

MEL Scholar Plants test

K-12

Scheme of Work • Plants and Photosynthesis

Assessment Focus • Scientific Method – Evaluation

First Name _____

Middle Name (s) _____

Last Name _____

Date of Birth Day _____ Month _____ Year _____

School Name _____


Instructions

Please read this carefully:

Questions and answers

You have **30 minutes** to complete this test.

Follow the instructions for each question.

 This pencil shows where you will need to put your answer.

For some questions you may need to draw an answer instead of writing one.

Do not write or draw over any barcodes or in the grey margins.

If you cannot do one of the questions, **go on to the next one**.

You can come back to it later, if you have time.

If you finish before the end, **go back and check your work**.

Marks

The number under each box at the side of the page tells you the maximum number of marks for each question.

Plants investigation

Students were asked to collect a few leaves from the nearest holly tree at the different heights. Below is a picture of their collection of leaves:



From the top

From the top

From the top

From the
bottom

From the
bottom

Q1

The students wrote the list of their predictions prior to the experiment. Scientists usually do this to prove if their estimations were right or wrong. Tick those predictions which matched their results.

The leaves will have different number of spines

The leaves from the top will have more spines than leaves from the bottom

All the leaves will be symmetric (have the same number of spines on both sides of the petiole)

There will be leaves without spines

The maximum number of spines on the leaf will be 10

2 marks

Q2 Based on your examination, write down conclusion from your data. How does the shape of leaves affect survival of the holly tree?

✍

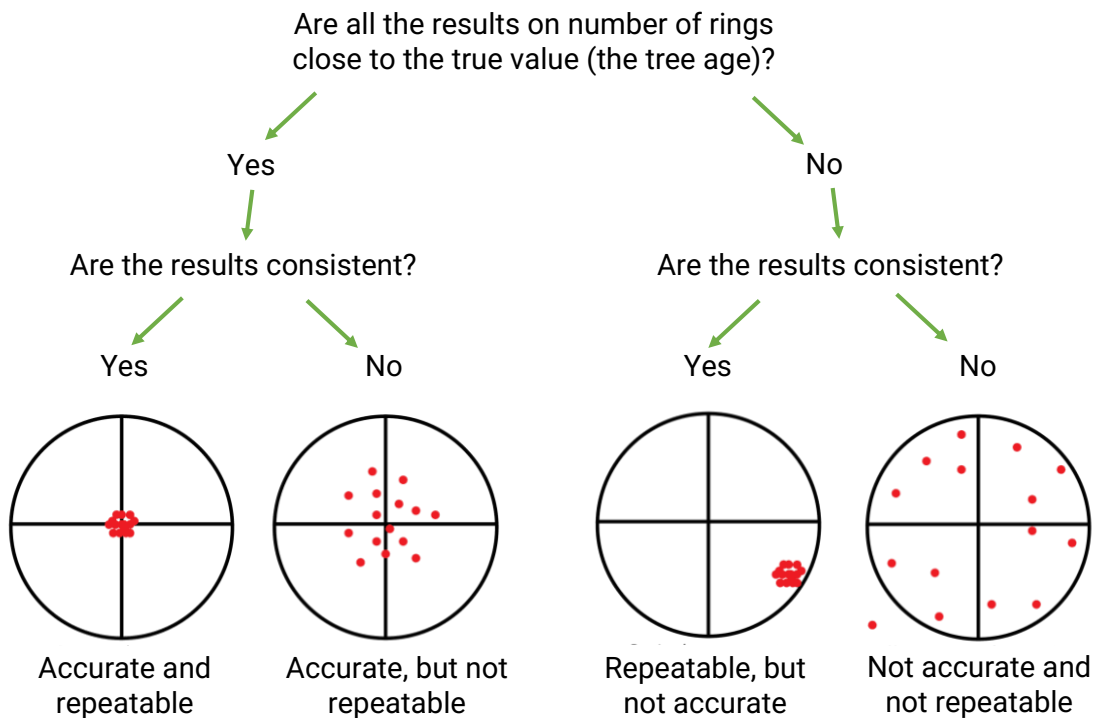
2 marks

Tree investigation

A set of data was received on the number of rings of each tree trunk of 30 years old trees which were grown at the same park. Below is a table with the results.

Tree	Tree 1	Tree 2	Tree 3	Tree 4	Tree 5
Number of rings	36	36	36	36	36

The algorithm below helps to check whether the valid results were collected.



Q3

Using the algorithm above, decide if the data you received was accurate and repeatable.



- Accurate and repeatable
- Accurate, but not repeatable
- Repeatable, but not accurate
- Not accurate and not repeatable

2 marks

Q4

Which of the variables were more likely not controlled?



- Trees origin
- The trees are more likely to be older than 30 years old
- The mass of each tree

3 marks

Herbicide investigation

Herbicides are chemicals used to control undesired plants.

An agricultural company tries their new herbicide on three different plants: 10 dandelion species, 10 creeping thistle species and 10 waterhemp species. The number of plants survived after herbicidation is presented in the table below.

Plant / Mass of herbicide	0 mg	5 mg	10 mg	50 mg
Dandelion	10/10	3/10	0/10	0/10
Creeping thistle	10/10	2/10	0/10	0/10
Waterhemp	10/10	3/10	8/10	0/10

Q5

Where did the misreadings occur?



In dandelion data

In creeping thistle data

In waterhemp data

1 mark

Q6

In the table below there is a list of reasons for possible errors in plants and herbicide data. Draw a line between an error reason and suggested way of data improvement.



The used herbicide was taken from different packages, which may vary.

Repeat the experiment with the same conditions to achieve consistent results and report about ineffectiveness of the herbicide.

The plants became resistant to the herbicide.

Redo the experiment with herbicide taken from one package.

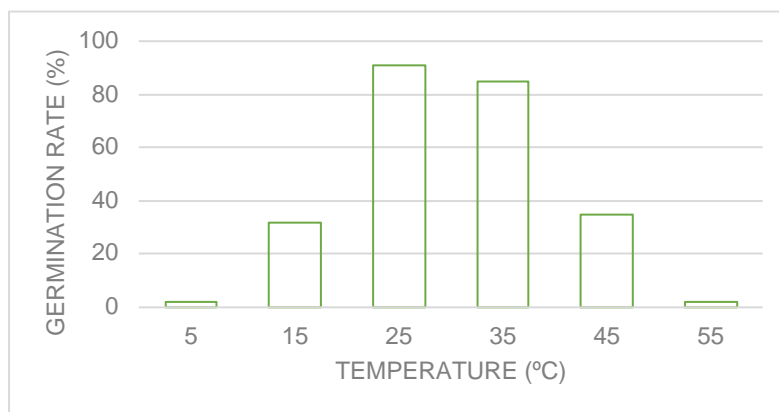
The mass of herbicide was not accurately controlled in all the samples.

Redo the experiment with mass control.

1 mark

Seeds investigation

Your teacher asks you to test how temperature affects basil seeds germination. Your seeds were germinated on a wet towel, and the temperature was controlled with a thermometer. You received a set of results, which is presented in the diagram below.



Q7

Which experiments could you plan in the nearest future that might generate a similar set of results? Give two examples for each variable.



Type of seeds

1. _____

2. _____

Conditions

1. _____

2. _____

Substrate type

1. _____

2. _____



2 marks