For each problem, complete the statements before calculating the energy.

a) Is energy being absorbed or released? Will the sign of energy be positive or negative?

b) What is happening to the particles? (e.g. speeding up, slowing down, moving further apart, moving closer together)

c) What constant will you use? (e.g. heat of fusion, heat of vaporization, specific heat capacity, heat of sublimation)

d) Do the math.

1. How many kilojoules of energy would be necessary to melt a 5.13 kg block of lead?
   a) Energy is being _____________________. The sign of energy should be _____________________.
   b) The particles are _____________________________.
   c) I will use _________________________________.
   d) Do the math...
      a: 118 kJ

2. How many grams of silver could be cooled from 24.5 °C to 10.5 °C by the transfer of -4.23 kJ of energy?
   a) Energy is being _____________________. The sign of energy should be _____________________.
   b) The particles are _____________________________.
   c) I will use _________________________________.
   d) Do the math...
      a: 2.36 x 10³ g

3. What mass of paraffin wax can be warmed from 19.05 °C to 77.4 °C – just below its melting point of 78.4 °C – by the transfer of 5121 J of energy?
   a) Energy is being _____________________. The sign of energy should be _____________________.
   b) The particles are _____________________________.
   c) I will use _________________________________.
   d) Do the math...
      a: 37.3 g
4. How much energy is required to take 876 grams of water from solid ice at -5.01 °C to 106.8 °C? (Hint, five steps needed)
   a) Energy is being ___________________. The sign of energy should be ____________________.
   b) The particles are ___________________ from -5.01°C to 0°C...then they ___________________ at zero... then ___________________ from 0°C to 100°C...then while at 100°C ___________________,
       they...then ___________________ from 100°C to 106.8°C
   c) I will use ___________________ , ___________________ and _________________.
   d) Now, do the math... a: 2.66 x 10^3 kJ

<table>
<thead>
<tr>
<th>Substance</th>
<th>Specific heat (J g⁻¹ C⁻¹)</th>
<th>Heat of Fusion (kJ / mol)</th>
<th>Heat of vaporization (kJ / mol)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>0.128</td>
<td>4.77</td>
<td>178</td>
</tr>
<tr>
<td>Paraffin wax (C₂₅H₅₂)</td>
<td>2.35</td>
<td>4.05</td>
<td>2257</td>
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<tr>
<td>Ethyl alcohol (C₂H₅OH)</td>
<td>0.58</td>
<td>4.79</td>
<td>38.56</td>
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<tr>
<td>silver</td>
<td>0.128</td>
<td>9.51</td>
<td>255</td>
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<tr>
<td>tin</td>
<td>0.233</td>
<td>7.03</td>
<td>291</td>
</tr>
<tr>
<td>water (ice)</td>
<td>2.03</td>
<td>6.01</td>
<td>40.7</td>
</tr>
<tr>
<td>water (steam)</td>
<td>1.70</td>
<td>6.01</td>
<td>40.7</td>
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