Specific Heat Problems

Solve problems 1 through 6 using the format for solving word problems that was demonstrated in class. Refer to the table at the right for specific heat capacity values.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Specific heat capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>4.184 J/(g⋅°C)</td>
</tr>
<tr>
<td>Iron</td>
<td>0.451 J/(g⋅°C)</td>
</tr>
<tr>
<td>Lead</td>
<td>0.160 J/(g⋅°C)</td>
</tr>
<tr>
<td>Aluminum</td>
<td>0.902 J/(g⋅°C)</td>
</tr>
<tr>
<td>Copper</td>
<td>0.385 J/(g⋅°C)</td>
</tr>
<tr>
<td>Wood</td>
<td>1.762 J/(g⋅°C)</td>
</tr>
<tr>
<td>Concrete</td>
<td>0.880 J/(g⋅°C)</td>
</tr>
</tbody>
</table>

1. A copper pipe absorbs 3600 joules of heat as the temperature changes from 53.5°C to 70.0°C. What is the mass of the pipe?

2. As the sun shines on a 1500 kg concrete slab the slab absorbs 3.4 kJ of energy. What will be the increase in temperature as this occurs?

3. How much heat is absorbed by a 2 kg iron skillet over a camp fire as it goes from 25°C to 150°C?
4. The iron skillet in the previous question has a 0.5 kg wooden handle. How much heat was absorbed by the handle if its final temperature was 75.5°C?

5. A pot is filled with 500 mL of water at 41°C. The mass of 1 mL of water is approximately 1 gram. How much heat is required to cause the water to begin to boil?

6. A 73.7 gram piece of metal at 45.0°C loses 253.5 joules of energy as it cools to 23.5°C. What is the metal substance? (Hint: find the specific heat capacity.)