Pure Substances and Mixtures Review

1. *In your classroom, identify something made of a material that is heterogeneous. To show you can be **sure** that the material is heterogeneous, list a set of properties for each different kind of matter in the material.*

   There are many possible answers; I will choose a chocolate chip cookie.

Chocolate Chips	Dough
Dark Brown	Light Brown
Soft	Hard
Smooth	Rough
etc	etc

2. *In your classroom, identify something made of a material that **might** be homogeneous. List its properties. Explain why further investigation would be needed to be sure that the material really is homogeneous.*

   There are many possible answers, I will choose the white board, which I can only list one set of properties for.

   White Board
   White
   Smooth
   Hard
   Shiny
   etc

   In order to be sure that the white board is homogeneous I would have to further examine by looking more closely at it. This could involve using a magnifying glass. However, I do not think that I would see much more, so I would then have to take a section of it and study it under a microscope to see if I could see a difference in particles.

3. *Are heterogeneous materials more common in the natural environment than homogeneous materials? Why?*

   You could argue both points. I would say that heterogeneous materials are more common because most things in nature are made of many parts. Rocks, soil and trees are examples of things made from different substances, with different sets of properties.

4. *Are heterogeneous materials more common in the <u>human-made</u> environment than homogeneous materials? Why?*

   You could argue both points. I would say heterogeneous materials are more common because, even though we filter and process materials, the majority of things are made of multiple substances, each with its own set of properties.

5. *Explain how an understanding of mixtures and pure substances can help people make decisions about what to do when:*
   - *handling materials in the school laboratory*
   - *handling materials, such as paint thinner, at home*
   - *hearing about an "air quality advisory" on the news*

   By understanding pure substances and mixtures, one would know of any safety precautions that need to be taken. It would be understood that when substances are mixed the properties could change.
   Substances can also be harmful because of their particular properties, which may be found on safety symbols.
   An air quality advisory indicates that smog, a mixture of air and pollutants, is present, so you would know to avoid the smog.

6. *Use the particle theory to explain why a mixture can be either homogeneous or heterogeneous.*

   A mixture can be homogeneous or heterogeneous, depending on how the particles of each substance within the mixture are scattered throughout the mixture. In a heterogeneous mixture, the particles of each substance can be seen and the mixture has more than one set of properties. In a homogeneous mixture, the particles are evenly scattered and the properties of each substance are blended.

7. *Are the particles in each of the following identical or not identical? Give reasons for your answers.*
   - *the bubbles of soda water*
   - *the blobs of milk*
   - *the pulp bits of orange juice*

   The bubbles of soda water are not identical, since they are different shapes and sizes; however each bubble contains the same gas, carbon dioxide, therefore it can be assumed that the particles would be identical.
   The fat blobs in milk appear to be identical, all relatively the same size. Each is also the same colour, which would lead to the assumption that the millions of microscopic blobs in each drop of milk are composed of the same particles.
   The bits of pulp in orange juice are not identical, since they are different shapes and sizes. Also, when looking at the bits of pulp, they appear to have different textures and colour variation. This would mean that the particles are not identical throughout the pulp.