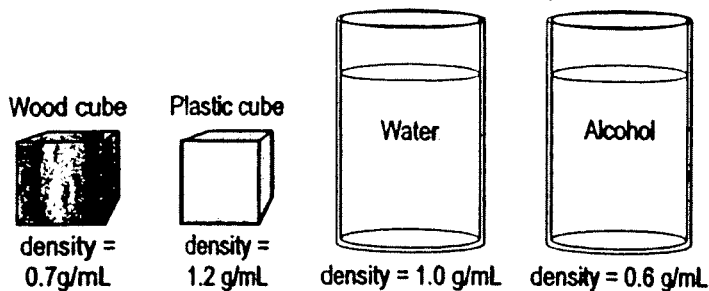


MEA CHEMISTRY REVIEW TEST

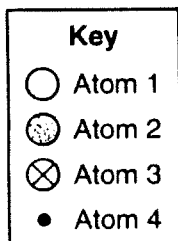
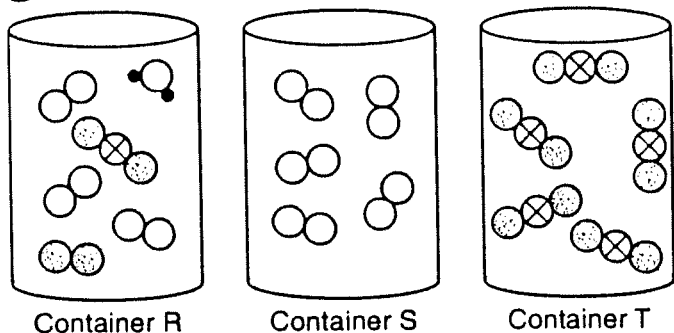
Use the graphic below to answer question 23.



23. The wood cube floats in water, but it sinks in alcohol. Using this information, what should the plastic cube do in water and alcohol?

- A. float in water, sink in alcohol
 B. float in water, float in alcohol
 C. sink in water, float in alcohol
 D. sink in water, sink in alcohol

15 The diagram below shows three containers of gas.



Which list correctly describes the gases in containers R, S, and T?

- A. R = element, S = compound, T = mixture
 B. R = compound, S = element, T = mixture
 C. R = element, S = mixture, T = compound
 D. R = mixture, S = element, T = compound

For question 32, write the words that fill in the blanks.

32. If the four states of matter are placed in order from having the most molecular movement to having the least, it would be plasma, gas, _____, and _____.

6

9. A rock and a raindrop are alike in that both have

- A. a definite mass.
 B. a definite shape.
 C. the same types of elements.
 D. the same numbers of atoms and molecules.

7

When electricity passes through water, hydrogen and oxygen are produced. Which table correctly labels the compounds and elements involved in the process?

A. Water—Compound
 Hydrogen—Compound
 Oxygen—Element

B. Water—Compound
 Hydrogen—Element
 Oxygen—Compound

C. Water—Compound
 Hydrogen—Element
 Oxygen—Element

D. Water—Element
 Hydrogen—Element
 Oxygen—Compound

8

19 Which chemical is a compound?

- A. helium (He)
 B. hydrochloric acid (HCl)
 C. hydrogen (H₂)
 D. nitrogen (N₂)

- 9C 8 The table below shows five elements and the way they react with chlorine (Cl).

Element	Compound Formed when Reacted with Chlorine
Sodium (Na)	NaCl
Aluminum (Al)	AlCl ₃
Potassium (K)	KCl
Magnesium (Mg)	MgCl ₂
Calcium (Ca)	CaCl ₂

Which two elements are **most likely** from the same family or group in the periodic table?

- A. calcium and chlorine
 B. sodium and potassium
 C. potassium and aluminum
 D. aluminum and magnesium

- 10C 17. A solid chunk of iron was left outside on a black-topped driveway on a very hot, sunny day. By mid-afternoon the chunk of iron will be

- A. a little smaller than before.
 B. a little larger than before.
 C. much smaller than before.
 D. much larger than before.

- 11C 11 When the motion of liquid water molecules slows, what **most likely** happens?

- A. The liquid water forms a solid.
 B. The liquid water condenses.
 C. The liquid water undergoes a chemical change.
 D. The liquid water becomes a vapor.

- 12C 2 The diagram below shows the chemical structure of water.



What can be concluded about the structure of water?

- A. It is an atom made up of two elements.
 B. It is an atom made up of three elements.
 C. It is a molecule made up of two elements.
 D. It is a molecule made up of three elements.

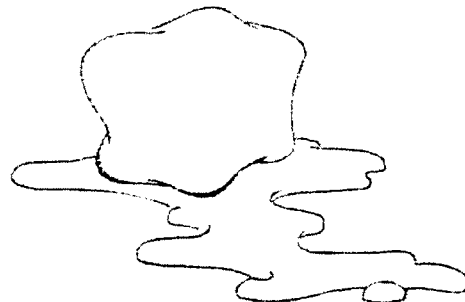
- 13C 16 The elements listed below are located in the same vertical column of the Periodic Table of the Elements.

