



# KY Standards

Your home for Kentucky Academic Standards.

## WELCOME TO HIGH SCHOOL!

### A Family's Guide to the *Kentucky Academic Standards*

This guide was made to help families understand the *Kentucky Academic Standards* and to show what children will learn by the end of high school. This tool provides information about the key ideas and skills teachers will introduce in mathematics, reading and writing, science and social studies. It includes possible examples of what students will be asked to do in class, how to help your child at home, questions you can ask your high schooler and questions families can ask their child's teacher.

This guide also was designed to help parents understand how they can work with teachers to support the learning of their high schooler. When teachers and families work together to help students master *Kentucky's Academic Standards*, students can succeed by developing the skills they will need for life after graduation.

If you have questions about this information or if your child needs extra help, please contact your child's teacher.

#### Why are the *Kentucky Academic Standards* important?

*Kentucky Academic Standards* are important because they help make sure that all students, no matter where they live or what school they attend, have the skills they need to go after a successful future. Standards represent a goal or outcome of a subject area (such as mathematics, reading and writing, science and social studies). They help set clear and consistent expectations for what students should know and be able to do from kindergarten through high school. The standards are not a curriculum and do not determine the design of a lesson plan or how units should be organized. Decisions on how best to help students meet the goals in the standards are left to local school districts and teachers.

#### How are the standards organized?

The *Kentucky Academic Standards* are organized differently based on the content area. Some of the *Kentucky Academic Standards* are arranged grade-by-grade, while others are grouped into several grade levels, such as "high school" for grades 9-12. In all subjects, the standards show what students should learn and be able to do, but not how those learning experiences are to be designed or what resources should be used. For more information on the *Kentucky Academic Standards*, visit <https://kystandards.org/> to read the complete standards and find standards-related resources.



kystandards.org



standards@education.ky.gov



facebook.com/kydeptofed



@KyDeptofEd

# HIGH SCHOOL MATHEMATICS

## ALGEBRA 1 OVERVIEW:

During Algebra 1, students will continue to build upon and extend the concepts developed in middle school. Your child will:

- Write and solve equations and create graphs as they model real-world situations;
- Examine quadratic and exponential functions; and
- Attend to a given level of precision, whether that is demonstrated through using units appropriately or selecting a reasonable scale when creating graphs.

Note: If your child is attending a school that offers an integrated pathway as opposed to a more traditional sequence, your child should be learning any standards tagged to Algebra 1 or Geometry by the end of Integrated Math 2.

### Examples of Your Child's Work at School:

- Using a variety of methods to solve systems of equations and inequalities;
- Using multiple representations (equations, tables, graphs) to represent functions;
- Solving, graphing and comparing linear, exponential and quadratic equations and functions; and
- Applying linear, quadratic and exponential equations to real-world situations to solve problems, make conjectures and answer questions.

### How to Help Your Child at Home:

- Mathematics can be challenging. Encourage your child to not give up until multiple strategies and tools have been exhausted.
- Remember, your experience with mathematics – whether positive or negative – does not define your child's experience.
- One way to be successful in mathematics is to not fall behind. Encourage your child to pay attention, ask questions and keep caught up during class time.
- Seek outside-of-class assistance from the teacher before or after school and from online resources.

### Questions You Can Ask Your Child:

- What are some things that vary and what are some things that stay the same?
- If you got paid a penny on day one, two pennies on day 2, four pennies on day 3 and every day your pay continued to double, how long until you make \$100?
- How many strategies did you try on this problem?
- Does this answer seem reasonable for the situation?

### Questions You Can Ask Your Child's Teacher:

- Does my child give up easily on difficult tasks?
- How much time should my child spend on homework each night?
- What do you think is giving my child the most trouble? How can I help her or him improve in this area?
- Are there any tools (resources, websites, videos, etc.) we can use at home to help him or her?
- How can we access Desmos? (Desmos is the online calculator students will have access to during the upcoming assessments)? Are there any features that we should use at home to support classroom learning?
- What will my child be learning this year? How can I support my child's development in that area?

# HIGH SCHOOL MATHEMATICS

## GEOMETRY OVERVIEW:

During Geometry, students will build on the concepts from middle school geometry as they continue to work with angles, lines and a variety of two-dimensional and three-dimensional shapes. Your child will:

- Explore theorems relating to congruency and similarity more deeply through transformations and constructions;
- Be introduced to basic trigonometric ratios and learn how those ratios can be used to solve real-world problems; and
- Apply a variety of other geometric concepts to model and solve various real-world situations.

Note: If your child is attending a school that offers an integrated pathway as opposed to a more traditional sequence, your child should be learning any standards tagged to Algebra 1 or Geometry by the end of Integrated Math 2.

