

## IV. Application

### A. Economic Problems

- Click on the "Health" site.
- Read the page, think about the impacts of ozone depletion and answer the following question:

1. Remembering that a decrease in ozone causes the Earth's surface to receive an increase in ultraviolet rays, describe the economic effects on people affected by ozone depletion. Include medical problems in humans, crops, and livestock, etc.

---

---

---

---

---

---

---

---

---

---

- Click "Back" to return to the Ozone "Application.1" web page.

### B. Ozone Formation

- Click on the "Ozone Shield" site.
- Read the "Ozone and Humankind" section.





1. Recall that the oxygen we can breathe exists as a molecule of two oxygen atoms bound together ( $O_2$ ). Draw how three oxygen molecules can turn into two ozone molecules ( $O_3$ ). Include all three steps and show everything necessary for the reaction to occur.



- Click "Back" to return to the Ozone "Application.1" web page.
- Click "Forward" at the bottom of the page.

### C. Ozone-Related Laws

Maybe you've heard of DDT before. It is a chemical pesticide that is also very poisonous to animals. It doesn't break down very quickly, so it keeps on killing for years. The use of DDT is illegal in this country, but it is available in other countries.



1. If CFCs cannot be used, what will happen to the ozone layer?

---

---

---

2. Why was there an international convention to discuss ozone depletion?

---

---

---

3. What can companies that now produce CFCs do to replace money lost when CFCs are banned?

---

---

---

- Click "Return" at the bottom of the page, or choose "Ozone" from your Bookmarks or Favorites.
- Click on "Enrichment."

## V. Enrichment Activities

### A. Research

1. Use resources on the Internet to write a report on electric cars. Include how they could help lower nitrous oxide emissions. Include the energy sources we could use to provide power for the cars if we want to use non-polluting sources of energy.
2. Use resources on the Internet to write a report on fuel cells. Include the use of water electrolysis to make hydrogen from water.
3. Research the relationship of ultraviolet radiation to skin cancer.





4. Research the relationship of ultraviolet radiation to cataracts.
5. Find out how ozone is created by lightning.
6. Research the change in the shape of the Antarctic ozone hole every five years since 1957. Draw the change and label each one.

### **B. Newspaper Activities**

1. Collect articles related to ozone and summarize each one.

### **C. Related Web Sites**

1. Earth System Research Laboratory, Chemical Sciences Division  
<http://www.esrl.noaa.gov/csd>
2. Ozone  
<http://earthobservatory.nasa.gov/Library/Ozone/>
3. Ultraviolet Radiation  
<http://earthobservatory.nasa.gov/Library/UVB/>
4. Ozone Depletion  
<http://www.epa.gov/docs/ozone/>
5. Stratospheric Ozone and Human Health  
<http://sedac.ciesin.org/ozone/>
6. The Ozone Hole Tour  
<http://www.atm.ch.cam.ac.uk/tour/>

