



PLTW - Standards Alignment

Our programs are designed to empower students to thrive in an evolving world. As a part of this, we take standards alignment into account when developing and updating our curriculum. We define alignment as:

- Students complete a designated task(s) that demonstrates the outlined knowledge and/or skills of the specific standard or objective.
- Our multidisciplinary programs align to a variety of standards and provide districts and schools with the flexibility to tailor programs to meet their specific state or local requirements as needed.
- All PLTW pathways align to Common Core State Standards for Mathematics and English Language Arts and Next Generation Science Standards. Additionally, our computer science pathway aligns to Computer Science Teachers Association Standards.

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Next Generation Science Standards

Engineering Design

NGSS.MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Lesson 1 Lesson 2 Lesson 3

NGSS.MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

Lesson 1 Lesson 2 Lesson 3

NGSS.MS-ETS1-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

Lesson 1 Lesson 2 Lesson 3

NGSS.MS-ETS1-4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Lesson 1 Lesson 2 Lesson 3

Science and Engineering Practices

NGSS.P1 Asking questions (for science) and defining problems (for engineering).

Lesson 1 Lesson 2 Lesson 3

NGSS.P2 Developing and using models.

Lesson 1 Lesson 2 Lesson 3

NGSS.P3 Planning and carrying out investigations.

Lesson 1 Lesson 2 Lesson 3

NGSS.P4 Analyzing and interpreting data.

Lesson 1 Lesson 2 Lesson 3

NGSS.P5 Using mathematics and computational thinking.

Lesson 1 Lesson 2 Lesson 3

NGSS.P6 Constructing explanations (for science) and designing solutions (for engineering).

Lesson 1 Lesson 2 Lesson 3

NGSS.P7 Engaging in argument from evidence.

Lesson 1 Lesson 2 Lesson 3

NGSS.P8 Obtaining, evaluating, and communicating information.

Lesson 1 Lesson 2 Lesson 3

Reading

AS.R.1 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

Lesson 1 Lesson 2 Lesson 3

Common Core State Standards for English Language Arts Anchor Standards

AS.R.4 Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

Lesson 1 Lesson 2 Lesson 3

AS.R.7 Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

Lesson 1 Lesson 2 Lesson 3

Writing

AS.W.3 Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

Lesson 1 Lesson 2 Lesson 3

AS.W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Lesson 1 Lesson 2 Lesson 3

AS.W.6 Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Lesson 1 Lesson 2 Lesson 3

Speaking and Listening

AS.SL.1 Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

Lesson 1 Lesson 2 Lesson 3

AS.SL.2 Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

Lesson 1 Lesson 2 Lesson 3

AS.SL.4 Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

Lesson 1 Lesson 2 Lesson 3

AS.SL.5 Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

Lesson 1 Lesson 2 Lesson 3

Language

AS.L.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Lesson 1 Lesson 2 Lesson 3

Common Core State Standards for English Language Arts Anchor Standards

AS.L.6 Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Lesson 1 Lesson 2 Lesson 3

Reading History/Social Studies

6-8.RH.7 Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

Lesson 1 Lesson 2 Lesson 3

Reading Science/Technical

6-8.RST.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

Lesson 1 Lesson 2 Lesson 3

6-8.RST.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

Lesson 1 Lesson 2 Lesson 3

6-8.RST.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

Lesson 1 Lesson 2 Lesson 3

Writing

7.W.2.a Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.

Lesson 1 Lesson 2 Lesson 3

7.W.2.d Use precise language and domain-specific vocabulary to inform about or explain the topic.

Lesson 1 Lesson 2 Lesson 3

7.W.3 Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.

Lesson 1 Lesson 2 Lesson 3

7.W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Lesson 1 Lesson 2 Lesson 3

Speaking and Listening

7.SL.1.b Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.

