



**General Certificate of Education**

**20XX**

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**Agriculture and Land Use**

**Unit 1 Soils, Crops & Habitats**

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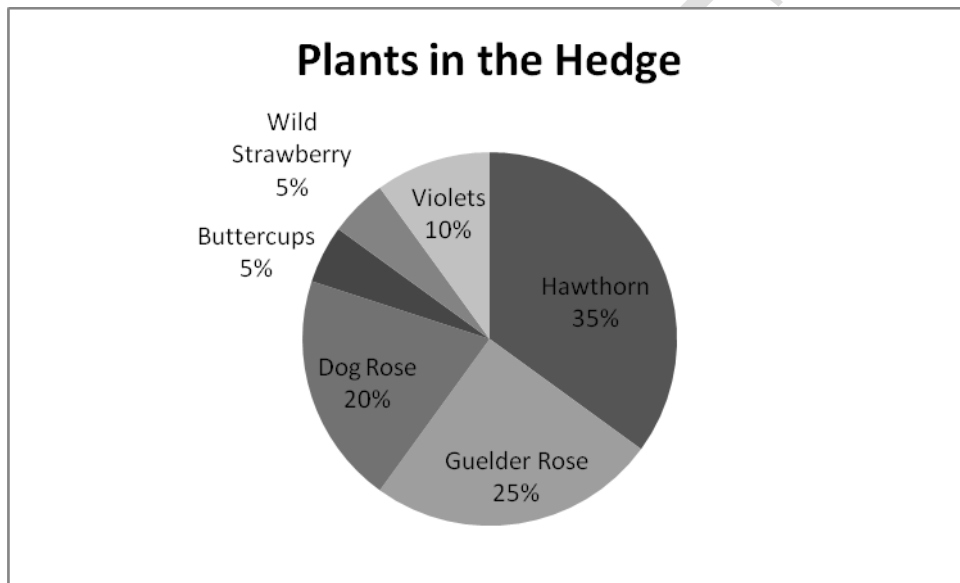
DRAFT

## Unit 1 Soil, Crops & Habitats

### Time 1 hr 15 mins

Please answer **all** questions

1(a) The fields on a farm are surrounded by hedges to keep animals in the field and to protect crops. Fig 1.1 below shows a pie chart highlighting some of the plants in a hedge.



Use the information in the pie chart to answer the following questions;

(i) Which plant makes up the major part of the hedge?

.....[1]

(ii) Which type of rose is present in the greatest amount?

.....[1]

(iii) Calculate the total percentage of Violets and Buttercups in the hedge plants?

.....[1]

(iv) Name one other type of plant species which you might find in a typical hedge in Northern Ireland

.....[1]

(b) Draw a line to match each species in group A with its preferred habitat from group B. The first one has been done for you.

