Other Factors that Affect Climate

*Complete the blanks with the words in green. Keep this sheet to help you study.*

Let's get started by defining \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:  
  
*The balance of incoming and outgoing energy is called the Earth's energy balance. If incoming energy and outgoing energy are \_\_\_\_\_\_\_\_\_\_\_\_, Earth's average temperatures and climate will be stable over time. However, there are factors that can change the amount of incoming and outgoing energy so that Earth's climate may change over time. Currently, we are contributing to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy to decrease, trapping heat in the Earth and changing its balance.*

So, what other factors affect climate?

**1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

The amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that reaches Earth is affected by the \_\_\_\_\_\_\_ of our planet on its \_\_\_\_\_\_\_\_\_ and its \_\_\_\_\_\_\_\_\_ around the Sun.  
  
Earth's orbit and tilt are slowly changing. Over the past 400 000 years, Earth's orbit has been changing from more to less \_\_\_\_\_\_\_\_\_\_\_\_\_. This affects how close Earth gets to the Sun at different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. In the past 41 000 years, Earth's tilt has also changed slightly.  
  
How might the change in tilt affect our seasons?  
  
Because Earth also \_\_\_\_\_\_\_\_\_\_\_\_\_\_ on its axis, it is not always \_\_\_\_\_\_\_\_\_\_\_\_\_ in the same direction. A complete wobble takes about 26 000 years. This wobble is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Knowing about the slow changes in Earth's orbit and tilt explains the change in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that take place over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of years. These changes have sometimes been dramatic, but they happened \_\_\_\_\_\_\_\_\_\_\_\_.  
  
**2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  
  
When \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_hits the Earth's surface, it is either \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and converted to \_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_ back into the atmosphere. The amount of light reflected back from a surface is called its \_\_\_\_\_\_\_\_\_\_\_\_. Surfaces that \_\_\_\_\_\_\_\_\_\_\_\_ a lot of light have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_. Those that \_\_\_\_\_\_\_\_\_\_\_\_ most of the light have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  
  
Surfaces with a low albedo appear \_\_\_\_\_\_\_\_\_ because they \_\_\_\_\_\_\_\_\_ most of the light that hits them. The light is converted into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, causing them to \_\_\_\_\_\_\_\_\_\_\_\_. Surfaces with high albedo appear \_\_\_\_\_\_\_\_\_\_\_\_ in colour and remain \_\_\_\_\_\_\_\_\_\_\_\_.  
  
On a hot and sunny day, would you stay cooler wearing a dark-coloured T-shirt or a white one? Why?

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The albedo of surfaces on Earth varies. Snow and ice reflect almost all the sunlight. Why do you think a lake's surface appear dark?

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Clear-cutting can \_\_\_\_\_\_\_\_\_\_\_\_ the albedo of a forest during winter if the open areas become \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Would clear cut areas be warmer or cooler than areas covered in trees?  
  
Why or why not?

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The albedo on Earth's surface changes naturally over time and can alter the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and temperature of Earth. Large parts of Canada are covered in snow and ice during the winter. Because snow and ice \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ than grass and open water, the albedo \_\_\_\_\_\_\_\_\_\_\_.  
  
A change in albedo also can \_\_\_\_\_\_\_\_\_\_\_\_ the speed in which ice melts. Surfaces covered in snow and ice have a high albedo. As the ice melts, more light is absorbed by the open water.  
  
**3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  
  
Some natural events can cause \_\_\_\_\_\_\_\_\_\_\_\_ changes in Earth's energy balance. These changes can affect the weather patterns for a year or more, but have \_\_\_\_\_\_\_\_\_\_\_\_\_\_ on long-term climate patterns.  
  
The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can alter Earth's energy balance. The amount of energy emitted by the Sun \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. These variations can cause both short-term and long-term changes in Earth's climate. Over the past 30 years, the Sun's energy output has \_\_\_\_\_\_\_\_\_\_\_\_\_\_ slightly.  
  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can release large amounts of \_\_\_\_\_\_\_\_\_ high into the atmosphere. In extreme cases, they cause the atmosphere to \_\_\_\_\_\_\_\_\_\_ more sunlight than usual. The result is a short-term \_\_\_\_\_\_\_\_\_\_\_\_ of Earth lasting from a few months to a year or more.  
  
Changes in ocean currents can also cause short-term changes in weather. During an El Nino event, parts of the Pacific Ocean are warmer than usual, affecting \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on land. Temperatures may be \_\_\_\_\_\_\_\_\_\_\_ than usual and precipitation may be \_\_\_\_\_\_\_\_\_\_ than normal.  
  
What can happen to the environment and the people who live around it, if temperatures get warmer and drier?