1 Some information about pollutants, their sources and their effects on the environment are shown in Table 1.1.

Table 1.1

pollutant	source	effect on the environment
heavy metals in chemical waste		disrupts functioning of plants, causes brain damage
phosphate		eutrophication of streams, rivers and lakes
sulfur dioxide		damage to trees, e.g. death of leaves
ionising radiation		
DDT	pesticide sprays	accumulates in tissues of animals

(a) Complete Table 1.1. [5]

(b) Explain what happens in streams, lakes and rivers when eutrophication occurs.

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.....[5]

(c) Sulfur dioxide dissolves in rain water to form acid rain.

Describe **two** measures that can be taken to reduce the effects of acid rain.

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2 .....

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[2]

[Total: 12]

2 Fig. 3.1 is a diagram of the water cycle.

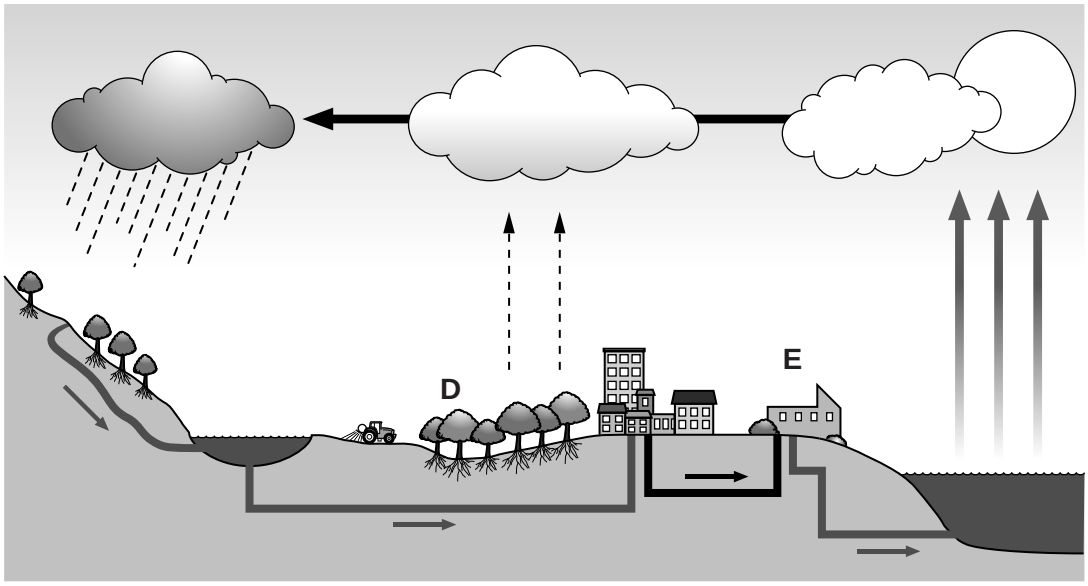

Fig. 3.1

(a) Water is a large component of the cells in the leaves of trees, as labelled **D** on Fig. 3.1.

Explain how water passes from a leaf cell to the atmosphere.

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..... [4]

(b) Explain how the loss of water from the leaves helps to move water from the roots to the leaves.

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..... [4]

(c) Explain how water enters the roots of the trees from the soil.

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..... [3]

(d) Fig. 3.1 shows a sewage treatment works, labelled **E**.

Describe **three** processes used in the treatment of sewage.

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2 .....

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3 .....

..... [3]

(e) Herbicides are used by farmers to control weeds.

Explain the environmental damage that may be caused by herbicides.

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..... [3]

[Total: 17]

3 Sulfur dioxide (SO_2) can cause acid rain.

(a) Name **one** other pollutant that can cause acid rain.

.....[1]

(b) Describe the effects of acid rain on the environment.

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.....[3]

(c) State **three** methods to reduce atmospheric SO_2 pollution.

1 .....

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2 .....

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3 .....

