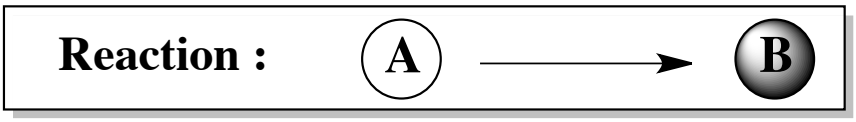
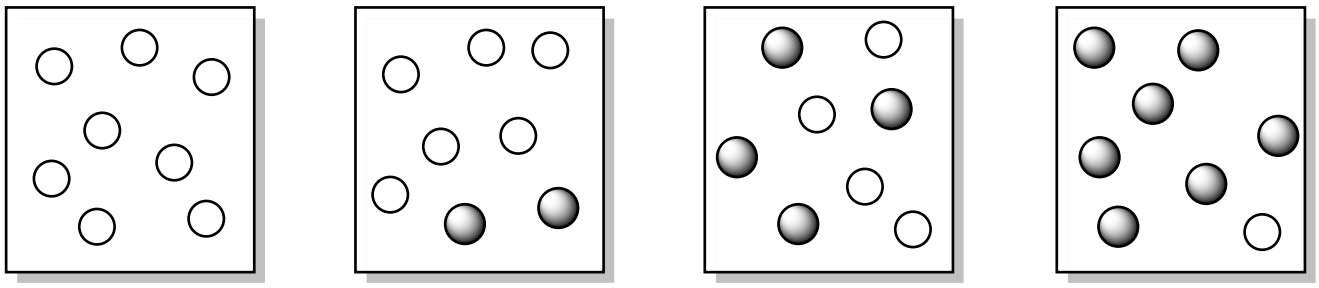
CONCEPT: RATE OF REACTION

_____ is the study of reaction rates, and tells us the change in concentrations of reactants or products over a period of time.

Although a chemical equation can help us calculate the theoretical yield from reactants, it can't tell us how fast it goes.

- Looking at a chemical reaction in the simplest way can be seen as _____ breaking down to form _____.





0 Seconds **30 Seconds** **60 Seconds** **90 Seconds**

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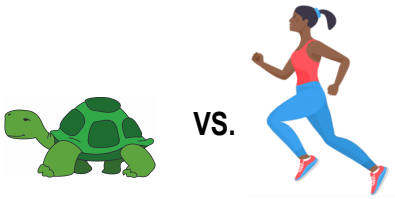
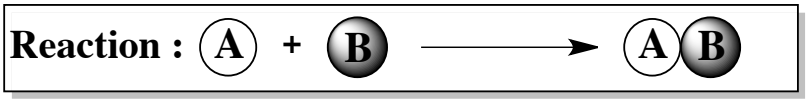
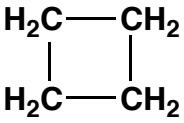


1. **Concentration**: Molecules must _____ to react.

- Increasing the number of molecules in a container, **increases** their _____ and thereby causes the rate to **increase**.



2. **Surface Area**: The frequency of collisions increases with _____ surface area.

$CH_3CH_2CH_2CH_3$ VS. 

3. **Temperature**: Increasing the temperature **increases** the reaction rate by **increasing** the _____ and _____ of collisions.

4. **Catalyst:** A catalyst increases the rate of a reaction by _____ the energy of activation.