Spring Forward

1. What have the Fritters observed over the course of 47 years of observations with regard to plant flowering time?
2. According to the 2002 IPCC study, what percentage of organisms have changed their phenology over the last 20 years?
3. Why does Fritter believe a change in flowering time may be harmful? (What may happen to the plants?)
4. How are rising temperatures potentially affecting ecosystems?

5. What does Visser’s research attempt to address?

6. What has Visser found over the last 20 years with regard to the phenology of the great tit mating behavior?

7. How has a change in caterpillar phenology affected the great tits?

8. How does a change in oak tree bud burst affect the caterpillar populations?

9. What is the match mismatch hypothesis?

10. How might climate change cause mismatches?

11. How might different species signals for changes in phenology (such as in the tit- caterpillar-oak example) cause a mismatch?

12. How might global warming affect the phenology of migrating birds?

13. What has William Fraser observed in Adelie penguin populations over the past 30 years?

14. What is the reason for this change in the Adelie penguin population?

15. How has climate change affected the breeding of Adelie penguins?

**Reflection Questions**

16. What is the link between phenology and food chains?

17. Describe how climate change can affect whole ecosystems. Provide an example to support your answer (may be an example used in the paper).