Group A

Group B

Bluebells

Curlew

White Clover

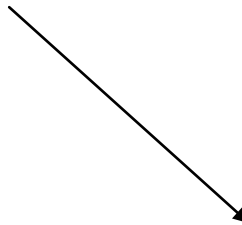
Gorse

Grassland

Forest floor

Wetland area

Dry areas

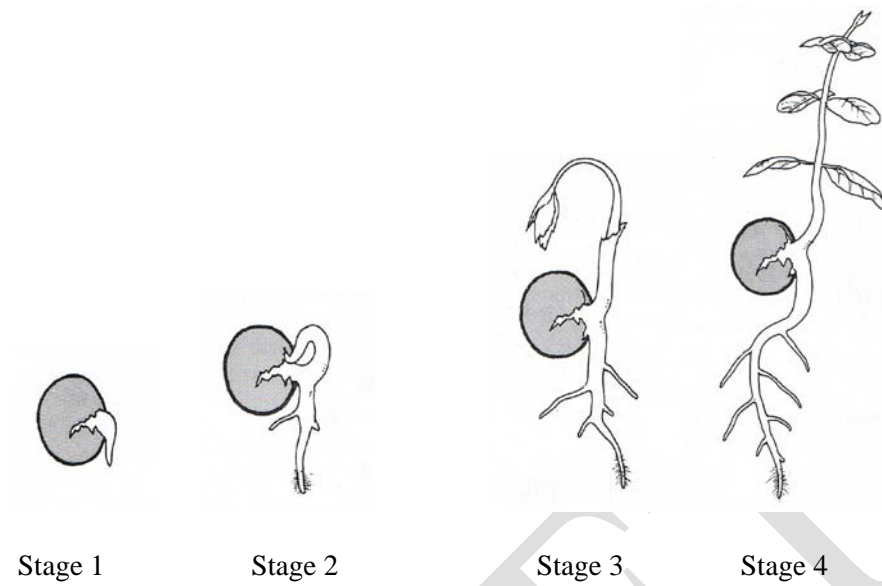


[3]

[7]

DRAFT

2 The diagrams below show the different stages in the germination of a pea seed.



Describe what is happening at each stage. Include the following words in your answers:

**radicle, plumule, root hairs, cotyledon**

Stage 1

.....  
 .....  
 ..... [2]

Stage 2

.....  
 .....  
 ..... [2]

Stage 3

.....  
 .....  
 ..... [2]

Stage 4

.....  
 .....  
 ..... [2]

[8]

3 (a) Figure 3.1 shows a picture of a fertilizer bag.



Fig 3.1

(i) The fertilizer contains 3 essential elements needed for healthy plant growth; Nitrogen is one of the elements, what are the other two?

..... [2]

(ii) Choose one of the three elements and explain why it so important to plants.

.....  
.....  
..... [2]

(iii) What do the numbers 5-10-5 represent?

.....  
.....  
..... [2]

[6]

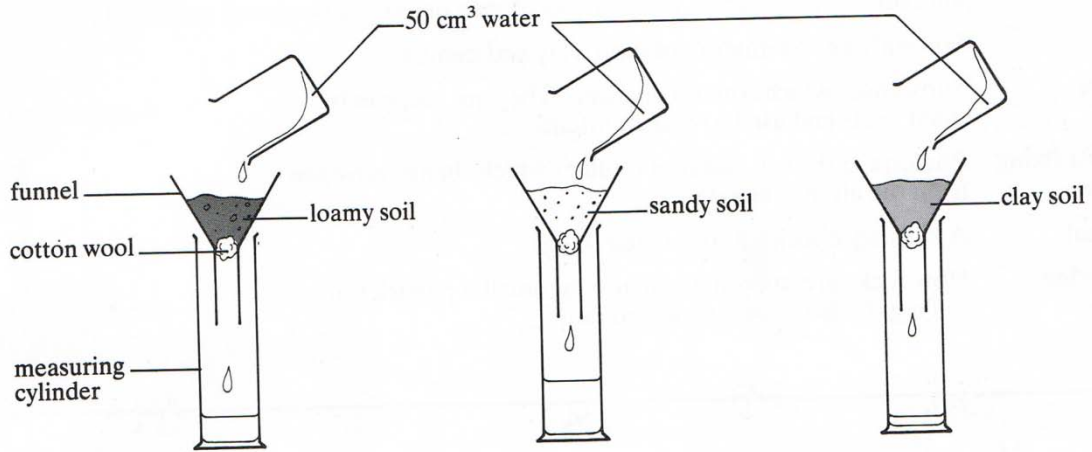


Fig 4.1

Fig 4.1 shows an experiment carried out by some pupils to measure drainage in three different soil samples. They added the same amount of water to the three soil types and displayed their results in the table below.

	<b>LOAMY SOIL</b>	<b>SANDY SOIL</b>	<b>CLAY SOIL</b>
Time taken for first drop of water to fall into measuring cylinder	68 seconds	12 seconds	311 seconds
Volume of water passed through in one hour	28 cm <sup>3</sup>	42 cm <sup>3</sup>	8 cm <sup>3</sup>

(a) Which soil has the fastest drainage?

