

Name:

Edexcel Style

Combined Science GCSE

Ecosystems and Material Cycle Test

(Levels 4–9)

Date:

Time Allowed: 50mins

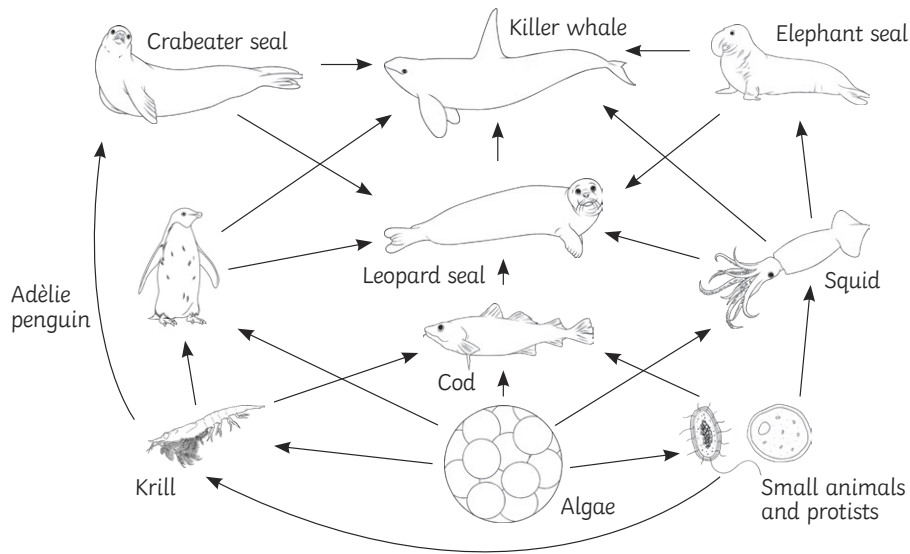
Question	Links to Student Progress Sheet	Score	Total Marks Available
1	9.2a, b, 9.3, 9.4		6
2	9.5, 9.6		6
3	9.9a, b, c		14
4	9.12, 9.13		5
5	9.14a, b		12
6	9.12, 9.15		7
Total	Topic 9		50

Score	Estimated Grade
47 – 50	9
40 – 46	8
33 – 39	7
28 – 32	6
24 – 27	5
20 – 23	4
0 – 19	U

Please be aware that these grade boundaries are Twinkl's own, and may not be in-line with Edexcel's own.

Area for Improvement:

1. (a) The diagram below shows the feeding relationships of organisms within a marine environment.



Draw a single food chain from the food web above.

(2)

- (b) Tuna fish is introduced into the ecosystem. It feeds on krill and animal and plant plankton. What is meant by the term 'ecosystem'?

(1)

- (c) Tuna fish feed on krill and animal and plant plankton. Describe the effect this have on cod.

(2)

- (d) A tapeworm is a type of organisms that can live inside a person's intestinal system. It gains it's nutrition from the person, known as a host.

What name is given to the relationship between the worm and the human?

(1)

☐ mutualism

☐ parasitism

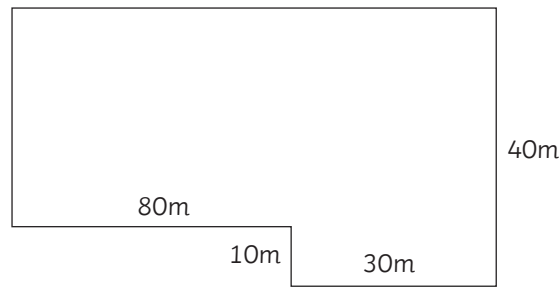
☐ predation

☐ competition

(Total for Question 1 = 6 marks)

2. Some students are estimating the number of daisies on the school field. They are using 1m^2 quadrats.

A map of the school field is shown below.



- (a) Which method of placing the quadrats should the students use?

(1)

- ☐ Place the quadrats where there is large range of different plants.
- ☐ Place the quadrats only where the daisies are present.
- ☐ Place the quadrats randomly in different sample areas.

- (b) Which method of placing the quadrats should the students use?

Quadrat	Number of daisies
1	12
2	16
3	10
4	6
5	15
6	18
7	14
8	11
9	9
10	17

Calculate the mean average number of daisies.

(2)

Mean number of daisies =

- (c) A second group of students repeated the investigation. They calculated a mean average of 13.1.

Estimate the number of daisies in the whole school field using their average.

Use the school map and the equation below.

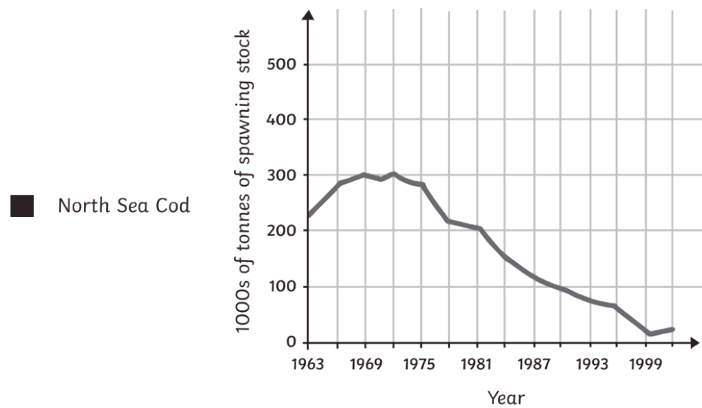
Estimated number of daisies = average daisies per quadrat $\times$ number of quadrats that cover the school field

(3)

Estimated number of daisies =

(Total for Question 2 = 6 marks)

3. Fish make up approximately 15% of the average human diet. Most fish are caught from the wild. The graph below shows the number of cod in the North Sea.