F
Cl
Br
I
At

- 14C Why are these elements grouped together in the same chemical family?

- A. They have the same density.
 B. They have similar properties.
 C. They are made of the same type of atom.
 D. They have different properties.

Use the picture below to answer question 2.



- 15C 2 As the ice cube melts, what happens to the water particles?

- A. They speed up.
 B. They slow down.
 C. They increase in size.
 D. Their motion and size stay the same.

- 16C 3. When energy is added to ice, the motion of its molecules increases. The molecules also lose their arrangement and slide past each other. During this process, the ice

- A. evaporates.
 B. condenses.
 C. freezes.
 D. melts.

17

12. The diagrams below represent four different substances.

C

Diagram 1

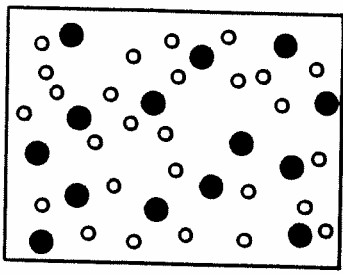


Diagram 2

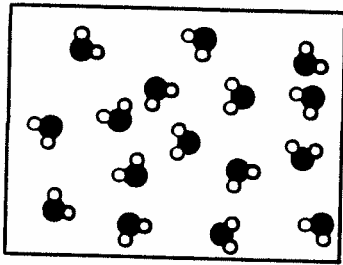


Diagram 3

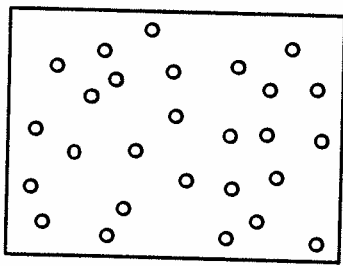
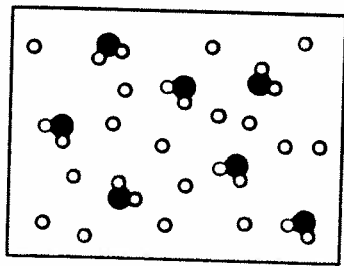


Diagram 4



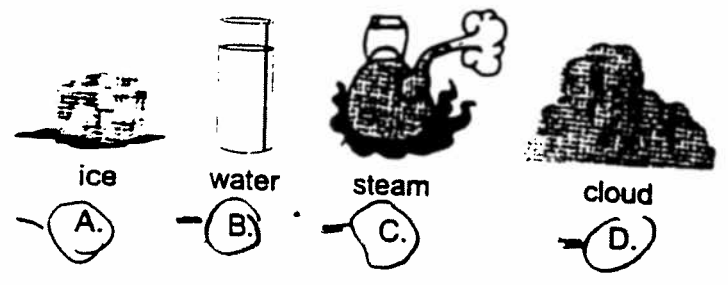
Which diagram **best** represents a mixture of a compound and an element?

- A. Diagram 1
- B. Diagram 2
- C. Diagram 3
- D. Diagram 4

18

23. In which picture are the atoms moving the slowest?

C



19

19. Which of the following is made of atoms?

- C A. gravity
- B. light
- C. heat
- D. air

20

20. The smallest particle of iron that still has all the properties of iron is

C

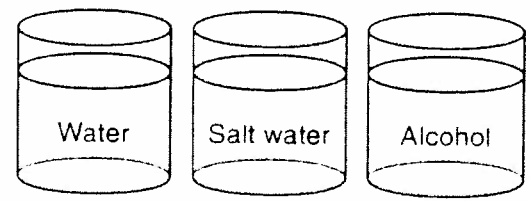
- A. an atom.
- B. a proton.
- C. a neutron.
- D. an electron.

21

Amber



1.1 g/mL



1.0 g/mL 1.2 g/mL 0.89 g/mL

21. What will the piece of amber **most likely** do when placed in each liquid?

C

- A. It will sink in all three liquids.
- B. It will float in all three liquids.
- C. It will sink in water and alcohol and float in salt water.
- D. It will sink in water and float in alcohol and salt water.

Use the periodic table of the elements below to answer question 10.