..... [1]

(b) Explain why the volume of water that passed through each type of soil was different? You should make reference to particle size in your answer

.....  
 .....  
 .....  
 ..... [3]

(c) Suggest what a farmer might add to sandy soil to help it retain water? Give a reason for your answer.

.....  
.....  
..... [2]

[6]

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5 (a) Fig 5.1 and fig 5.2 below show an experiment on photosynthesis.  
 The test-tube in fig 5.1 was kept in the light while the test-tube in fig 5.2 was kept in the dark.

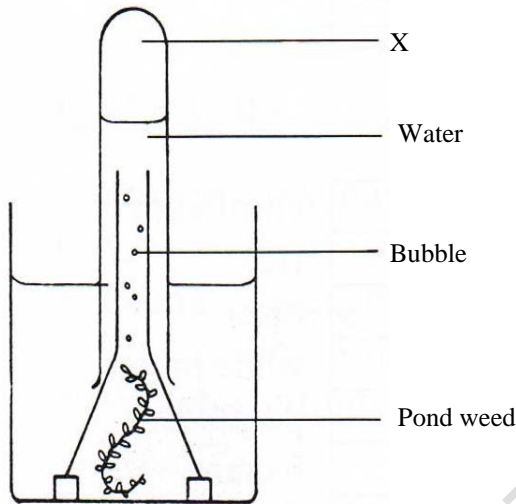


Fig 5.1

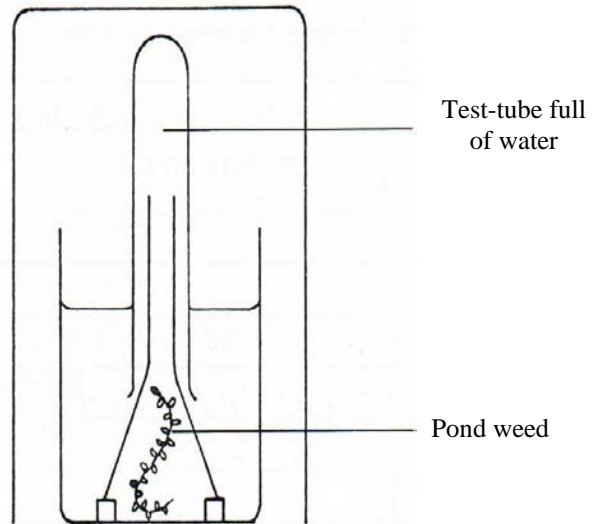


Fig 5.2

(i) What is the name of the gas marked X in fig.5.1?

Gas X = ..... [1]

(ii) Where did the bubbles come from in the test tube in Fig 5.1

..... [1]

(iii) Explain why the test tube in fig. 5.2 was full of water at the end of the experiment and give a reason for your answer

.....  
 .....  
 .....  
 ..... [2]

(b) Complete the word equation for photosynthesis by filling in the spaces below.

..... + **water** = ..... + ..... [3]

(c) The sun is a primary source of energy. Explain why sunlight is essential to maintain life on earth.

.....  
.....  
..... [2]

[9]

DRAFT

- 6 (a) Find a meaning in group B that best explains each word in group A below.  
Place a circle around your answer

The first one is done for you

**Group A**

- |                |                      |     |
|----------------|----------------------|-----|
| 1. pH          | a b c d e f <b>g</b> |     |
| 2. Biomass     | a b c d e f g        | [1] |
| 3. Biennial    | a b c d e f g        | [1] |
| 4. Hydroponics | a b c d e f g        | [1] |
| 5. G.M         | a b c d e f g        | [1] |
| 6. Deciduous   | a b c d e f g        | [1] |
| 7. Annual      | a b c d e f g        | [1] |

**Group B**

- a A plant which completes its life cycle in one year.
- b A plant which loses its leaves in winter.
- c A plant the DNA of which has been changed.
- d Plant matter used as a fuel.
- e A plant which completes its life cycle in two years.
- f Growing plants without soil.
- g A measure of acidity

[6]

(b)



The photograph above shows vegetables which have been grown organically. Describe four conditions necessary for organic farming.