Lesson 1 Lesson 2 Lesson 3

- 7.SL.1.c Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.
- Lesson 1 Lesson 2 Lesson 3
- 7.SL.1.d Acknowledge new information expressed by others and, when warranted, modify their own views.
- Lesson 1 Lesson 2 Lesson 3
- 7.SL.2 Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.
- Lesson 1 Lesson 2 Lesson 3
- 7.SL.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.
- Lesson 1 Lesson 2 Lesson 3
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Ratios And Proportional Relationships

- 6.RP.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
- Lesson 1 Lesson 2 Lesson 3
- 6.RP.3.b Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?
- Lesson 1 Lesson 2 Lesson 3
- 6.RP.3.d Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
- Lesson 1 Lesson 2 Lesson 3
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The Number System

- 6.NS.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $3/4$ -cup servings are in $2/3$ of a cup of yogurt? How wide is a rectangular strip of land with length $3/4$ mi and area $1/2$ square mi?
- Lesson 1 Lesson 2 Lesson 3
- 6.NS.2 Fluently divide multi-digit numbers using the standard algorithm.
- Lesson 1 Lesson 2 Lesson 3
- 6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
- Lesson 1 Lesson 2 Lesson 3

6.NS.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.

Lesson 1 Lesson 2 Lesson 3

6.NS.6.a Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite.

Lesson 1 Lesson 2 Lesson 3

6.NS.6.b Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

Lesson 1 Lesson 2 Lesson 3

6.NS.6.c Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

Lesson 1 Lesson 2 Lesson 3

6.NS.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Lesson 1 Lesson 2 Lesson 3

Geometry

6.G.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

Lesson 1 Lesson 2 Lesson 3

6.G.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l w h$ and $V = b h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

Lesson 1 Lesson 2 Lesson 3

6.G.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

Lesson 1 Lesson 2 Lesson 3

6.G.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Lesson 1 Lesson 2 Lesson 3

Statistics And Probability

- 6.SP.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, “How old am I?” is not a statistical question, but “How old are the students in my school?” is a statistical question because one anticipates variability in students’ ages.
- Lesson 1 Lesson 2 Lesson 3
- 6.SP.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.
- Lesson 1 Lesson 2 Lesson 3
- 6.SP.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
- Lesson 1 Lesson 2 Lesson 3
- 6.SP.5 Summarize numerical data sets in relation to their context.
- Lesson 1 Lesson 2 Lesson 3
- 6.SP.5.a Reporting the number of observations.
- Lesson 1 Lesson 2 Lesson 3
- 6.SP.5.b Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
- Lesson 1 Lesson 2 Lesson 3
- 6.SP.5.c Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
- Lesson 1 Lesson 2 Lesson 3
- 6.SP.5.d Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.
- Lesson 1 Lesson 2 Lesson 3

The Number System

- 7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.
- Lesson 1 Lesson 2 Lesson 3

Geometry

- 7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
- Lesson 1 Lesson 2 Lesson 3
- 7.G.2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
- Lesson 1 Lesson 2 Lesson 3

Common Core State Standards for Mathematics

7.G.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

Lesson 1 Lesson 2 Lesson 3

7.G.4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

Lesson 1 Lesson 2 Lesson 3

7.G.6 Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Lesson 1 Lesson 2 Lesson 3

Statistics And Probability

7.SP.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

Lesson 1 Lesson 2 Lesson 3

7.SP.8.b Represent sample spaces for compound events using methods such as organized lists, tables, and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.

Lesson 1 Lesson 2 Lesson 3

Geometry

8.G.1 Verify experimentally the properties of rotations, reflections, and translations.

Lesson 1 Lesson 2 Lesson 3

8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Lesson 1 Lesson 2 Lesson 3

Students will develop an understanding of the core concepts of technology.

2.6-8.M Technologies systems include input, processes, output, and at times, feedback.

Lesson 1 Lesson 2 Lesson 3

2.6-8.R Requirements are the parameters placed on the development of a product or system.

Lesson 1 Lesson 2 Lesson 3

2.6-8.S Trade-off is a decision process recognizing the need for careful compromises among competing factors.

