# Unit # 1: Limits and Continuity

Content Area: **Mathematics**
Course(s): **AP Calculus AB, AP Calculus BC**
Time Period: **Semester 1**
Length: **2 weeks**
Status: **Published**

## Standards

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| MA.K-12.1 | Make sense of problems and persevere in solving them. |
| MA.K-12.2 | Reason abstractly and quantitatively. |
| MA.K-12.6 | Attend to precision. |
| MA.9-12.4.1.12 C.1 | Recognize the limitations of estimation, assess the amount of error resulting from estimation, and determine whether the error is within acceptable tolerance limits. |

## Enduring Understandings

Calculus is the study of a few big ideas. These big ideas are based on the fundamentals of understanding limits both algebraically as well as graphically. In order for students to understand the basics of the big ideas of Calculus such as derivatives and integration they must first understand the overarching idea of what a limit is and the meaning of a limit.

## Essential Questions

What is Calculus?

How do limits describe the behavior of a function?

What are the strategies used to determine the limit of a function?

What determines continuity and how can you find and describe discontinuities?

## Knowledge and Skills

- Compare precalculus and calculus.
- Estimate a limit using a numerical or graphical approach.
- Identify different ways that a limit can fail to exist.
- Evaluate a limit using the properties of limits.
- Develop and use a strategy for finding limits.
- Estimate a limit using simplifying and rationalizing techniques.
- Evaluate one sided limits.
- Evaluate infinite limits from the left and from the right.

- Find and sketch the vertical asymptote on a graph of a function.

## Transfer Goals

Recognize and solve practical or theoretical problems involving mathematics, including those for which the solution approach is not obvious, by using mathematical reasoning and strategic thinking.

Understanding the criteria of a question allows for correctly determining an answer.

## Resources

Calculus Graphical, Numerical, Algebraic, by Finney

Online resources which include, but are not limited to: AP Classroom,  Desmos, Class Kick, Delta Math, and Math XL.