Spring Term 1

B15 -Genetics and evolution

&

B16 Adaptations, interdependence, and competition.

Aiming for Grade 4

Extended Homework Assignment

Name: _____

Set: _____

Instructions

A printed copy should be handed into your teacher.

The knowledge required to complete this assignment will be supported in class in lessons of the half term.

Aiming for Grade 4

Aims

The aim of this homework is to help you revise the main topics in B15, Genetics and evolution and B16 Adaptations, interdependence, and competition.

Learning outcomes

After completing this homework, you should be able to:

- state different theories of evolution
- state some causes of extinction
- describe how antibiotic resistance develops in bacteria.
- state some abiotic and biotic factors
- calculate population size
- state some things that animals and plants compete for
- state adaptations of animals and plants to their environment.

B15 Genetics and evolution

Task

There are three tasks to complete. Each task will help you to revise different material from Chapter B15, *Genetics and evolution*.

Task 1 – Fossils and extinction

You will be answering questions on fossils and extinction.

Task 2 – Antibiotic resistance

You will be drawing a flowchart to describe how antibiotic resistance develops in bacteria, and stating some ways to avoid antibiotic resistance developing.

1 Fossils and extinction

Answer these questions about fossils and extinction after you have been taught about them.

a What conditions are needed for fossils to form?

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b Give one reason why we do not have a complete fossil record.

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c Research and write down as many reasons as you can think of why species might become extinct.

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2 Antibiotic resistance

a Cut out these statements about the development of resistance to antibiotics in bacteria.

Stick them in the correct order. (you can also copy them out if you wish)

Add pictures to go with the statements

resistant strains survive and reproduce
bacteria mutate and produce new strains
resistant strain will spread
some strains are resistant to antibiotics and are not killed
population of resistant strain increases due to natural selection

b i Write down ways we can avoid the development of antibiotic resistant bacteria.

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ii Write down ways we can reduce the spread of antibiotic resistant bacteria such as MRSA (Methicillin-resistant *Staphylococcus aureus*).

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B16 Adaptations, interdependence, and competition

Questions:

Task 1 – Abiotic and biotic factors

Cut out (or copy) the following factors. Sort them into abiotic factors and biotic factors.

availability of food	interspecific competition
availability of oxygen / carbon dioxide	light intensity
mineral content of soil	moisture levels
presence of pathogens	new predators
pH	temperature
wind intensity	

Cover your answers. Write down all the abiotic factors you can remember. Repeat with biotic factors.

Task 2 – Estimating population size

Ruby wanted to find the number of dandelions in her garden. She took 10 quadrat samples. The quadrat size was 1 m^2. Her garden was 250 m^2. The table shows her results.

Quadrat number	1	2	3	4	5	6	7	8	9	10
Number of dandelions	6	0	2	1	7	0	3	2	0	9

Estimate the total number of dandelions in Ruby's garden by answering these questions:

1 Calculate the mean number of dandelions per 1 m^2 by adding together the number of dandelions in each quadrat, and then dividing by the number of quadrats.

2 Multiply the mean number of dandelions per 1 m^2 by 250 to give an estimate of the number of dandelions in the whole garden.

3 Suggest why the actual number of dandelions will be different than your answer to question **2**.

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4 Can you suggest ways to make your estimate more accurate?

Task 3 – Competition

Cut out and sort (or copy) these into factors that **animals** compete for and factors that **plants** compete for.

food	light	mates
nutrients	space	territory
water		

Task 4 – Adaptations of animals and plants

Look at the photos of a camel, a polar bear, and a cactus.

Write down as many adaptations to their environment that you can think of.

Task 5 – Adaptations of teeth to diet

Look at the skulls / photos of teeth. Remember that herbivores are plant eaters that have flat teeth for grinding. Carnivores are meat eaters that have pointed teeth for tearing meat.

Sort the skulls into which ones you think are herbivores and carnivores. Give reasons for your decisions.

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