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[3]

(d) Scientists in China measured the concentration of sulfur dioxide (SO_2) in the atmosphere and sulfur in plant tissues from 1990 until 2005. They did not record any measurements between 1990 and 1996.
Their results are shown in Fig. 2.1.

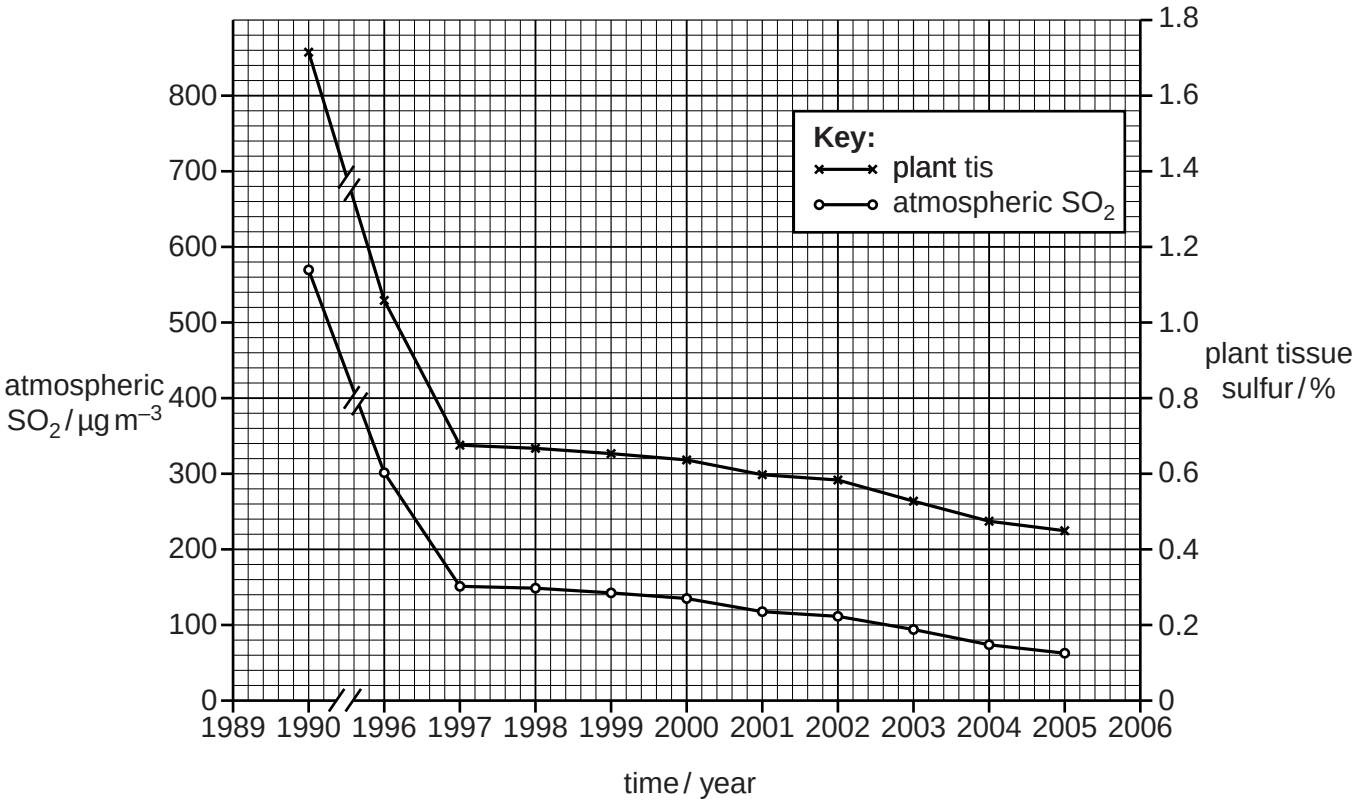

Fig. 2.1

(i) Describe the trends in the concentrations of sulfur found in the atmosphere and in the plant tissues as shown in Fig. 2.1. You will gain credit for using the data in the graph to support your answer.

