

**Reading: Read the text and answer questions 1-6****The impact of climate change on butterflies in Britain**

According to conservationists, populations of around two thirds of butterfly species have declined in Britain over the past 40 years. If this trend continues, it might have unpredictable knock-on effects for other species in the ecosystem. Butterfly eggs develop into caterpillars and these insects, which are the second stage in a new butterfly's lifecycle, consume vast quantities of plant material, and in turn act as prey for birds as well as bats and other small mammals. Only by arming themselves with an understanding of why butterfly numbers are down can conservationists hope to halt or reverse the decline.

Butterflies prefer outdoor conditions to be 'just right', which means neither too hot nor too cold. Under the conditions of climate change, the temperature at any given time in summer is generally getting warmer, leaving butterflies with the challenge of how to deal with this. One of the main ways in which species are ensuring conditions suit them is by changing the time of year at which they are active and reproduce. Scientists refer to the timing of such lifecycle events as 'phenology', so when an animal or plant starts to do something earlier in the year than it usually does, it is said to be 'advancing its phenology'.

These advances have been observed already in a wide range of butterflies – indeed, most species are advancing their phenology to some extent. In Britain, as the average spring temperature has increased by roughly 0.5°C over the past 20 years, species have advanced by between three days and a week on average, to keep in line with cooler temperatures. Is this a sign that butterflies are well equipped to cope with climate change, and readily adjust to new temperatures? Or are these populations under stress, being dragged along unwillingly by unnaturally fast changes? The answer is still unknown, but a new study is seeking to answer these questions.

First, the researchers pulled together data from millions of records that had been submitted by butterfly enthusiasts – people who spend their free time observing the activities of different species. This provided information on 130 species of butterflies in Great Britain every year for a 20-year period. They then estimated the abundance and distribution of each species across this time, along with how far north in the country they had moved. The data also, crucially, allowed researchers to estimate subtle changes in what time of the year each species was changing into an adult butterfly.

**Questions 1-6**

Do the following statements agree with the information given in Reading Passage?

*In boxes on your answer sheet, write*

**TRUE**                    if the statement agrees with the information  
**FALSE**                if the statement contradicts the information  
**NOT GIVEN**        if there is no information on this

1. Forty years ago, there were fewer butterflies in Britain than at present.

- A TRUE  
 B FALSE  
 C NOT GIVEN

2. Caterpillars are eaten by a number of different predators.

- A TRUE  
 B FALSE  
 C NOT GIVEN

3. 'Phenology' is a term used to describe a creature's ability to alter the location of a lifecycle event.

- A TRUE  
 B FALSE  
 C NOT GIVEN

4. Some species of butterfly have a reduced lifespan due to spring temperature increases.

- A TRUE  
 B FALSE  
 C NOT GIVEN

5. There is a clear reason for the adaptations that butterflies are making to climate change.

- A TRUE  
 B FALSE  
 C NOT GIVEN

6. The data used in the study was taken from the work of amateur butterfly watchers.

- A TRUE  
 B FALSE  
 C NOT GIVEN