Warm Up

1. If drag cars can accelerate at 16.0 m/s^2 and achieve a final velocity of 175 m/s from a stand still, how long must the track be for them to race?
2. A space station with a mass of 10,000. kg is moving toward a satellite at 5.00 m/s. What force is needed to avoid a collision if you only have 500. sec?
3. What is the power generated if 750. N moved a gear a total distance of 24.0 km in 5.00 hr?
4. If it takes 15.0 N of force to get a 60.0 kg skier started going down a slope, what is the coefficient of friction?
5. What is the radius of a tube that has a velocity of 12.0 m/s with an acceleration of 55.0 m/s^2?

Target

- I can explain thermal energy and specific heat.

Thermal Energy

- Thermal energy is the total energy of the molecules in an object.
- All matter is in motion at the atomic scale.
- The more thermal energy matter has the faster it moves.

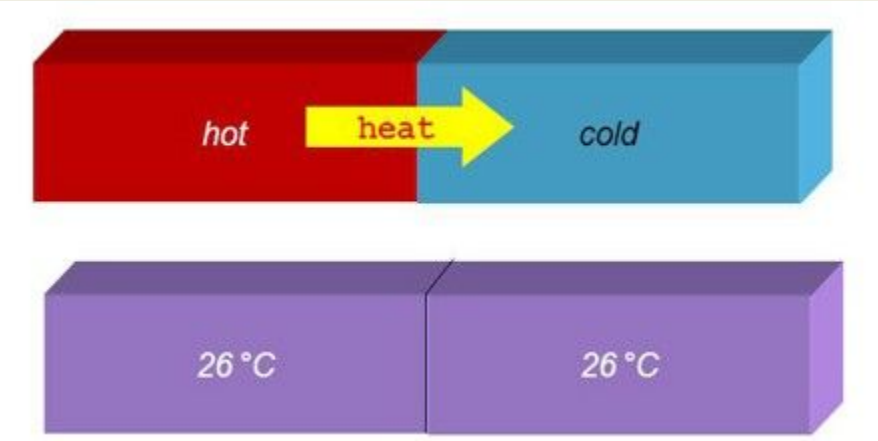
- This can be seen in objects with gases like a balloon.
- More thermal energy causes the molecules to move faster.
- This causes the pressure inside a balloon to increase making the balloon bigger.

- Temperature is a way of expressing the kinetic energy of the molecules in an object.
- Temperature can be expressed as ^{o}F, ^{o}C, or kelvin.

Flow of Heat

- Heat will naturally flow from hot to cold objects.
- If two objects of different temperatures are placed together, the thermal energy (heat) from the hot object will flow toward the colder object.

- When the flow of heat is the same between the two objects, it has reached thermal equilibrium.



Specific Heat

- Some objects are easier to heat than others.
- What determines the amount of heat needed to change the temperature of an object is the specific heat.
- $Q = mC\Delta T$

Practice

- You're cooling a 80.0 kg glass block, specific heat capacity of 840 J/kg•^{o}C, lowering its temperature by 16^{o}C. What heat do you have to extract?
- Answer:

Practice

- You add 10,000 J into a 8.0 kg block of copper, specific heat capacity of 387 J/kg•^{o}C. How much have you raised its temperature?
- Answer:

Summary

- Thermal energy (heat) is related to the motion of matter.
- Heat spontaneously flows from hot to cold objects.
- The specific heat of an object will determine its temperature change.

Assignment

- Specific Heat Worksheet