Forward Education

Autonomous Electric Vehicles of the Future

Texas Essential Knowledge and Skills (TEKS)
Mathematics
Grade **11** - Adopted: **2012**

TEKS	111.39.	Algebra I, Adopted 2012 (One Credit).
STUDENT EXPECTATION	111.39.c.1.	Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
GRADE LEVEL EXPECTATION	111.39.c.1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.39.c.1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.39.c.1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.

TEKS	111.39.	Algebra I, Adopted 2012 (One Credit).
STUDENT EXPECTATION	111.39.c.2.	Linear functions, equations, and inequalities. The student applies the mathematical process standards when using properties of linear functions to write and represent in multiple ways, with and without technology, linear equations, inequalities, and systems of equations. The student is expected to:
GRADE LEVEL EXPECTATION	111.39.c.2.B.	Write linear equations in two variables in various forms, including y = mx + b, Ax + By = C, and y - y1 = m(x - x1), given one point and the slope and given two points.
GRADE LEVEL EXPECTATION	111.39.c.2.E.	Write the equation of a line that contains a given point and is parallel to a given line.
GRADE LEVEL EXPECTATION	111.39.c.2.F.	Write the equation of a line that contains a given point and is perpendicular to a given line.

TEKS	111.39.	Algebra I, Adopted 2012 (One Credit).
STUDENT EXPECTATION	111.39.c.3.	Linear functions, equations, and inequalities. The student applies the mathematical process standards when using graphs of linear functions, key features, and related transformations to represent in multiple ways and solve, with and without technology, equations, inequalities, and systems of equations. The student is expected to:
GRADE LEVEL EXPECTATION	111.39.c.3.C.	Graph linear functions on the coordinate plane and identify key features, including x-intercept, y-intercept, zeros, and slope, in mathematical and real-world problems.

TEKS	111.40.	Algebra II, Adopted 2012 (One-Half to One Credit).
STUDENT EXPECTATION	111.40.c.1.	Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
GRADE LEVEL EXPECTATION	111.40.c.1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.

GRADE LEVEL EXPECTATION	111.40.c. 1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.40.c. 1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.

TEKS	111.41.	Geometry, Adopted 2012 (One Credit).
STUDENT EXPECTATION	111.41. c.1.	Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
GRADE LEVEL EXPECTATION	111.41.c. 1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.41.c. 1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.41.c. 1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.

TEKS	111.41.	Geometry, Adopted 2012 (One Credit).
STUDENT EXPECTATION	111.41. c.2.	Coordinate and transformational geometry. The student uses the process skills to understand the connections between algebra and geometry and uses the one- and two-dimensional coordinate systems to verify geometric conjectures. The student is expected to:
GRADE LEVEL EXPECTATION	111.41.c. 2.C.	Determine an equation of a line parallel or perpendicular to a given line that passes through a given point.

TEKS	111.42.	Precalculus, Adopted 2012 (One-Half to One Credit).
STUDENT EXPECTATION	111.42. c.1.	Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
GRADE LEVEL EXPECTATION	111.42.c. 1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.42.c. 1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.42.c. 1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.

TEKS	111.43.	Mathematical Models with Applications, Adopted 2012 (One-Half to One Credit).
STUDENT EXPECTATION	111.43. c.1.	Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
GRADE LEVEL EXPECTATION	111.43.c. 1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.43.c. 1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.

GRADE LEVEL EXPECTATION	111.43.c. 1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.

TEKS	111.44.	**Advanced Quantitative Reasoning, Adopted 2012 (One-Half to One Credit)**
STUDENT EXPECTATION	**111.44. c.1.**	**Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:**
GRADE LEVEL EXPECTATION	111.44.c. 1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.44.c. 1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.44.c. 1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.

TEKS	111.45.	**Independent Study in Mathematics, Adopted 2012 (One-Half to One Credit).**
STUDENT EXPECTATION	**111.45. c.**	**Knowledge and Skills: Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:**
GRADE LEVEL EXPECTATION	111.45.c. 2.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.45.c. 3.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.45.c. 6	Analyze mathematical relationships to connect and communicate mathematical ideas.

Grade **11** - Adopted: **2013**

TEKS	111.46.	**Discrete Mathematics for Problem Solving, Adopted 2013 (One-Half to One Credit).**
STUDENT EXPECTATION	**111.46. c.1.**	**Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:**
GRADE LEVEL EXPECTATION	111.46.c. 1.A.	Apply mathematics to problems arising in everyday life, society, and the workplace.
GRADE LEVEL EXPECTATION	111.46.c. 1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.46.c. 1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.46.c. 1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.

Grade **11** - Adopted: **2015**

TEKS	111.47.	**Statistics, Adopted 2015 (One Credit)**

STUDENT EXPECTATION	111.47. c.1.	**Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:**
GRADE LEVEL EXPECTATION	111.47.c. 1.A.	Apply mathematics to problems arising in everyday life, society, and the workplace.
GRADE LEVEL EXPECTATION	111.47.c. 1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.47.c. 1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.47.c. 1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.

TEKS	111.48.	**Algebraic Reasoning, Adopted 2015 (One Credit).**
STUDENT EXPECTATION	111.48. c.1.	**Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:**
GRADE LEVEL EXPECTATION	111.48.c. 1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.48.c. 1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.48.c. 1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.

TEKS	111.48.	**Algebraic Reasoning, Adopted 2015 (One Credit).**
STUDENT EXPECTATION	111.48. c.2.	**Patterns and structure. The student applies mathematical processes to connect finite differences or common ratios to attributes of functions. The student is expected to:**
GRADE LEVEL EXPECTATION	111.48.c. 2.A.	Determine the patterns that identify the relationship between a function and its common ratio or related finite differences as appropriate, including linear, quadratic, cubic, and exponential functions.
GRADE LEVEL EXPECTATION	111.48.c. 2.B.	Classify a function as linear, quadratic, cubic, and exponential when a function is represented tabular using finite differences or common ratios as appropriate.

TEKS	111.48.	**Algebraic Reasoning, Adopted 2015 (One Credit).**
STUDENT EXPECTATION	111.48. c.6.	**Number and algebraic methods. The student applies mathematical processes to estimate and determine solutions to equations resulting from functions and real-world applications with fluency. The student is expected to:**
GRADE LEVEL EXPECTATION	111.48.c. 6.B.	Solve equations arising from questions asked about functions that model real-world applications, including linear and quadratic functions, tabular, graphically, and symbolically.

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Texas Essential Knowledge and Skills (TEKS)
Mathematics
Grade **12** - Adopted: **2012**

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TEKS	111.39.	**Algebra I, Adopted 2012 (One Credit).**

STUDENT EXPECTATION	111.39.c.1.	Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
GRADE LEVEL EXPECTATION	111.39.c.1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.39.c.1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.39.c.1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.

