

Additional Assessment Materials Summer 2021

Pearson Edexcel GCE in AS Biology

Practical Skills and Maths – Paper 2

(Public release version)

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General guidance to Additional Assessment Materials for use in 2021

Context

- Additional Assessment Materials are being produced for GCSE, AS and A levels (with the exception of Art and Design).
- The Additional Assessment Materials presented in this booklet are an **optional** part of the range of evidence teachers may use when deciding on a candidate's grade.
- 2021 Additional Assessment Materials have been drawn from previous examination materials, namely past papers.
- Additional Assessment Materials have come from past papers both published (those materials available publicly) and unpublished (those currently under padlock to our centres) presented in a different format to allow teachers to adapt them for use with candidate.

Purpose

- The purpose of this resource to provide qualification-specific sets/groups of questions covering the knowledge, skills and understanding relevant to this Pearson qualification.
- This document should be used in conjunction with the mapping guidance which will map content and/or skills covered within each set of questions.
- These materials are only intended to support the summer 2021 series.

Antibiotics are widely used to treat infections.			
Some antibiotics are bactericidal.			
(c) Describe how you would use aseptic techniques to transfer bacterial cells growing on an agar plate to a tube containing a sterile broth.			
	(5)		

Insects such as locusts do not breathe through the mouth.

The gas exchange system of a locust includes air sacs, tracheae and tracheoles.

(b) A student investigated the effect of different gases on the breathing rate of a locust. The student blew exhaled air over a locust in a syringe and recorded its breathing rate. The locust was immediately given pure oxygen and the breathing rate was recorded. The table shows the results of this investigation.

Treatment	Breathing rate / breaths min ⁻¹			
Exhaled air	56			
Pure oxygen	3			

The student concluded that carbon dioxide increased the breathing rate of the locust.

Comment on how the limitations of this method affect the validity of this conclusion.

(5)

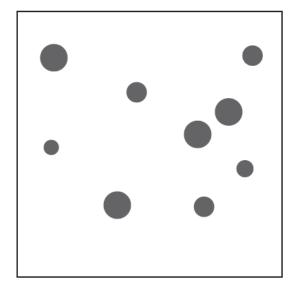
The drawing shows a plant called white clover, Trifolium repens.



A student used a 50 cm \times 50 cm quadrat to compare the abundance of white clover in a trampled area of grassland and an untrampled area of grassland.

Each area measured 90 m \times 45 m.

The diagram shows the distribution of white clover plants in one quadrat from the area of trampled grassland. Each circle represents one clover plant.

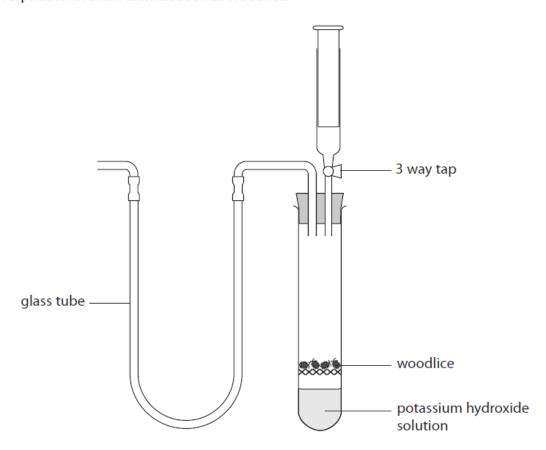


(a) (i) Use the results from this quadrat to calculate the total number of white clover plants present in the area of trampled grassland.

(2)

(ii) The student used the same method to calculate the total number of white clover plants in the area of untrampled grassland.	
The student decided that the calculated values were not accurate.	
Explain how you would modify the method to obtain more accurate results.	(3)
(b) The student investigated the effect of one abiotic factor on the abundance of white clover plants.	
(i) Name one abiotic factor, other than soil water content, that could affect the abundance of white clover plants in these areas.	(1)
	(1)
abundance of white clover plants in these areas.	
abundance of white clover plants in these areas.	
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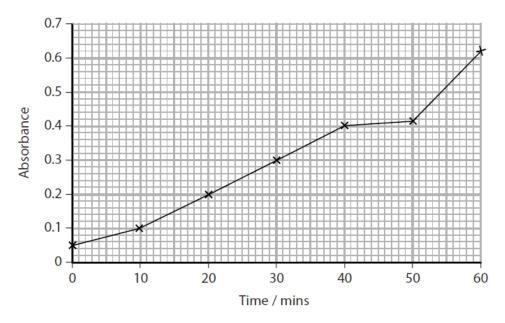
The diagram shows some apparatus that can be used to measure the rate of respiration in small animals such as woodlice.



Discuss how you would modify this apparatusions have a significant effect on the rate of an	s and use it to find out if fluoride naerobic respiration in yeast.	(9)

- (a) A student investigated the effect of ethanol on plant cell membranes.
 - **Step 1:** The student cut leaf discs from leaves, using a cork borer.
 - **Step 2:** These leaf discs were then added to a boiling tube containing 10 cm³ of 40% ethanol solution. The pigments in the leaf discs dissolved in the ethanol, producing a green solution.
 - **Step 3:** The boiling tube was shaken and the amount of red light absorbed by this solution (absorbance) was measured at the start.
 - **Step 4:** The absorbance was measured every 10 minutes, for an hour.

The graph shows the results of this investigation.



(i) Explain why red light was used in this investigation.

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(2)

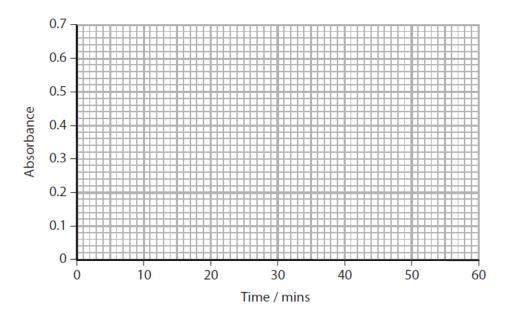
(ii)	Explain	the	absorbance	value at	0	minutes.
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(2)

(b) The student also carried out a control, using water instead of 40% ethanol.

Draw a line on the graph to show the results for this control.

(2)



(c)	(c) The student then investigated the effect of ethanol concentration on leaves from different plant species.					
	Justify the modifications to the procedure in part (a) that will be required to obtain valid data.					
		(5)				

Devise an experiment, which uses changes in mass, to compare the water				
potential of carrot tissue with the water potential of potato tissue.	(5)			
	(3)			