The Browns want to raise some vegetables to help with the budget problems and not have to run to the store all the time and waste gas. They have brought you a sample of their soil. Please test the soil and give your findings.

1) ________________ pH 3) ________________ Nitrogen
2) ________________ Potash 4) ________________ Phosphorous

The Smiths have brought you the results they measured with a soil test kit of their soil. They found a pH of 5.45, the Phosphorous was very low, the Potash was optimum, and the Nitrogen was high. What fertilizer would you recommend if they are planting tomatoes?

5) ________________________________

Explain your reasoning.

6) ________________________________

What fertilizer would you recommend if they want to grow lettuce?

7) ________________________________

Explain your reasoning.

8) ________________________________

What do you recommend the Smiths do about the pH if they want to grow tomatoes?

9) ________________________________

Explain your reasoning.

10) ________________________________

What do you recommend the Smiths do about the pH if they want to grow lettuce?

11) ________________________________

Explain your reasoning.

12) ________________________________
The Jones are afraid that their soil has been contaminated by heavy metals from a nearby sewage treatment plant. A sample of the dirt from their garden was digested and you have it available to test. Whatever reagents that need to be added to cause the metals to have a color have been added so they are ready for use in the colorimeter. Please test if for Chromium.

<table>
<thead>
<tr>
<th>Metal</th>
<th>Color to eye</th>
<th>Color where ion absorbs most</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel</td>
<td>Green</td>
<td>Purple 430 nm</td>
</tr>
<tr>
<td>Iron</td>
<td>Red</td>
<td>Blue 470 nm</td>
</tr>
<tr>
<td>Copper</td>
<td>Blue</td>
<td>Red 635 nm</td>
</tr>
<tr>
<td>Chromium</td>
<td>Yellow</td>
<td>Green 565 nm</td>
</tr>
</tbody>
</table>

Based on the calibration chart you were given, what is the concentration of the Chromium ion?

13) _______________________________________

Does it seem likely that Chromium leached in from the sewage plant?

14) ___________________________________________________________________________________

Explain your reasoning.

15) ___________________________________________________________________________________

Take the initial temperature of both samples of soil you have before you.

16) Ti dry __________________________________ Ti wet __________________________________

Put both soil samples in the ice bath. At the end of five minutes, record the final temperatures.

17) Tf dry __________________________________ Tf wet __________________________________

Which type of soil, (wet or dry) would protect plants better from freezing their roots?

18) _____________________________________________

Based on your knowledge of the chemistry involved, which type of soil (wet or dry) would protect plants from a hot spell better?

19) ___________________________________________________________________________________

Explain your reasoning.

20) ___________________________________________________________________________________