Lesson Plan - Road Safety - Communicating and Understanding What's on Board (Placards)

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Contributes to these Educational Standards</td>
<td>Math, Reading, Relationships, Safety</td>
</tr>
<tr>
<td>Supports these CRLs</td>
<td>Communication, Employment Foundations, Personal Management</td>
</tr>
<tr>
<td>Learning Environment requirements:</td>
<td>Central focus space to set the stage. Projection device for PowerPoint presentation. Individual access to electronic device to access web site(s), Twitter, and/or podcasts. Related URLs: <a href="http://environmentalchemistry.com/yogi/hazmat/erg/ProtectiveTableNotes.html">http://environmentalchemistry.com/yogi/hazmat/erg/ProtectiveTableNotes.html</a> Spillage <a href="http://www.truckflix.com">www.truckflix.com</a> (view trucking industry video vault and podcasts)  <a href="http://www.truckline.com">www.truckline.com</a> (American Trucking Association); <a href="http://www.truckdriver.com">www.truckdriver.com</a> –tips on getting started in trucking <a href="http://www.womenintrucking.org">www.womenintrucking.org</a> (opportunities for women in the trucking industry)</td>
</tr>
<tr>
<td>Introduction</td>
<td>Trucks carry many different products to many different places. Almost everything we buy has been delivered by truck to a store or to our homes. Truck drivers use math in many different contexts. Today, we will apply the math we have learned in some trucking contexts. And we will learn a new formula that truck drivers use when they respond to a liquid spill. People who drive the trucks travel all over the United States. Sometimes drivers encounter accidents, and frequently during an accident, liquids will spill from the wreckage. We will discuss what drivers are expected to do, what they need to know, and apply some calculations that they would do in response to spillage.</td>
</tr>
<tr>
<td>Objective</td>
<td>Time (minutes)</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>----------------</td>
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</tbody>
</table>
| #1 Explore websites that provide information about road safety and displaying placards to signal when trucks are carrying hazardous or dangerous materials. | 15 min         | Are you ever curious what is inside the trucks as they travel down the road? Title 49 of the United States Code of Federal Regulations (also known as the Federal Motor Carriers Safety Regulations) requires the use of hazardous materials placards when shipping hazardous materials cargo and dangerous goods in the United States. The shipper has a responsibility to provide the placards to the driver. The driver has the responsibility to attach the placards on the truck.  
http://environmentalchemistry.com/yogi/hazmat/placards/  
http://environmentalchemistry.com/yogi/hazmat/erg/ProtectiveTableNotes.html | Computers or other electronic devices with access to the Internet.       | Corrosive  
Oxidizing  
Radioactive |
| #2 Recognize when trucks are carrying hazardous or dangerous materials.     | 20 min         | Using the Grade 9 Road Safety-Placards PowerPoint, emphasize the following: Placards have a definitive shape/color/possible graphic to help identify when a truck is carrying hazardous or dangerous materials. Review the nine classifications of hazardous materials. Lead the learners through four examples of placards and what the signs tell us. Provide each student the Placards exercise, review. | Grade 9 Road Safety-Placards PowerPoint  
Placards exercises | Asphyxiation  
Flammable  
Combustible  
Toxicity |
| Total:                                                                    | 35 min         |                                                                                                                                                                                                                                                                                                                                                                |                                                                          |                                                                                |
### Understanding What’s on Board (Placards) Exercise

NOTE: Information can be found in the *2004 Emergency Response Guidebook*, or online at [http://environmentalchemistry.com/yogi/hazmat/placards/](http://environmentalchemistry.com/yogi/hazmat/placards/)

Fill in the blanks! Match the placard to the classification and definition.

<table>
<thead>
<tr>
<th>Placard</th>
<th>Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Flammable Liquids" /></td>
<td><strong>Class 3- Flammable Liquids</strong></td>
<td>A liquid having a flash point of not more than 60.5°C (141°F)</td>
</tr>
<tr>
<td><img src="image" alt="Oxidizers" /></td>
<td><strong>Class 5-Oxidizers</strong></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Explosives" /></td>
<td><strong>Class 1- Explosives</strong></td>
<td>A material, other than a gas, which is known to be so toxic to humans as to afford a hazard to health during transportation.</td>
</tr>
<tr>
<td><img src="image" alt="Toxic" /></td>
<td></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Pollutant" /></td>
<td></td>
<td>A material which presents a hazard during transportation but which does not meet the definition of any other hazard class.</td>
</tr>
<tr>
<td><img src="image" alt="Explosives" /></td>
<td><strong>Class 1- Explosives</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Class 1-Explosives**

Explosives are any substance or article, including a device, which is designed to function by explosion or which, by chemical reaction within itself is able to function in a similar manner even if not designed to function by explosion. There are an additional six subdivisions of explosives:

1.1: mass explosion hazard

1.2: projection hazard but not a mass explosion hazard

1.3: fire hazard and either a minor blast hazard or a minor projection hazard or, both but not a mass explosion hazard

1.4: minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected.

1.5: Consists of very insensitive explosives. Substances which have a mass explosion hazard but are so insensitive that there is very little probability of transition from burning to detonation under normal conditions of transport.

1.6: Consists of extremely insensitive articles which do not have a mass explosive hazard. This division is comprised of articles which contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation.

**Class 2-Compressed Gases**

454 kg (1001 lbs) of any material which is a gas at 20°C (68°F) or less and 14.7 psi of pressure (a material which has a boiling point of 20°C (68°F) or less at 14.7 psi).

**Class 3-Flammable Liquids**

A liquid having a flash point of not more than 60.5°C (141°F).

**Class 4-Flammable Solids**

Flammable solids can be desensitized explosives that when dry are Explosives of Class 1 other than those of compatibility group A, which are wetted with sufficient water, alcohol, or plasticizer to suppress explosive properties, or self-reactive materials.

Self-reactive materials are materials that are thermally unstable and that can undergo a strongly exothermic decomposition even without participation of oxygen (air).

**Class 5-Oxidizers**

Oxidizer means a material that may, generally by yielding oxygen, cause or enhance the combustion of other materials.
Class 6-Poisons
Poisonous material means a material, other than a gas, which is known to be so toxic to humans as to afford a hazard to health during transportation.

Class 7-Radioactive Materials
Any material having a specific activity greater than 70 Bq per gram (0.002 microcurie per gram). The specific activity of a material in which the radionuclide is essentially uniformly distributed is the activity per unit mass of the material.

Class 8-Corrosives
A liquid or solid that causes full thickness destruction of human skin at the site of contact within a specified period of time.

Class 9-Miscellaneous
A material which presents a hazard during transportation but which does not meet the definition of any other hazard class. This class includes:

a. Any material which has an anesthetic, noxious or other similar property which could cause extreme annoyance or discomfort to a flight crew member so as to prevent the correct performance of assigned duties; or

b. Any material that meets the definition in 49CFR 171.8 of this subchapter for an elevated temperature material, a hazardous substance, a hazardous waste, or a marine pollutant.