, the student observed and recorded in a table the amount of water that drained from Soil A, Soil B and Soil C. (See below).



Soil Type	Amount of Water After 15 minutes
Soil A	68 ml
Soil B	25 ml
Soil C	42 ml

Examine the data presented in the table and the amount of water collected in each beaker and answer the following questions.

10a) Which soil has the highest water holding capacity? (ie. Trapped the most water)

A. Soil A
B. Soil B
C. Soil C

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Soil Type	Amount of Water After 15 minutes
Soil A	68 ml
Soil B	25 ml
Soil C	42 ml

Examine the data presented in the table and the amount of water collected in each beaker and answer the following questions.

10b) Which soil is most suitable for growing plants?

A. Soil A
B. Soil B
C. Soil C

10c) Which soil is most likely to be sand? _____

Which soil is most likely to be loam? _____

Which soil is most likely to be clay? _____

Was the student's hypothesis True or False? _____

10d) What should the student do after conducting the experiment once?

A. Select the best soil
B. Repeat the experiment a few more times
C. Share the findings with others
D. Wash and clean all the equipment

10e) If this experiment was a fair test, what are some of the conditions that should be kept the same?

A. The amount of water poured into each soil sample.
B. The wearing of protective glasses to conduct this experiment
C. The type of soil put in each pot
D. The amount of soil put in each pot
E. The colour of the pots used in this experiment
F. The amount of fertilizer put in each pot

10f) If this experiment was a **fair test**, which is the one condition that should be **different/changed** in this experiment?

A. The amount of water poured into each soil sample.
B. The wearing of protective glasses to conduct this experiment
C. The type of soil put in each pot
D. The amount of soil put in each pot
E. The colour of the pots used in this experiment
F. The amount of fertilizer put in each pot

====THE END===

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