LAYING THE FOUNDATION

Building Academic Excellence

LAYING THE FOUNDATION

COMPREHENSIVE TEACHER TRAINING FOR THE COMMON CORE STANDARDS

LAYING THE FOUNDATION© FOR MEETING THE COMMON CORE STANDARDS IN ENGLISH, MATHEMATICS, AND SCIENCE

Laying the Foundation (LTF) is a 501(c)(3) nonprofit company dedicated to providing instructional resources vertically-aligned to the Common Core Standards in conjunction with a professional development program that ensures teachers have the content knowledge, critical thinking strategies, and pedagogy necessary to effectively implement these college readiness standards in the classroom.

LTF's lessons, labs, and formative assessments are based on a cumulative progression of skills and concepts for English, math, and science for grades 6-12.

- The ***English / language arts*** materials developed by LTF utilize a wide variety of texts, including texts relevant to social studies and the sciences, which promote student discussion, analysis, and synthesis of ideas across genres, time periods, cultures, and disciplines.
- In much the same way, LTF ***mathematics*** materials utilize real world problems that require students to reason, both abstractly and quantitatively, to determine solutions and to evaluate the logic and validity of proposed solutions.
- LTF also provides ***science*** materials for sixth grade through high school. Embedded within the labs and inquiry-based lessons, are questions that require students to know and utilize the terminology, processes, and methods unique to science as they analyze data to understand the world around them.

These resources can be embedded into any existing curriculum to raise the level of instructional rigor for all students.

WHY LAYING THE FOUNDATION?

The Common Core Standards were developed to prepare students to graduate from high school prepared to succeed in college or workforce training programs. To meet this goal, the evidence-based Common Core Standards

- Align student instruction with college expectations; and
- Promote the use of rigorous content and the application of knowledge through high-order skills.

The Laying the Foundation instructional resources were built upon these same principles. LTF materials provide students with the ***deep content knowledge*** and ***essential critical thinking skills*** necessary to meet the Common Core Standards and to be prepared for college success.

Research shows that ***teachers are the key*** ingredient to improving student performance. For this reason, LTF provides a ***comprehensive teacher training program*** that ensures teachers have the ***strategies***, ***pedagogy***, and ***content knowledge*** necessary to raise the level of instructional rigor.

Laying the Foundation does not provide a curriculum. LTF's approach is to provide, in conjunction with the teacher training program, an extensive and ever-growing collection of lessons, labs, projects, and formative assessments that can be used to raise the level of instructional rigor of any curriculum. This feature allows districts to make the critical curricular decisions about how LTF materials are embedded into the existing curriculum to meet the Common Core Standards

LAYING THE FOUNDATION AND THE ENGLISH COMMON CORE STANDARDS

English/Language Arts materials developed by Laying the Foundation integrate key concepts and skills from the three primary ELA domains—close reading, grammar, and composition. These three domains encompass the four major categories recognized by the Common Core Standards for English/ Language Arts—reading, writing, speaking and listening, and language. While some LTF lessons address individual skills or groups of skills, most lessons include activities from all three domains and, by extension, all four Common Core categories.

The foundation for LTF English lessons is the Skill Progression Chart that identifies key skills for each domain, beginning with grade 6 and adding more complex skills at each subsequent grade level while reinforcing skills introduced at previous grade levels. At the core of all LTF English training and lessons is the revised Bloom's Taxonomy, developed by Lorin Anderson and David Krathwohl (2001). LTF materials begin with the more elemental levels of Remember and Understand and take students through increasingly more complex and sophisticated activities that require them to Apply, Analyze, Evaluate, and Create.

In LTF English training, teachers work through lessons, learn research-based strategies, discuss assessment outcomes, and collaborate with their peers to bring the most effective instructional practices and resources back to the classroom.

Standards for Reading

LTF Close Reading lessons are text-based, incorporating selections from classical and contemporary fiction, nonfiction, poetry, and drama. These lessons require students to respond to literal, inferential, and thematic questions based on increasingly more complex texts for grades 6-10. These scaffolded lessons guide students through analysis of characterization, setting, theme, tone, point of view, purpose, and other complex literary elements. LTF also provides lessons that train students to identify relevant textual support for an idea and how to evaluate arguments based on the quality of evidence and the validity of the reasoning.

Lessons include a variety of formative assessments that rely heavily on inferential thinking. Additional multiple choice and free response assessments complete with scoring guides and authentic student samples also provide valuable instructional support.

LTF training encourages teachers to select rigorous texts that are drawn from historical and scientific documents, contemporary literature, contemporary and historical persuasive writings, and both American and British classics, including Shakespeare. Teachers are provided resources to work as vertical teams to ensure that students in grades 6 through 12 read and respond to complete texts (i.e. novels, plays, nonfiction) that are increasingly complex in language and themes. In addition, LTF training emphasizes the importance of close, analytical reading of short pieces of text at each grade level including a range of nonfiction from pre-19th century through contemporary selections.

