Chapter 17 Organising an Ecosystem Part 2

Name: _____

Class: _____

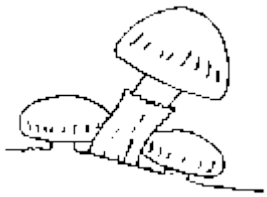
Date: _____

Time: **68 minutes**

Marks: **68 marks**

Comments:

1 Mushrooms can be grown on compost. The compost is made by mixing straw and manure which rot down.



(a) Write down **three** things which are needed for the straw and manure to rot.

1. .....

2. .....

3. .....

(3)

(b) Some substances, like plastic, are not biodegradable.

What does this mean?

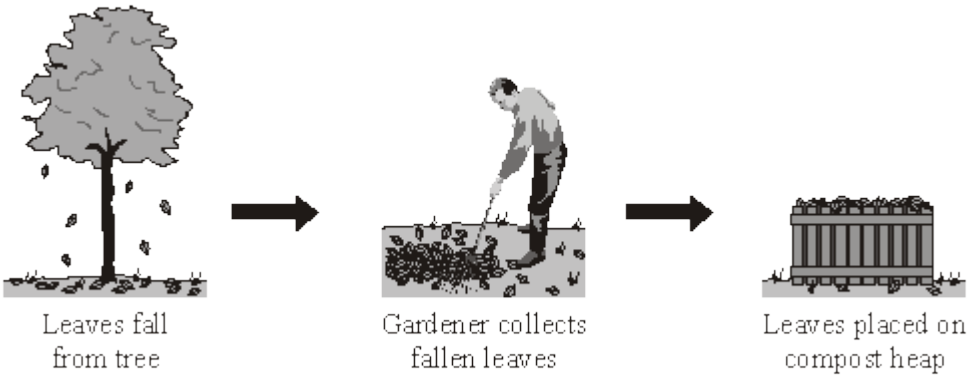
.....

.....

(1)

(Total 4 marks)

2 Gardeners often collect fallen leaves in autumn and place them on compost heaps.



(a) Over the next year the leaves decay.

Which living things cause leaves to decay?

.....

(1)

(b) The leaves decay more quickly in summer than in winter.

Give **one** reason why.

.....

.....

(1)

(c) The compost heap has holes in its sides to allow gases to enter.

Which gas is needed for decay?

Put a tick (✓) in the box next to your choice.

Carbon dioxide ☐

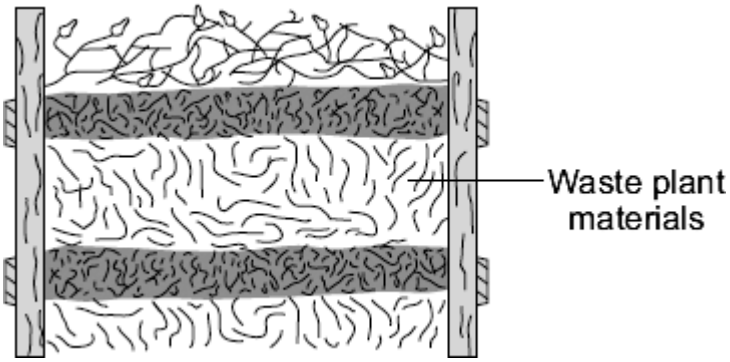
Nitrogen ☐

Oxygen ☐

(1)

(Total 3 marks)

3 Compost heaps are used to recycle waste plant materials.



(a) Draw a ring around the correct answer in the box to complete the sentence.

Microorganisms break down waste plant materials by a process

called

decay.
growth.
photosynthesis.

(1)

(b) Use the correct word from the box to complete each sentence.

cool	decay	dry	grow	moist	warm

The process in (a) releases substances that other plants can

use to ..... .

The waste plant materials break down faster when the conditions are

..... and .....

(3)

(Total 4 marks)

4 Food decays more slowly if it is kept dry or cool.

Explain why.

.....

.....

.....

.....

(Total 3 marks)

5 All living organisms need a supply of energy and materials to stay alive.

(a) (i) What is the name of the process plants use to make carbohydrates?

.....

(1)

(ii) Where do plants get energy from to make carbohydrates?

.....

(1)

(iii) Plants need carbon to make their food.