TEKS	111.39.	Algebra I, Adopted 2012 (One Credit).
STUDENT EXPECTATION	111.39.c.2.	Linear functions, equations, and inequalities. The student applies the mathematical process standards when using properties of linear functions to write and represent in multiple ways, with and without technology, linear equations, inequalities, and systems of equations. The student is expected to:
GRADE LEVEL EXPECTATION	111.39.c.2.B.	Write linear equations in two variables in various forms, including $y = mx + b$, $Ax + By = C$, and $y - y_1 = m(x - x_1)$, given one point and the slope and given two points.
GRADE LEVEL EXPECTATION	111.39.c.2.E.	Write the equation of a line that contains a given point and is parallel to a given line.
GRADE LEVEL EXPECTATION	111.39.c.2.F.	Write the equation of a line that contains a given point and is perpendicular to a given line.

TEKS	111.39.	Algebra I, Adopted 2012 (One Credit).
STUDENT EXPECTATION	111.39.c.3.	Linear functions, equations, and inequalities. The student applies the mathematical process standards when using graphs of linear functions, key features, and related transformations to represent in multiple ways and solve, with and without technology, equations, inequalities, and systems of equations. The student is expected to:
GRADE LEVEL EXPECTATION	111.39.c.3.C.	Graph linear functions on the coordinate plane and identify key features, including x-intercept, y-intercept, zeros, and slope, in mathematical and real-world problems.

TEKS	111.40.	Algebra II, Adopted 2012 (One-Half to One Credit).
STUDENT EXPECTATION	111.40.c.1.	Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
GRADE LEVEL EXPECTATION	111.40.c.1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.40.c.1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.40.c.1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.

TEKS	111.41.	Geometry, Adopted 2012 (One Credit).
STUDENT EXPECTATION	111.41.c.1.	Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

GRADE LEVEL EXPECTATION	111.41.c. 1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.41.c. 1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.41.c. 1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.
TEKS	**111.41.**	**Geometry, Adopted 2012 (One Credit).**
STUDENT EXPECTATION	**111.41. c.2.**	**Coordinate and transformational geometry. The student uses the process skills to understand the connections between algebra and geometry and uses the one- and two-dimensional coordinate systems to verify geometric conjectures. The student is expected to:**
GRADE LEVEL EXPECTATION	111.41.c. 2.C.	Determine an equation of a line parallel or perpendicular to a given line that passes through a given point.
TEKS	**111.42.**	**Precalculus, Adopted 2012 (One-Half to One Credit).**
STUDENT EXPECTATION	**111.42. c.1.**	**Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:**
GRADE LEVEL EXPECTATION	111.42.c. 1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.42.c. 1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.42.c. 1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.
TEKS	**111.43.**	**Mathematical Models with Applications, Adopted 2012 (One-Half to One Credit).**
STUDENT EXPECTATION	**111.43. c.1.**	**Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:**
GRADE LEVEL EXPECTATION	111.43.c. 1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.43.c. 1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.43.c. 1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.
TEKS	**111.44.**	**Advanced Quantitative Reasoning, Adopted 2012 (One-Half to One Credit)**
STUDENT EXPECTATION	**111.44. c.1.**	**Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:**
GRADE LEVEL EXPECTATION	111.44.c. 1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.

GRADE LEVEL EXPECTATION	111.44.c. 1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.44.c. 1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.

TEKS	111.45.	Independent Study in Mathematics, Adopted 2012 (One-Half to One Credit).
STUDENT EXPECTATION	111.45. c.	Knowledge and Skills: Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
GRADE LEVEL EXPECTATION	111.45.c. 2.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.45.c. 3.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.45.c. 6	Analyze mathematical relationships to connect and communicate mathematical ideas.

Grade **12** - Adopted: **2013**

TEKS	111.46.	Discrete Mathematics for Problem Solving, Adopted 2013 (One-Half to One Credit).
STUDENT EXPECTATION	111.46. c.1.	Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
GRADE LEVEL EXPECTATION	111.46.c. 1.A.	Apply mathematics to problems arising in everyday life, society, and the workplace.
GRADE LEVEL EXPECTATION	111.46.c. 1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.46.c. 1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.46.c. 1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.

Grade **12** - Adopted: **2015**

TEKS	111.47.	Statistics, Adopted 2015 (One Credit)
STUDENT EXPECTATION	111.47. c.1.	Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
GRADE LEVEL EXPECTATION	111.47.c. 1.A.	Apply mathematics to problems arising in everyday life, society, and the workplace.
GRADE LEVEL EXPECTATION	111.47.c. 1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.47.c. 1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.

GRADE LEVEL EXPECTATION	111.47.c. 1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.

TEKS	111.48.	**Algebraic Reasoning, Adopted 2015 (One Credit).**
STUDENT EXPECTATION	**111.48. c.1.**	**Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:**
GRADE LEVEL EXPECTATION	111.48.c. 1.B.	Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
GRADE LEVEL EXPECTATION	111.48.c. 1.C.	Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
GRADE LEVEL EXPECTATION	111.48.c. 1.F.	Analyze mathematical relationships to connect and communicate mathematical ideas.

TEKS	111.48.	**Algebraic Reasoning, Adopted 2015 (One Credit).**
STUDENT EXPECTATION	**111.48. c.2.**	**Patterns and structure. The student applies mathematical processes to connect finite differences or common ratios to attributes of functions. The student is expected to:**
GRADE LEVEL EXPECTATION	111.48.c. 2.A.	Determine the patterns that identify the relationship between a function and its common ratio or related finite differences as appropriate, including linear, quadratic, cubic, and exponential functions.
GRADE LEVEL EXPECTATION	111.48.c. 2.B.	Classify a function as linear, quadratic, cubic, and exponential when a function is represented tabular using finite differences or common ratios as appropriate.

TEKS	111.48.	**Algebraic Reasoning, Adopted 2015 (One Credit).**
STUDENT EXPECTATION	**111.48. c.6.**	**Number and algebraic methods. The student applies mathematical processes to estimate and determine solutions to equations resulting from functions and real-world applications with fluency. The student is expected to:**
GRADE LEVEL EXPECTATION	111.48.c. 6.B.	Solve equations arising from questions asked about functions that model real-world applications, including linear and quadratic functions, tabular, graphically, and symbolically.