Standards for Writing

Writing—both process and product—is a key component of LTF training and materials. Scaffolded activities guide students through the pre-writing, planning, composing, editing, and revising processes for descriptive, expository, narrative, and persuasive essays and for essays that combine modes. Students also learn to evaluate information from various sources and then to synthesize appropriate and applicable information into a cohesive persuasive essay. Through extensive use of dialectical journals and graphic organizers, students create and gather information for inclusion in their essays, evaluate sources from which they draw support for their arguments, and cite material accurately.

Through LTF training, teachers are encouraged to provide opportunities for students to write in-class essays under timed constraints as well as papers that require multiple drafts over an extended period of time.

Standards for Speaking and Listening

LTF English lessons integrate reading, speaking, listening, and writing skills. Student lessons include opportunities for students to use both individual and group discussion methods to read, analyze, and evaluate texts from many different genres; to create responses to discussion and writing assignments; and to present their ideas to both their teacher and their peers.

Throughout LTF training, ELA teachers are encouraged to use multiple instructional strategies to allow students both to learn new concepts and to demonstrate their understanding of these concepts. Training sessions model group discussion, small groups and/or partner activities, and individual work.

Standards for Language

LTF English Lessons guide students through the process of connecting a writers' choice of words, phrases, punctuation, and syntax to create the desired meaning within a text. Writing assignments focus both on the process of analyzing rhetorical effects and the process of imitating the complex models they have studied in order to expand and strengthen their own stylistic choices. Revision lessons emphasize the importance of the conventions of standard English grammar and usage, punctuation, capitalization, and spelling, and guide students through peer-revision activities and self-reflection. Text-based vocabulary lessons provide opportunities for students to learn challenging new words in context and then use those words in their own writing.

LTF English training stresses the importance of close, analytical reading of syntactically rich texts as models for the improvement of student writing. Teachers are encouraged to choose rigorous, multi-layered texts for classroom reading and to use these texts as a vehicle for teaching vocabulary and grammatical rules such as punctuation, usage, and mechanics.

LAYING THE FOUNDATION AND THE MATHEMATICS COMMON CORE STANDARDS

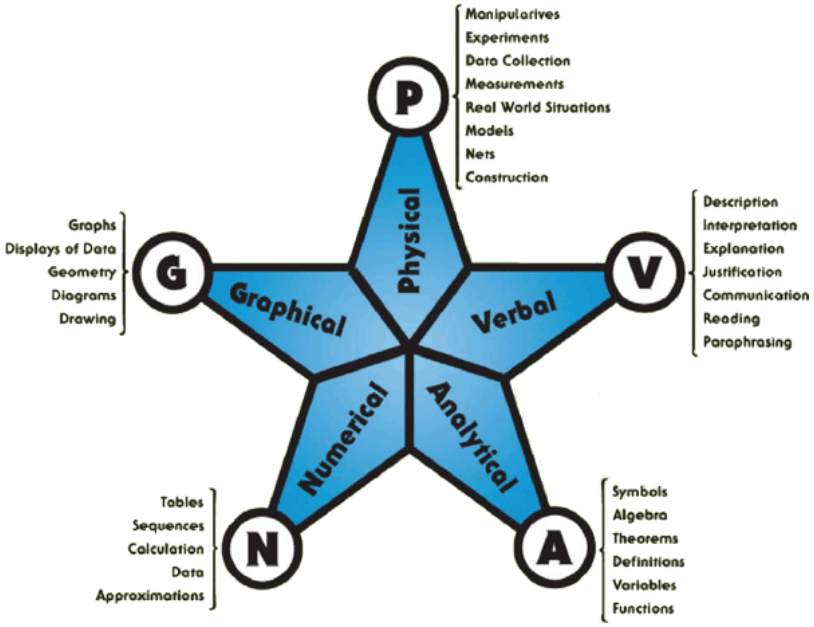
LTF mathematics lessons take students beyond the standard skill-based approach to a conceptual understanding of mathematics. Training for teachers includes using different modalities to address various learning styles and using a variety of questioning styles to train students to think through sophisticated situations. By incorporating many concepts into one lesson and by presenting questions in a variety of modalities, students are engaged in interesting activities that require them to think, to reason, and to engage in mathematical inquiry. Students are encouraged to explain their solutions and to verbalize their thinking processes.

Teachers are challenged to teach concepts, not routines, and to use technology as investigative tools, not simply as instruments to process answers. Through training, teachers learn to help students make connections between their current understandings and new concepts.

