

Unit 10 – Reactions

Essential Questions

How is a chemical change different from a physical change?

How does a balanced chemical equation show relationships between the reactants and products of a chemical reaction?

How can chemical reactions be classified?

How are acids and bases characterized?

How is neutralization achieved in an acid base reaction?

How is a pH scale used to describe acids and bases?

Instructional Goals

By the end of this unit, you should be able to do the following:

1. Chemical reactions

Describe chemical changes in terms of rearranging atoms to form new substances.

Recognize that the total number of particles (sum of the coefficients) can change during a reaction because of differences in the bonding ratios of each substance.

Recognize that the total number of atoms does not change during a reaction because every reactant atom must be included in a product molecule.

Learn to describe reactions in terms of macroscopic observations.

2. Writing balanced equations

Learn to write balanced equations to represent these changes symbolically.

Explain that the coefficients in a chemical equation describe the quantities of the elements and compounds involved.

3. Reaction types

Observe basic patterns in the way substances react and learn to generalize them to other reactions students encounter.

- Synthesis reactions
- Decomposition reactions
- Combustion reactions
- Single replacement reactions
- Double replacement (ionic) reactions

Describe properties of acids and bases.

Account for differences between acids and bases in terms of the Arrhenius model.

Recognize that pH is a way of describing a substance as an acid or a base. This logarithmic scale can be used to determine the strength or weakness of the acid/base.

Sequence

1. Mass and change lab part 2 (part 1 was done in Unit 6)
2. Activity 1 - Rearranging Atoms.
3. Exercise 1: Balancing Equations
4. Exercise 2: More Balanced Equations
5. Quiz: Balancing Equations

6. Lab - Reaction Types
7. Activity 2 - Reaction Types Card Sort and identification of reaction types for equations in Ex1 and 2
8. Activity 3 - Exploration of properties of acids and bases.
9. Introduction of Arrhenius model to account for observations from exploration.
10. Neutralizing substances
11. Exercise 3 – Acids and Bases
12. Test