



MATH Core Training Modules—Year One

Participants will explore the AP* Calculus or AP Statistics Connection topics through manipulative-rich student lessons. Graphing calculator skills will be introduced, extended, and applied as a part of each training session. In addition, the participants will explore the LTF on-line diagnostics with both multiple choice and free response problems and will discuss scoring practices and rubrics of Pre-AP* questions related to the AP connection topic. Teachers finish every training day with lessons that are classroom-ready and with sufficient preparation to start using the lessons and assessment tools immediately.

Day One

Introduction to the LTF Guides through Analysis of Piecewise Functions

A combined group of middle school and high school Pre-AP teachers examine an overview of the entire Laying the Foundation mathematics program. One particular strand, Analysis of Functions, is used to illustrate the design of the mathematics guides. Teachers will explore how the guides can be used by vertical teams to strengthen and coordinate the middle school and high school curriculum. In the training, teachers investigate student lessons that describe and analyze piecewise functions. These lessons demonstrate how AP concepts are developed from sixth grade through pre-calculus. Participants are given password access to on-line versions of LTF guide lessons, diagnostics tests, and end-of-course examinations.

Day Two

Areas and Volumes

Middle school and high school Pre-AP teachers attend separate sessions where they explore manipulative-rich student lessons that investigate the area of two-dimensional figures, as well as surface area and volume of three-dimensional solids that result from revolving the planar figures about an axis. As the lessons progress through the vertical strand, teachers learn how students graph the original planar figure by first plotting points, then graphing equations, and finally graphing systems of inequalities. Trainers demonstrate how concepts involving area and volume are developed in Pre-AP mathematics classes from sixth grade through pre-calculus.

Day Three

Rate of Change: Average and Instantaneous

Middle school and high school Pre-AP teachers attend separate sessions where they explore student lessons connecting slope to the AP Calculus concept of rate of change. They will explore lessons that differentiate between the average and the instantaneous rate of change of a function. Middle school teachers will explore manipulative-rich lessons that introduce the concepts of constant rate of change and average rate of change. Additional lessons introduce high school teachers to the concept of a curve with a varying slope and to the calculus notation for a derivative to represent that slope. High school teachers also learn strategies for using a graphing utility in parametric mode to graph a curve that is not a function. The session further emphasizes how the concepts involving rate of change are developed in Pre-AP classes from sixth grade through pre-calculus.

Day Four

Graphical Displays; Distributions: Measures of Center, Variability, and Shape

Middle school and high school Pre-AP teachers attend separate sessions where they explore the concept of graphical displays by working student lessons that construct, compare, analyze, and interpret box-and-whisker plots, line plots (dot plots), and stem-and-leaf plots. Each lesson employs real-world data to construct, by hand and with a graphing calculator, appropriate graphical displays and to analyze the graph using measures of central tendency, variability, and shape. The training concludes with an exploration of AP Statistics free-response questions that are accessible to Pre-AP students. The session will emphasize how the concepts involving graphical displays and distributions are developed in Pre-AP mathematics classes and can be used from sixth grade through pre-calculus.

*Pre-AP, AP and Advanced Placement are trademarks of the College Entrance Examination Board. The College Entrance Examination Board was not involved in the production of this material.

Laying the Foundation and LTF are trademarks of Laying the Foundation, Inc.