

What is Pressure?

Worksheet

Pressure is force per unit area: $P = F/A$, measured in pascals (Pa) where $1 \text{ Pa} = 1 \text{ N/m}^2$. For the same force, a smaller area produces greater pressure.

$$P = \frac{F}{A}$$

Questions

1. A 100 N force acts on a 0.5 m² area. The pressure is...

- A) 50 Pa
- B) 200 Pa
- C) 0.005 Pa
- D) 500 Pa

2. Why do snowshoes prevent sinking into snow?

- A) They increase force
- B) They increase area, lowering pressure
- C) They reduce mass
- D) They increase pressure

3. The SI unit of pressure is the...

- A) Newton
- B) Joule
- C) Pascal
- D) Watt

4. A force of 900 N acts over 3 m². What is the pressure?

- A) 300 Pa
- B) 2700 Pa
- C) 0.003 Pa
- D) 900 Pa

5. A 600 N force is applied over an area of 0.3 m². Find the pressure.

6. A knife blade has a contact area of 0.0002 m² and you press with 20 N. Find the pressure.

7. A pressure of 250 Pa acts over an area of 4 m². Find the force.

8. Define: What is pressure?

9. Define: Why does a sharp knife cut more easily?

10. Define: What is the unit of pressure?

Answer Key

1. B) 200 Pa - $P = F/A = 100/0.5 = 200$ Pa.
2. B) They increase area, lowering pressure - A larger area spreads the same weight into lower pressure.
3. C) Pascal - 1 Pa = 1 N/m.
4. A) 300 Pa - $P = F/A = 900/3 = 300$ Pa.
5. $P = F/A = 600/0.3 = 2000$ Pa
6. $P = F/A = 20/0.0002 = 100000$ Pa
7. $F = P A = 250 \cdot 4 = 1000$ N
8. Force per unit area: $P = F/A$, measured in pascals (Pa).
9. Its small contact area concentrates the same force into much higher pressure.
10. The pascal (Pa) = 1 N/m.

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