

## Temperature

Temperature tells how hot or cold something is. In the U.S., we mostly use Fahrenheit ( $^{\circ}\text{F}$ ): water freezes at  $32^{\circ}\text{F}$  and boils at  $212^{\circ}\text{F}$ .


| Reference temperatures ( $^{\circ}\text{F}$ ) | What it feels like           |
|---|------------------------------|
| $32^{\circ}\text{F}$                          | water freezes (icy outside)  |
| $50^{\circ}\text{F}$                          | cool day, need a sweater     |
| $70^{\circ}\text{F}$                          | comfortable room temperature |
| $90^{\circ}\text{F}$                          | hot summer day               |

### Key Concepts

- Temperature** measures hot/cold. The unit in the U.S. is *degrees Fahrenheit* ( $^{\circ}\text{F}$ ).
- Water **freezes** at  $32^{\circ}\text{F}$ . Below  $32^{\circ}\text{F}$  is below freezing; above is above freezing.
- A typical comfortable room is about  $70^{\circ}\text{F}$ . Cold winter days are  $20^{\circ}\text{F}$  or below; hot summer days reach  $90^{\circ}\text{F}$  or more.
- Temperature changes** are simple addition or subtraction. “Rose 13 degrees” adds 13; “dropped 13 degrees” subtracts 13.


### Worked Examples

① The temperature was  $58^{\circ}\text{F}$  in the morning and  $75^{\circ}\text{F}$  in the afternoon. How much did it rise?

 “How much did it rise” is a difference:  $75 - 58 = 17$ . So the temperature rose  $17^{\circ}\text{F}$ .


 **Answer:**  $17^{\circ}\text{F}$

② Is  $30^{\circ}\text{F}$  above or below freezing?

 Water freezes at  $32^{\circ}\text{F}$ . Since  $30 < 32$ ,  $30^{\circ}\text{F}$  is *below* freezing.

 **Answer:** *Below freezing*

③ Which is warmer:  $85^{\circ}\text{F}$  or  $60^{\circ}\text{F}$ ?

 Higher number = warmer.  $85 > 60$ , so  $85^{\circ}\text{F}$  is warmer.

 **Answer:**  $85^{\circ}\text{F}$

### Practice Problems

Calculate, compare, or pick the right description.

1.  $72^{\circ}\text{F} - 55^{\circ}\text{F} = ?$  \_\_\_\_\_

5. Warmer:  $80^{\circ}\text{F}$  or  $65^{\circ}\text{F}$ ? \_\_\_\_\_

2.  $90^{\circ}\text{F} - 68^{\circ}\text{F} = ?$  \_\_\_\_\_

6.  $50^{\circ}\text{F} + 22^{\circ}\text{F} = ?$  \_\_\_\_\_

3.  $40^{\circ}\text{F} + 18^{\circ}\text{F} = ?$  \_\_\_\_\_

7.  $100^{\circ}\text{F} - 35^{\circ}\text{F} = ?$  \_\_\_\_\_

4. Above or below freezing:  $25^{\circ}\text{F}$ ? \_\_\_\_\_

8. Above or below freezing:  $35^{\circ}\text{F}$ ? \_\_\_\_\_

9. Cooler:  $45^{\circ}\text{F}$  or  $60^{\circ}\text{F}$ ? \_\_\_\_\_

11. Coat or shorts at  $28^{\circ}\text{F}$ ? \_\_\_\_\_

10.  $82^{\circ}\text{F} - 59^{\circ}\text{F} = ?$  \_\_\_\_\_

12.  $65^{\circ}\text{F} + 15^{\circ}\text{F} = ?$  \_\_\_\_\_

### Study Tips

- 👉 Memorize three reference points:  $32^{\circ}\text{F}$  = freezing,  $70^{\circ}\text{F}$  = comfy room,  $100^{\circ}\text{F}$  = scorching hot. They make new temperatures easier to picture.
- 👉 Higher number = warmer; lower number = colder. Comparing temperatures is just comparing whole numbers.
- 👉 A *change* in temperature is just the difference between two readings. “Rose  $\Delta$  degrees” adds; “dropped  $\Delta$  degrees” subtracts.

### Word Problems

1. On Monday the high was  $78^{\circ}\text{F}$ . On Tuesday it was  $65^{\circ}\text{F}$ . How many degrees cooler was Tuesday?

Answer: \_\_\_\_\_

2. The temperature at 6 a.m. was  $48^{\circ}\text{F}$ . By noon it rose  $24^{\circ}\text{F}$ . What was the noon temperature? Was it above or below room temperature ( $70^{\circ}\text{F}$ )?

Answer: \_\_\_\_\_

**Answer Key — with Friendly Explanations****Practice Problems**

1.  $72 - 55 = 17$ .

 **Answer:**  $17^{\circ}F$ 

2.  $90 - 68 = 22$ .

 **Answer:**  $22^{\circ}F$ 

3.  $40 + 18 = 58$ .

 **Answer:**  $58^{\circ}F$ 

4.  $25 < 32$ , so below freezing.

 **Answer:** *Below freezing*

5.  $80 > 65$ , so  $80^{\circ}F$  is warmer.

 **Answer:**  $80^{\circ}F$ 

6.  $50 + 22 = 72$ .

 **Answer:**  $72^{\circ}F$ 

7.  $100 - 35 = 65$ .

 **Answer:**  $65^{\circ}F$ 

8.  $35 > 32$ , so above freezing (barely).

 **Answer:** *Above freezing*

9.  $45 < 60$ , so  $45^{\circ}F$  is cooler.

 **Answer:**  $45^{\circ}F$ 

10.  $82 - 59 = 23$ .

 **Answer:**  $23^{\circ}F$ 

11.  $28^{\circ}F$  is below freezing — definitely a coat.

 **Answer:** *Coat*

12.  $65 + 15 = 80$ .

 **Answer:**  $80^{\circ}F$ **Word Problems**

1.  $78 - 65 = 13$  degrees cooler.

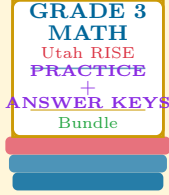
 **Answer:**  $13^{\circ}F$  cooler

2.  $48 + 24 = 72^{\circ}F$ . Above room temperature.

 **Answer:**  $72^{\circ}F$ , above

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