Texas Essential Knowledge and Skills (TEKS)

Science

Grade **11** - Adopted: **2017**

TEKS	§112.39	**Physics (One Credit), Adopted 2017 – The provisions of §§112.34, 112.35, 112.38, and 112.39 of this subchapter adopted in 2017 shall be implemented by school districts beginning with the 2018-2019 school year.**
STUDENT EXPECTATION	**§112.39. c**	**Knowledge and skills.**
GRADE LEVEL EXPECTATION	**§112.39. c.5**	**Science concepts. The student knows the nature of forces in the physical world. The student is expected to:**
INDICATOR	§112.39.c .5.D	identify and describe examples of electric and magnetic forces and fields in everyday life such as generators, motors, and transformers

TEKS	§112.35	**Chemistry (One Credit), Adopted 2017 – The provisions of §§112.34, 112.35, 112.38, and 112.39 of this subchapter adopted in 2017 shall be implemented by school districts beginning with the 2018-2019 school year.**

STUDENT EXPECTATION	§112.35.c	Knowledge and skills.
GRADE LEVEL EXPECTATION	§112.35.c.3	Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:

INDICATOR	§112.35.c.3.D	evaluate the impact of research on scientific thought, society, and the environment

TEKS	§112.35	Chemistry (One Credit), Adopted 2017 – The provisions of §§112.34, 112.35, 112.38, and 112.39 of this subchapter adopted in 2017 shall be implemented by school districts beginning with the 2018-2019 school year.
STUDENT EXPECTATION	§112.35.c	Knowledge and skills.
GRADE LEVEL EXPECTATION	§112.35.c.8	Science concepts. The student can quantify the changes that occur during chemical reactions. The student is expected to:

INDICATOR	§112.35.c.8.F	differentiate among double replacement reactions, including acid-base reactions and precipitation reactions, and oxidation-reduction reactions such as synthesis, decomposition, single replacement, and combustion reactions

TEKS	§112.36	Earth and Space Science, Beginning with School Year 2010-2011 (One Credit).
STUDENT EXPECTATION	§112.36.c	Knowledge and skills.
GRADE LEVEL EXPECTATION	§112.36.c.11	Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to:

INDICATOR	§112.36.c.11.E	evaluate the impact of changes in Earth's subsystems on humans such as earthquakes, tsunamis, volcanic eruptions, hurricanes, flooding, and storm surges and the impact of humans on Earth's subsystems such as population growth, fossil fuel burning, and use of fresh water

TEKS	§112.36	Earth and Space Science, Beginning with School Year 2010-2011 (One Credit).
STUDENT EXPECTATION	§112.36.c	Knowledge and skills.
GRADE LEVEL EXPECTATION	§112.36.c.12	Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to:

INDICATOR	§112.36.c.12.A	evaluate how the use of energy, water, mineral, and rock resources affects Earth's subsystems

TEKS	§112.36	Earth and Space Science, Beginning with School Year 2010-2011 (One Credit).
STUDENT EXPECTATION	§112.36.c	Knowledge and skills.
GRADE LEVEL EXPECTATION	§112.36.c.13	Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to:

INDICATOR	§112.36.c.13.C	analyze the empirical relationship between the emissions of carbon dioxide, atmospheric carbon dioxide levels, and the average global temperature trends over the past 150 years

INDICATOR	§112.36.c.13.D	discuss mechanisms and causes such as selective absorbers, major volcanic eruptions, solar luminance, giant meteorite impacts, and human activities that result in significant changes in Earth's climate

TEKS	§112.36	Earth and Space Science, Beginning with School Year 2010-2011 (One Credit).
STUDENT EXPECTATION	§112.36.c	Knowledge and skills.

GRADE LEVEL EXPECTATION	§112.36.c.14	**Fluid Earth. The student knows that Earth's global ocean stores solar energy and is a major driving force for weather and climate through complex atmospheric interactions. The student is expected to:**
INDICATOR	§112.36.c.14.B	investigate how the atmosphere is heated from Earth's surface due to absorption of solar energy, which is re-radiated as thermal energy and trapped by selective absorbers

TEKS	§112.36	**Earth and Space Science, Beginning with School Year 2010-2011 (One Credit).**
STUDENT EXPECTATION	§112.36.c	**Knowledge and skills.**
GRADE LEVEL EXPECTATION	§112.36.c.15	**Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to:**
INDICATOR	§112.36.c.15.E	analyze recent global ocean temperature data to predict the consequences of changing ocean temperature on evaporation, sea level, algal growth, coral bleaching, hurricane intensity, and biodiversity

TEKS	§112.37	**Environmental Systems, Beginning with School Year 2010-2011 (One Credit).**
STUDENT EXPECTATION	§112.37.c	**Knowledge and skills.**
GRADE LEVEL EXPECTATION	§112.37.c.6	**Science concepts. The student knows the sources and flow of energy through an environmental system. The student is expected to:**
INDICATOR	§112.37.c.6.B	describe and compare renewable and non-renewable energy derived from natural and alternative sources such as oil, natural gas, coal, nuclear, solar, geothermal, hydroelectric, and wind

TEKS	§112.37	**Environmental Systems, Beginning with School Year 2010-2011 (One Credit).**
STUDENT EXPECTATION	§112.37.c	**Knowledge and skills.**
GRADE LEVEL EXPECTATION	§112.37.c.9	**Science concepts. The student knows the impact of human activities on the environment. The student is expected to:**
INDICATOR	§112.37.c.9.D	describe the effect of pollution on global warming, glacial and ice cap melting, greenhouse effect, ozone layer, and aquatic viability
INDICATOR	§112.37.c.9.H	analyze and evaluate different views on the existence of global warming

Texas Essential Knowledge and Skills (TEKS)
Science
Grade **12** - Adopted: **2017**

TEKS	§112.39	**Physics (One Credit), Adopted 2017 – The provisions of §§112.34, 112.35, 112.38, and 112.39 of this subchapter adopted in 2017 shall be implemented by school districts beginning with the 2018-2019 school year.**
STUDENT EXPECTATION	§112.39.c	**Knowledge and skills.**
GRADE LEVEL EXPECTATION	§112.39.c.5	**Science concepts. The student knows the nature of forces in the physical world. The student is expected to:**
INDICATOR	§112.39.c.5.D	identify and describe examples of electric and magnetic forces and fields in everyday life such as generators, motors, and transformers

TEKS	§112.35	**Chemistry (One Credit), Adopted 2017 – The provisions of §§112.34, 112.35, 112.38, and 112.39 of this subchapter adopted in 2017 shall be implemented by school districts beginning with the 2018-2019 school year.**

STUDENT EXPECTATION	§112.35.c	Knowledge and skills.
GRADE LEVEL EXPECTATION	§112.35.c.3	**Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:**
INDICATOR	§112.35.c.3.D	evaluate the impact of research on scientific thought, society, and the environment

TEKS	§112.35	**Chemistry (One Credit), Adopted 2017 – The provisions of §§112.34, 112.35, 112.38, and 112.39 of this subchapter adopted in 2017 shall be implemented by school districts beginning with the 2018-2019 school year.**
STUDENT EXPECTATION	§112.35.c	Knowledge and skills.
GRADE LEVEL EXPECTATION	§112.35.c.8	**Science concepts. The student can quantify the changes that occur during chemical reactions. The student is expected to:**
INDICATOR	§112.35.c.8.F	differentiate among double replacement reactions, including acid-base reactions and precipitation reactions, and oxidation-reduction reactions such as synthesis, decomposition, single replacement, and combustion reactions

