Welcome!
Happy Tuesday!!!!

Learning Target: I can explain the use of distillation as a separation technique and how it relates to petroleum refining.

AGENDA:
1. HOMEWORK CHECK
   - The Greenest Thing that you can do SG p.7
   - 3A6 Reading Guide: Petroleum Refining
   - PRELAB: FRACTIONAL DISTILLATION
2. Lab: Fractional Distillation DAY 2
3. Finish Analysis Questions

HOMEWORK: FINISH ANALYSIS QUESTIONS
### 3A6 Reading Guide: Petroleum Refining

As you read section 3A6, compare the process of petroleum refining to the process of distillation:

<table>
<thead>
<tr>
<th>Distillation</th>
<th>Fractional Distillation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Which process separates each compound in the mixture?</strong></td>
<td>Simple, distil 1 pure substance</td>
</tr>
<tr>
<td><strong>For each process, separation is based on what property?</strong></td>
<td><strong>BOILING POINTS</strong></td>
</tr>
<tr>
<td><strong>Equipment needed</strong>&lt;br&gt;(<em>use figure 3.14</em>)</td>
<td></td>
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<tr>
<td><strong>Describe what is produced through each process.</strong>&lt;br&gt;(distillate or fraction/solid, liquid or gas)</td>
<td><strong>Distillate liquid</strong></td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
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<tr>
<td>Do all components get vaporized (turns into a gas)?</td>
<td>Yes</td>
</tr>
<tr>
<td>What happens to the molecules with the lowest boiling points?</td>
<td>Boil first, because the weakest intermolecular forces</td>
</tr>
<tr>
<td>Where is the hottest temperature?</td>
<td>In the column right before it reaches the condenser</td>
</tr>
</tbody>
</table>
Introduction:
The separation of liquid substances based on their differing boiling points is called **distillation**. As you heat a liquid mixture containing two components, the component with the lower boiling point will vaporize first and leave the distillation flask. That component will then condense back to a liquid as it passes through a condenser—all before the second component begins to boil. If you were to graph the temperature as you were distilling a mixture, you would notice that heating the liquid mixture raises its temperature. However, once the first component begins to boil and vaporize from the mixture, the temperature of the liquid remains steady until that component completely boils off. Continued heating then causes the temperature to rise again, until the second component begins to boil and distill.

What does this mean?
1. What safety rules are important for this lab?
   1) Safety goggles
   2) Don't boil off all of the liquid
   3) Separate liquids by their boiling points

2. What is the purpose of a distillation?

3. Summarize the process of distillation.
   http://www.youtube.com/watch?v=3VRi0KPGb3o
   1) Boil mixture
   2) Condense the gas
   3) Collect distillate (Repeat)

4. Label the parts of a distillation column in the right.