

# ••••• Measure the Temperature and Use a Thermometer

## Fact to Know

- The temperature on a thermometer is determined by finding the level of the red mercury in the tube and the number on the temperature scale across from it.
- The temperature is written in numbers with the ° sign. For example, 70° F is read: 70 degrees Fahrenheit.

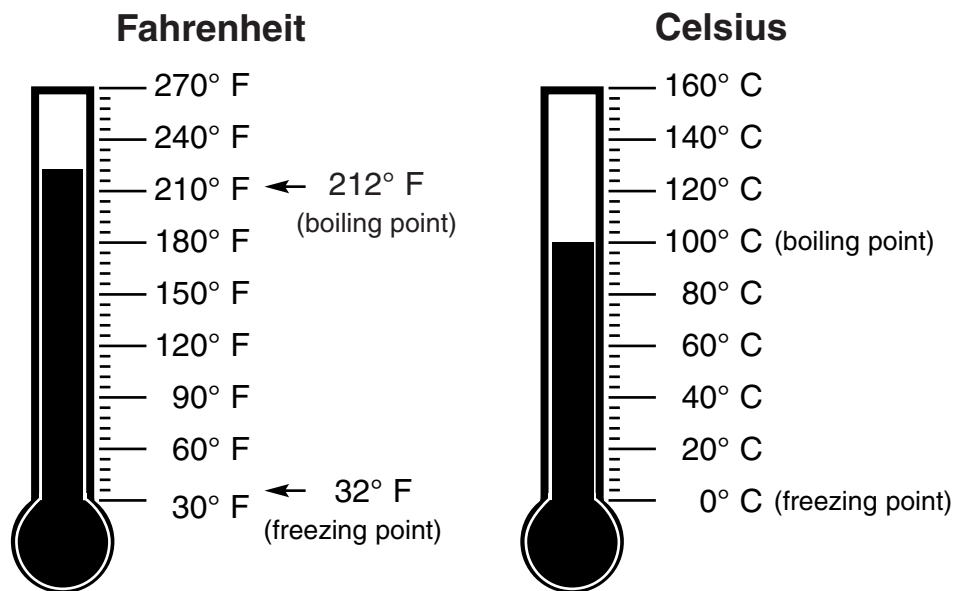
## Fahrenheit

- The Fahrenheit scale records the freezing point of water at 32° F and the boiling point of water at 212° F (at sea level).
- The temperature is usually reported in degrees Fahrenheit in newspapers, on the radio, and on television.

## Celsius

- The Celsius scale is based on the freezing point of water at 0° C and a boiling point of water at 100° C (at sea level).
- The Celsius thermometer is usually used by scientists.

Here are the two thermometers:



## Sample A

A Fahrenheit thermometer has a reading of 68°, a normal room temperature. How much above freezing is this? To find the answer, subtract 32 (the freezing point of water) from 68.

$$\begin{array}{r} 68 \\ - 32 \\ \hline 36 \end{array}$$

The answer is 36 degrees above the freezing point of water, or 36° F.

## Sample B

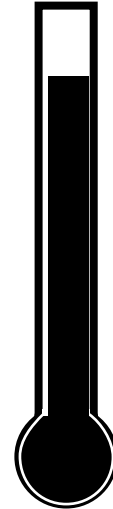
How many degrees below freezing is  $-10^{\circ}$  F? Freezing is 32° F which is 32 degrees above 0° F. Add 10 more degrees (for the  $-10^{\circ}$  F). The temperature is 42 degrees below freezing.

$$\begin{array}{r} 32 \\ + 10 \\ \hline 42 \end{array}$$

## ••••• Using a Fahrenheit Thermometer

**Directions:** Use the information on page 29 and a Fahrenheit scale thermometer, if available, to answer these questions.

1. What is the temperature at which water freezes? \_\_\_\_\_
2. What is the temperature at which water boils? \_\_\_\_\_
3. What temperature is 10 degrees above freezing? \_\_\_\_\_
4. What temperature is 70 degrees above freezing? \_\_\_\_\_
5. What temperature is 22 degrees below freezing? \_\_\_\_\_
6. How many degrees below freezing is  $20^{\circ}\text{F}$ ? \_\_\_\_\_
7. How many degrees below freezing is  $28^{\circ}\text{F}$ ? \_\_\_\_\_
8. Your body has a temperature of  $98.6^{\circ}\text{F}$  which is almost  $99^{\circ}\text{F}$ . About how many degrees above freezing is your body temperature? \_\_\_\_\_
9. A temperature of  $0^{\circ}\text{F}$  is 32 degrees below freezing. How many degrees below freezing is  $-10^{\circ}\text{F}$  (10 below zero)? \_\_\_\_\_
10. How many degrees below freezing is  $-20^{\circ}\text{F}$  (20 degrees below zero)? \_\_\_\_\_
11. How many degrees below freezing is  $-40^{\circ}\text{F}$  (40 degrees below zero)? \_\_\_\_\_
12. The boiling point of water is  $212^{\circ}\text{F}$ . How many degrees below the boiling point is  $100^{\circ}\text{F}$ ? \_\_\_\_\_



### On Your Own

Use a thermometer to determine the temperature at your school or home this afternoon and tomorrow morning. Record the temperatures here.