### Examples of Your Child's Work at School:

- Using coordinates to find the slope, distance and midpoint between two points and justify parallel and perpendicular lines;
- Understanding the effects of transformations in the plane;
- Applying theorems for lines, angles, triangles and parallelograms;
- Creating and applying geometric constructions;
- Describing relationships among different angles and the corresponding circle;
- Understanding the relationship between the algebraic and geometric representations of circles;
- Applying properties of similarity including dilations; and
- Understanding the properties of right triangles.

### How to Help Your Child at Home:

- Mathematics can be challenging. Encourage your child to not give up until multiple strategies and tools have been exhausted.
- Remember, your experience with mathematics (whether positive or negative) does not define your child's experience.
- One way to be successful in mathematics is to not fall behind. Encourage your child to pay attention, ask questions and keep caught up during class time.
- Seek outside-of-class assistance from the teacher before or after school and from online resources.

### Questions You Can Ask Your Child:

- What makes two shapes congruent (identical)? (Give an example of two congruent objects.)
- What makes two shapes similar? (Give an example of two similar objects.)
- Give a real-world example of two things that are parallel. Is there a reason or benefit to having those items be parallel?
- Can you start with any size circle and create another size circle by changing the scale?

### Questions You Can Ask Your Child's Teacher:

- Does my child learn better by exploring geometric concepts manually or with technology?
- Does my child have difficulty visualizing geometric concepts?
- How much time should my child spend on homework each night?
- What do you think is giving my child the most trouble? How can I help her or him improve in this area?
- Are there any tools (resources, websites, videos, etc.) that we can use at home?
- What is Desmos? Are there any features that we should specifically utilize at home to support classroom learning?
- What are the fluency standards my child will be learning this year? How can I support my child's development of fluency in that area?

# HIGH SCHOOL MATHEMATICS

## POST FOUNDATIONAL OVERVIEW:

Algebra 1 and Geometry are considered to be the foundational courses of mathematics in Kentucky. Completing Algebra 1, Geometry and two post foundational courses should satisfy all of the requirements set forth in the Kentucky Academic Standards for Mathematics. During the post foundational courses, students will build upon and extend the concepts developed in the foundational courses. Your child will:

- Expand upon the linear, quadratic and exponential models to engage more deeply with higher degree polynomials, logarithmic and rational expressions, equations and functions; and
- Investigate statistics and probability concepts and how those concepts apply to real-world situations.

## Examples of Your Child's Work at School:

- Understanding the concept of complex numbers and solving quadratic equations that have complex solutions;
- Using matrices to represent data and be able to perform operations with matrices;
- Using the factored form of an expression, whenever possible, to find roots for equations and/or zeros for functions;
- Representing, organizing and looking for trends in two-variable data;
- Understanding that statistics is a process for making observations and forming conclusions; and
- Representing a function in a variety of ways.

## How to Help Your Child at Home:

- Mathematics can be challenging. Encourage your child to not give up until multiple strategies and tools have been exhausted.
- Remember, your experience with mathematics (whether positive or negative) does not define your child's experience.
- One way to be successful in mathematics is to not fall behind. Encourage your child to pay attention, ask questions and keep caught up during class time.
- Seek outside-of-class assistance from the teacher before or after school and from online resources.

## Questions You Can Ask Your Child:

- If I wanted to sample among the population the students at your high school, what would be a fair and representative way to do that?
- If the weather man says there is a 90% chance of rain tomorrow, does that mean it will rain for certain?
- Would you rather get paid a penny on the first day, then double that the second day, then double that the third day and so on for a month or get \$10 a day for a month?

## Questions You Can Ask Your Child's Teacher:

- Does my child have any gaps in foundational knowledge that are causing problems? If so, what are those gaps and how can we close those gaps?
- How much time should my child spend on homework each night?
- What do you think is giving my child the most trouble? How can I help her or him improve in this area?
- Are there any tools (resources, websites, videos, etc.) that we can use at home for content support?
- What is Desmos? Are there any features that we should specifically utilize at home to support classroom learning?
- What are the fluency standards my child will be learning this year? How can I support my child's development of fluency in that area?

# HIGH SCHOOL READING AND WRITING

## OVERVIEW:

During high school, students will read increasingly challenging texts from many cultures, time periods and disciplines and write a variety of products for different purposes and audiences. Your child will:

- Cite relevant and thorough evidence to support the analysis of a topic;
- Read closely to analyze an author’s choices of words, structures, points of view and perspectives to evaluate how these choices impact audiences;
- Evaluate text structure, diverse media interpretations, arguments, claims, evidence and reasoning; and
- Apply the rules of standard English to be prepared for opportunities to communicate in an increasingly global society.

## Examples of Your Child’s Work at School:

- Providing details to explain what a text says, as well as what it means;
- Viewing information in print and non-print forms to boost knowledge of a topic;
- Understanding how the meaning of words and phrases can affect the overall meaning of a text; and
- Comparing/contrasting texts written by different authors concerning similar subjects.