Standards for Mathematical Practice

The Common Core's "Standards for Mathematical Practice" describe a variety of instructional practices based on processes and proficiencies that are critical for mathematics instruction. LTF incorporates all of these important processes and proficiencies in materials and training to help students develop knowledge and understanding.

1. **Make sense of problems and persevere in solving them**
   LTF emphasizes using multiple representations to connect various approaches to a situation in order to increase student understanding. The LTF Star identifies five types of representations: physical, numerical, graphical, verbal, and analytical. The materials provide multiple strategies and models for using these representations to introduce, explore, and reinforce mathematical concepts and to enhance understanding. Opportunities for students to collaborate and brainstorm with one another are provided to assist in sense-making and perseverance.



2. **Reason abstractly and quantitatively**
   The ability to "contextualize and decontextualize" is part of the LTF philosophy. Students need to be able to compute a given quantity as well as understand the meaning of the quantity in the context of the situation. One strategy incorporated in many LTF materials requires students to include the units throughout the question and to reach the required answer using dimensional analysis. Students are asked to think quantitatively by exploring how changes in the information or situation will cause the answer to be smaller, larger, or remain the same. Opportunities to decontextualize are provided in questions requiring the use of literal equations where students are asked to represent a given situation symbolically. Students are required to take a problem-solving situation, convert it to mathematical equations, solve it, and then write or explain the answer in the context of the situation, thus re-contextualizing the situation.

3. **Construct viable arguments and critique the reasoning of others**
   A primary component of LTF materials involves students justifying their answers, explaining their reasoning, refuting or confirming given statements or processes, and formulating concluding statements based on their investigations. Students are often asked to work collaboratively to give them the opportunity to compare and analyze different approaches to problem-solving. Students are also provided questions where several correct answers are possible. The materials focus on inquiry-based learning which provides students an opportunity to be involved in their learning and to seek resolutions to questions while constructing new knowledge. In math training, teachers learn questioning techniques to utilize different levels of inquiry-based learning. As part of this learner-centered approach, students are engaged in their learning through LTF's infusion of technology, data collection, display, and analysis. With these strategies and tools, students are encouraged to explore, explain, elaborate, and evaluate situations and questions.

4. **Model with mathematics**
   LTF math materials provide opportunities for students to investigate, model, and solve authentic, real-world problems. Some problem-solving strategies that are incorporated into the teacher training and infused into the LTF materials include making a table, guessing and checking, drawing a diagram or picture, working the problem backwards, eliminating possibilities, using logical reasoning, exploring multiple solutions, using a formula, simplifying the problem, selecting the operation, generating and testing a hypothesis, using simulations, and using manipulatives. The materials scaffold ideas as students move from a procedural approach to problem-solving to conceptual development of the application of concepts to meaningful situations, thus providing a gradual release of responsibility from the teacher to the students.

5. **Use appropriate tools strategically**
   Teachers in training and students in the classroom explore a variety of tools to solve problems, effectively enabling them to make decisions based on the appropriateness of each method in a given situation. LTF materials include questions which require a hands-on approach through the use of manipulatives, others that apply a traditional paper-pencil approach, as well as those that require a technologically advanced approach including the use of graphing calculators with and without computer algebra systems, calculator-based motion detectors, and data collection and exploration software. When using technology, the goal is to incorporate the tools for investigation and problem solving rather than computation. LTF strives to incorporate the latest technological advances when appropriate but also provide alternative methods for schools that may not have access to this advanced technology.

6. **Attend to precision**

   In LTF training, teachers are encouraged to use precise mathematical language based on definitions and to encourage students to do likewise. A common vocabulary is built during training that can be used from sixth grade through calculus/statistics. In addition, LTF reminds teachers to encourage students to avoid rounding or truncating answers in intermediate steps of a problem to achieve optimal accuracy in the final result. The activities consistently require labeling graphs, identifying function values in the context of a situation, and labeling answers with appropriate units.

7. **Look for and make use of structure**

   LTF activities are designed to scaffold student understanding, beginning with the concrete and progressing toward generalizations and abstract representations. In training, teachers look at the basic skills embedded in more complicated problems that focus on connecting the content of their course level to more advanced topics. Within LTF activities, students are given opportunities to notice and explore patterns. Often, students are asked to complete a table based on measurements or deductive reasoning and then to generalize the pattern into a mathematical formula or expression. Other activities provide opportunities to connect algebraic structure with geometric applications and to connect graphical displays and functions.