22

Periodic Table of the Elements

1 H 1.008																	2 He 4.003
3 Li 6.94	4 Be 9.01											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18
11 Na 22.99	12 Mg 24.31											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.06	17 Cl 35.45	18 Ar 39.95
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.88	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.70	29 Cu 63.55	30 Zn 65.38	31 Ga 69.72	32 Ge 72.59	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc (97)	44 Ru 101.07	45 Rh 102.91	46 Pd 106.4	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.69	51 Sb 121.75	52 Te 127.60	53 I 126.90	54 Xe 131.30
55 Cs 132.91	56 Ba 137.33	*La 138.91	72 Hf 178.49	73 Ta 180.95	74 W 183.85	75 Re 186.21	76 Os 190.2	77 Ir 192.22	78 Pt 195.09	79 Au 196.97	80 Hg 200.59	81 Tl 204.37	82 Pb 207.2	83 Bi 208.98	84 Po (209)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra 226.03	**Ac (227)	104 Unq (261)	105 Unp (262)	106 Unh (263)	107 Uns (262)											

Lanthanide Series

58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm (147)	62 Sm 150.4	63 Eu 151.96	64 Gd 157.25	65 Tb 158.93	66 Dy 162.50	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.04	71 Lu 174.97
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****Actinide Series**

90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np 237.05	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (254)	100 Fm (257)	101 Md (258)	102 No (259)	103 Lr (260)
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10. Na is to Cl as Li is to

- C
- A. C.
 - B. Al.
 - C. Be.
 - D. F.

24

Use the diagram and table below to answer question 10.

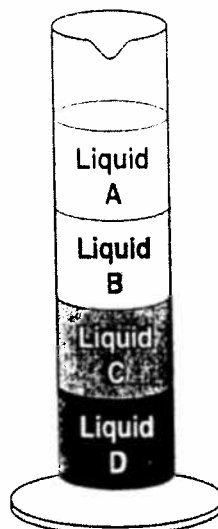
Use the table below to answer question 8.

Table 1

Hot Water		Cold Water	
Substance	Amount of substance that dissolves in 100 mL of water	Substance	Amount of substance that dissolves in 100 mL of water
A	12 grams	A	6 grams
B	24 grams	B	20 grams
C	6 grams	C	5 grams

8. What is the best conclusion based on the data in Table 1?

- A. Twice as much of each substance can dissolve in hot water as in cold water.
- B. More of each substance dissolves in hot water than in cold water.
- C. Each substance dissolves faster in hot water than in cold water.
- D. Any substance will dissolve in 100 mL of water.



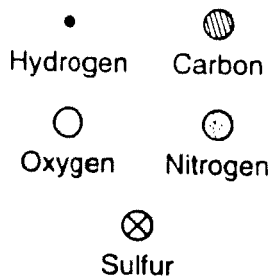
Density of Liquids

Liquid	Density (g/mL)
A	0.97
B	1.09
C	?
D	1.23

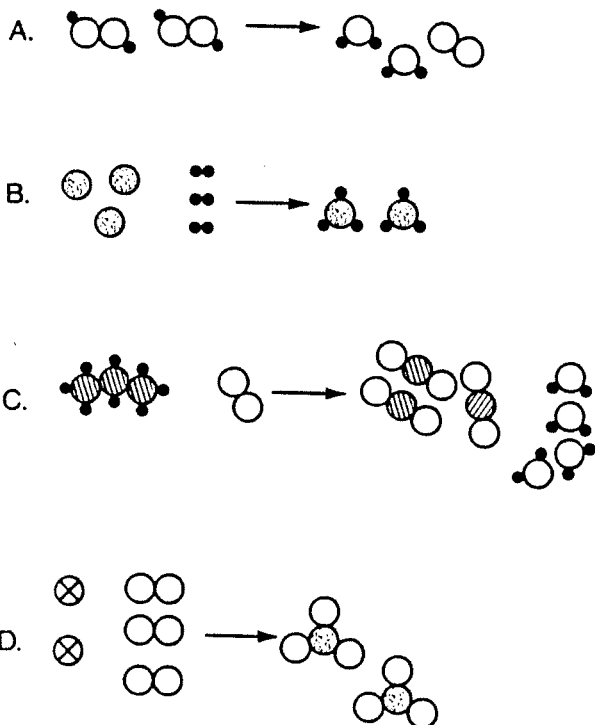
10. What is the approximate density of Liquid C?

- C
- A. less than 0.97 g/mL
 - B. greater than 1.23 g/mL
 - C. greater than 0.97 g/mL but less than 1.09 g/mL
 - D. greater than 1.09 g/mL but less than 1.23 g/mL

25. Each circle shown below represents a different atom.



Which diagram illustrates that matter is always conserved during a chemical reaction?



Use the table below to answer question 2.

26. Boiling Points of Carbon Compounds

Name	Number of Carbon Atoms	Boiling Point
Ethane	2	-88°C
Butane	4	0°C
Hexane	6	69°C
Octane	8	126°C
Decane	10	174°C

2. Which of the following is the **best** estimate of the boiling point of heptane, a compound that contains seven carbon atoms?