TEKS	§112.36	**Earth and Space Science, Beginning with School Year 2010-2011 (One Credit).**
STUDENT EXPECTATION	§112.36.c	Knowledge and skills.
GRADE LEVEL EXPECTATION	§112.36.c.11	**Solid Earth. The student knows that the geosphere continuously changes over a range of time scales involving dynamic and complex interactions among Earth's subsystems. The student is expected to:**
INDICATOR	§112.36.c.11.E	evaluate the impact of changes in Earth's subsystems on humans such as earthquakes, tsunamis, volcanic eruptions, hurricanes, flooding, and storm surges and the impact of humans on Earth's subsystems such as population growth, fossil fuel burning, and use of fresh water

TEKS	§112.36	**Earth and Space Science, Beginning with School Year 2010-2011 (One Credit).**
STUDENT EXPECTATION	§112.36.c	Knowledge and skills.
GRADE LEVEL EXPECTATION	§112.36.c.12	**Solid Earth. The student knows that Earth contains energy, water, mineral, and rock resources and that use of these resources impacts Earth's subsystems. The student is expected to:**
INDICATOR	§112.36.c.12.A	evaluate how the use of energy, water, mineral, and rock resources affects Earth's subsystems

TEKS	§112.36	**Earth and Space Science, Beginning with School Year 2010-2011 (One Credit).**
STUDENT EXPECTATION	§112.36.c	Knowledge and skills.
GRADE LEVEL EXPECTATION	§112.36.c.13	**Fluid Earth. The student knows that the fluid Earth is composed of the hydrosphere, cryosphere, and atmosphere subsystems that interact on various time scales with the biosphere and geosphere. The student is expected to:**
INDICATOR	§112.36.c.13.C	analyze the empirical relationship between the emissions of carbon dioxide, atmospheric carbon dioxide levels, and the average global temperature trends over the past 150 years
INDICATOR	§112.36.c.13.D	discuss mechanisms and causes such as selective absorbers, major volcanic eruptions, solar luminance, giant meteorite impacts, and human activities that result in significant changes in Earth's climate

TEKS	§112.36	**Earth and Space Science, Beginning with School Year 2010-2011 (One Credit).**
STUDENT EXPECTATION	§112.36.c	Knowledge and skills.

GRADE LEVEL EXPECTATION	§112.36.c.14	Fluid Earth. The student knows that Earth's global ocean stores solar energy and is a major driving force for weather and climate through complex atmospheric interactions. The student is expected to:
INDICATOR	§112.36.c.14.B	investigate how the atmosphere is heated from Earth's surface due to absorption of solar energy, which is re-radiated as thermal energy and trapped by selective absorbers

TEKS	§112.36	Earth and Space Science, Beginning with School Year 2010-2011 (One Credit).
STUDENT EXPECTATION	§112.36.c	Knowledge and skills.
GRADE LEVEL EXPECTATION	§112.36.c.15	Fluid Earth. The student knows that interactions among Earth's five subsystems influence climate and resource availability, which affect Earth's habitability. The student is expected to:
INDICATOR	§112.36.c.15.E	analyze recent global ocean temperature data to predict the consequences of changing ocean temperature on evaporation, sea level, algal growth, coral bleaching, hurricane intensity, and biodiversity

TEKS	§112.37	Environmental Systems, Beginning with School Year 2010-2011 (One Credit).
STUDENT EXPECTATION	§112.37.c	Knowledge and skills.
GRADE LEVEL EXPECTATION	§112.37.c.6	Science concepts. The student knows the sources and flow of energy through an environmental system. The student is expected to:
INDICATOR	§112.37.c.6.B	describe and compare renewable and non-renewable energy derived from natural and alternative sources such as oil, natural gas, coal, nuclear, solar, geothermal, hydroelectric, and wind

TEKS	§112.37	Environmental Systems, Beginning with School Year 2010-2011 (One Credit).
STUDENT EXPECTATION	§112.37.c	Knowledge and skills.
GRADE LEVEL EXPECTATION	§112.37.c.9	Science concepts. The student knows the impact of human activities on the environment. The student is expected to:
INDICATOR	§112.37.c.9.D	describe the effect of pollution on global warming, glacial and ice cap melting, greenhouse effect, ozone layer, and aquatic viability
INDICATOR	§112.37.c.9.H	analyze and evaluate different views on the existence of global warming

Texas Essential Knowledge and Skills (TEKS)
Technology Education
Grade **11** - Adopted: **2011**

TEKS	§126.32.	Fundamentals of Computer Science (One-Half to One Credit)
STUDENT EXPECTATION	§126.32.(1)	Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:
GRADE LEVEL EXPECTATION	§126.32.(1)(D)	Create algorithms for the solution of various problems.

TEKS	§126.32.	Fundamentals of Computer Science (One-Half to One Credit)
STUDENT EXPECTATION	§126.32.(4)	Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:
GRADE LEVEL EXPECTATION	§126.32.(4)(D)	Read and define a problem's description, purpose, and goals.

TEKS	§126.33.	Computer Science I (One-Half to One Credit)
STUDENT EXPECTATION	§126.33. (2)	Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:
GRADE LEVEL EXPECTATION	§126.33. (2)(D)	Write programs with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, spacing, indentation, and a standardized program style.

TEKS	§126.33.	Computer Science I (One-Half to One Credit)
STUDENT EXPECTATION	§126.33. (4)	Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:
GRADE LEVEL EXPECTATION	§126.33. (4)(A)	Use program design problem-solving strategies to create program solutions.
GRADE LEVEL EXPECTATION	§126.33. (4)(B)	Define and specify the purpose and goals of solving a problem.
GRADE LEVEL EXPECTATION	§126.33. (4)(C)	Identify the subtasks needed to solve a problem.
GRADE LEVEL EXPECTATION	§126.33. (4)(D)	Identify the data types and objects needed to solve a problem.
GRADE LEVEL EXPECTATION	§126.33. (4)(E)	Identify reusable components from existing code.
GRADE LEVEL EXPECTATION	§126.33. (4)(F)	Design a solution to a problem.
GRADE LEVEL EXPECTATION	§126.33. (4)(G)	Code a solution from a program design.
GRADE LEVEL EXPECTATION	§126.33. (4)(H)	Identify and debug errors.
GRADE LEVEL EXPECTATION	§126.33. (4)(I)	Test program solutions with appropriate valid and invalid test data for correctness.
GRADE LEVEL EXPECTATION	§126.33. (4)(J)	Debug and solve problems using error messages, reference materials, language documentation, and effective strategies.
GRADE LEVEL EXPECTATION	§126.33. (4)(K)	Explore common algorithms, including finding greatest common divisor, finding the biggest number out of three, finding primes, making change, and finding the average.
GRADE LEVEL EXPECTATION	§126.33. (4)(L)	Analyze and modify existing code to improve the underlying algorithm.
GRADE LEVEL EXPECTATION	§126.33. (4)(M)	Create program solutions that exhibit robust behavior by understanding, avoiding, and preventing runtime errors, including division by zero and type mismatch.

