Name: _____ Group: _____ Date: _____

# Checkup • Chapter 1

## 1 What is matter?

*(pp. 6–9)*

**1.** How do we define matter?

_____

_____

_____

**2.** What holds the particles of a solid together?

_____

**3.** Using the particle model, describe two differences between a solid, a liquid and a gas.

| SOLID | LIQUID | GAS |
|---|---|---|
| | | |

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**4.** The particles in a sample of matter are very close together.

**a)** Using only this information, can you confirm that this sample is a solid? Explain your answer.

_____

_____

**b)** What other information could you use to be certain that the sample is a solid?

_____

_____

_____

**5.** What is the name of the smallest particle of matter that cannot be chemically divided? _____

## 2 Mixtures

*(pp. 10–20)*

**6.** Look at the photo at right. What type of mixture is each of the items in the photo?

| HETEROGENEOUS MIXTURES | HOMOGENOUS MIXTURES |
|---|---|
| | |

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**7.** What type of mixture is each of the following?

| | HETEROGENEOUS MIXTURE | HOMOGENEOUS MIXTURE |
|---|---|---|
| **a)** a handful of earth | | |
| **b)** air | | |
| **c)** smog | | |
| **d)** a stainless steel fork | | |
| **e)** seawater | | |
| **f)** whipping cream | | |
| **g)** a raisin muffin | | |

**8.** Give the term for each of the following definitions.

**a)** a substance that can dissolve another substance _____

**b)** a substance that can dissolve into another substance _____

**c)** a homogeneous mixture made up of one substance dissolved in another substance _____

**9.** What determines the concentration of a solution?

_____

_____

_____

**10.** A patient receives a prescription from the doctor for a medication that needs to be dissolved in water at a concentration of 2 g/L. The dosage is the following: one teaspoon (5 mL) three times a day for 10 days.

**a)** What is the minimum volume of the medication in solution that the patient will need?

_____

_____

**b)** If you were the pharmacist, how would you prepare the medication from a powder? Describe what you would do and show all of the calculations you need to prepare the right quantity of medication for the patient.

| STEPS | PROBLEM-SOLVING APPROACH |
|---|---|
| | |

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**11.** A woman wants to dye her hair lighter than her natural colour. Her hairdresser uses a hydrogen peroxide solution at 3 percent V/V to lighten her hair. He needs to prepare 100 mL of this solution by diluting a concentrate to 30 percent. How should he do it? Describe how you reached your answer, showing all your calculations.

| STEPS | PROBLEM-SOLVING APPROACH |
|---|---|
| | |

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**12.** The label on a bottle of wine indicates that the wine contains 12 percent alcohol m/V. How much alcohol does a 750-mL bottle of wine contain? Show all the steps leading to your answer.

| STEPS | PROBLEM-SOLVING APPROACH |
|---|---|
| | |

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**13.** The Nutrition Facts label on a container of apple juice indicates that 250 mL of juice contains 25 g of sugar. Calculate the concentration of sugar in the juice in g/L. Show all the steps leading to your answer.


| STEPS | PROBLEM-SOLVING APPROACH |
|---|---|
| | |

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**14.** Name four factors that can affect the solubility of a substance.

_____ _____

_____ _____

**15.** How does the solubility of table salt in water change with temperature?

_____

_____

_____

_____

**16.** Look at the graph at right. What is the solubility in g/L of this solid at a temperature of 60ºC?

_____

_____

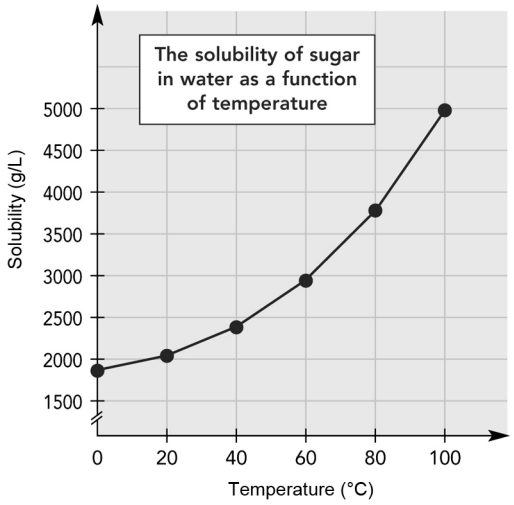
_____

_____

_____

_____

_____




**17.** Some industries dump hot water into the environment. How is this practice harmful to fish?

_____

_____

_____

_____

_____

_____

_____

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**18.** How can we obtain pure substances from a mixture?

_____

_____

_____

**19.** Indicate which separation technique you think would be the most appropriate for each of the following mixtures:

| | SEPARATION TECHNIQUE |
|---|---|
| **a)** a saltwater solution | _____ |
| **b)** water mixed with sand | _____ |
| **c)** a blood sample | _____ |
| **d)** an oil-and-vinegar dressing | _____ |
| **e)** water mixed with alcohol | _____ |
| **f)** black ink | _____ |
| **g)** toxic smoke | _____ |
| **h)** oil | _____ |

## 3 Pure substances

*(pp. 21–26)*

**20.** Give two examples of non-characteristic properties.

_____

_____

**21.** We can identify a substance by observing its characteristic properties.

**a)** What is the difference between a characteristic physical property and a characteristic chemical property?

_____

_____

_____

_____

_____

**b)** Give an example of a characteristic physical property.

**c)** Give an example of a characteristic chemical property.

**22.** Why is density a characteristic physical property, but not mass or volume?

**23.** You are given three solid substances, all in the form of a white powder. How can solubility help you to identify each of the three substances?

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**24.** A technician is given a gas sample to identify. She performs a series of tests and compiles her results as follows:

| PROPERTIES | RESULTS |
|---|---|
| Freezing point | –259ºC |
| Density | 0.000 09 g/mL |
| Colour | Colourless |
| Odour | Odourless |
| Reaction to limewater | No change |
| Reaction to open flame | An explosion |

**a)** Study the results in the table. Which tests can be used to identify the gas?

_____

_____

_____

**b)** What is the gas in the sample?

_____