Where do plants get the carbon they need from?

.....

(1)

(b) (i) Where do animals get the energy, carbon and minerals they need?

.....

(1)

(ii) What is the name of the process animals use to get energy from carbohydrates?

.....

(1)

(c) Some microorganisms grow on the remains of dead animals and plants.

Use words from the box to complete the sentences.

carbon dioxide	**moist**	**break down**	**cold**	**food**
dry	**warm**	**oxygen**	**nitrogen**	**eat**

Microorganisms ..... dead animals and plants to get the ..... they need.

Microorganisms grow best when conditions are .....

and ..... .

Microorganisms often need a good supply of .....

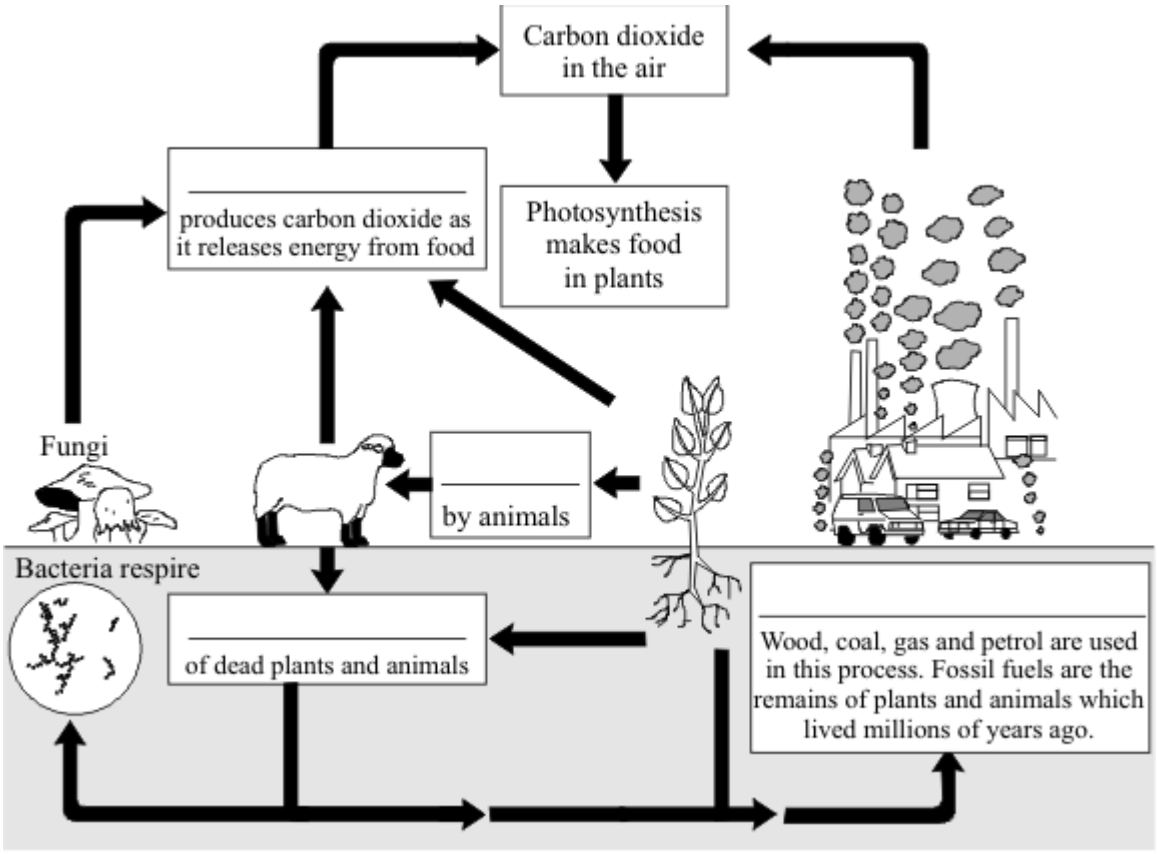
gas to grow well.

(5)

(Total 10 marks)

6 (a) Use the words in the box to fill in the gaps in the diagram. You may use each word once or not at all.

carbon	burning	decay	eaten
nitrogen	oxygen	pollution	respiration



(4)

(b) (i) Why are fungi called decomposers?

