Particles Have Spaces Between Them

50 mL of water plus 50 mL of alcohol gives only about 96 mL. The reason: particles of matter have spaces between them.

Name: Date: Score: ____ / 17

A. Fill in the blanks

1. Particles of matter have ____ between them.

2. Sugar dissolves because its particles go into the ____ between water particles.

3. Space between particles is least in ____ and most in gases.

4. Gases are easily ____ because their particles are far apart.

B. True or False

5. 50 mL alcohol + 50 mL water gives exactly 100 mL. True / False

6. Gases can be compressed more than solids. True / False

7. Particles in a solid have no space at all between them. True / False

8. Dissolving sugar does not raise the water level much. True / False

C. Assertion and reason

9. Assertion (A): Gases can be compressed easily.
Reason (R): Particles of a gas have large spaces between them.

(a) Both A and R are true, and R explains A
(b) Both A and R are true, but R does not explain A
(c) A is true, R is false
(d) A is false, R is true

Answer: _____

10. Assertion (A): 50 mL water + 50 mL alcohol gives exactly 100 mL.
Reason (R): Particles of liquids have spaces between them.

(a) Both A and R are true, and R explains A
(b) Both A and R are true, but R does not explain A
(c) A is true, R is false
(d) A is false, R is true

Answer: _____

D. Choose the correct option

11. Space between particles is greatest in:

(a) solid
(b) liquid
(c) gas
(d) all equal

Answer: _____

12. Mixing two liquids gives a smaller total volume because:

(a) particles vanish
(b) particles fit into spaces
(c) liquids evaporate
(d) mass is lost

Answer: _____

13. Which is easiest to compress?

(a) iron
(b) water
(c) air
(d) ice

Answer: _____

14. Sugar dissolves in water because:

(a) it melts
(b) it fills the spaces between water particles
(c) it reacts
(d) water absorbs it

Answer: _____

E. Short answer questions

15. Describe an activity that shows particles have spaces.

16. Arrange solid, liquid and gas by the space between particles, and give one consequence.

F. Match the columns

17. Match each item in Column A with the correct item in Column B.

Column A	Column B	Your answer
1. Gas	(a) Particles far apart	1 → ____
2. Solid	(b) Fills spaces between water particles	2 → ____
3. 50 mL + 50 mL ≈ 96 mL	(c) Particles closely packed	3 → ____
4. Sugar dissolving	(d) Particles fill spaces	4 → ____

Detailed solutions

1. spaces

2. spaces

3. solids

4. compressed

5. False. It gives about 96 mL: particles fit into spaces.

6. True. Their particles are farther apart.

7. False. Small spaces exist, but fewer.

8. True. Sugar particles occupy the spaces.

9. (a) R explains A.

10. (d) A is false (about 96 mL); R is true and explains why.

11. (c) gas. Gas particles are far apart.

12. (b) particles fit into spaces. Spaces get filled.

13. (c) air. Gas.

14. (b) it fills the spaces between water particles. Particle spaces.

15. Mix 50 mL alcohol with 50 mL water: the total is about 96 mL, not 100 mL, because some particles fill spaces between others.

16. Solid < liquid < gas. So gases compress easily and solids hardly at all.

17. 1 → (a), 2 → (c), 3 → (d), 4 → (b). Spaces between particles explain mixing and compression.