

10. Selective herbicides can be used to control weeds growing in wheat fields.

- (a) (i) State why the presence of weeds reduces the productivity of wheat plants.

1

- (ii) Explain why selective herbicides have a greater effect on some weeds compared to wheat plants.

1

- (b) The global human population and the number of species of herbicide-resistant weeds were recorded from 1980 until 2020.

The results are shown in the table.

| Year | Global human population (billions) | Number of herbicide-resistant weed species |
|------|---------------------------------------|--|
| 1980 | 4.4 | 8 |
| 1990 | 5.3 | 113 |
| 2000 | 6.1 | 264 |
| 2010 | 7.0 | 404 |
| 2020 | 7.8 | 480 |

- (i) Calculate how many times greater the number of herbicide-resistant species was in 2020 compared to 1980.

1

Space for calculation

_____ times



10. (b) (continued)

- (ii) Use information from the table to suggest why there was a decrease in global food security between 1980 and 2020.

2

- (c) In terms of natural selection, explain how the use of herbicides results in an increase in the number of herbicide-resistant weed species.

2

[Turn over

