

**Titan Learning Center
Science ACT Prep
Week 8**

Passage I

Reaction rates measure how quickly a chemical reaction takes place. There are many factors that can affect reaction rate: the concentration of the reactants, the temperature of a reaction, and the physical size of the reactants are some examples.

Experiment 1

A 5 g piece of calcium carbonate was placed in test tubes with different concentrations (measured in moles or M) of hydrochloric acid. The time it took the acid to dissolve the calcium carbonate was recorded.

Concentration of acid	Time to dissolve
1 M	93 sec
3 M	58 sec
5 M	32 sec

Experiment 2

3 different volumes of 5 grams of calcium carbonate were placed in test tubes with 3 M hydrochloric acid. The time it took the acid to dissolve the calcium carbonate was recorded.

Volume of calcium carbonate	Time to dissolve
5 cm ³	56 sec
10 cm ³	28 sec
15 cm ³	13 sec

Experiment 3

The amount of 3 M hydrochloric acid was varied when mixed with 5 g of calcium carbonate with a volume of 10 mL. The time it took for the calcium carbonate to dissolve was recorded.

Volume of hydrochloric acid	Time to dissolve
3 mL	42 sec
5 mL	39 sec
7 mL	13 sec

Be sure to fill out your name on a raffle ticket.

- Which of the following reaction rates was not tested?
 - Temperature of the reaction
 - Volume of hydrochloric acid
 - Concentration of hydrochloric acid
 - Volume of calcium carbonate
- In Experiment 2, the volume of the calcium carbonate was studied. Which of the following volumes would have the fastest reaction time?
 - 15 cm³
 - 18 cm³
 - 17 cm³
 - 16 cm³
- In Experiment 3, as the amount of acid was increased, the reaction rate:
 - Sped up
 - Slowed down
 - Sped up and then slowed down
 - Slowed down and then sped up
- In Experiment 2, what was actually being varied?
 - The amount of calcium carbonate being added
 - The amount of hydrochloric acid being added
 - The concentration of hydrochloric acid being added
 - The volume of calcium carbonate being added
- Experiment 1 measures reaction time by testing which variable?
 - The time it took the calcium carbonate to dissolve
 - The amount of calcium carbonate used
 - The concentration of hydrochloric acid
 - The amount of hydrochloric acid
- What set of circumstances will most *optimize* reaction time?
 - Large volume of strong hydrochloric acid with a large volume of calcium *carbonate*
 - Small volume of strong hydrochloric acid with a large volume of calcium *carbonate*
 - Large volume of weak hydrochloric acid with a large volume of calcium *carbonate*
 - Small volume of weak hydrochloric acid with a large volume of calcium *carbonate*

TLC Stamp

