

Key

Goal • Use this page to compare the densities of different substances.

What to Do

Use the information in the table to answer the following questions.

Fluid	Density (g/mL)	Solid	Density (g/cm ³)
hydrogen	0.000 09	Styrofoam™	0.005
helium	0.0002	cork	0.24
air	0.0013	oak	0.70
oxygen	0.0014	sugar	1.59
carbon dioxide	0.002	salt	2.16
ethyl alcohol	0.79	aluminum	2.70
machine oil	0.90	iron	7.87
water	1.00	nickel	8.90
seawater	1.03	copper	8.92
glycerol	1.26	lead	11.34
mercury	13.55	gold	19.32

1. You drop three things into a glass of water: a piece of Styrofoam™, a piece of oak, and a gold ring.

(a) Which will float?

Styrofoam + oak float

(b) Which will sink?

gold ring sinks.

2. Which is denser:

(a) carbon dioxide or air?

(b) oxygen or air?

(c) hydrogen or air?

□ = denser one!

Continued on next page

3. You find a white granular substance in a jar in your cupboard. You suspect that it may be either sugar or salt. How could you find out without tasting the substance?

Salt is denser than sugar! Compare the
densities by measuring the mass to volume
ratios!

4. Why is it easier to swim in seawater than it is to swim in fresh water?

Seawater is denser than fresh water so
we float easier in the sea!

5. A student comes to the conclusion that solids are denser than liquids. Is this true? Explain.

In general yes, but there are some
exceptions (like ice vs water!)

Key

Goal • Check your understanding of Chapter 7.

What to Do

Circle the letter of the best answer.

- The particles in _____ are closely spaced and in contact with each other, but they can slip and slide past one another.
 A. ice
 B. water vapour
 C. air
 D. water *D*
- The more energy particles have
 A. the faster they move
 B. the slower they move
 C. the higher the mass of the object
 D. the more particles there are per unit volume *A*
- In a solid
 A. particles have very large spaces between them
 B. particles can move freely in all directions
 C. particles vibrate in a fixed position
 D. particles have no motion *C*
- When the temperature of a solid, liquid, or gas decreases
 A. the particles slow down
 B. the particles lose energy
 C. the particles have less space between them
 D. all of the above *A*
- Which of the following describes a change in state?
 A. melting point
 B. sublimation
 C. thermal expansion
 D. kinetic energy *B*
- Which of the following does not describe a change in state?
 A. condensation
 B. solidification
 C. evaporation
 D. thermal energy *D*

Copyright © 2006, McGraw-Hill Ryerson Limited, a Subsidiary of the McGraw-Hill Companies. All rights reserved. This page may be reproduced for classroom use by the purchaser of this book without the written permission of the publisher.

Short Answer Questions

17. Explain the difference between heat and thermal energy.

*heat + thermal energy are similar. Heat = energy transfer
 Thermal energy = total amount of heat/energy in a substance.*

18. Explain why a cold drinking glass cracks when it is placed in very hot water.

cold particles are moving slow when hot water is added they speed up very quickly causing thermal expansion to occur, breaking the glass.

19. Calculate the density of the following substances:

(a) 40 cm³ container filled with 62.8 g of brown sugar

1.57 g/cm³

(b) 135 g of aluminum that has a volume of 50 cm³

2.7 g/cm³

(c) 12 mL of oil with a mass of 10.5 g

0.875 g/mL

Copyright © 2006, McGraw-Hill Ryerson Limited, a Subsidiary of the McGraw-Hill Companies. All rights reserved. This page may be reproduced for classroom use by the purchaser of this book without the written permission of the publisher.

7. _____ is the temperature at which a solid turns to a liquid.

- A. boiling point
- B. melting point
- C. freezing point
- D. 0° C

B

8. Highway bridges have gaps built into them to allow for

- A. thermal contraction
- B. thermal expansion
- C. drainage
- D. the easier passage of cars

B

9. As the thermal energy of a substance increases, its particles move farther apart. As a result,

- A. density increases
- B. mass increases
- C. density decreases
- D. density does not change

C

10. Which of the following is not a fluid?

- A. air
- B. magma
- C. dry ice
- D. liquid oxygen

C

Match the Term on the left with the best Descriptor on the right. Each Descriptor may be used only once.	
Term	Descriptor
<i>F</i> 11. density	A. temperature at which liquid turns to gas
<i>D</i> 12. fluid	B. the amount of space taken up by a substance
<i>C</i> 13. deposition	C. change in state from gas to solid
<i>A</i> 14. boiling point	D. can be a liquid or gas
<i>E</i> 15. evaporation	E. mass per unit volume
<i>F</i> 16. volume	F. change in state from liquid to gas
<i>B</i>	G. change in state from solid to gas

The correct order, but they don't line up... sorry!!

Continued on next page

Copyright © 2006, McGraw-Hill Ryerson Limited, a Subsidiary of the McGraw-Hill Companies. All rights reserved. This page may be reproduced for classroom use by the purchaser of this book without the written permission of the publisher.

