Why Does Ice Float?

Most solids sink in their own liquid, but ice floats. How open hexagons make ice less dense, and why that keeps lakes alive.

Name: Date: Score: ____ / 19

A. Fill in the blanks

1. A solid floats if it is ____ dense than the liquid.

2. Density equals mass divided by ____.

3. In ice, water molecules form open ____.

4. On freezing, water's volume grows by about ____ percent.

5. A lake freezes from the ____.

B. True or False

6. Most solids sink in their own liquid. True / False

7. Ice has less mass than the water it came from. True / False

8. Iron floats on mercury. True / False

9. Ice floats in ethanol. True / False

C. Assertion and reason

10. Assertion (A): Ice floats on water.
Reason (R): Ice is less dense than water.

(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: _____

11. Assertion (A): Water pipes can burst in winter.
Reason (R): Water expands when it freezes.

(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

12. Ice is less dense than water because:

(a) it is colder
(b) its molecules leave empty space
(c) it has less mass
(d) it has no hydrogen

Answer: _____

13. Which floats in water?

(a) Iron
(b) Gold
(c) Wax
(d) Aluminium

Answer: _____

14. About how much of an iceberg is under water?

(a) 8%
(b) 50%
(c) 92%
(d) 100%

Answer: _____

15. Fish survive under a frozen lake because:

(a) ice is warm
(b) ice stays on top
(c) water turns to air
(d) fish freeze

Answer: _____

E. Numerical problems

16. A floating block has density 0.8 in a liquid of density 1.0. What percent is under the surface?

17. Density of a 10 g object with volume 5 cm^3, in g/cm^3?

F. Short answer questions

18. Why does solid wax sink in liquid wax but ice float on water?

G. Match the columns

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

Column A	Column B	Your answer
1. Ice	(a) about 1.00 g/cm³	1 → ____
2. Water	(b) about 0.92 g/cm³	2 → ____
3. Iron	(c) about 13.5 g/cm³	3 → ____
4. Mercury	(d) about 7.87 g/cm³	4 → ____

Detailed solutions

1. less

2. volume

3. hexagons

4. 9

5. top

6. True. Water is unusual.

7. False. The mass stays the same.

8. True. Mercury is denser.

9. False. Ethanol is less dense than ice.

10. (a) R explains A.

11. (a) R explains A.

12. (b) its molecules leave empty space. Open hexagons.

13. (c) Wax. Wax is 0.90 g/cm³.

14. (c) 92%. 0.92 ÷ 1.00.

15. (b) ice stays on top. Water stays liquid below.

16. 0.8 ÷ 1.0. **Answer: 80**

17. 10 ÷ 5. **Answer: 2**

18. Solid wax is denser than liquid wax. Ice is less dense than water, because freezing locks molecules into open hexagons.

19. 1 → (b), 2 → (a), 3 → (d), 4 → (c). Each item matches its partner.