GRADE LEVEL EXPECTATION	§126.33. (4)(N)	Select the most appropriate algorithm for a defined problem.
GRADE LEVEL EXPECTATION	§126.33. (4)(O)	Demonstrate proficiency in the use of the arithmetic operators to create mathematical expressions, including addition, subtraction, multiplication, real division, integer division, and modulus division.
GRADE LEVEL EXPECTATION	§126.33. (4)(P)	Create program solutions to problems using available mathematics libraries, including absolute value, round, power, square, and square root.
GRADE LEVEL EXPECTATION	§126.33. (4)(Q)	Develop program solutions that use assignment.
GRADE LEVEL EXPECTATION	§126.33. (4)(R)	Develop sequential algorithms to solve non-branching and non-iterative problems.
GRADE LEVEL EXPECTATION	§126.33. (4)(S)	Develop algorithms to decision-making problems using branching control statements.
GRADE LEVEL EXPECTATION	§126.33. (4)(T)	Develop iterative algorithms and code programs to solve practical problems.
GRADE LEVEL EXPECTATION	§126.33. (4)(U)	Demonstrate proficiency in the use of the relational operators.
GRADE LEVEL EXPECTATION	§126.33. (4)(V)	Demonstrate proficiency in the use of the logical operators.
GRADE LEVEL EXPECTATION	§126.33. (4)(W)	Generate and use random numbers.
TEKS	**§126.34.**	**Computer Science II (One Credit)**
STUDENT EXPECTATION	**§126.34 .(1)**	**Creativity and innovation. The student develops products and generates new understandings by extending existing knowledge. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.34. (1)(G)	Choose, identify, and use the appropriate abstract data type, advanced data structure, and supporting algorithms to properly represent the data in a program problem solution.
TEKS	**§126.34.**	**Computer Science II (One Credit)**
STUDENT EXPECTATION	**§126.34 .(2)**	**Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.34. (2)(D)	Write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style.
TEKS	**§126.34.**	**Computer Science II (One Credit)**
STUDENT EXPECTATION	**§126.34 .(4)**	**Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.34. (4)(G)	Design, construct, evaluate, and compare search algorithms, including linear searching and binary searching.

GRADE LEVEL EXPECTATION	§126.34. (4)(H)	Identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort.
GRADE LEVEL EXPECTATION	§126.34. (4)(I)	Measure time/space efficiency of various sorting algorithms.
GRADE LEVEL EXPECTATION	§126.34. (4)(J)	Compare and contrast search and sort algorithms, including linear, quadratic, and recursive strategies, for time/space efficiency.
GRADE LEVEL EXPECTATION	§126.34. (4)(K)	Analyze algorithms using "big-O" notation for best, average, and worst-case data patterns.
GRADE LEVEL EXPECTATION	§126.34. (4)(L)	Develop algorithms to solve various problems, including factoring, summing a series, finding the roots of a quadratic equation, and generating Fibonacci numbers.
GRADE LEVEL EXPECTATION	§126.34. (4)(O)	Compare and contrast algorithm efficiency by using informal runtime comparisons, exact calculation of statement execution counts, and theoretical efficiency values using "big-O" notation, including worst-case, best-case, and average-case time/space analysis.

TEKS	§126.35.	Computer Science III (One Credit)
STUDENT EXPECTATION	§126.35. (1)	**Creativity and innovation. The student develops products and generates new understandings by extending existing knowledge. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.35. (1)(F)	Identify, describe, design, create, evaluate, and compare standard sorting algorithms that perform sorting operations on data structures, including quick sort and heap sort.

TEKS	§126.35.	Computer Science III (One Credit)
STUDENT EXPECTATION	§126.35. (3)	**Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.35. (3)(J)	Write and modify text file data.

TEKS	§126.35.	Computer Science III (One Credit)
STUDENT EXPECTATION	§126.35. (4)	**Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.35. (4)(A)	Develop choice algorithms using selection control statements, including break, label, and continue.
GRADE LEVEL EXPECTATION	§126.35. (4)(I)	Explore common algorithms, including matrix addition and multiplication, fractals, Towers of Hanoi, and magic square.

TEKS	§126.40.	Robotics Programming and Design (One-Half to One Credit)
STUDENT EXPECTATION	§126.40 .(1)	**Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.40. (1)(C)	Use the design process to construct a robot.
GRADE LEVEL EXPECTATION	§126.40. (1)(D)	Refine the design of a robot.

GRADE LEVEL EXPECTATION	§126.40. (1)(E)	Build robots of simple, moderate, and advanced complexity.
GRADE LEVEL EXPECTATION	§126.40. (1)(F)	Improve a robot design to meet a specified need.

TEKS	§126.40.	Robotics Programming and Design (One-Half to One Credit)
STUDENT EXPECTATION	§126.40 .(2)	**Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.40. (2)(A)	Demonstrate an understanding of and implement design teams.
GRADE LEVEL EXPECTATION	§126.40. (2)(B)	Use design teams to solve problems.
GRADE LEVEL EXPECTATION	§126.40. (2)(C)	Serve as a team leader and a team member.
GRADE LEVEL EXPECTATION	§126.40. (2)(D)	Describe a problem and identify design specifications.
GRADE LEVEL EXPECTATION	§126.40. (2)(E)	Design a solution to a problem and share a solution through various media.
GRADE LEVEL EXPECTATION	§126.40. (2)(F)	Document prototypes, adjustments, and corrections in the design process.
GRADE LEVEL EXPECTATION	§126.40. (2)(G)	Document a final design and solution.
GRADE LEVEL EXPECTATION	§126.40. (2)(H)	Present a final design, testing results, and solution.

TEKS	§126.40.	Robotics Programming and Design (One-Half to One Credit)
STUDENT EXPECTATION	§126.40 .(3)	**Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.40. (3)(A)	Test and evaluate a robot design.
GRADE LEVEL EXPECTATION	§126.40. (3)(B)	Implement position tracking to complete assigned robot tasks.
GRADE LEVEL EXPECTATION	§126.40. (3)(C)	Develop solution systems and implement systems analysis.
GRADE LEVEL EXPECTATION	§126.40. (3)(D)	Modify a robot to respond to a change in specifications.