.....

(1)

(ii) Give **one** other type of decomposer.

.....

(1)

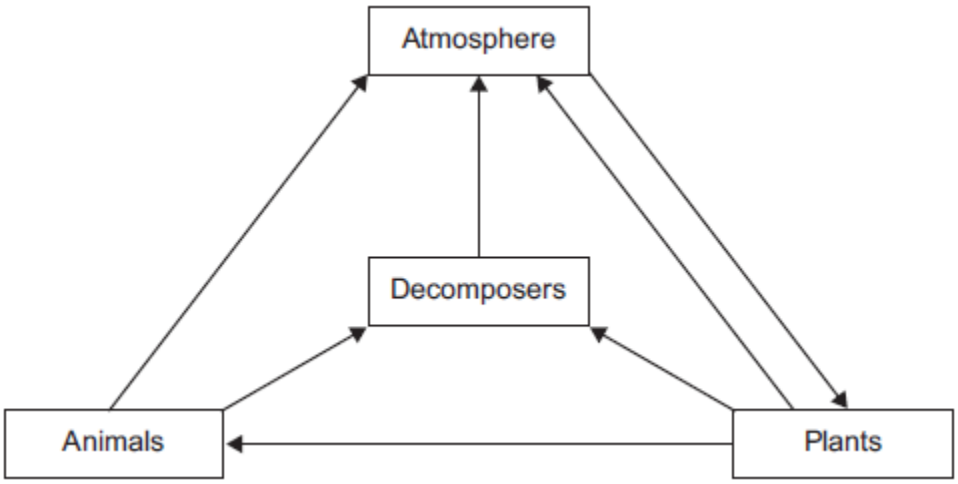
(Total 6 marks)

7 **In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.**

All living organisms need carbon-containing compounds.

The carbon in these compounds is recycled all the time.

The figure below shows how carbon is recycled all the time (the carbon cycle).



Describe how carbon is recycled.

In your answer you should:

- name the processes involved
- describe how plants and animals and decomposers get their carbon-containing compounds
- describe how living organisms return carbon to the environment.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Extra space .....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total 6 marks)

8 Each autumn, many trees lose their leaves.

(a) Describe how carbon compounds in the leaves can be recycled so that they can be used again by the trees.

To gain full marks in this question you should write your ideas in good English. Put them into a sensible order and use the correct scientific words.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4)

(b) Give **two** environmental conditions which speed up the processes that you have described in part (a).

1 .....

2 .....

(2)

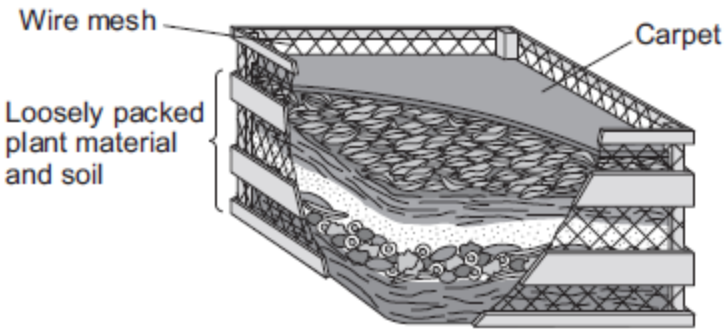
(Total 6 marks)

9 **In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.**

Compost is made when plant material decomposes.

A gardener made a compost heap. She filled a container, made of wood and wire mesh, with a mixture of loosely packed plant material and soil.

The diagram shows the features of the compost heap made by the gardener.



Describe the conditions needed to make compost and how the features of the compost heap made by the gardener helps to produce these conditions.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total 6 marks)

10 (a) The table shows what happens to the total energy taken in by different organisms.

Organism	Total amount of energy in MJ per day		
	In waste	Released during respiration	Used for growth
Producer	18	12	8
Primary consumer	14	22	4
Secondary consumer	12		4

(i) Calculate the percentage of the total energy the primary consumer takes in that is released during respiration.

.....

Answer ..... %

(2)

(ii) 60% of the total energy the secondary consumer takes in is released during respiration.

Calculate the amount of energy the secondary consumer releases during respiration.

.....

.....

.....

