AQA GCSE
THE RATE AND EXTENT OF CHEMICAL CHANGE
THINK IT!

$$N_2 + 3H_2 \rightleftharpoons 2NH_3$$
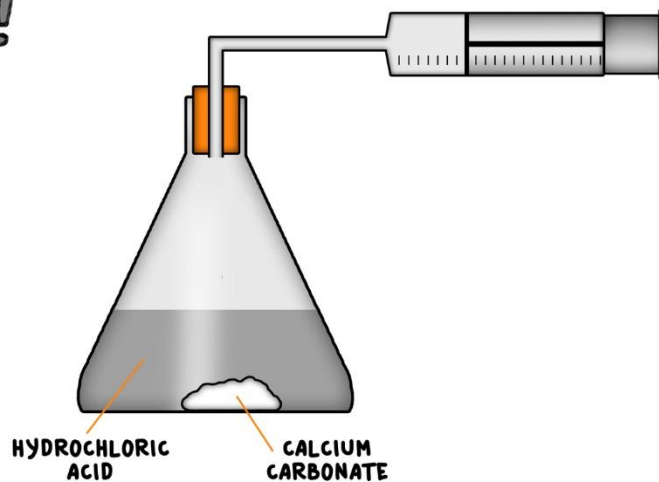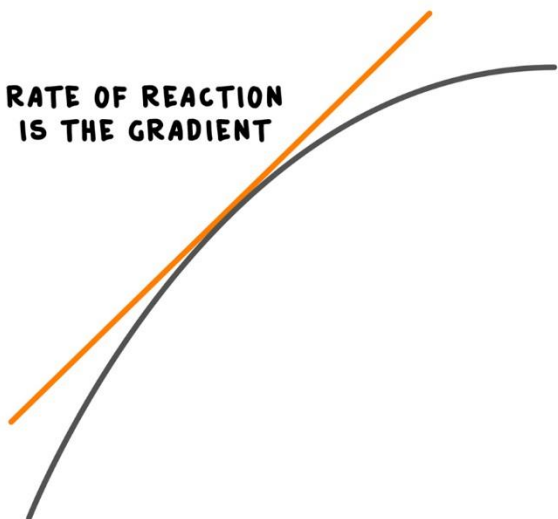
Calculating rates of reaction:

- A student carried out an experiment to measure the mass of gas lost by a reaction in a certain length of time. The rate of reaction was 1.5 g/sec and the length of time she did the reaction for was 30 seconds. How much gas was lost and what was the unit?
- **(HT only)** 11g of carbon dioxide was released by a reaction in 40 seconds, Calculate the rate of reaction in moles per second.

Catalysts:

- Use the lock and key mechanism, with diagrams, to explain why catalysts are reaction specific.
- Draw a reaction profile to explain how using a catalyst can increase the rate of reaction.
- **(HT only)** draw a reaction profile to explain why a catalyst would increase the rate of reaction for an endothermic reaction.

The effect of changing concentration on equilibrium (HT Only)

- Use Le Chatelier's principle to explain what affect increasing the concentration of a product will have on an equilibrium.
- What would happen to the concentration of the reactants if we halved the concentration of the products?

Factors which affect the rates of reaction

- What are the five factors that affect the rate of a reaction and explain how the rate changes when the factor is changed.
- Draw a graph to show the change in reaction rate when any one factor is altered.
- Explain how you would use a tangent on the graph to calculate the rate of reaction.

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The effect of changing temperature on equilibrium (HT Only)

- A system is in equilibrium giving the reaction $A + B \rightleftharpoons C + D$
  If the forward reaction is endothermic, explain what will happen to the system if the temperature of the system is increased and why this happens.

Collision theory and activation energy

- Explain, using the collision theory, how increasing concentration and decreasing the size of solid reacting particles can increase the rate of reaction.
- Describe what activation energy is and explain why reactions with high activation energies are difficult to start.

Energy changes, reversible reactions and equilibrium

- Write a balanced symbol equation for the reversible reaction when nitrogen gas reacts with hydrogen gas to make ammonia gas.
- What would you need to do to ensure that the above reaction could reach equilibrium?

The effect of changing pressure on equilibrium (HT Only)

- In the equilibrium below, what will happen to the position of equilibrium if the pressure in the system is halved?

$$2W \rightleftharpoons C + 5D$$