Finding Reaction Order

→ Method of Initial rates gives order for each reactant in the differential rate law
($rate = k[A]^m [B]^n [C]^p$ etc)

→ Integrated rate law plots identify order for each reactant by checking each plot to see if it is linear

Effect of concentration on Rate

→ Differential rate laws will relate rate to concentration. (how fast is it going when [A] = ▩?)

→ Integrated rate laws will relate time to concentration. (how long does it take to reach [A] = ▩)

↳ half life is a special point: the time it takes to go from [A] to $\frac{1}{2}$[A]. It can be used as a characteristic to identify order (like the I.R.L.) or as a shortcut to finding time → eg. time to 75% completion is $2 \times t_{1/2}$.

Effect of temperature on rate

- Differential and integrated rate laws are written for a single set of conditions → changing T will change k.
- The Arrhenius equation describes the relation between temp and rate constant. You can also use a plot of (ln k) vs (1/T) or compare 2 measurements of k and T to find the activation energy

Collision Theory (Kinetic Molecular Theory)

- Conceptually explains the relation between rate

and temperature, activation energy, concentration,
and physical state

- A "successful" collision that results in a reaction must
  → have enough energy
  → be at a "good orientation"
- More collisions or more energetic collisions will ↑ rate of reaction
- Collisions also describe the mechanism of a reaction (by the elementary steps)
  → catalysts speed up a reaction by altering the mechanism

That's not everything from Ch. 14, but I think its a quick rundown of what we went over so FAST this week

Try the text problems and play around with the simulation (linked in the notes) to help it settle

:) AM