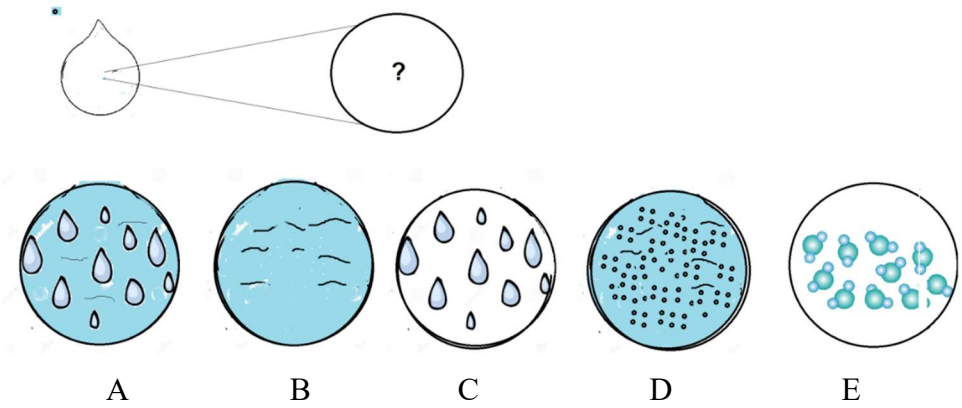
Items 6, 7 , 10 and 11 are linking items. The items marked in red, were excluded from the analysis.

Models of Matter Survey Form II

Are you male / female? ____ What language do you speak at home? _____

1. Julie wants to sleep but the dripping faucet in the bathroom in the room next door keeps her up. While she lies in her bed, she imagines how water is composed. How do you think the particles of which water is composed look like?



A B C D E

Explain your choice.

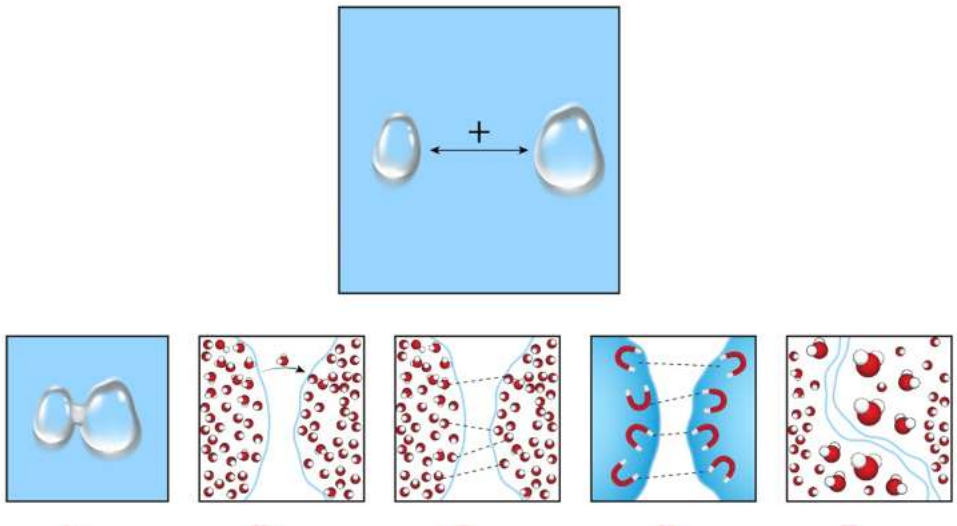
_____

_____

2. When we put a tea bag in a cup, and pour hot water over it we obtain a reddish brown liquid. Why does the color of water change from clear and colourless to reddish-brown when we make tea?

A. The reddish brown is coming from the tea bag.
B. The reddish brown colour is due to particles in the tea that mix with the water particles.
C. The tea particles bond with the water particles and make a new compound
D. There are other substances around the tea particles that pass through the teabag and colour the water reddish brown
E. The reddish brown tea particles take up all the space in the colourless water

3. When you bring two drops of water near each other, they combine and become one drop. Which of the following explains why this happens?

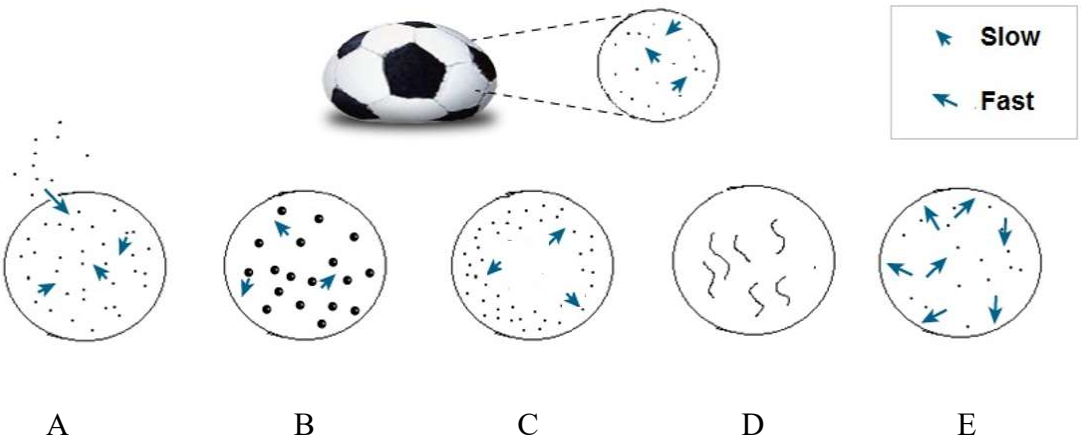


4. Some air is released from a balloon filled with air. The balloon is closed with a knot afterwards. How do the remaining air particles arrange in the balloon?