Answer ..... MJ

(2)

(iii) The producer releases less energy during respiration than the primary consumer. The primary consumer releases less energy during respiration than the secondary consumer.

Explain why.

.....

.....

.....

.....

.....

.....

.....

(3)

(b) Producers convert carbon dioxide from the atmosphere into organic molecules.

Name **three** organic molecules producers make in this way.

.....

.....

.....

(2)

(Total 9 marks)

11 Living organisms on Earth are found in the biosphere. The organisms make up food chains which need a constant supply of energy so that the organisms stay alive.

(a) (i) Describe how energy enters the food chains in the biosphere.

.....

.....

.....

.....

.....

.....

(3)

(ii) Describe how energy leaves the living organisms found in the biosphere.

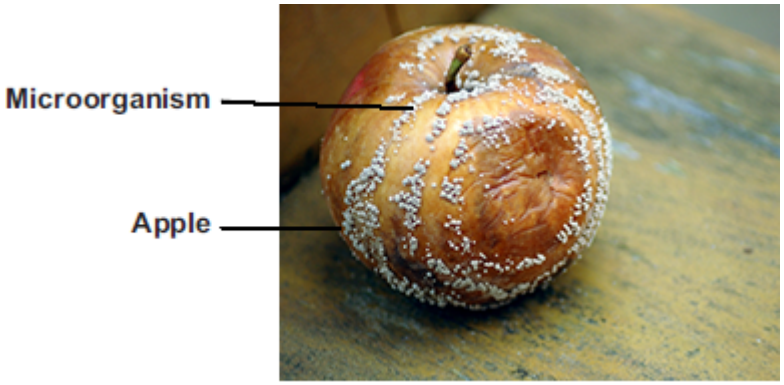
.....

.....

.....

(2)

(b) The photograph shows a microorganism growing on an apple.



(i) Name the process shown in the photograph, and suggest the type of microorganism responsible for the process.

.....

.....

.....

.....

(2)

(ii) What does the microorganism get from this process?

.....

.....

.....

.....

(2)

(iii) The process shown in the photograph is important for life on Earth to continue.

Explain why.

.....

.....

.....

.....

(2)

(Total 11 marks)

Mark schemes

1 (a) warmth/heat
oxygen/air
moisture
microbes/micro-organisms/fungi/moulds/bacteria

any three for 1 mark each

3

(b) do not rot

for 1 mark

1

[4]

2 (a) microorganisms / bacteria / fungi / microbes

*allow named example **or** mould*

ignore decomposers unqualified / germs / maggots / worms

1

(b) it is warm(er) / hot / increased heat / increased temperature

ignore 'sun is hot' unqualified

1

(c) oxygen

1

[3]

3 (a) decay

1

(b) grow

1

warm (*)

1

moist (*)

(*) these words can be either order

more than one word in the space, unless crossed out, negates the mark

1

[4]

4 *idea that*

microbes/bacteria/fungi/moulds/micro-organisms/decomposers.
NOT germs/worms/bugs/organisms

gains 1 mark

but microbes etc. need/grow/cause decay/decompose in

gains 2 marks

but microbes etc. need/grow/caused decay/decompose
faster in warm/moist conditions

gains 3 marks

(Allow reverse arguments)

[3]

5 (a) (i) photosynthesis

accept reasonable phoenetic spelling

1

(ii) light

accept 'sun'

ignore photosynthesis

1

(iii) carbon dioxide (from the air)

accept carbonate / bicarbonate / hydrogencarbonate (from water) / CO_2 / CO2 Ingnore CO^2

1

(b) (i) Food (and drink)

allow'what they eat / (other) animals / plants / producer / prey

ignore digestion / sun / water / fats / carbohydrates / protein / hunting

*do **not** accept air / soil*

1

(ii) respiration

accept respire / respiring

1

(c) break down

1

food

1

warm

1

moist

either order

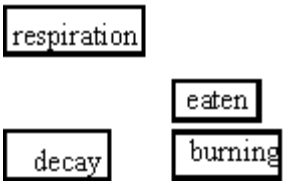
1

oxygen

1

[10]

6 (a) **1** mark for each



4

(b) (i) digests **or** breaks down **or** decays
dead (organic) material

accept rots for digests

accept plants for dead organic material

*do **not** accept 'live on' **or** 'decompose'*

1

(ii) bacteria **or** worms **or** maggots

*accept microbes but **not** germs **or** viruses*

1

[6]

7 Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response.