.....

.....

.....

.....

.....

..... [4]

[10]

7 The picture below shows an Irish Hare. This animal is a priority species for Northern Ireland.



(a) Explain what is meant by a ‘priority species’

.....  
.....  
..... [2]

(b) Name **one** other priority species

..... [1]

(c) The list below shows two things that a farmer can do to reduce the impact on ecosystems and improve biodiversity.

- (a) Prevent soil erosion
- (b) Reduce reliance on chemicals

Discuss **two** environmental benefits to be gained from each approach

(a).....  
.....  
.....  
(b).....  
.....  
..... [4]

[7]





## Mark Scheme Unit 1 Soils, Crops & Habitats

### Questions

- Q1** (a) (i) Hawthorn [1]  
(ii) Guelder rose [1]  
(iii) 15% [1]  
(iv) one mark for any of hazel, holly, rowan, oak, cherry [1]
- [4]

- (b) Curlew ----- Wetland area [1]  
White Clover -----Grassland [1]  
Gorse -----Dry areas [1]
- [3]

**Total Marks [7]**

- Q2** (a) One mark for correct use of words, one mark for description

Stage 1 Seed absorbs water, seed coat bursts and new root (radicle) emerges [1]

Stage 2 root grows down, root hairs help anchor plant into the soil and also absorb minerals and water [1]

Stage 3 plumule (new shoot) grows up using energy absorbed from cotyledon [1]

Stage 4 Seedling produces green leaves which begin photosynthesis to make food for plant [1]

**Total Marks [8]**

- Q3** (i) Potassium [1]  
Phosphorus [1]
- [2]

- (ii) Phosphorus – essential for seed germination [1] and root development [1]  
Potassium – promotes flower and fruit production [1], helps resist disease [2]

- (iii) the proportions/percentages of N,P,K present in the fertilizer [2]

**Total Marks [6]**

- Q4** (a) Sandy soil [1] [1]  
 (b) The amount of water passing through depends on the drainage capability of the soil/ different soils hold or lose water in different ways [1]  
 Any two from below;  
 The greater the volume of water the higher the drainage or vice versa [1]  
 Clay soil, very small particles, water does not drain as easily [1]  
 Sandy soil, very large particles, water drains quickly and in greater volume [1]  
 Loamy soil, in between particle size [1]  
 [3]  
 (c) Clay [1], will reduce spaces between particles and slow drainage [1] [2]

**Total Marks [6]**

- Q5** (a) (i) Oxygen [1]  
 (ii) the pondweed [1]  
 (iii) No photosynthesis, no light because of darkness [1]  
 No gas produced [1] [2]  
 (b) Carbon Dioxide [1], Sugar/food [1], Oxygen [1] [3]  
 (d) Sunlight is necessary for photosynthesis/without sunlight plants can't make food [1]  
 All animals rely on plants either directly or indirectly [1] [2]

**Total Marks [9]**

- Q6** (a) Biomass ----- d [1]  
 Biennial -----e [1]  
 Hydroponics --- f [1]  
 GM -----c [1]  
 Deciduous ---- b [1]  
 Annual ----a [1]  
 [6]

- (b) Any 4 from  
 No chemical fertilizers – use green manure [1]  
 No pesticides/chemical sprays, herbicides/insecticide/fungicides [1]  
 Registered as an organic grower/organic status [1]  
 Seed sourced form organic source – registered organic [1]  
 No hormones/growth promoters/genetic modification [1]  
 [4]

