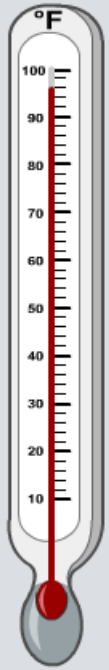
Temperature and Reaction Rates



Effect of temperature on rate

The higher the temperature, the faster the rate of a reaction. In many reactions, a rise in temperature of 10 °C causes the rate of reaction to approximately double.

Why does increased temperature increase the rate of reaction?

At a higher temperature, particles have more energy. This means they move faster and are more likely to collide with other particles.

When the particles collide, they do so with more energy, and so the number of successful collisions increases.

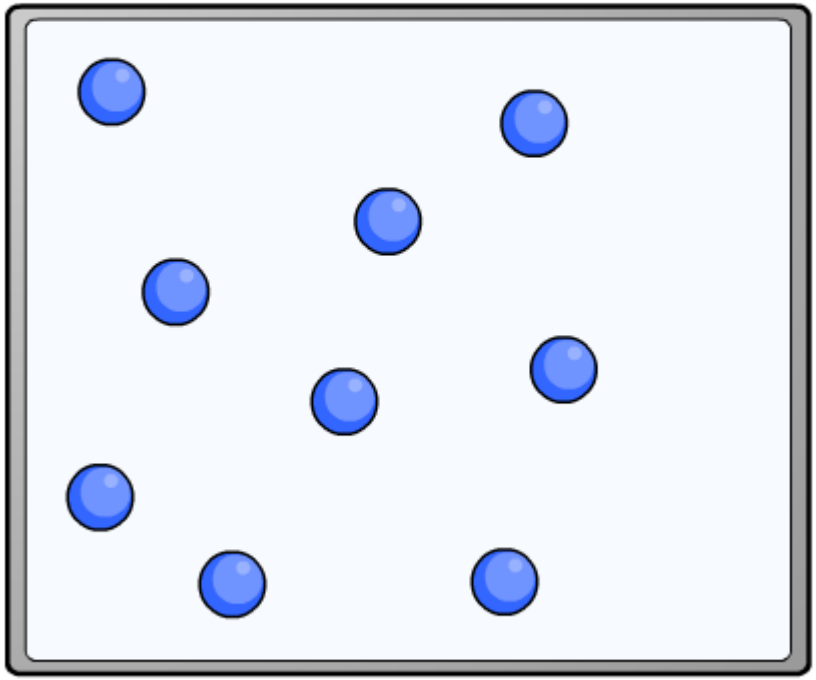
Temperature and particle collisions

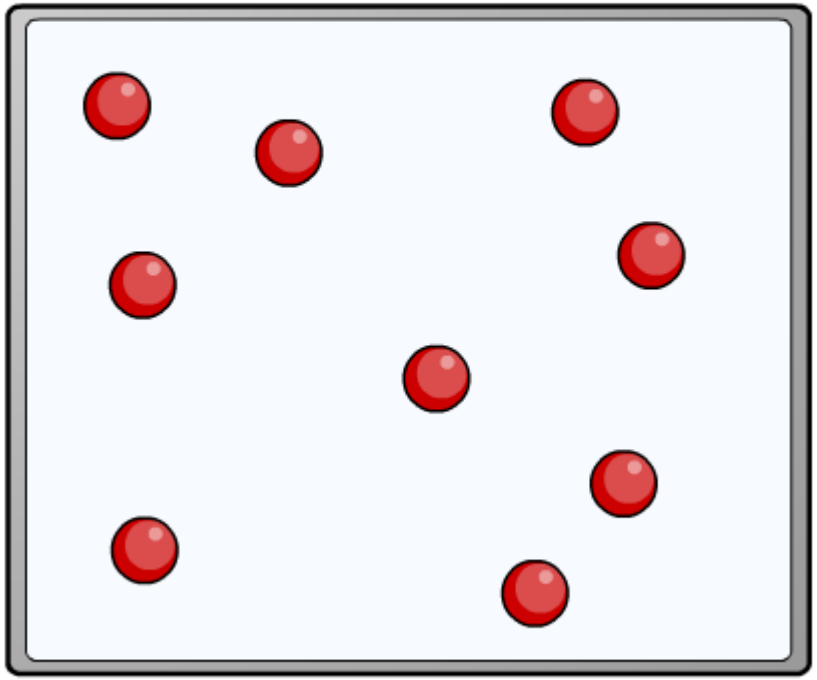
How does temperature affect particle collisions?

0

15

0





low temperature

high temperature

Temperature and batteries

Why are batteries more likely to run down more quickly in cold weather?

At low temperatures, the reaction that generates the electric current proceeds more slowly than at higher temperatures.

This means batteries are less likely to deliver enough current to meet demand.

How does temperature affect rate?

The reaction between sodium thiosulfate and hydrochloric acid produces sulfur.

sodium thiosulfate	+	**hydrochloric acid**	→	**sodium chloride**	+	**sulfur dioxide**	+	**sulfur**	+	**water**
$Na_2S_2O_3$ (aq)	+	**2HCl** (aq)	→	**2NaCl** (aq)	+	**SO_2** (g)	+	**S** (s)	+	**H_2O** (l)

Sulfur is solid, and so it turns the solution cloudy.

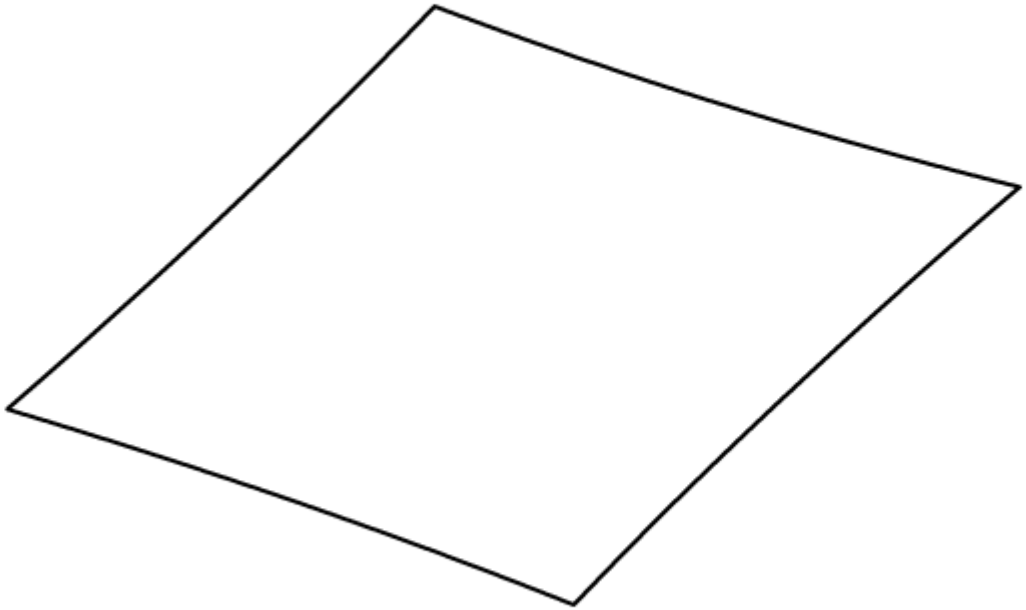
How can this fact be used to measure the effect of temperature on rate of reaction?

The effect of temperature on rate

How does temperature affect the rate of reaction?

The reaction between sodium thiosulfate and hydrochloric acid can be used to investigate the effect of temperature on rate of reaction.

Click "**start**" to find out how.



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