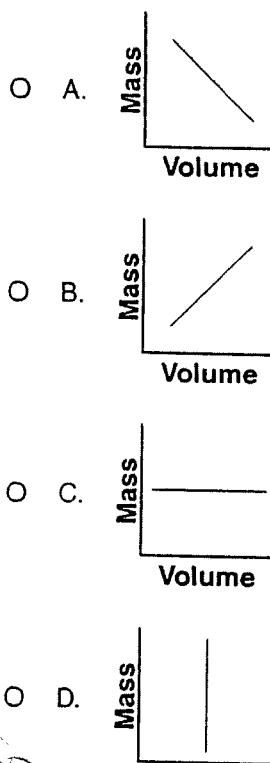
- A. -40°C
 B. 35°C
 C. 95°C
 D. 150°C

Use the data table below to answer question 7.

27. Three Mineral Samples

Mineral Sample	Mass (g)	Volume (cm ³)
1	30	10
2	60	20
3	90	30

7. The table shows the mass and volume of three samples of the same mineral. Which graph **best** represents the relationship between mass and volume?



28. If 100 g of mercury (Hg) melts at -36°C, what is the melting point of 50 g of mercury?

- A. -9°C
 B. -18°C
 C. -36°C
 D. -72°C

29. Which of the following is the **best** example of the law of conservation of matter?

- A. water cycle
 B. static electricity
 C. refraction of light
 D. reflection of sound

30
6. When a gas, such as water vapor, condenses to form liquid water, the molecules

- A. stop moving.
- B. slow down.
- C. speed up.
- D. slow down, and then speed up.

34
26. What is the **best** explanation to support the fact that a relatively small number of naturally occurring elements result in a large variety of substances?

- A. Elements are made up of many atoms.
- B. Atoms are made up of many particles.
- C. Elements combine in many ways to make many substances.
- D. Molecules are made up of many particles.

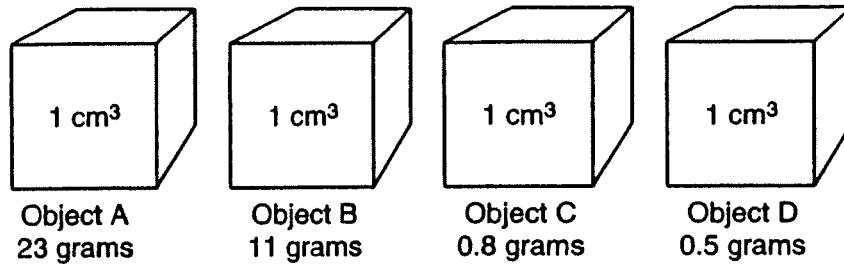
31
21. Changes that are observed in everyday living are listed below.

- C
- Rusting iron
 - Cutting paper
 - Burning wood
 - Cooking an egg
 - Charging a battery
 - Making lemonade
 - Melting ice
 - Mowing grass
 - Eating food

31A
a. Choose six changes from the list and identify each change as a physical or a chemical change.

31B
b. Explain your reasoning for each of your identifications.

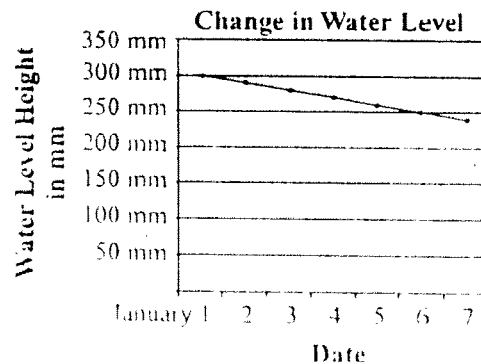
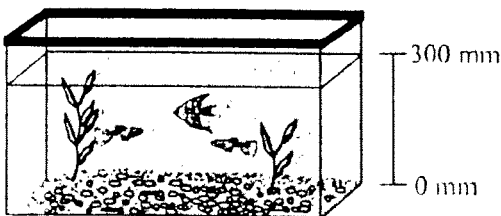
Use the diagram below to answer question 16.



16. In the diagram above, all four objects have a volume of one cubic centimeter, but each object has a different mass.

C
Based on the information given about each object, list all of the objects that will float in a bucket of water. (The density of water is 1 g/cm^3 .)

Use the picture and graph below to answer question 41.



41. Using scientific terminology, explain the change in the water level and describe the motion of the water molecules during that change.

C

35

Use the chart below to answer question 24.

States of Matter

Solid	Liquid	Gas	Plasma
-------	--------	-----	--------

24. Compare the relative motion of particles in each state of matter. You may use labeled diagrams to support your answer.

36

Use the pictures to the right to answer question 21.

21. A thermometer at 20°C is placed in hot water. The column of liquid in the thermometer rises.

C
G

- a. What is the temperature reading on the thermometer in the hot water?
- b. Explain what happens to the molecules of the liquid inside the thermometer when the thermometer is put into the hot water. Use the word "molecules" in your answer.

