Geometry

Course Description

In our ever-increasing technological world, a rich study of logic and mathematical proof is fundamental for reasoning and good decision making. The study of Geometry offers students the opportunity to develop skill in reasoning and formal proof. Additionally, it helps students to describe, analyze, and recognize the underlying beauty in the structures that compose our world. Geometric thinking is a powerful tool for understanding and solving both mathematical and applied problems, and offers alternate ways of reasoning mathematically, beyond algebra, including analytical and spatial reasoning.

Geometry builds on a number of key geometric topics developed in the middle grades, namely relationships between angles, triangles, quadrilaterals, circles, and simple three-dimensional shapes. It is expected that students beginning Geometry are able to recognize, classify, and apply properties of simple geometric shapes, know and apply basic similarity and congruence theorems, understand simple constructions with a compass and straight edge, and find area and volume of basic shapes.

Students studying Geometry in high school, further develop analytic and spatial reasoning. They apply what they know about two-dimensional figures to three-dimensional figures in real-world contexts, building spatial visualization skills and deepening their understanding of shape and shape relationships. Geometry includes a study of right triangle trigonometry that is developed through similarity relationships. These topics allow for many rich real-world problems to help students expand geometric reasoning skills. It is critical that connections are made from algebraic reasoning to geometric situations. Connections between transformations of linear and quadratic functions to geometric transformations should be made. Earlier work in linear functions and coordinate graphing leads into coordinate Geometry.

The study of formal logic and proof helps students to understand the axiomatic system that underlies mathematics through the presentation and development of postulates, definitions, and theorems. It is essential that students develop deductive reasoning skills that can be applied to both mathematical and real-world problem contexts.

Throughout Geometry, students will experience geometric thinking and reasoning techniques as accessible and powerful tools that can be used to explore the concept of mathematical proofs, as well as to model and solve real-world problems.

September 2011