This afternoon \_\_\_\_\_ $^{\circ}\text{F}$

Tomorrow morning \_\_\_\_\_ $^{\circ}\text{F}$



# ..... Answer Key

**Page 6**

1. 2 inches
2. 1  $\frac{1}{2}$  inches
3. 2 inches
4. 2  $\frac{1}{2}$  inches
5. Answers will vary.
6. Answers will vary.
7. Answers will vary.
8. Answers will vary.

**Page 7**

Answers will vary.

**Page 8**

Answers will vary.

**Page 10**

1. 5  $\frac{7}{8}$  inches
2. 2  $\frac{5}{8}$  inches
3. 3  $\frac{3}{8}$  inches or 3  $\frac{1}{4}$  inches
4. 2  $\frac{7}{8}$  inches
5. Answers will vary.
6. Answers will vary.
7. Answers will vary.
8. Answers will vary.
9. Answers will vary.
10. Answers will vary.
11. Answers will vary.
12. Answers will vary.

**Page 11**

1.  $1\frac{3}{4} + 1\frac{1}{2} = 3\frac{1}{4}$  inches
2.  $1\frac{3}{4} + 2\frac{1}{2} = 4\frac{1}{4}$  inches
3.  $\frac{7}{8} + 1\frac{1}{8}$  inches = 2  $\frac{5}{8}$  inches or 2  $\frac{3}{4}$  inches
4.  $3 - 1\frac{1}{2} = 1\frac{1}{2}$  inch
5.  $3\frac{1}{2} - \frac{1}{8} = 3\frac{3}{8}$  inches

**Page 12**

1. 7 cm, 70 mm
2. 3  $\frac{1}{2}$  cm, 35 mm
3. 2  $\frac{1}{2}$  cm, 25 mm
4. 5 cm, 50 mm
5. 8 cm, 80 mm
6. 2 cm, 20 mm
7. 7 cm, 70 mm
8. 5 cm, 50 mm

**Page 14**

1. 22 yds.
2. 24 m
3. 220 m
4. 220 m
5. 22 in.
6. 30 ft.
7. 140 yds.
8. 280 ft.
9. 74 ft.
10. 170 m

**Page 15**

1. 12 m
2. 16 ft.
3. 14 yds.
4. 17 cm
5. 14 ft.
6. 11 m
7. 24 m
8. 180 m
9. Answers will vary.
10. Answers will vary.
11. Answers will vary.

**Page 16**

1. 60 ft.
2. 160 ft.
3. 76 ft.
4. 220 ft.
5. 288 ft.
6. 180 ft.
7. 880 ft.
8. 920 ft.
9. Answers will vary.
10. Answers will vary.
11. Answers will vary.

**Page 18**

1. 2 sq. in.
2. 3 sq. in.
3. 4 sq. in.
4. 6 sq. in.
5. 12 sq. in.
6. 15 sq. in.
7. 24 sq. in.
8. 40 sq. in.
9. 99 sq. in.

**Page 19**

1. 18 sq. in.
2. 35 sq. ft.
3. 4,000 sq. m
4. 1,800 sq. cm
5. 108 sq. ft.
6. 600 sq. ft.
7. 30 sq. ft.
8. 800 sq. in.
9. 616 sq. cm
10. 360 sq. ft.

**Page 20**

1. 9 sq. in.
2. 16 sq. m
3. 36 sq. ft.
4. 49 sq. m
5. 3,600 sq. m
6. 2,500 sq. m
7. 900 sq. in.
8. 625 sq. ft.

**Page 22**

Answers will vary.

**Page 23**

Answers will vary.

**Page 24**

Answers will vary.

**Page 26**

Answers will vary on 1–10.

11. 2 pounds
12. 3 pounds
13. 48 ounces; 3 pounds
14. 10 pounds
15. 9 pounds
16. 6 pounds

**Page 27**

Answers will vary.

**Page 28**

1. 450 lbs.
2. 2,000 bags
3. 1,000 almanacs
4. 20 VCR cassettes
5. 15 lbs.
6. 150 lbs.
7. 4 black bears
8. 40 bobcats
9. 80 badgers
10. 10,000 lbs.

Challenge: 20 sets

**Page 30**

1. 32° F
2. 212° F
3. 42° F
4. 102° F
5. 10° F
6. 12° F
7. 4° F
8. 67° F
9. 42° F
10. 52° F
11. 72° F
12. 112° F

**Page 31**

1. 20° C
2. -10° C
3. 90° C
4. -60° C
5. 80° C
6. 0° C
7. 100° C
8. 70° C
9. -40° C
10. 10° C