

For each question, select the best answer from the four alternatives.

- Which of the following is a solution? (5.1) **K/U**
 - sand
 - salt water
 - orange juice
 - granola
- Which of the following is a chemical property? (5.3) **K/U**
 - colour
 - density
 - boiling point
 - ability to burn
- Which phrase correctly defines density? (5.6) **K/U**
 - the ratio of a substance's mass to its volume
 - the ratio of a substance's volume to its weight
 - the ratio of a substance's length to its volume
 - the ratio of a substance's mass to its weight
- Which of the following is a pure substance? (5.1) **K/U**
 - wood
 - apple
 - gold
 - paper

Indicate whether each of the following statements is **TRUE** or **FALSE**. If you think the statement is false, rewrite it to make it true.

- The mass of a substance is an example of a qualitative property. (5.2) **K/U**
- Adding salt to water causes the water to freeze at a lower temperature. (5.6) **K/U**

Copy each of the following statements into your notebook. Fill in the blanks with a word or phrase that correctly completes the sentence.

- The particles of a substance move _____ as the temperature of the substance increases. (5.1) **K/U**
- When a teaspoon of salt is dissolved in a pot of water, the salt undergoes a _____ change. (5.2) **K/U**

Match each term on the left with the most appropriate description on the right.

- | | |
|------------------|------------------------------------------------------------------|
| 9. (a) lustre | (i) the ability to flow or pour |
| (b) viscosity | (ii) the ability to be pulled into fine strands |
| (c) ductility | (iii) the level of breakability or flexibility |
| (d) brittleness | (iv) the level of shininess or dullness |
| (e) malleability | (v) the ability to be hammered into thin sheets (5.2) K/U |

Write a short answer to each of these questions.

- How can you tell that a hamburger is undergoing a chemical change when you cook it? (5.3) **K/U**
- Name at least two physical properties that are required of a metal used to make kitchen pots and pans. (5.2) **K/U**
- Which occupies more space: 5 g of solid gold or 5 g of liquid gold? Explain your answer. (5.6) **K/U**
- Explain why temperature is a physical property but not a characteristic physical property. (5.2, 5.6) **K/U**
- Give an example of a solid mixture, a liquid mixture, and a gas mixture. (5.1) **K/U**
- The mass of a sample of aluminium is 12.15 g and its volume is 4.5 cm³. What is the density of aluminium? (5.6) **T/I**

16. The density of sodium is 0.97 g/cm^3 . If a sample of sodium has a volume of 2.6 cm^3 , what is the mass of the sample? (5.6) T/I
17. You can separate some substances based on their chemical or physical properties. You are given a mixture of sawdust, small pieces of iron, and small pieces of rock. Devise a procedure to separate the mixture into its three components based on their physical properties. (5.2, 5.3, 5.6) T/I
18. You and a friend watch workmen putting tree limbs into a wood chipper. Large pieces go into the chipper and small pieces come out. Your friend says that because the pieces coming out of the chipper do not look anything like the pieces going in, the tree limbs have undergone a chemical change. Is your friend correct? Explain your answer. (5.2, 5.3) T/I
19. Sea water freezes at lower temperatures than fresh water. Explain why. (5.6) A
20. Imagine that you work for a science magazine. This month, your job is to write a short article that tells readers why water is such an amazing substance. In your article, be sure to mention several properties of water. (5.6) C
21. Name at least three characteristic physical properties that could be used to identify you. Use both qualitative and quantitative properties. (5.6) K/U A
22. It is your turn to make lunch. You decide to heat some canned soup and toast some bread. Identify the chemical change and the physical change that take place as you prepare lunch. Explain your answer. (5.2, 5.3) A
23. Explain the following statement in your own words: “The freezing point of a substance is the same temperature as the melting point of the same substance.” (5.6) C
24. The density of liquid mercury is 13.53 g/cm^3 . The density of solid copper is 8.96 g/cm^3 . Would you expect a piece of copper to sink or float when placed in a container of liquid mercury? Explain your answer. (5.6) K/U T/I
25. Classify the following properties of hydrogen as physical properties or chemical properties. (5.2, 5.3) K/U
 - (a) It is a colourless gas.
 - (b) It reacts with oxygen to form water.
 - (c) It combines with corn oil to form margarine.
 - (d) It floats in air.
 - (e) It has a strong odour.
26. Carbon fibre is now replacing aluminum as the material used to make racing bicycle frames. (5.2, 5.3, 5.6) K/U A
 - (a) The density of carbon fibre can be less than half the density of aluminum. Why is this property an advantage for the racing bicycles?
 - (b) What other physical properties and chemical properties should carbon fibre have if it is to be used to make bicycles?
27. A dented table tennis ball can sometimes be “repaired” by placing it in a cup of hot water. Use the particle theory of matter to explain how this is possible. (5.1) K/U A
28. Backyard barbecues are fuelled by gas. (5.2, 5.3) K/U A
 - (a) Identify one physical property that barbecue fuel should have. Explain why this property is important for barbecue fuel.
 - (b) Identify one chemical property barbecue fuel should have. Explain why this property is important for barbecue fuel.