

Standard: Students will assess the dependence of all organisms on one another and the flow of energy and matter within their ecosystems.

Element: Assess and explain human activities that influence and modify the environment such as global warming, population growth, pesticide use, and water and power consumption.

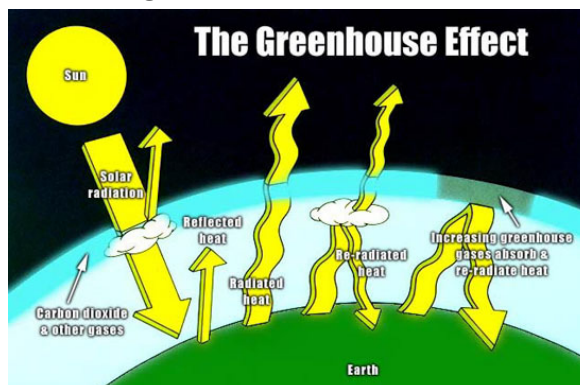
EQ: What are some effects of human activity on the environment?

Global Warming

Burning fossil fuels releases **carbon dioxide** into the atmosphere.

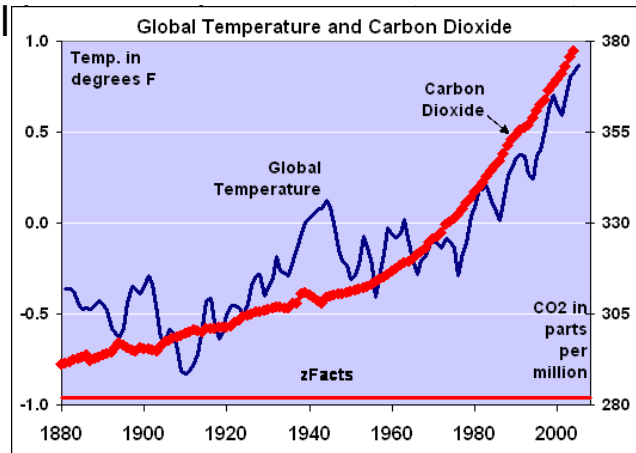
Carbon Dioxide is a **greenhouse gas**, which is a type of gas that traps heat close to the Earth's surface (like the glass of a greenhouse)

This is called the **greenhouse effect**.



Over time, scientists have noticed that **carbon dioxide** levels in the atmosphere have been rising, and the average global **temperature** has increased as well.

Global warming is the term used to describe the gradual **on Earth**.



Global warming is a concern because it can lead to:

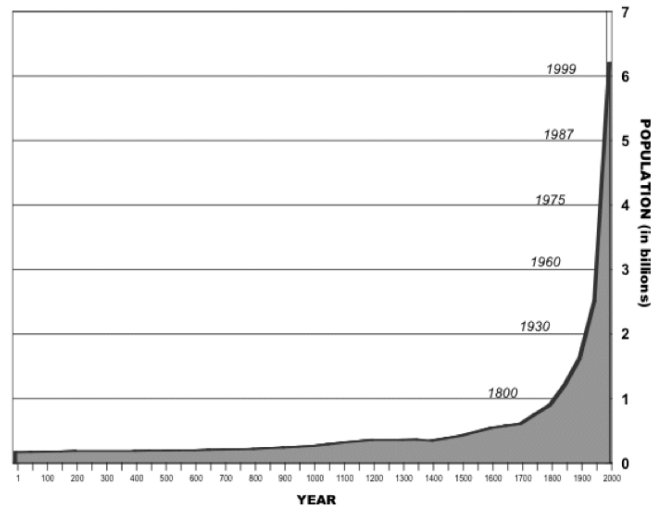
- **melting ice sheets, causing sea level rise**
- **more intense weather patterns**
- **increased drought**



Population Growth

The human population is currently growing **exponentially**, but this cannot continue forever because we will **run out of resources**.

Human Population Growth Since 1 A.D.

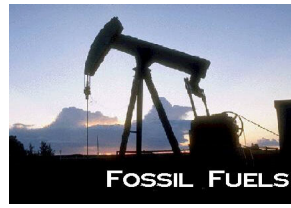


Advances in science and technology have fuels this growth by:

- **more efficient farming techniques**
- **better hygiene and sanitation**
- **improved medicine and vaccines**



Nonrenewable Resources, like **fossil fuels**, cannot be regenerated within our lifetime, so we should conserve them as much as possible.



Renewable resources, like **wind**, **solar**, and **hydroelectric** power, are plentiful and can be used over and over again.



Pesticide Use

Part of the improvements to human agriculture has been the use of **pesticides**.

Pesticides are **chemicals** that kill crop-damaging **insects**.

Pesticides can have unintended consequences:

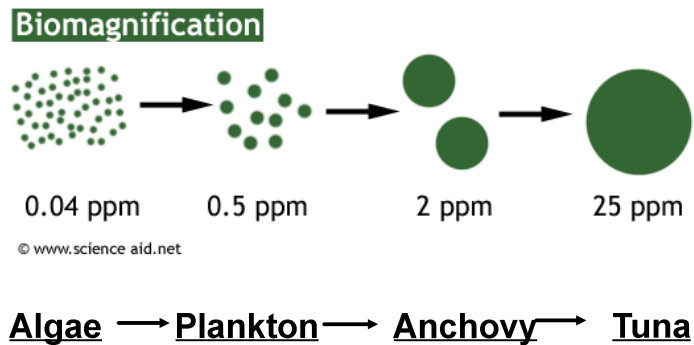


The pesticide DDT was used in the US until 1972, when it was discovered that the chemical was thinning the shells of the bald eagle. Since the ban, the bald eagle population has recovered and is no longer endangered.

Part of the problem with pesticide use is **biomagnification**.

Biomagnification is the accumulation of **toxins** in higher-level **consumers**.

For example:



Water Consumption

Only **3%** of the water on Earth is fresh, and less than **1%** of it is drinkable.

Many human activities pollute the water we rely on for drinking:

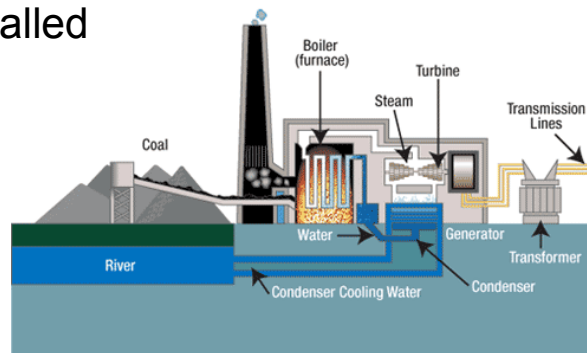
- **fertilizer and pesticide runoff**
- **industrial waste**
- **oil from roads**
- **unlined landfills**



Power Consumption

Humans today rely on **electricity** much more than in the past.

About **half** of the electricity in the United States comes from **coal-powered power plants**. The coal is burned in order to boil **water**. The **steam** from the water rises and turns a wheel called a **turbine**.



Burning coal releases a lot of pollution, which leads to **acid rain**.

Alternative energy sources that *don't* rely on fossil fuels can be an environmentally friendly way to get the **electricity** we need.



Hydroelectric Power



Solar Power



Wind Power



Hydrogen Fuel Cell