0 marks
no relevant content

Level 1 (1–2 marks)
at least one process
or
at least one way carbon is obtained
or
at least one way carbon is returned to the atmosphere is given

Level 2 (3–4 marks)
at least one process is identified
and
is correctly linked to the way in which it obtains carbon for the organism or returns carbon to the atmosphere

Level 3 (5–6 marks)
Processes are identified
and
they are correctly linked to a description of how the process obtains carbon for the organism or returns carbon to the atmosphere.
At least two of animals, plants and decomposers should be described

examples of the points made in the response

extra information

- carbon dioxide
- from the air
- plants get their carbon by photosynthesis
- make organic compounds
- carbohydrates proteins fats
- animals get their carbon by feeding on plants or other animals
- decomposers get their carbon by breaking down dead plants and animals
- respiration
- returns carbon dioxide to the atmosphere

information from a well annotated diagram can be considered

[6]

8 (a) **Quality of written communication**:
ideas given in a sensible order

broken down
giving products (could be CO_2, minerals or gas)
(used by trees)
Q ✓ or Q ✗

1

any **three** from:

- microorganisms / bacteria / fungi / saprotrophs
- accept saprophytes / saprobionts / detritivores (named)
- digest / break down organic matter / leaves / decompose / reference decomposers / decay / rot
- use of enzymes / correct named example
- absorption by diffusion / active transport
- must be of breakdown products
- respiration / combustion
- release of carbon dioxide

CO_2 can be used (by trees) in photosynthesis

*do **not** accept CO_2 taken in by roots*

3

(b) any **two** from:

- warmth / suitable temperature

  *do **not** accept heat / hot weather*
- damp / water / rain / humid / moisture
- oxygen
- suitable pH

2

[6]

9 Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information in the Marking Guidance and apply a 'best-fit' approach to the marking.

0 marks
No relevant content

Level 1 (1−2 marks)
At least one factor is given

Level 2 (3−4 marks)
At least one factor is given
and
is correctly **linked** to a feature or reason

Level 3 (5−6 marks)
At least two factors are given which are each correctly linked to a feature
and
at least one factor or feature is also correctly linked to a reason.

Examples of the points made in the response
features:
added soil
carpet
wire mesh
loose packing.

factors needed:
microbes
warmth
air / oxygen
moisture.

reasons:
microbes cause decomposition
microbes grow / work best in warmth
microbes grow / work best with oxygen / air
microbes grow / work best when it is moist.

*Accept decomposers / bacteria / fungi for microbes but **not viruses***
If microbes not given accept reference to detritivores or examples

[6]

10 (a) (i) = 55%

*correct answer with or without working gains **2** marks*
*if answer incorrect, 22 / 40 x 100 gains **1** mark*

2

(ii) 24

*correct answer with or without working gains **2** marks*
*if answer incorrect, 12 + 4 = 16 = 40% **or** 16/40 = 40% gains **1** mark*

2

(iii) producer doesn't move

1

but the consumers do need to move

1

secondary consumer needs more energy in movement because it needs to catch prey

1

(b) protein, carbohydrate, fats

*all three correct for **2** marks*

*1 or 2 correct for **1** mark*

accept amino acids for protein

accept glucose / starch for carbohydrate

accept oils for fats

accept any other correctly named organic molecule

2

[9]

11 (a) (i) light (energy)

1

is absorbed by photosynthesis

1

and stored as chemical <u>energy</u>

allow implication of energy stored in food

1

(ii) <u>respiration</u> (of stored chemical energy)

1

produces heat (which leaves the biosphere)

1

(b) (i) decay

accept decomposition / rotting / decomposing

1

by decomposers

allow bacteria / fungus / mould

ignore detritivores

1

(ii) (fungus) obtains energy

1

(fungus) obtains raw materials / nutrients / food for growth / reproduction

*do **not** accept vitamins*

1

(iii) the idea that:

carbon from compounds in the apple is recycled as carbon dioxide / carbon cycle

1

minerals / nutrients are returned to the soil / recycled

1

[11]