GRADE LEVEL EXPECTATION	§126.40. (3)(E)	Implement a system to identify and track all components of a robot.
TEKS	**§126.40.**	**Robotics Programming and Design (One-Half to One Credit)**
STUDENT EXPECTATION	**§126.40 .(4)**	**Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.40. (4)(G)	Apply decision-making strategies when developing solutions.
TEKS	**§126.40.**	**Robotics Programming and Design (One-Half to One Credit)**
STUDENT EXPECTATION	**§126.40 .(6)**	**Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.40. (6)(C)	Use software applications to simulate robotic behavior, present design concepts, and test solution strategies.
GRADE LEVEL EXPECTATION	§126.40. (6)(M)	Implement movement control using shaft encoding.
GRADE LEVEL EXPECTATION	§126.40. (6)(N)	Demonstrate robot navigation.
GRADE LEVEL EXPECTATION	§126.40. (6)(O)	Implement path planning using geometry and multiple sensor feedback.
GRADE LEVEL EXPECTATION	§126.40. (6)(P)	Program a robot to perform simple tasks, including following lines, moving objects, and avoiding obstacles.
GRADE LEVEL EXPECTATION	§126.40. (6)(Q)	Demonstrate and implement a robotic task solution using robotic arm construction.
GRADE LEVEL EXPECTATION	§126.40. (6)(R)	Demonstrate knowledge of feedback control loops to provide information.
GRADE LEVEL EXPECTATION	§126.40. (6)(S)	Demonstrate knowledge of torque and power factors used in the operation of a robot servo.
GRADE LEVEL EXPECTATION	§126.40. (6)(T)	Troubleshoot and maintain robotic systems and subsystems.
TEKS	**§126.45.**	**Digital Video and Audio Design (One Credit)**
STUDENT EXPECTATION	§126.45. (4)	Creativity and innovation. The student understands design systems. The student is expected to analyze and summarize the history and evolution of audio and video production fields.
TEKS	**§126.46.**	**Web Communications (One-Half Credit)**
STUDENT EXPECTATION	**§126.46 .(2)**	**Communication and collaboration. The student uses digital technology to work collaboratively toward his or her own learning and the learning of others. The student is expected to:**

GRADE LEVEL EXPECTATION	§126.46. (2)(D)	Solve problems using critical-thinking strategies.

TEKS	§126.48.	Web Game Development (One Credit)
STUDENT EXPECTATION	§126.48. (6)	Technology operations and concepts. The student demonstrates a sound understanding of technology concepts, systems, and operations. The student is expected to:
GRADE LEVEL EXPECTATION	§126.48 .(6)(B)	Create a fully functional online game that includes:

INDICATOR	§126.48. (6)(B) (iii)	Physics, including center of mass, collision detection, lighting, shading, perspective, anatomy, motion blur, lens flare, and reflections.

TEKS	§126.49.	Independent Study in Technology Applications (One-Half to One Credit)
STUDENT EXPECTATION	§126.49 .(1)	Creativity and innovation. The student demonstrates creative thinking, constructs knowledge, and develops innovative products and processes using technology. The student is expected to:

GRADE LEVEL EXPECTATION	§126.49. (1)(H)	Identify and solve problems, individually and with input from peers and professionals, using research methods and advanced creativity and innovation skills used in a selected profession or discipline.

TEKS	§126.49.	Independent Study in Technology Applications (One-Half to One Credit)
STUDENT EXPECTATION	§126.49 .(2)	Communication and collaboration. The student uses digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning experience of others. The student is expected to:

GRADE LEVEL EXPECTATION	§126.49. (2)(G)	Collaborate with others to identify a problem to be solved, hypotheses, and strategies to accomplish a task.

TEKS	§126.49.	Independent Study in Technology Applications (One-Half to One Credit)
STUDENT EXPECTATION	§126.49 .(4)	Critical thinking, problem solving, and decision making. The student uses critical-thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. The student is expected to:

GRADE LEVEL EXPECTATION	§126.49. (4)(C)	Demonstrate creative-thinking and problem-solving skills.

TEKS	§126.50.	Independent Study in Evolving/Emerging Technologies (One-Half to One Credit)
STUDENT EXPECTATION	§126.50. (1)	Creativity and innovation. The student demonstrates creative thinking, constructs knowledge, and develops innovative products and processes using technology. The student is expected to:

GRADE LEVEL EXPECTATION	§126.50. (1)(H)	Identify and solve problems, individually and with input from peers and professionals, using research methods and advanced creativity and innovation skills used in a selected profession or discipline.

TEKS	§126.50.	Independent Study in Evolving/Emerging Technologies (One-Half to One Credit)
STUDENT EXPECTATION	§126.50. (4)	Critical thinking, problem solving, and decision making. The student uses critical-thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. The student is expected to:

GRADE LEVEL EXPECTATION	§126.50. (4)(C)	Demonstrate creative-thinking and problem-solving skills.

Grade **11** - Adopted: **2019**

TEKS	§126.36.	Digital Forensics (one credit), Adopted 2019

STUDENT EXPECTATION	§126.36. (1)	**Employability Skills. The student identifies necessary skills for career development and employment opportunities. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.36. (1)(H)	solve problems and think critically.

TEKS	§126.51.	**Foundations of Cybersecurity (One Credit), Adopted 2019**
STUDENT EXPECTATION	§126.51. (1)	**Employability skills. The student demonstrates necessary skills for career development and successful completion of course outcomes. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.51. (1)(C)	solve problems and think critically;

TEKS	§126.52.	**Cybersecurity Capstone (One Credit), Adopted 2019**
STUDENT EXPECTATION	§126.52. (1)	**Employability skills. The student demonstrates necessary skills for career development and successful completion of course outcomes. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.52. (1)(C)	solve problems and think critically;

Texas Essential Knowledge and Skills (TEKS)
Technology Education
Grade **12** - Adopted: **2011**

TEKS	§126.32.	**Fundamentals of Computer Science (One-Half to One Credit)**
STUDENT EXPECTATION	§126.32. (1)	**Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.32. (1)(D)	Create algorithms for the solution of various problems.

TEKS	§126.32.	**Fundamentals of Computer Science (One-Half to One Credit)**
STUDENT EXPECTATION	§126.32. (4)	**Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.32. (4)(D)	Read and define a problem's description, purpose, and goals.

TEKS	§126.33.	**Computer Science I (One-Half to One Credit)**
STUDENT EXPECTATION	§126.33. (2)	**Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.33. (2)(D)	Write programs with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, spacing, indentation, and a standardized program style.

TEKS	§126.33.	**Computer Science I (One-Half to One Credit)**
STUDENT EXPECTATION	§126.33. (4)	**Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.33. (4)(A)	Use program design problem-solving strategies to create program solutions.

