Firework Show

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**CONCEPT MAP OF UNIT**

To understand how different metals give off different colors of light as well as amounts of energy when photons are emitted.

**TEACHER**
Miranda, Steve, and Kaitlin

**GRADE**
High School

**LEARNING STANDARDS**

**CHEMISTRY**

Key Idea 3- Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.

3.1k- When an electron returns from a higher energy state to a lower energy state, a specific amount of energy is emitted. This emitted energy can be used to identify an element.

**PHYSICS**

5.3d the energy of a photon is proportional to its frequency.

**MATH**

Make sense of problems and persevere in solving them.
Solve equations and inequalities in one variable.

**LEARNING TARGETS**

Students will be able to:

- Manipulate the given model
- Describe the relationship between metals, light emission and energy
- Figure out how to distract the zombie for the longest amount of time possible given the provided budget
- Determine the energy of a photon of a specific color

**OPTIONAL INSTRUCTIONAL TOOLS**

Netlogo Model

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<thead>
<tr>
<th>CONCEPT</th>
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<tbody>
<tr>
<td>Chemistry</td>
<td>Physics</td>
<td>Mathematics</td>
<td>Cross-Cutting</td>
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<thead>
<tr>
<th>LESSON ESSENTIAL QUESTIONS</th>
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<tbody>
<tr>
<td>Which color is the most effective at distracting the zombie? Least effective? Using the provided budget how can you most effectively distract the zombie for the longest period of time?</td>
<td>How can the amount of energy within each firework be determined?</td>
<td>Given the color of light, what is the associated energy?</td>
<td>What firework show do you need to create to distract the zombies for a sufficient amount of time?</td>
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<tr>
<th>VOCABULARY</th>
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<tbody>
<tr>
<td>Light emission, energy level, electron</td>
<td>Photon, light emission, energy, Planck’s Constant</td>
<td>Frequency, Planck’s constant, photons</td>
<td>Cause, effect, time, cost</td>
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