a) The air particles bunch-up near the balloon's knot.
b) The air particles bunch-up in the middle of the balloon.
c) The air particles bunch-up at the top of the balloon.
d) The air particles scatter evenly throughout the balloon.
e) There are no particles in the air, but the air itself scatters evenly in the balloon.

5. In a hot summer day, Ercan wants to play soccer outside with his friends. He takes his ball from home and comes to the soccer field. He leaves the ball in the sun for a while. When they start playing the game they notice that the ball has expanded a little.

Which of the following pictures shows what made the ball expand?



Explain your choice.

_____

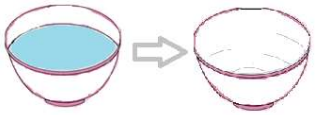
_____

_____

6. When we add a sugar cube to hot water and stir the water, the sugar cube is no longer seen. Which of the following statements describes what happens to the sugar in the hot water?

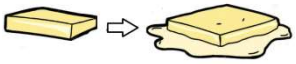
a) The sugar scatters to the bottom of the cup
b) The sugar molecules mix and scatter between the water molecules
c) The sugar cube turns into water molecules
d) The sugar disappears, and the sweet taste is transferred to the water molecules
e) The sugar particles separate by moving further apart when in water.

7. On a hot summer day a boy puts a bowl of water in the garden so that birds can drink from it. After three hours, although he didn't see any bird, there is almost no water left in the bowl. How would you explain this observation?



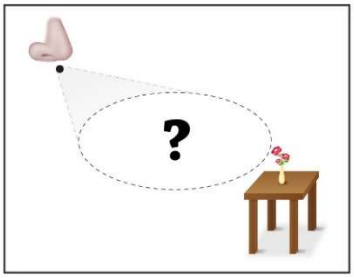
a) The water vaporized and only the water molecules remained in the bowl.
b) The water sank through the bowl into the ground.
c) The water moleules bond with the molecules of the bowl
d) The water molecules went into the air
e) The water molecules turned into hydrogen and oxygen gas.

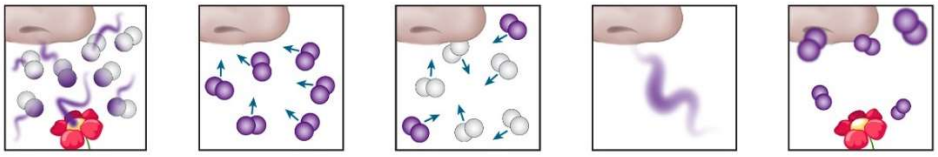
8. A package of butter was left outside the fridge and melted.
What happens to the particles in the butter after it melts?



a) The butter particles expand.
b) The butter particles become squiggly like jelly.
c) The butter particles move far away from each other, creating large spaces between them.
d) The butter particles start to vibrate.
e) The butter particles can slide across each other and are no longer vibrating in one place

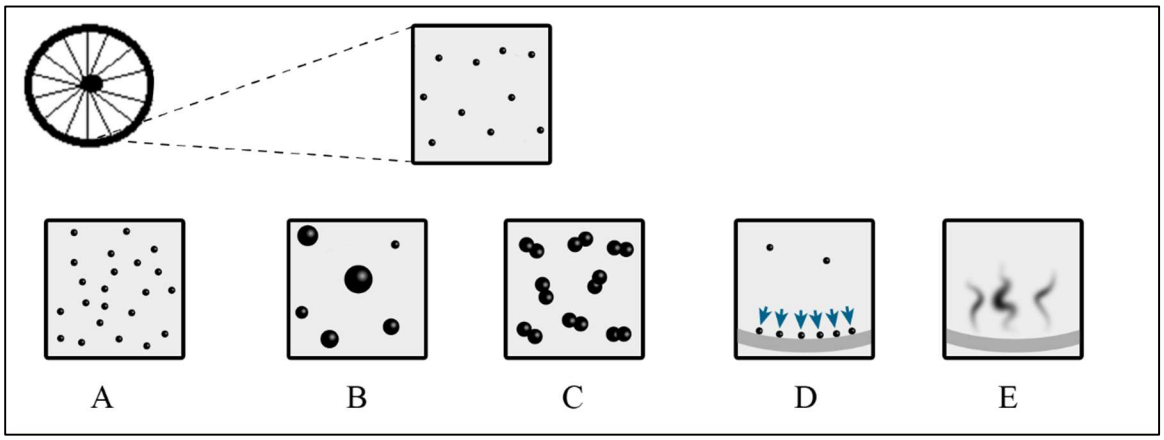
9. Playing in his room, Danny smelled the flowers in the other room. Which of the following pictures shows how the smell of the flowers reach Danny's nose?