Lesson 1 Lesson 2 Lesson 3

2.6-8.T Different technologies involve different sets of processes.

Lesson 1 Lesson 2 Lesson 3

Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.

3.6-8.F Knowledge gained from other fields of study has a direct effect on the development of technological products and systems.

Lesson 1 Lesson 2 Lesson 3

Standards for Technological Literacy

Students will develop an understanding of the cultural, social, economic, and political effects of technology.

4.6-8.D The use of technology affects humans in various ways, including their safety, comfort, choices, and attitudes about technology's development and use.

Lesson 1 Lesson 2 Lesson 3

4.6-8.F The development and use of technology poses ethical issues.

Lesson 1 Lesson 2 Lesson 3

6.6-8.E The use of inventions and innovations has led to changes in society and the creation of new needs and wants.

Lesson 1 Lesson 2 Lesson 3

7.6-8-C Many inventions and innovations have evolved using slow and methodical processes of tests and refinements.

Lesson 1 Lesson 2 Lesson 3

7.6-8-D The specialization of function has been at the heart of many technological improvements.

Lesson 1 Lesson 2 Lesson 3

Students will develop an understanding of the attributes of design.

8.6-8.E Design is a creative planning process that leads to useful products and systems.

Lesson 1 Lesson 2 Lesson 3

8.6-8.F There is no perfect design.

Lesson 1 Lesson 2 Lesson 3

8.6-8.G Requirements for design are made up of criteria and constraints.

Lesson 1 Lesson 2 Lesson 3

Students will develop an understanding of engineering design.

9.6-8.F Design involves a set of steps, which can be performed in different sequences and repeated as needed.

Lesson 1 Lesson 2 Lesson 3

9.6-8.G Brainstorming is a group problem-solving design process in which each person in the group presents his or her ideas in an open forum.

Lesson 1 Lesson 2 Lesson 3

9.6-8.H Modeling, testing, evaluating, and modifying are used to transform ideas into practical solutions.

Lesson 1 Lesson 2 Lesson 3

Students will develop the abilities to apply the design process.

11.6-8.H Apply a design process to solve problems in and beyond the laboratory-classroom.

Lesson 1 Lesson 2 Lesson 3

11.6-8.I Specify criteria and constraints for the design.

Lesson 1 Lesson 2 Lesson 3

Standards for Technological Literacy

11.6-8.J Make two-dimensional and three-dimensional representations of the designed solution.

Lesson 1 Lesson 2 Lesson 3

11.6-8.K Test and evaluate the design in relation to pre-established requirements, such as criteria and constraints, and refine as needed.

Lesson 1 Lesson 2 Lesson 3

11.6-8.L Make a product or system and document the solution.

Lesson 1 Lesson 2 Lesson 3

Students will develop the abilities to use and maintain technological products and systems.

12.6-8.H Use information provided in manuals, protocols, or by experienced people to see and understand how things work.

Lesson 1 Lesson 2 Lesson 3

12.6-8.J Use computers and calculators in various applications.

Lesson 1 Lesson 2 Lesson 3

13.6-8.G Use data collected to analyze and interpret trends in order to identify the positive and negative effects of a technology.

Lesson 1 Lesson 2 Lesson 3

13.6-8.I Interpret and evaluate the accuracy of the information obtained and determine if it is useful.

Lesson 1 Lesson 2 Lesson 3

Students will develop an understanding of and be able to select and use medical technologies.

14.6-8.G Advances and innovations in medical technologies are used to improve healthcare.

Lesson 1 Lesson 2 Lesson 3

Students will develop an understanding of and be able to select and use information and communication technologies.

17.6-8.J The design of a message is influenced by such factors as intended audience, medium, purpose, and the nature of the message.

Lesson 1 Lesson 2 Lesson 3

17.6-8.K The use of symbols, measurements, and drawings promotes a clear communication by providing a common language to express ideas.

Lesson 1 Lesson 2 Lesson 3