Analyzing & Creating Safety Labels

Background
In this activity, you will learn how the NFPA fire diamond is used to provide safety information, especially for first responders who might encounter chemicals in an emergency situation.

Objective
By the end of this activity, you should be able to look at a NFPA safety diamond and determine what safety concerns are associated with that chemical.

Prelab Questions
1. Why would a firefighter or paramedic need to know safety concerns about specific chemicals?

2. Why do you think a symbol is used with color coded images and not a list of text?

3. Research the meaning of these terms and symbols commonly found in the fire diamond label and record below:
   a. ACID:
   b. ALK:
   c. COR:
   d. Flammable:
   e. Flash point:
   f. OX:
   g. Caustic:
   h. W:
   i. ☢:
   j. Instability:
Procedure
1. Create a sample safety label by randomly assigning numbers from 0 – 4 in each of the four colored sections. On the back of the label, write the important information you intended to convey to a first responder. Attach this label to an empty bottle.
2. Your teacher will collect the bottles and give one bottle to each team of two students.
3. Teams of students will pair up so that there are two teams and two bottles in a four-person group. Analyze the labels by telling the other team what information was conveyed by their labeled bottle.
4. If the information is correctly identified, you earn a point, and should indicate it in the scorecard below.
5. After one pairing, exchange your bottle with another pair of students and repeat the process.
6. Complete at least 5 safety labels.

Scorecard

<table>
<thead>
<tr>
<th></th>
<th>Bottle 1</th>
<th>Bottle 2</th>
<th>Bottle 3</th>
<th>Bottle 4</th>
<th>Bottle 5</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Points</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Analysis
1. Below is the symbol used for acetone, which is often use as nail polish remover. What safety information is important to know about acetone?

**Acetone:** Colorless, highly volatile liquid; sweet odor, irritating. Also causes: muscle weakness, mental confusion, coma (high concentrations). Ingestion: GI irritation, kidney and liver damage, metabolic changes. Highly Flammable

2. A truck carrying nitric acid crashes and spills nitric acid. What would be the main safety concerns that clean-up crews should be aware of?

**Nitric Acid:** Clear to yellow fuming liquid; acid, suffocating odor. Corrosive, causes severe burns to eyes/skin/respiratory tract. Also causes: lung damage. Strong oxidizer capable of igniting combustibles.
3. Sulfuric acid is the acid found in car batteries. Most batteries have several warnings about not opening the battery under and circumstances. Based on the label below, why is this safety information put on all car batteries?

<table>
<thead>
<tr>
<th>0</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>W</td>
</tr>
</tbody>
</table>

**Sulfuric Acid**: Colorless to dark-brown, oil, odorless liquid. Corrosive, causes severe burns to eyes/skin/respiratory tract. May cause blindness. Chronic: tooth erosion, GI disturbances and dermatitis. Reaction with water produces excessive heat.

4. What chemical should you not use if some sulfuric acid spilled on your clothes?

5. Choose one scenario from this [article](https://www.firerescue1.com/fire-products/hazmat-equipment/articles/275818018-3-common-hazmat-scenarios-and-how-to-respond/) and create a fire diamond for the type of chemical described, based on the information in the article. (URL: https://www.firerescue1.com/fire-products/hazmat-equipment/articles/275818018-3-common-hazmat-scenarios-and-how-to-respond/)