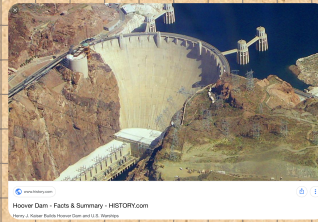


Warm-up:

Hoover Dam

The Hoover Dam on the Arizona-Nevada border is the highest concrete dam in the United States. Standing an incredible 726 feet tall, it is one of our nation's biggest tourist attractions.

The top of the Hoover Dam is only as wide as a road's width, yet the bottom is over 600 feet thick. Use a calculation to explain why this needs to be so. *Hint:* Remember that for each 31 feet that you go deeper in water, the pressure increases by one atmosphere (14.7 lbs/in²).



$$\frac{726 \text{ Ft tall}}{31 \text{ Ft}} = 23.4 \times \text{greater}$$

• Temperature: measurement of the average KE of a substance

- ↳ discussed in terms of hot/cold
- ↳ descriptors of heat, not temperature

• Thermometer: measure KE by using liquids that expand

- ↳ Galileo is credited w/ first invention

• Celsius - Fahrenheit:

- ↳ H₂O reference ↳ Human body
- ↳ 0°C → 100°C ↳ 100°F = body temp

• Kelvin: KE present in molecules

- ↳ Absolute Zero = Zero movement / Zero KE
- ↳ 0 K = -273 °C

Eg's:

$$^{\circ}\text{F} = \left[\frac{9}{5} \cdot ^{\circ}\text{C} \right] + 32.0 \quad ^{\circ}\text{C} = \frac{5}{9} [^{\circ}\text{F} - 32.0] \quad \text{K} = ^{\circ}\text{C} + 273$$

Practice:

- Convert body temp [98.6 °F] to °C & K.

$$^{\circ}\text{C} = \frac{5}{9} (98.6 - 32.0) = 37^{\circ}\text{C} \quad \text{K} = 37 + 273 = 310 \text{ K}$$

- Convert room temp [25 °C] to °F & K.

$$^{\circ}\text{F} = \left(\frac{9}{5} \cdot 25 \right) + 32.0 = 77^{\circ}\text{F} \quad \text{K} = 25 + 273 = 298 \text{ K}$$