GRADE LEVEL EXPECTATION	§126.33. (4)(B)	Define and specify the purpose and goals of solving a problem.
GRADE LEVEL EXPECTATION	§126.33. (4)(C)	Identify the subtasks needed to solve a problem.
GRADE LEVEL EXPECTATION	§126.33. (4)(D)	Identify the data types and objects needed to solve a problem.
GRADE LEVEL EXPECTATION	§126.33. (4)(E)	Identify reusable components from existing code.
GRADE LEVEL EXPECTATION	§126.33. (4)(F)	Design a solution to a problem.
GRADE LEVEL EXPECTATION	§126.33. (4)(G)	Code a solution from a program design.
GRADE LEVEL EXPECTATION	§126.33. (4)(H)	Identify and debug errors.
GRADE LEVEL EXPECTATION	§126.33. (4)(I)	Test program solutions with appropriate valid and invalid test data for correctness.
GRADE LEVEL EXPECTATION	§126.33. (4)(J)	Debug and solve problems using error messages, reference materials, language documentation, and effective strategies.
GRADE LEVEL EXPECTATION	§126.33. (4)(K)	Explore common algorithms, including finding greatest common divisor, finding the biggest number out of three, finding primes, making change, and finding the average.
GRADE LEVEL EXPECTATION	§126.33. (4)(L)	Analyze and modify existing code to improve the underlying algorithm.
GRADE LEVEL EXPECTATION	§126.33. (4)(M)	Create program solutions that exhibit robust behavior by understanding, avoiding, and preventing runtime errors, including division by zero and type mismatch.
GRADE LEVEL EXPECTATION	§126.33. (4)(N)	Select the most appropriate algorithm for a defined problem.
GRADE LEVEL EXPECTATION	§126.33. (4)(O)	Demonstrate proficiency in the use of the arithmetic operators to create mathematical expressions, including addition, subtraction, multiplication, real division, integer division, and modulus division.
GRADE LEVEL EXPECTATION	§126.33. (4)(P)	Create program solutions to problems using available mathematics libraries, including absolute value, round, power, square, and square root.
GRADE LEVEL EXPECTATION	§126.33. (4)(Q)	Develop program solutions that use assignment.
GRADE LEVEL EXPECTATION	§126.33. (4)(R)	Develop sequential algorithms to solve non-branching and non-iterative problems.

GRADE LEVEL EXPECTATION	§126.33. (4)(S)	Develop algorithms to decision-making problems using branching control statements.
GRADE LEVEL EXPECTATION	§126.33. (4)(T)	Develop iterative algorithms and code programs to solve practical problems.
GRADE LEVEL EXPECTATION	§126.33. (4)(U)	Demonstrate proficiency in the use of the relational operators.
GRADE LEVEL EXPECTATION	§126.33. (4)(V)	Demonstrate proficiency in the use of the logical operators.
GRADE LEVEL EXPECTATION	§126.33. (4)(W)	Generate and use random numbers.

TEKS	§126.34.	Computer Science II (One Credit)
STUDENT EXPECTATION	§126.34 .(1)	**Creativity and innovation. The student develops products and generates new understandings by extending existing knowledge. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.34. (1)(G)	Choose, identify, and use the appropriate abstract data type, advanced data structure, and supporting algorithms to properly represent the data in a program problem solution.

TEKS	§126.34.	Computer Science II (One Credit)
STUDENT EXPECTATION	§126.34 .(2)	**Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.34. (2)(D)	Write programs and communicate with proper programming style to enhance the readability and functionality of the code by using meaningful descriptive identifiers, internal comments, white space, indentation, and a standardized program style.

TEKS	§126.34.	Computer Science II (One Credit)
STUDENT EXPECTATION	§126.34 .(4)	**Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.34. (4)(G)	Design, construct, evaluate, and compare search algorithms, including linear searching and binary searching.
GRADE LEVEL EXPECTATION	§126.34. (4)(H)	Identify, describe, design, create, evaluate, and compare standard sorting algorithms, including selection sort, bubble sort, insertion sort, and merge sort.
GRADE LEVEL EXPECTATION	§126.34. (4)(I)	Measure time/space efficiency of various sorting algorithms.
GRADE LEVEL EXPECTATION	§126.34. (4)(J)	Compare and contrast search and sort algorithms, including linear, quadratic, and recursive strategies, for time/space efficiency.
GRADE LEVEL EXPECTATION	§126.34. (4)(K)	Analyze algorithms using "big-O" notation for best, average, and worst-case data patterns.
GRADE LEVEL EXPECTATION	§126.34. (4)(L)	Develop algorithms to solve various problems, including factoring, summing a series, finding the roots of a quadratic equation, and generating Fibonacci numbers.

GRADE LEVEL EXPECTATION	§126.34. (4)(O)	Compare and contrast algorithm efficiency by using informal runtime comparisons, exact calculation of statement execution counts, and theoretical efficiency values using "big-O" notation, including worst-case, best-case, and average-case time/space analysis.

TEKS	§126.35.	Computer Science III (One Credit)
STUDENT EXPECTATION	§126.35. (1)	Creativity and innovation. The student develops products and generates new understandings by extending existing knowledge. The student is expected to:
GRADE LEVEL EXPECTATION	§126.35. (1)(F)	Identify, describe, design, create, evaluate, and compare standard sorting algorithms that perform sorting operations on data structures, including quick sort and heap sort.

TEKS	§126.35.	Computer Science III (One Credit)
STUDENT EXPECTATION	§126.35. (3)	Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:
GRADE LEVEL EXPECTATION	§126.35. (3)(J)	Write and modify text file data.

TEKS	§126.35.	Computer Science III (One Credit)
STUDENT EXPECTATION	§126.35. (4)	Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:
GRADE LEVEL EXPECTATION	§126.35. (4)(A)	Develop choice algorithms using selection control statements, including break, label, and continue.
GRADE LEVEL EXPECTATION	§126.35. (4)(I)	Explore common algorithms, including matrix addition and multiplication, fractals, Towers of Hanoi, and magic square.

TEKS	§126.40.	Robotics Programming and Design (One-Half to One Credit)
STUDENT EXPECTATION	§126.40 .(1)	Creativity and innovation. The student develops products and generates new understanding by extending existing knowledge. The student is expected to:
GRADE LEVEL EXPECTATION	§126.40. (1)(C)	Use the design process to construct a robot.
GRADE LEVEL EXPECTATION	§126.40. (1)(D)	Refine the design of a robot.
GRADE LEVEL EXPECTATION	§126.40. (1)(E)	Build robots of simple, moderate, and advanced complexity.
GRADE LEVEL EXPECTATION	§126.40. (1)(F)	Improve a robot design to meet a specified need.

TEKS	§126.40.	Robotics Programming and Design (One-Half to One Credit)
STUDENT EXPECTATION	§126.40 .(2)	Communication and collaboration. The student communicates and collaborates with peers to contribute to his or her own learning and the learning of others. The student is expected to:
GRADE LEVEL EXPECTATION	§126.40. (2)(A)	Demonstrate an understanding of and implement design teams.