**Total Marks [10]**

- Q7** (a) A species which requires protection/special measures/management to ensure that its population remains viable/of sufficient numbers within a particular habitat/region [2] [2]
- (b) yellowhammer [1] red squirrel [1] lapwing [1] barn owl [1] [1]
- (e) Benefits – one mark each for any two from the following list
- (a) Prevent soil erosion  
 helps to fix soils so crops will crop, erosion strips soil from field [1]  
 stops soil being washed off land and silting up rivers, causing flood [1]  
 stops minerals from soil being washed into river which can cause pollution [1] [2]
- (b) Reducing reliance on chemicals  
 Reduces chemicals, which can affect biodiversity [1]  
 Prevents pollution of waterways and soil [1]  
 Allows natural flora and fauna [1]  
 Chemicals can have a negative impact on the food chain [1] [2]
- Total Marks** [7]
- Q8** (a) weather [1]  
 Soil fertility [1] [2]

**Indicative content**

Costs to include, land, labour, fertilizer, chemicals  
 Machinery for ploughing, planting and harvesting,  
 Contracts for the supply of potatoes and cereals, possible markets for fruit and veg via specialist country markets/farm shops, roadside stalls etc.

Response	Mark
Candidates must use appropriate specialist terms throughout and make reference to all 3 elements (cost, machinery and markets) They use good spelling, punctuation and grammar and form and style are of a high standards	[5-6]
Candidates use some appropriate specialist terms to explain and make limited reference to all 3 elements or explicit reference to 2 elements. They use satisfactory spelling, punctuation and grammar and form and style are of a satisfactory standard.	[3-4]
Candidates do not refer to all elements. They use limited spelling, punctuation and grammar and they have made little use of specialist terms. The form and style are of a limited standard	[1-2]
Response not worthy of credit	[0]

## Q9

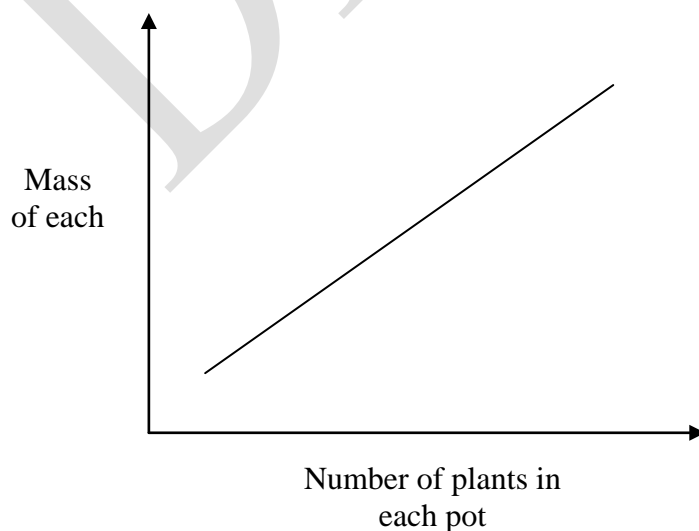
### Indicative Content

(a) Experiment described using all necessary apparatus

Reliable results – same amount of compost, same size of pot, sow at same time, same conditions (light, water). Change only the number of seeds meaningful conclusion drawn, more seeds = smaller plants,  
less seed = bigger and healthier plants

Response	Mark
Candidates must use appropriate specialist terms throughout to explain fully how the experiment should be carried out and what results are expected. Good understanding of how to achieve reliable results. Candidates use good spelling, punctuation and grammar, and form and style are of a high standard.	[5-6]
Candidates use some appropriate specialist terms to explain how the experiment should be carried out. Limited understanding of how to achieve reliable results. Candidates use satisfactory spelling, punctuation and grammar, and form and style are of a satisfactory standard.	[3-4]
Candidates give some explanation of how the experiment should be carried out. No reference to or basic understanding shown of how to achieve reliable results. Candidates use limited spelling, punctuation and grammar and have made little use of specialist terms. The form and style are of a limited standard.	[1-2]
Response not worthy of credit	[0]

(b)



[1]

**Total [7]**