National 5

Unit 3

Life on earth

Ink exercise 5

Human impact on the environment

Once completed and marked-

Think about and list below the areas I need to work on:

Multiple choice

Tick one answer from each question.

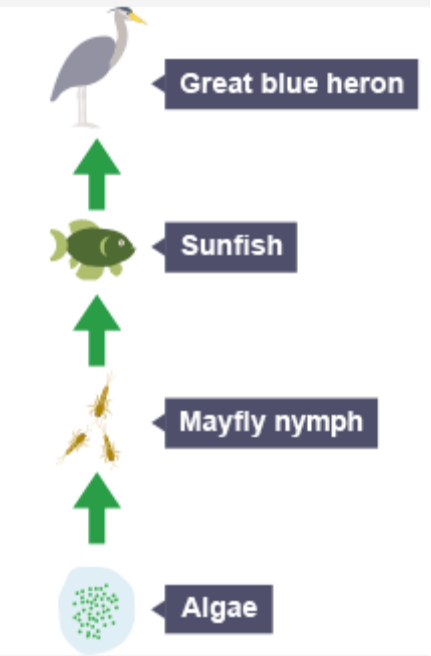
1. Which term describes the loss of fertiliser chemicals as water moves through soil?
    a) Leaching
    b) Denitrification
    c) Accumulation

2. What effect can leached fertiliser have on fresh water?
    a) Increased nutrient concentration
    b) Increased pH
    c) Increased oxygen concentration

3. What can cause algal blooms?
    a) A decrease in the populations of consumers in a lake
    b) A reduction in the oxygen concentration of a lake
    c) An increase in the concentration of dissolved nutrients in a lake

4. Weeds compete with crop plants for nutrients, water and light. How can farmers reduce this competition for resources?
    a) By using fertilisers
    b) By using pesticides
    c) By using indicator species

5. A pesticide accumulates in the bodies of organisms in the food chain shown below.



In which organism will the highest concentration of the pesticide be found?

a) Algae
b) Great blue heron
c) Sunfish

6. What happens to the toxicity of a pesticide in the bodies of organisms at higher levels in a food chain?

a) Stays the same
b) Decreases
c) Increases

7. What information does the presence or absence of an indicator species provide about an environment?

a) How much biodiversity is present
b) How much competition is present
c) How much pollution is present

8. Which term describes an organism of one species that can be used to reduce the population size of another species?
    a) Indicator species
    b) Pest species
    c) Biological control agent

9. Which chemical must be inserted into a crop plant to genetically modify it?
    a) Nitrate
    b) DNA
    c) Protein

10. Which of the following characteristics of a genetically modified crop plant would reduce the need to give it large quantities of fertiliser?
    a) Increased ability to take up carbon dioxide from the air
    b) Increased ability to take up nitrates from the soil
    c) Increased ability to take up water from the soil

11. Six conical flasks were set up to investigate the effect fertilisers had on the growth of algae found in a pond.

A single sample of pond water was collected. The pond water was shaken and then each flask had the same volume of pond water added.

Each flask had a different volume of fertiliser added. The volumes added are shown in the table below.

Flask	Volume of fertiliser added (cm^3)	Dry weight of algae produced (g)
1	0	0.05
2	0.5	0.10
3	1.0	0.18
4	1.5	0.20
5	2.0	0.34
6	4.0	0.34

a) State the variable that was investigated in this experiment.

_____ (1)

b) Give two variables that would have to have been kept constant to make this a valid experiment.

_____

_____ (1)

c) Suggest how the reliability of the experiment could have been improved.

_____ (1)

d) Suggest why the pond water was shaken before being added to the flasks.

