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## LAB

# Stratospheric Ozone Depletion

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### Purpose

The purpose of this lab is to have you identify the depletion of ozone gas in the stratosphere over a 40-year period and its relationship to increased amounts of deadly ultraviolet radiation reaching the Earth's surface.

### Materials

graph paper or  
computer spreadsheet program  
colored pencils

### Procedure

Complete the following steps.

1. Using the data on stratospheric ozone concentration shown in Table 44-1, create a line graph that plots the concentration of ozone gas for each year. Label the  $x$ -axis "Year" and the  $y$ -axis "Total Ozone (Dobson Units)."

**TABLE 44-1 Stratospheric Ozone Concentration**

Year	Total Ozone (Dobson Units)
1956	324
1957	327
1958	312
1959	310
1960	300
1961	315
1962	330
1963	311
1964	315
1965	280
1966	313
1967	320
1968	300
1969	280
1970	280
1971	295
1972	305
1973	285
1974	275
1975	305
1976	280
1977	250
1978	282
1979	255
1980	225
1981	230
1982	227
1983	210
1984	200
1985	195
1986	250
1987	160
1988	225
1989	165
1990	175
1991	150
1992	145
1993	120
1994	125

2. Using the data on the relationship between ozone loss and ultraviolet radiation striking the Earth's surface in Table 44-2, create a line graph that shows this relationship. Label the x-axis "Percent Ozone Change" and the y-axis "Percent Change in UV Radiation at the Earth's Surface."

Percent Ozone Change	Percent Change in UV Radiation at the Earth's Surface
0	0
5	5
10	12
15	20
20	28
25	36
30	47
35	60
40	76
45	92
50	116
55	130
60	150

## Conclusions

1. Does your data support the theory that ozone gas in the stratosphere is being depleted?
2. Calculate the rate of ozone lost in the stratosphere between the years 1956 and 1994 by using the following formula and show your work:

$$\frac{\text{change in ozone}}{\text{change in time}}$$

3. Describe the relationship between loss of stratospheric ozone and ultraviolet radiation at the surface.
4. Calculate the percentage loss of stratospheric ozone between 1956 and 1994. Show your work.
5. Using the answer from the previous question, determine what percentage the ultraviolet radiation reaching the Earth's surface increased for the same time period.
6. Explain the importance of ozone gas in the stratosphere.
7. Describe the negative effects of increasing amounts of ultraviolet radiation reaching the Earth's surface.