

1(a). The number of elephants living in Africa is decreasing. They are often killed by hunters.

The table shows estimates for the number of elephants in Africa.

Year	1979	1989	2015
Number of elephants	1.3 million	600 000	400 000

- i. Calculate how many times more elephants there were in 1979 compared to in 2015.

Answer = **[2]**

- ii. Suggest **two** reasons why it is difficult for scientists to give an accurate estimate for the number of elephants living in Africa.

1 _____

2 _____

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

(b). Elephants are very important for ecotourism in southern Africa.

Explain how ecotourism benefits the elephants and the local people.

Elephants benefit from ecotourism because _____

Local people benefit from ecotourism because _____

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

2(a). Describe how scientists could estimate the number of one type of **plant** in a habitat.

[3]

(b).

Buddleia, a pest or a friend?



Many people grow buddleia bushes in their gardens.

Buddleia flowers attract butterflies that feed on nectar. Birds and bats feed on butterflies. Foxes and badgers can live under the cover of the bushes.

Buddleia bushes spread and grow very quickly. In some areas this has caused the numbers of other plants to decrease.

In these areas, scientists have seen large numbers of butterflies. However, they only see the more common types of butterflies and not rare ones.

Some scientists say buddleia are 'pests' but others say they are 'friends'.

Use information from the passage to explain these different opinions about buddleia.

In your answer use ideas about:

- interdependence
- competition
- biodiversity.

- i. What is the **independent** variable in this investigation?

[1]

- ii. Identify the **pH** of the pondwater where the mean number of duckweed plants is the same as the mode for the four beakers.

Tick (✓) **one** box.

4.5 ☐

6.5 ☐

8.5 ☐

[1]

- iii. The student thinks that there is a problem with their data at pH 8.5. This resulted in the mean being inaccurate.

Explain how the student could improve their investigation to get a more accurate result for the mean.

[2]

- iv. The student concluded that acid pollution slows the rate of duckweed reproduction.

Explain how acid pollution slows the rate of duckweed reproduction.

Use ideas about enzymes and photosynthesis in your answer.

[2]

- v. The student also concluded that pH 6.5 is the best pH for duckweed reproduction.

The student's teacher says that they need to extend the experiment to be sure of this.

Describe how the student should extend their experiment.

[2]

Which row gives a benefit and a problem caused by ecotourism?

	Benefit	Problem
A	educates people about conservation	brings money into the local economy
B	brings money into the local economy	tourists can cause pollution and damage
C	tourists can cause pollution and damage	educates people about conservation
D	brings money into the local economy	educates people about conservation

[2]

Although infected bulbs produced attractive flowers, growers found that the bulbs became weaker every year until they died.

- Dig up and burn any tulips as soon as they show signs of infection.
- Spray their fields with insecticides.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

6. The table shows the number of insects caught using a net on different days in a week.

Day	M	Tu	W	Th	F	S	Su
Number of insects	6	8	5	4	8	9	2

What is the median and mode of the number of insects caught in **one** day?

- A** Median = 6 Mode = 8
B Median = 6 Mode = 6
C Median = 8 Mode = 8
D Median = 8 Mode = 6

Your answer ☐

[1]

7. A student finds this organism in a pond:



The student uses this key to identify the organism.

- | | |
|---------------------------------|-------------------|
| 1 3 pairs of legs | go to 3 |
| more than 3 pairs of legs | go to 2 |
| 2 curved body | freshwater shrimp |
| straight body | water-louse |
| 3 tail parts | go to 4 |
| no tail parts | water-boatman |
| 4 2 tail parts | stonefly nymph |
| 3 tail parts | mayfly nymph |

What is the name of the organism?

- A** Freshwater shrimp
B Mayfly nymph
C Stonefly nymph
D Water-louse

Your answer ☐

[1]