

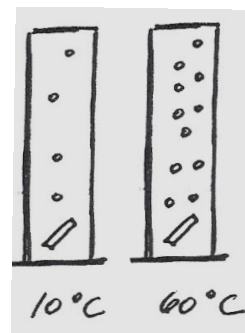
Aim: What factors affect REACTION RATE?

-how fast **A** collides with **B** to form **AB**

1. TEMPERATURE

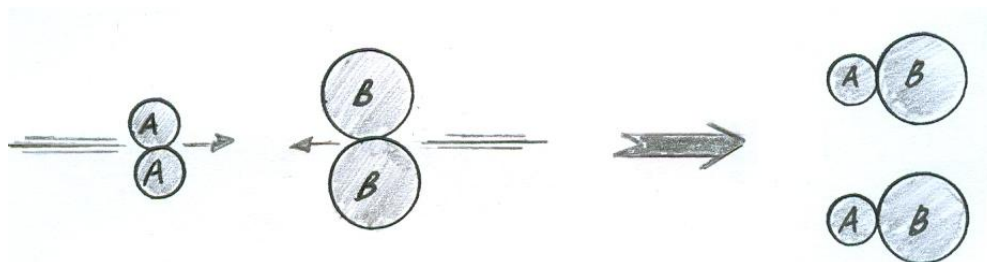
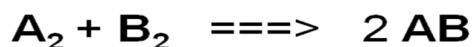
DEMO: Alka seltzer in water

{higher temperature, faster reaction rate}



Why? At a higher temperature, the particles of reactants collide more often and with greater force.

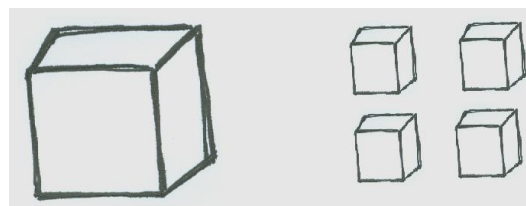
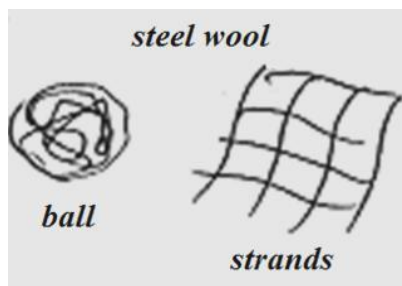
Force is needed to break the chemical bonds in the reactants.



In other words, the *frequency* and the *effectiveness* of the collisions increase.

2. PARTICLE SIZE

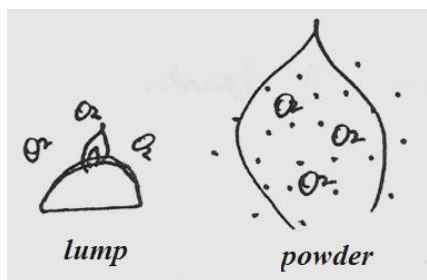
DEMO: burning steel wool



{smaller particle size, greater total surface area, faster reaction rate}

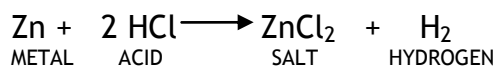
Why? More reactant is exposed which leads to more collisions per second between particles of reactants.

DEMO: burning lycopodium powder

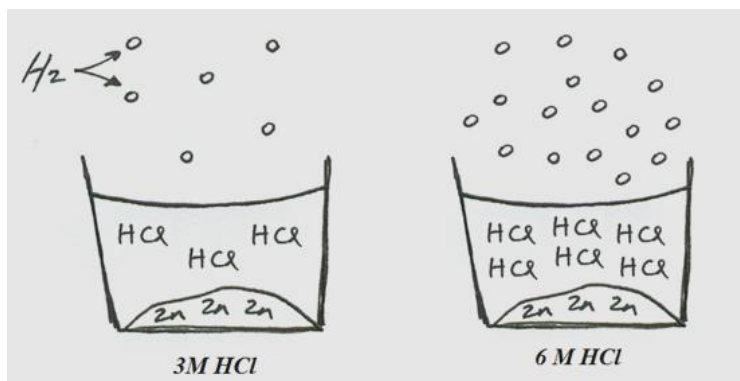


3. Concentration (Molarity = moles/Liter)

DEMO: reacting zinc in hydrochloric acid

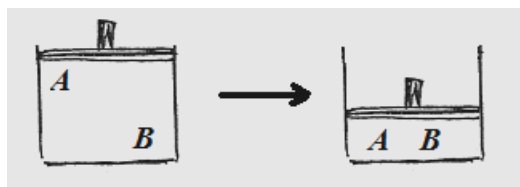
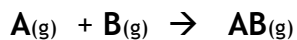


{greater concentration, faster reaction rate}



Why? More reactant in the same volume leads to more collisions per second.

4. Pressure



{smaller volume of container, higher pressure of gases, faster reaction rate}

Why? Less space leads to more collisions per second.

Note: Increasing the pressure by decreasing the volume of the container, increases the concentration.

$$M = \frac{\text{moles}}{V}$$