Describing Trends and Writing Hypotheses About Causes – Student Activity Set

Environmental Conditions:
Describing Trends and Writing Hypotheses about Causes

In Part 1 of the MEECS unit on climate change, you investigated several different kinds of evidence for climate change. In Part 2, you will explore some effects of climate change. We will focus especially on the kinds of change that could have the most impact on the Michigan economy and the lifestyles of Michigan residents.
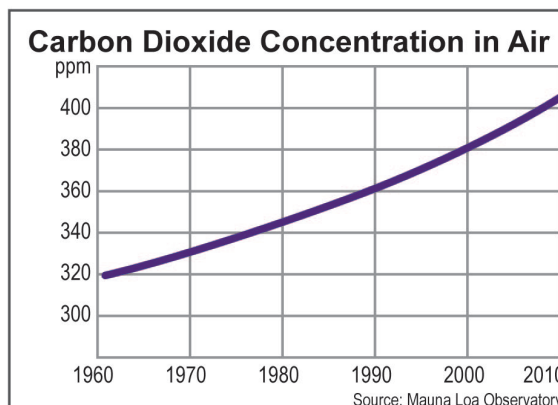
Lesson 1 is a kind of review of the scientific principles in Part 1. The next few pages have a number of graphs that show trends in environmental conditions over the past 50 years. For each graph, you should first describe the trend (the change through time) in your own words. Try to use language that a "non-scientist" citizen could understand. Then, you should write a sentence that identifies the specific forces or changes that might cause the trend you observe on the graph.

Describe the trend on this graph.

Every year the air has more CO2 in it. It keeps increasing faster - it went up only 10 ppm in the 1960s but more than 20 between 2000 and 2010.

Carbon Dioxide Concentration in Air

ppm

400
380
360
340
320
300

1960   1970   1980   1990   2000   2010

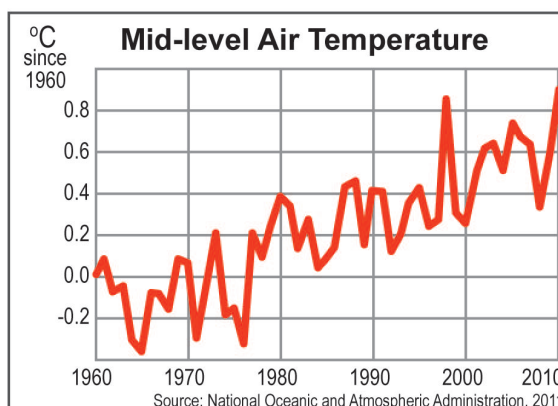Source: Mauna Loa Observatory

What do you think is the direct cause of the changes you describe?

People are burning more coal and oil. That releases carbon dioxide into the air.

Describe the trend on this graph.

Mid-level Air Temperature

°C since 1960

0.8
0.6
0.4
0.2
0.0
-0.2

1960   1970   1980   1990   2000   2010

Source: National Oceanic and Atmospheric Administration, 2011

What do you think is the direct cause of the changes you describe?

Carbon dioxide in the air traps longwave (heat) radiation from the ground, making the air warmer..

As you go through the graphs on the next pages, try to be as specific as possible in your descriptions of trends and explanations of possible causes. In other words, do NOT just write "that's due to global climate change" as the reason for a trend.

Keep in mind that some of the trends may indeed be direct effects of global warming. Some might be due to other causes that in turn are caused by global warming. Others, however, may just be unrelated trends, caused by something completely different.