

A-Level Edexcel

BIOLOGY

UNIT 2(IAL)
2015 – 2019

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Answers

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1 - (BI0-S 2015-Unit 2(IAL)-Q3) - *Molecules, Transport and Health*

Packaging materials can be made from plastics produced from oil or bioplastics. Bioplastics are made from either starch or cellulose.

(a) Starch and cellulose are both polysaccharides found in plants.

(i) The table below lists features of polysaccharides.

Complete the table by placing a cross in the appropriate box (☒) to indicate if each feature is present in cellulose, starch or both.

(4)

Feature	Cellulose only	Starch only	Both starch and cellulose
Polymer of α -glucose	☒	☒	☒
Polymer of β -glucose	☒	☒	☒
Contains 1,4-glycosidic bonds	☒	☒	☒
Contains 1,6-glycosidic bonds	☒	☒	☒

(ii) Describe how the structure of starch is related to its function in plants.

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(b) The photograph below shows a bioplastic wrapper made from starch.



Suggest the advantages of using bioplastic wrappers instead of plastic wrappers made from oil.

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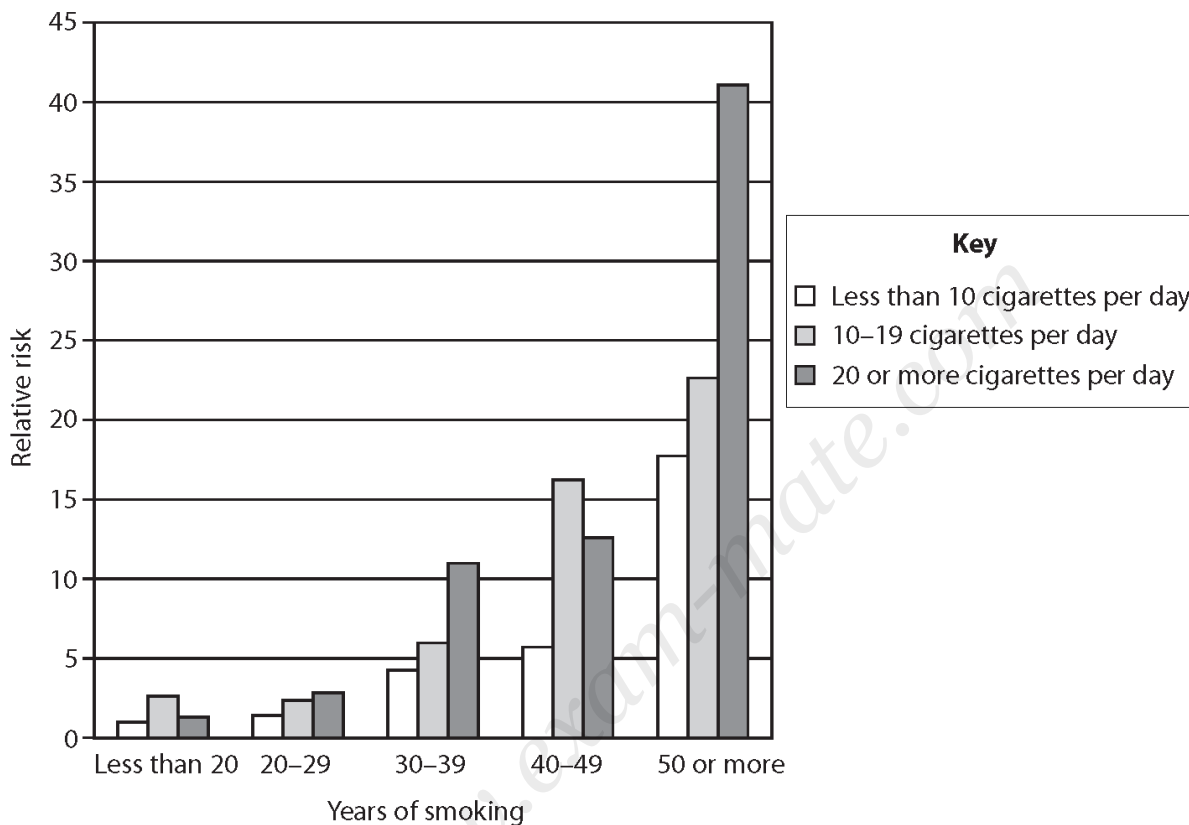
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2 - (BI0-W 2015-Unit 2(IAL)-Q8) - Molecules, Transport and Health, Cell Structure, Reproduction and Development

Smoking cigarettes increases the risk of developing lung cancer.

The graph below shows the relative risk of developing lung cancer in people who have smoked for different numbers of years.

The relative risk is how many times more likely a person is of developing lung cancer than a non-smoker.



(a) Using the information in the graph, describe the effect that smoking has on the relative risk of developing lung cancer.

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(b) It has been reported that the relative risk of developing lung cancer is doubled if a person has a close family member who has developed lung cancer.

Explain what this suggests about the causes of lung cancer.

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(c) Identical twins can provide evidence for the relative effects of the factors that affect a phenotype.

Identical twins develop from one fertilised egg.

(i) Explain why studies of identical twins can provide evidence for the relative effects of the factors that affect a phenotype.

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(ii) Non-identical twins are produced from the fertilisation of two eggs.

Concordance is the probability that each twin will have the same characteristic if it is present in one of the twins.

The table below shows the concordance of lung cancer in identical and non-identical twins.

Type of twin	Concordance of lung cancer (%)
Identical	20
Non-identical	11

Using information in the table, comment on the relative contributions of genotype and the environment to the probability of developing lung cancer.

(4)

3 - (BI0-S 2018-Unit 2(IAL)-Q7) - Molecules, Transport and Health

Bioplastics can be made from the polysaccharides starch and cellulose. These can be used to replace plastics derived from oil.

(a) The table below shows some features of starch and cellulose.

For each feature, put **one** cross in the appropriate box in each row, to show whether the feature is found in starch only, cellulose only, both starch and cellulose or in neither.

(4)

Feature	Starch only	Cellulose only	Both starch and cellulose	Found in neither starch nor cellulose
consists of two different polysaccharides	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
made from β glucose	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1,4-glycosidic bonds present	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
hydrogen bonds between molecules	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

(b) Explain the advantages of using bioplastics compared with using plastics derived from oil.

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(c) A study was carried out into the effect of adding cellulose to a starch-based plastic.

The tensile strength of the plastic was measured.

The table below shows the results of this study.

Starch : cellulose ratio	Mean tensile strength / MPa	Standard deviation / MPa
100:0	10.0	± 0.5
100:2.5	13.9	± 0.9
100:5	14.0	± 1.5
100:10	26.8	± 0.8
100:15	26.0	± 1.2

(i) Using the data in the table, describe the results of this study.

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(ii) Describe an investigation that could be carried out to confirm these results.

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