Why Metal Feels Colder than Wood

A steel railing and a wooden bench at the same 10 °C, yet the steel feels icy. Skin senses how fast heat leaves it, and metal conducts heat hundreds of times faster than wood.

Name: Date: Score: ____ / 18

A. Fill in the blanks

1. A material that conducts heat well is called a ____.

2. A material that conducts heat poorly is called an ____.

3. Objects kept in the same room reach the same ____.

4. Our skin senses the rate of ____ flow, not temperature directly.

5. The property that measures how fast a material conducts heat is thermal ____.

B. True or False

6. A steel railing at 10 °C is colder than a wooden bench at 10 °C. True / False

7. Wood is a poor conductor of heat. True / False

8. On a hot day, metal feels hotter than wood at the same temperature. True / False

9. Copper conducts heat better than glass. True / False

C. Assertion and reason

10. Assertion (A): Metal feels colder than wood at the same temperature.
Reason (R): Metal conducts heat away from the skin much faster.

(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): A wooden spoon stays cool in hot soup.
Reason (R): Wood is a poor conductor of heat.

(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. Why do cooking pans have wooden handles?

(a) wood is heavy
(b) wood is a poor conductor
(c) wood is cheap
(d) wood melts

Answer: _____

13. A tiled floor feels colder than a carpet because tiles:

(a) are at a lower temperature
(b) conduct heat away faster
(c) absorb cold
(d) are wet

Answer: _____

14. Which conducts heat the fastest?

(a) wood
(b) glass
(c) steel
(d) copper

Answer: _____

15. Two objects in a room for a long time will be:

(a) at different temperatures
(b) at the same temperature
(c) both at 0 °C
(d) at body temperature

Answer: _____

E. Short answer questions

16. Explain why a metal railing feels colder than a wooden bench on a winter morning.

17. Why does the same metal feel hotter than wood on a hot afternoon?

F. Match the columns

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

Column A	Column B	Your answer
1. Copper	(a) Measures temperature	1 → ____
2. Wood	(b) Insulator	2 → ____
3. Thermometer	(c) Senses rate of heat flow	3 → ____
4. Skin	(d) Very good conductor	4 → ____

Detailed solutions

1. conductor

2. insulator

3. temperature

4. heat

5. conductivity

6. False. Both are at the same temperature; steel only feels colder.

7. True. Its thermal conductivity is about 0.1–0.2 W/m·K.

8. True. Metal conducts heat into the skin faster.

9. True. About 400 vs 1 W/m·K.

10. (a) R explains A.

11. (a) R explains A.

12. (b) wood is a poor conductor. Heat reaches the hand slowly.

13. (b) conduct heat away faster. Same temperature, faster heat flow.

14. (d) copper. Copper, about 400 W/m·K.

15. (b) at the same temperature. Thermal equilibrium.

16. Both are at the air temperature. Skin senses heat loss: metal conducts heat away from the finger quickly so the skin cools; wood conducts slowly and the touched spot warms, so little heat is lost.

17. Now the objects are hotter than skin; metal conducts heat into the skin much faster than wood, so it feels hotter.

18. 1 → (d), 2 → (b), 3 → (a), 4 → (c). Each item matches its description.