8. **Look for and express regularity in repeated reasoning**

   Teachers in training are encouraged to assist students in determining effective general methods and in applying provided information in a general form. Questions are often presented in generic terms using variables paired with letters rather than numbers as the constant terms, encouraging students to develop a deeper understanding of a given application. Within the activities, students are asked to move between graphical and analytical representations using recognized repeated patterns. Students are asked to "own" the mathematics, developing their own level of understanding by using a variety of modalities.

Standards for Mathematical Content

The standards for mathematical content focus on the following critical areas and concepts in mathematics for middle grades and high school.

Middle Grade Mathematics:

- Ratios and Proportional Relationships
- The Number System
- Expressions and Equations
- Geometry
- Statistics and Probability
- Functions (Grade 8)

High School Mathematics:

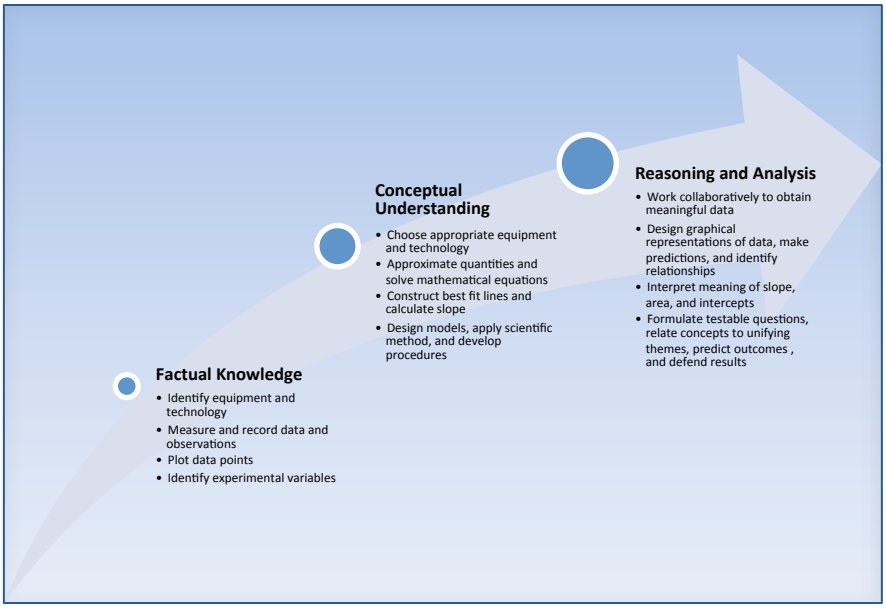
- Number and quantity
- Algebra
- Functions
- Geometry
- Modeling
- Statistics and Probability

The LTF mathematics materials encourage vertical alignment of a concept where connections are made to prior and future learning by threading a concept from introduction in the lower grades through an increasing level of sophistication in the upper grades. Through the modeling of activities in training, teachers learn to integrate standard skills into rigorous critical strands from Calculus and Statistics at every grade from sixth grade through pre-calculus. This integration allows students to build on concepts introduced early in middle grades and reinforced every year in order to fully master concepts to be prepared for college level work.

THE ADDED LTF ADVANTAGE – SCIENCE RESOURCES AND TRAINING

In addition to resources for English and Mathematics, Laying the Foundation also provides science materials and resources for middle grades and high school Biology, Chemistry, and Physics classes. The LTF science materials are content-based with an emphasis on laboratory skills and the integration of mathematics, technology, and the graphing calculator into the science classroom. Instructional strategies that promote gender equity and increase the number of females in upper level science courses are woven into teacher training. Trainings encourage the establishment of an academic climate that promotes excellence through rigorous, relevant, updated instruction.

The LTF science Process Skill Chart outlines a series of thinking skills that students should develop over the course of their middle and high school years. Students progress from acquiring facts to being able to analyze and evaluate various pieces of scientific information. The LTF process skill chart identifies the processing skills that weave throughout all science subjects and shows the progression of those skills through various levels of thinking and maturity of thought. Below is an example of how students should progress from factual knowledge through conceptual understanding to reasoning and analysis in science classes.



IMPLEMENTING THE COMMON CORE STANDARDS

Laying the Foundation provides districts with the rigorous, vertically-aligned instructional resources and a comprehensive professional development program for teachers that are necessary for meeting the Common Core Standards and building a culture of academic excellence for all students.

For more information about Laying the Foundation resources and training, visit www.ltftraining.org or email info@ltftraining.org.

The following organizations are providers of LTF training in their states:

ALABAMA
A+ College Ready

ARKANSAS
Arkansas Advanced Initiative for Math and Science (AAIMS)

CONNECTICUT
Project Opening Doors

KENTUCKY
Advance Kentucky

MASSACHUSETS
Mass Insight

SOUTH DAKOTA
Technology and Innovation in Education (TIE)

VIRGINIA
Virginia Advanced Study Strategies (VASS)