GRADE LEVEL EXPECTATION	§126.40. (2)(B)	Use design teams to solve problems.
GRADE LEVEL EXPECTATION	§126.40. (2)(C)	Serve as a team leader and a team member.
GRADE LEVEL EXPECTATION	§126.40. (2)(D)	Describe a problem and identify design specifications.
GRADE LEVEL EXPECTATION	§126.40. (2)(E)	Design a solution to a problem and share a solution through various media.
GRADE LEVEL EXPECTATION	§126.40. (2)(F)	Document prototypes, adjustments, and corrections in the design process.
GRADE LEVEL EXPECTATION	§126.40. (2)(G)	Document a final design and solution.
GRADE LEVEL EXPECTATION	§126.40. (2)(H)	Present a final design, testing results, and solution.
TEKS	**§126.40.**	**Robotics Programming and Design (One-Half to One Credit)**
STUDENT EXPECTATION	**§126.40 .(3)**	**Research and information fluency. The student locates, analyzes, processes, and organizes data. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.40. (3)(A)	Test and evaluate a robot design.
GRADE LEVEL EXPECTATION	§126.40. (3)(B)	Implement position tracking to complete assigned robot tasks.
GRADE LEVEL EXPECTATION	§126.40. (3)(C)	Develop solution systems and implement systems analysis.
GRADE LEVEL EXPECTATION	§126.40. (3)(D)	Modify a robot to respond to a change in specifications.
GRADE LEVEL EXPECTATION	§126.40. (3)(E)	Implement a system to identify and track all components of a robot.
TEKS	**§126.40.**	**Robotics Programming and Design (One-Half to One Credit)**
STUDENT EXPECTATION	**§126.40 .(4)**	**Critical thinking, problem solving, and decision making. The student uses appropriate strategies to analyze problems and design algorithms. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.40. (4)(G)	Apply decision-making strategies when developing solutions.
TEKS	**§126.40.**	**Robotics Programming and Design (One-Half to One Credit)**
STUDENT EXPECTATION	**§126.40 .(6)**	**Technology operations and concepts. The student understands technology concepts, systems, and operations as they apply to computer science. The student is expected to:**

GRADE LEVEL EXPECTATION	§126.40. (6)(C)	Use software applications to simulate robotic behavior, present design concepts, and test solution strategies.
GRADE LEVEL EXPECTATION	§126.40. (6)(M)	Implement movement control using shaft encoding.
GRADE LEVEL EXPECTATION	§126.40. (6)(N)	Demonstrate robot navigation.
GRADE LEVEL EXPECTATION	§126.40. (6)(O)	Implement path planning using geometry and multiple sensor feedback.
GRADE LEVEL EXPECTATION	§126.40. (6)(P)	Program a robot to perform simple tasks, including following lines, moving objects, and avoiding obstacles.
GRADE LEVEL EXPECTATION	§126.40. (6)(Q)	Demonstrate and implement a robotic task solution using robotic arm construction.
GRADE LEVEL EXPECTATION	§126.40. (6)(R)	Demonstrate knowledge of feedback control loops to provide information.
GRADE LEVEL EXPECTATION	§126.40. (6)(S)	Demonstrate knowledge of torque and power factors used in the operation of a robot servo.
GRADE LEVEL EXPECTATION	§126.40. (6)(T)	Troubleshoot and maintain robotic systems and subsystems.
TEKS	**§126.45.**	**Digital Video and Audio Design (One Credit)**
STUDENT EXPECTATION	§126.45. (4)	Creativity and innovation. The student understands design systems. The student is expected to analyze and summarize the history and evolution of audio and video production fields.
TEKS	**§126.46.**	**Web Communications (One-Half Credit)**
STUDENT EXPECTATION	**§126.46 .(2)**	**Communication and collaboration. The student uses digital technology to work collaboratively toward his or her own learning and the learning of others. The student is expected to:**
GRADE LEVEL EXPECTATION	§126.46. (2)(D)	Solve problems using critical-thinking strategies.
TEKS	**§126.48.**	**Web Game Development (One Credit)**
STUDENT EXPECTATION	**§126.48. (6)**	**Technology operations and concepts. The student demonstrates a sound understanding of technology concepts, systems, and operations. The student is expected to:**
GRADE LEVEL EXPECTATION	**§126.48 .(6)(B)**	**Create a fully functional online game that includes:**
INDICATOR	§126.48. (6)(B) (iii)	Physics, including center of mass, collision detection, lighting, shading, perspective, anatomy, motion blur, lens flare, and reflections.
TEKS	**§126.49.**	**Independent Study in Technology Applications (One-Half to One Credit)**
STUDENT EXPECTATION	**§126.49 .(1)**	**Creativity and innovation. The student demonstrates creative thinking, constructs knowledge, and develops innovative products and processes using technology. The student is expected to:**

GRADE LEVEL EXPECTATION	§126.49. (1)(H)	Identify and solve problems, individually and with input from peers and professionals, using research methods and advanced creativity and innovation skills used in a selected profession or discipline.

TEKS	**§126.49.**	**Independent Study in Technology Applications (One-Half to One Credit)**
STUDENT EXPECTATION	**§126.49 .(2)**	**Communication and collaboration. The student uses digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning experience of others. The student is expected to:**

GRADE LEVEL EXPECTATION	§126.49. (2)(G)	Collaborate with others to identify a problem to be solved, hypotheses, and strategies to accomplish a task.

TEKS	**§126.49.**	**Independent Study in Technology Applications (One-Half to One Credit)**
STUDENT EXPECTATION	**§126.49 .(4)**	**Critical thinking, problem solving, and decision making. The student uses critical-thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. The student is expected to:**

GRADE LEVEL EXPECTATION	§126.49. (4)(C)	Demonstrate creative-thinking and problem-solving skills.

TEKS	**§126.50.**	**Independent Study in Evolving/Emerging Technologies (One-Half to One Credit)**
STUDENT EXPECTATION	**§126.50. (1)**	**Creativity and innovation. The student demonstrates creative thinking, constructs knowledge, and develops innovative products and processes using technology. The student is expected to:**

GRADE LEVEL EXPECTATION	§126.50. (1)(H)	Identify and solve problems, individually and with input from peers and professionals, using research methods and advanced creativity and innovation skills used in a selected profession or discipline.

TEKS	**§126.50.**	**Independent Study in Evolving/Emerging Technologies (One-Half to One Credit)**
STUDENT EXPECTATION	**§126.50. (4)**	**Critical thinking, problem solving, and decision making. The student uses critical-thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. The student is expected to:**

GRADE LEVEL EXPECTATION	§126.50. (4)(C)	Demonstrate creative-thinking and problem-solving skills.

Grade **12** - Adopted: **2019**

TEKS	**§126.36.**	**Digital Forensics (one credit), Adopted 2019**
STUDENT EXPECTATION	**§126.36. (1)**	**Employability Skills. The student identifies necessary skills for career development and employment opportunities. The student is expected to:**

GRADE LEVEL EXPECTATION	§126.36. (1)(H)	solve problems and think critically.

TEKS	**§126.51.**	**Foundations of Cybersecurity (One Credit), Adopted 2019**
STUDENT EXPECTATION	**§126.51. (1)**	**Employability skills. The student demonstrates necessary skills for career development and successful completion of course outcomes. The student is expected to:**

GRADE LEVEL EXPECTATION	§126.51. (1)(C)	solve problems and think critically;

TEKS	**§126.52.**	**Cybersecurity Capstone (One Credit), Adopted 2019**
STUDENT EXPECTATION	**§126.52. (1)**	**Employability skills. The student demonstrates necessary skills for career development and successful completion of course outcomes. The student is expected to:**

| GRADE LEVEL EXPECTATION | §126.52. (1)(C) | solve problems and think critically; |