

Directions: Read the information below.

The Science of Heat

Energy is all around us – it's in the food we eat, it's what helps give us the ability to run in gym class, it even makes it possible for us to see colors. One special type of energy, however, can be felt. That's thermal energy. People most often associate thermal energy with heat.

As you may know, there is really no such thing as “cold.” In the wintertime, what we perceive as cold air is really just air with less thermal energy. On a hot day, the higher presence of thermal energy means we feel hotter. Think about baking a cake. The thermal energy in the oven allows the cake to rise. It heats it to be warm enough to bake. If we shut the oven off, the amount of heat decreases. We aren't adding “cold air,” rather decreasing the amount of heat in the oven.

Thermal energy is part of how engineers build cars. When your parents drive down a road, the rubber on the tires builds up thermal energy from the friction along the road. As the amount of thermal energy increases, the tires will expand slightly. Luckily, automakers know how to construct the tires so that the heat of the friction on the road will not cause the tires to expand to the point of popping.

Directions: Answer the questions below using the passage.

1. If somebody told you that it feels cooler in winter because of the presence of colder air, what would you say to them to refute that claim?
2. Name a different situation where you might need to rely on thermal energy.

Directions: As your class performs the experiment, record the results and your observations below.

1. In the simulation, what do you notice about the level of thermal energy as friction is increased?
2. Does the total energy change? Cite evidence for how you know your answer.
3. Use the digital ruler to determine how the distance changes with the addition of friction.