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.....[3]

(ii) Suggest why the concentration of sulfur in the plant tissues was calculated as a **percentage** of the **dry mass** of the plant tissue.

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.....[2]

[Total: 12]

4 Sewage treatment works use bacteria to digest the waste matter. Waste matter contains complex organic compounds, such as starch, cellulose, protein and fat.

Fig. 3.1 shows a diagram of a sewage works with an aerobic digestion tank.

The sewage works discharges clean water into a river. Downstream from the sewage works, water is removed to be used as drinking water for a nearby village.

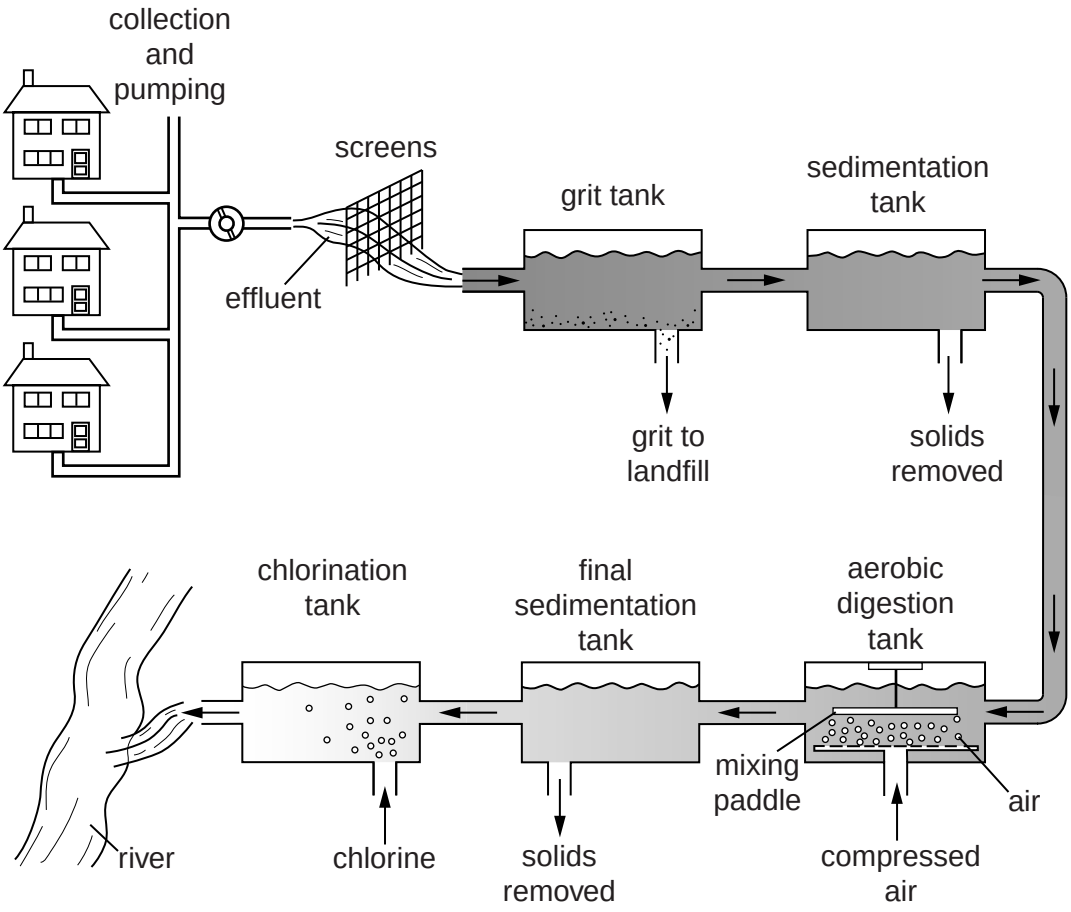

Fig. 3.1

(a) Explain the roles of bacteria in the aerobic digestion tank shown in Fig. 3.1.

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(b) Fig. 3.1 shows that chlorine is added to water before it leaves the sewage treatment works.

Explain why chlorine is added to the water.

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[Total: 7]