- (a) Describe the trend in the graph.

(1)

- (b) Explain the trend in the graph you have identified in question 3a.

(2)

- (c) In the 1930's, Australian sugar cane farmers were struggling with beetles which were eating their crops. Scientists introduced a non-indigenous species of cane toad, which was known to eat the beetles.

In 1935, 102 toads were introduced to predate on the beetles and control their populations to protect the farmer's crops.

Today the estimated 1.5 billion population of cane toads are regarded a pest in Australia, and have had an impact on the native species in the country.

Describe the effect that introducing non-indigenous species can have on the ecosystem. You should state one advantage and one disadvantage.

(2)

- (d) Fish farming is an alternative method of providing fish for human consumption. The fish are kept in large controlled tanks, rather than being caught from the wild. Evaluate the use of fish farms. You should present a balanced answer.

(4)

- (e) Describe how the use of fertilisers leads to eutrophication.

(5)

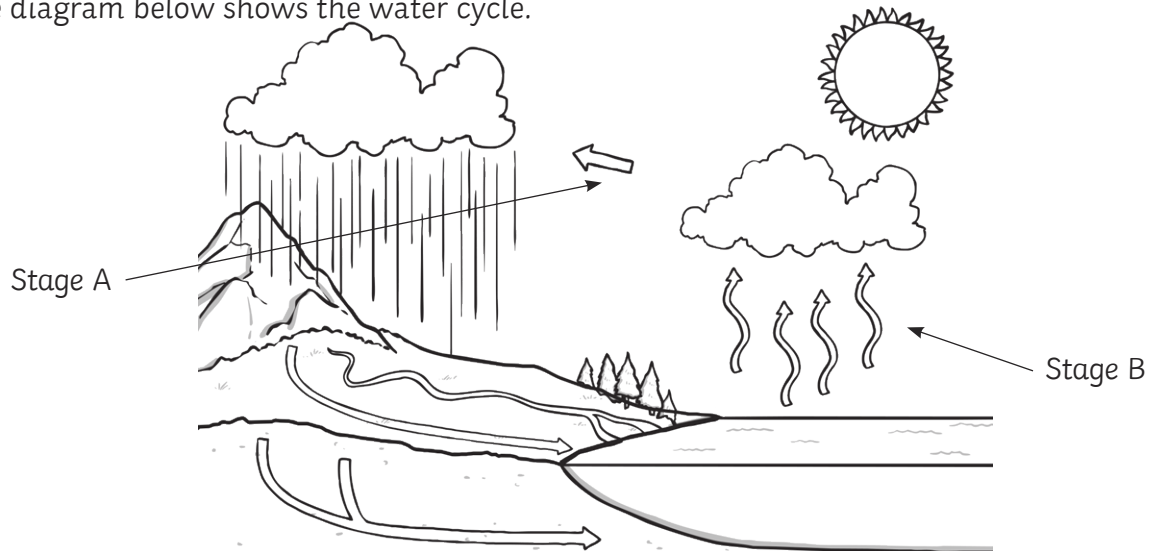
(Total for Question 3 = 14 marks)

4. (a) Describe how carbon is cycled through the environment include details of any compounds it forms.

(5)

(Total for Question 4 = 5 marks)

5. The diagram below shows the water cycle.



(a) What is happening at stage A?

☐

(1)

☐ precipitation

☐ evaporation

☐ condensation

transpiration

(b) What is happening at stage B?

☐

(1)

☐ precipitation

☐ evaporation

☐ condensation

transpiration

(c) What is potable water?

(1)

(d) Explain why access to potable water is important for life.

(2)

- (e) The paragraph below explains how potable water can be obtained by desalination.
Complete the sentences below by choosing the correct words from the box.

crystallised	boiled	condensed	distillation
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(3)

_____ can be used to obtain pure water seawater.

First the seawater is _____, to produce a vapour.

This is then cooled and _____, leaving the salt behind.

- (f) One problem of using desalination as a source of potable water is that it is expensive.
Tick two other disadvantages.

☐

☐ It increases the use of fossil fuels.

☐ It depletes the sea water, causing levels to drop.

☐ It increases CO₂ emissions which contribute to global warming.

The water obtained is not sterile.

(2)

- (g) Explain a method to test for pure water.

(2)

(Total for Question 5 = 12 marks)

6. (a) What percent of the air in the earth's atmosphere is nitrogen gas?

☐

(1)

☐ 0.04%

☐ 1%

☐ 21%

78%

(b) How do plants use nitrogen?

(1)

(c) Nitrogen is converted between different compounds by bacteria.

Match each type of bacteria with the compounds it converts by drawing a straight line between each pair of answers.

Nitrogen fixing bacteria

Nitrates into nitrogen gas

(3)

Nitrifying bacteria

Ammonia into nitrates

Denitrifying bacteria

Nitrogen gas into ammonia

(d) Describe two ways decomposers put nitrogen compounds into the soil.

(2)

(Total for Question 6 = 7 marks)

TOTAL FOR PAPER = 50 MARKS