_____ (1)

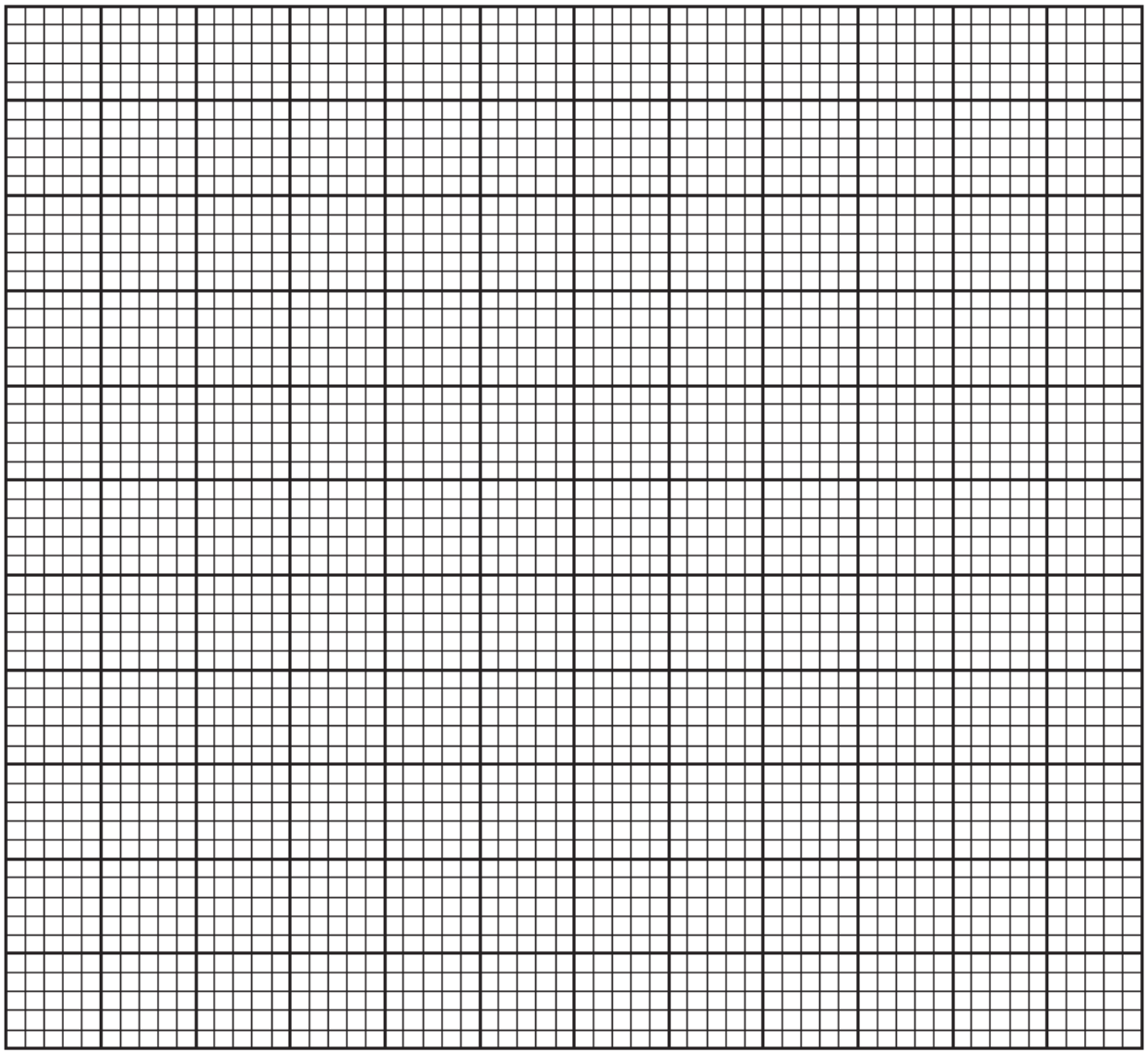
e) Suggest why the flasks were left on a warm, sunny window ledge.

_____ (1)

f) Explain why one flask had no fertiliser added.

_____ (1)

g) Draw a line graph to show the relationship between the volume of fertiliser added and the dry weight of algae produced. (5)



h) Describe the relationship between the volume of fertiliser added and the dry weight of algae.

_____

_____

_____ (1)

i) Explain why the dry weight of algae may have levelled off at concentrations above 2g.

_____

_____

_____ (1)

j) State how many times higher the dry weight of algae produced at 1.5cm^3 of fertiliser added was than the control.

(1)

k) Suggest why the dry weight of algae was used to compare the results rather than the fresh mass. (1)

_____

_____

12. The table below shows the average levels of DDT in human body fat of people living in the United States during the period 1942 – 1982

Year	DDT level in human body fat (mg/g fat)
1942	0
1950	5.3
1956	10.6
1962	12.6
1963	10.3
1968	12.5
1970	11.6
1972	9.2
1974	6.7
1976	5.5
1978	4.8
1980	0
1982	0

a) Suggest a reason for the lack of DDT in human body fat in 1942

_____

_____

_____ (1)

b) State the number of years it took for the DDT level in human body fat to double after it was first detected.

_____

_____ (1)

c) Suggest a reason for the lack of DDT from 1980 onwards.

_____

_____

_____ (1)

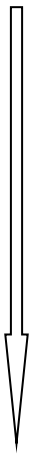
d) DDT is an insecticide. Suggest a reason why it might have been found in human body fat.

_____

_____

_____ (1)

13. The table below gives a summary of the species that indicate the varying oxygen concentrations found in a river polluted with organic waste.

Indicator species present	Oxygen concentration of water	Level of water pollution
Mayfly nymph Stonefly nymph	High	Absent or very low
Fresh water shrimp Caddis fly larva		Low/medium
Bloodworm Waterlouse		High
Rat tailed maggot Sludgeworm	Low	Very high
No animals present		Extreme

a) Explain what is meant by the term 'indicator species'

_____

_____(1)

b) What does the presence of a large population of Bloodworm and Mayfly nymph indicate about the oxygen concentration of a river's water?

(i) Bloodworm

_____(1)

(ii) Mayfly nymph

_____ (1)

30 marks