## How to Help Your Child at Home:

- Encourage your child to read and show comprehension of a variety of texts that are common to everyday life, including, but not limited to, recipes, instructions for assembling household items, monthly billing statements and insurance statements.
- Have discussions about what each of you is reading or viewing.
- Ask your child to write letters, emails and thank you notes which include grade-level vocabulary and exhibit correct spelling, grammar and punctuation;

## Questions You Can Ask Your Child:

- What message or conclusions can you take away from the text? How do the words or structures the writer uses impact that message?
- Can you share some samples of products you have created and tell me about what you learned?
- How do news programs, commercials, websites and magazine articles use narrative/stories to impact the audience?
- How would you compare how two authors communicate about the same topic?

## Questions You Can Ask Your Child’s Teacher:

- How well is my child comprehending the in- and out-of-class readings?
- How well is my child mastering the standards of the current unit?
- Are there any opportunities for enrichment or extra help available for my child?

# HIGH SCHOOL SCIENCE

## OVERVIEW:

During high school, your child will be an active learner who will be doing science to learn science. They will continue to build on concepts learned in middle school and experience similar science and engineering practices (skills) as those used by professionals in the field such as obtaining, evaluating and communicating information; constructing explanations and designing solutions; developing and using models; analyzing and interpreting data; planning and carrying out investigations; engaging in arguments from evidence; and using mathematics and computational thinking while making connections across the different areas of science to develop a deeper understanding of the science concepts. Your child will:

- Experience instruction in physical science (subatomic chemistry and electromagnetic radiation), life sciences (ecosystem dynamics, body systems, DNA), Earth and space sciences (geology, astronomy and biodiversity) and engineering design (how to define problems quantitatively and how to identify trade-offs when developing engineering solutions); and
- Develop key problem-solving skills to prepare your child for success in a wide variety of college majors and careers.

## Examples of Your Child's Work at School:

- Using the periodic table as a tool to explain and predict the properties of elements;
- Using statistics and probability concepts in written essays explaining how traits are expressed in a population;
- Using evidence from meteorites to form hypotheses about the early history of Earth; and
- Analyzing a major global challenge (access to clean water) to specify solutions that account for societal needs and wants.

## How to Help Your Child at Home:

- Ask your child about what they are learning in science class. Use current events as a foundation for discussion.
- Plan a trip to a nearby natural history museum or planetarium.
- Utilize community programs that focus on physical science, life science, Earth and space science and engineering design.

## Questions You Can Ask Your Child:

- What phenomena are you exploring?
- What are ways that humans have impacted the environment?
- What kinds of problems are you solving? Why did you/your team/your class choose the solution they did?

## Questions You Can Ask Your Child's Teacher:

- What are resources I could use to help my child at home?
- What kind of phenomena are being explored?
- What kinds of scientific research is my child experiencing?
- How is my child asked to incorporate evidence into explanations and arguments?
- How are reading and writing and mathematics included in science class?

# HIGH SCHOOL SOCIAL STUDIES

## OVERVIEW:

In high school, students are challenged to be culturally literate and prepared for responsible civic engagement by having knowledge of the four social studies disciplines (civics, economics, geography and history). Your child will:

- Understand the fundamental values and principles of America's democratic republic;
- Understand the interaction of buyers and sellers in markets, the workings of the national economy and interactions within the global marketplace;
- Understand the cultural, economic, social and civic implications of life in Earth's many environments, and the interplay of human activity and physical features on the Earth's surface; and
- Use historical thinking skills to confront today's problems, be informed on taking an active position on issues and make sense of the interconnected world around them.

## Examples of Your Child's Work at School:

- Determining the credibility of sources with varying perspectives through investigative study;
- Drafting and revising claims and counterclaims to address real-life and content-specific questions;
- Engaging in civil discussions to address real-life and content-specific questions;
- Developing arguments, explanations and communications to address questions; and
- Presenting a solution or action plan to address real-life, content-specific issues.

## How to Help Your Child at Home:

- Encourage your child to ask questions. As you watch the news, a documentary or read published media with your child, discuss questions she or he has and brainstorm where they can find answers and learn more about the subject.
- Find opportunities, such as elections or televised political debates, to discuss views regarding political issues and how those views impact decision-making in the election process.
- Encourage your child to research an issue facing your community and contact a legislator with an informed suggestion.
- Model civic engagement by researching candidates before voting, filling out census documents as a family and participating in local events.

## Questions You Can Ask Your Child:

- What issues matter to you?
- What conversations have you had in class that inspire you, confuse you or make you wonder?
- What have you read in class that challenged the way you think?

## Questions You Can Ask Your Child's Teacher:

- How do you create and maintain a safe learning environment that provides an opportunity for all children to express their views and ideas?
- How can I prepare my child to respectfully participate in class discussions in which an agreement may or may not be reached?
- What resources are available to families to support learning about social studies skills?