Name: ______________________

The Ozone Layer: Optional Lab

Background
The Ozone Layer is a layer of O\textsubscript{3} gas. The gas helps protect the earth’s biomes by absorbing most of the ultraviolet light from the sun. What proof do we have that the Ozone Layer does indeed absorb the electromagnetic waves from the sun?

Objective
How does the number of layers of tissue paper affect the amount of light going through the tissue paper?

Materials
- Light Source (flashlight or cellphone light)
- Ruler
- Masking tape (to hold the light source and light sensor distance constant)
- Paper
- Pencil or pen
- 8 squares of tissue paper, measured 8”X8”
- Interface (I used a LabQuest)
- Light Sensor
- Graphing paper or Graphing program

Procedure
1. Place two pieces of tape 15 cm apart on a flat surface.
2. Secure the light sensor at the 15 cm point facing the origin (zero point).
3. Secure the light source at 0 cm.
4. Test the sensor to see if the amount of light is being measured.
5. Turn off the lights.
6. Measure the amount of light being emitted from the light source without the tissue paper covering the source. This measurement is the control.
7. Cover the light source with one 8”X8” piece of tissue paper. Record the measurement in the data table.
8. Cover the light source with two 8”X8” pieces of tissue paper. Record the measurement in the data table.
9. Continue to add a piece of tissue paper until the final measurement of 8 pieces of tissue paper.
10. Repeat the experiment three more times.
11. Average the results.
12. Graph the Amount of Light (lumens) versus the number of pieces of tissue paper.
### Data

<table>
<thead>
<tr>
<th>Number of Pieces of Tissue Paper</th>
<th>Amount of Light (Lumens)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trial 1</td>
</tr>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1</td>
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<tr>
<td>8</td>
<td></td>
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</tbody>
</table>

### Analysis

1. What is the graphical relationship between the Amount of Light in Lumens and the number of sheets of tissue paper used?

2. What is happening to the electromagnetic waves of light?

3. How is this related to the ozone layer?

4. How could this idea be used to represent what is happening to the gases in the Ozone layer when electromagnetic waves collide with the gas particles?