

M^{rs}. Tam
Per 4
Chem.

Amya

Hand out ① "Chapter 2 test" is to be completed as a practice test for the real test tomorrow.

~~Then~~ Work in groups after the first ten minutes of independent work.

Name _____

Date _____

Class _____

2 Chapter Test

Energy and Matter

Multiple Choice

On the line at the left, write the letter of the answer that best completes each statement.

- Energy is defined as the capacity to
 - cause chemical change.
 - exert force.
 - do work.
 - resist gravity.
- Which of the following is an example of potential energy?
 - a dry-cell battery in your camera
 - the water behind a dam
 - the gasoline in your car tank
 - all of the above
- The SI scale used to measure temperature is the
 - Celsius scale.
 - Fahrenheit scale.
 - Kelvin scale.
 - Calorie scale.
- Absolute zero corresponds to
 - 0°C.
 - 273 K.
 - 273 K.
 - 0 K.
- The law of conservation of matter states that
 - matter is saved in the form of particles.
 - matter is conserved by chemical processes.
 - matter is very unlike energy.
 - matter is neither created nor destroyed in any process.
- The new properties observed during a change of state are not signs of a chemical change because
 - the new properties are temporary.
 - the chemical identity of the substance has not been altered.
 - the color of the substance has changed.
 - a gas is not produced.
- Which of the following is an example of a chemical change?
 - steam condensing on the bathroom mirror
 - cracking open an egg and removing the yolk
 - burning a piece of toast
 - water evaporating from a puddle on a hot day

Name _____

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Class _____

2 Chapter Test (continued)

- Elements and compounds are both considered pure substances because they
 - cannot be broken down into simpler substances.
 - appear on the periodic table.
 - contain two or more elements combined in a fixed proportion.
 - have a unique set of chemical and physical properties.
- Electrolysis could be used to
 - separate water into oxygen and hydrogen gas.
 - break zinc into simpler substances.
 - remove salt from ocean water.
 - both a and b
- Both homogeneous and heterogeneous mixtures
 - are blends of two or more pure substances.
 - can be separated by filtration.
 - appear to be made of a single kind of matter.
 - are less common than pure elemental substances.
- All of the following are heterogeneous mixtures except
 - air.
 - milk.
 - paint.
 - concrete.

Matching

Match the following elements to their corresponding element symbols. Write the letter on the line.

- | | | |
|-------|---------------|-------|
| _____ | 12. potassium | a. Na |
| _____ | 13. sodium | b. Hg |
| _____ | 14. copper | c. Pb |
| _____ | 15. gold | d. K |
| _____ | 16. iron | e. Cu |
| _____ | 17. mercury | f. Sn |
| _____ | 18. tin | g. Fe |
| _____ | 19. lead | h. Au |

Problems

Solve each of the following problems as directed. Show all your work.

- A runner burns about 10 kilocalories per minute. If the runner completes a race in one hour and fourteen minutes, how many kilocalories did he burn? How many grams of pasta would have provided him with this much energy? (The energy value of pasta is 17,000 J/g.)

2 Chapter Test (continued)

Additional Questions

Answer each of the following questions in the space provided.

26. If burning 1 mL of gasoline releases 1.03×10^{-4} calories, how many joules of potential chemical energy are in one gallon of gasoline? (1 gallon = 3.744 L)

27. What temperature, measured in Fahrenheit degrees, is exactly twice the measurement that the temperature would be on the Celsius scale? ($^{\circ}\text{F} = \frac{9}{5}^{\circ}\text{C} + 32$)

28. A swimming pool with the dimensions 12 m x 5 m x 2 m is filled with water. If the water temperature is 20°C , how many calories of energy are needed to raise the temperature to 25°C ? (The density of water is 1 kg/m^3)

29. Describe how distillation can be used to separate solid impurities from water and retain the pure water.

30. Wine contains alcohol, but foods cooked in a wine sauce usually do not. How can you account for this apparent contradiction to the law of conservation of matter?

Additional Essay

Write your answer to the following question on a separate sheet of paper.

Define absolute zero and explain why it has not been reached.

2 Chapter Test (continued)

21. Fill in the chart by supplying each missing temperature conversion.

	$^{\circ}\text{C}$	K
a. Boiling point of water	100	
b. Freezing point of water		273
c. Room temperature	20	
d. Normal body temperature	37	
e. Absolute zero		0

22. An electric current is passed through a 68.3-g sample of water to separate it into its component parts. If 7.59 g of hydrogen gas is released, how much oxygen is produced?

Short Answer

Answer the following question in the space provided.

23. Describe the steps you would take in order to separate a mixture of water, salt, sand, and paper clips.

Essays

Write your answers to the following questions on a separate sheet of paper.

24. Write a short paragraph describing an ordinary activity that involves at least five physical changes and three chemical changes. Underline the physical changes and circle the chemical changes.

25. Describe three ways in which energy and matter are related.