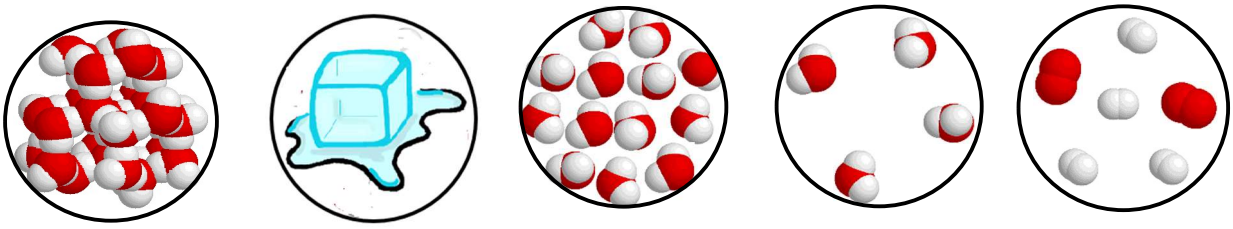


A B C D E

10. Tom noticed that his bicycle's front tyre is a little flat. Then he pumped it up until it was hard enough to ride. The picture above shows the inside of the tire before pumping. Which of the following pictures shows what happened inside the tire after pumping?

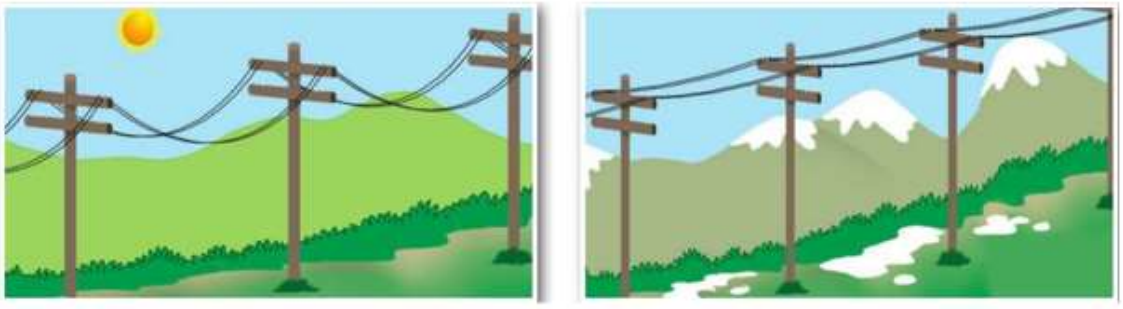


11. A piece of ice was left on the kitchen counter, and it started melting at room temperature. Which of the following pictures best shows what water would look like after melting?

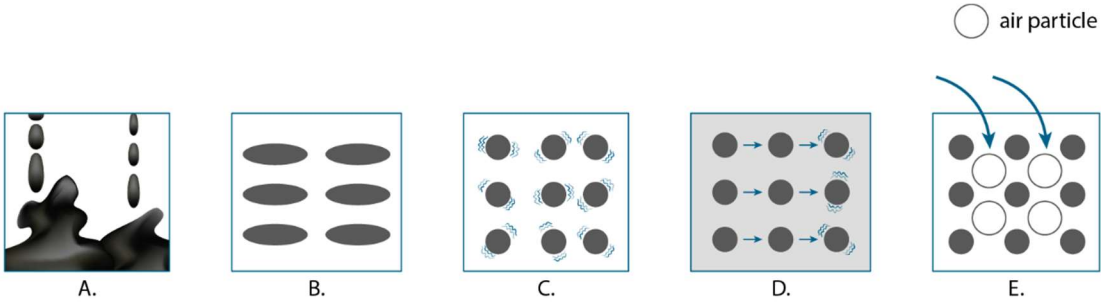


A. B. C. D. E.

12. As seen in the picture below, power line wires, which are usually made up of copper metal, look loose in the summer and tight in the winter.



Which of the following pictures best explains how does the metal inside the wires look like in the summer?



Explain your answer.

_____

_____

13. Katy added purple food colouring to two beakers: one beaker with hot water and one with cold water. Katy noted that the food colouring spreads in the hot water more quickly than in the cold water. Which of the following explains why food colouring spread more quickly in the hot water than the cold water?

A. The food colouring moves around the cup more in hot water than in cold water.
B. The hot water causes the food coloring particles to grow bigger.
C. The hot water molecules carry more food coloring than cold water molecules.
D. The food colouring particles in the water move faster when it is hot than when it is cold.
E. The hot water molecules move faster and push the food colouring particles to spread more quickly.