



WhyPower
in Whyville

STANDARDS MET

WhyPower

**Common Core Standards,
Next Generation Science Standards,
and Texas Standards (TEKS)**



GREEN BUILD 1
in Whyville

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

TEKS: Career Investigation

- (2) The student knows how to locate, analyze, and apply career information. The student is expected to:
 - (A) access career information using print and on-line resources to complete an educational and/or training plan for a career pathway;
 - (C) complete career critiques gained through a variety of experiences (for example, shadowing, career study tours, guest speakers, career fairs, videos, CD-ROM, Internet, and simulated work activities); and
- (3) The student knows that many skills are common to a variety of careers and that these skills can be transferred from one career opportunity to another. The student is expected to:
 - (A) compile a list of multiple career options matching interests and aptitudes; and
 - (E) role-play appropriate interviewing techniques for an employment opportunity in the student's interest area.
- (6) The student knows the process of career planning. The student is expected to:
 - (A) list and explain the steps in the decision-making process;
- (8) The student knows the effect change has on society and career opportunities. The student is expected to:
 - (A) cite examples of change in our society;
 - (B) compose a report explaining positive and negative aspects of one of the examples of societal change;

TEKS: Exploring Careers

- 1) The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to:
 - (D) research current and emerging fields related to personal interest areas;
 - (G) research educational options and requirements using appropriate technology.
- (2) The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to:
 - (C) develop and analyze tables, charts, and graphs related to career interests;
 - (D) determine the impact of technology on careers of personal interest; and
 - (E) identify entrepreneurial opportunities within a field of personal interest.
- (4) The student evaluates skills for personal success. The student is expected to:
 - (A) implement effective study skills for academic success;



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- (B) use interpersonal skills to facilitate effective teamwork;
 - (C) use a problem-solving model and critical-thinking skills to make informed decisions;**
 - (D) use effective time-management and goal-setting strategies;
 - (E) effectively use information and communication technology tools; and
 - (F) identify skills that can be transferable among a variety of careers.
- (5) The student recognizes the impact of career choice on personal lifestyle. The student is expected to:
- (A) prepare a personal budget reflecting the student's desired lifestyle;
 - (B) use appropriate resources to compare and contrast salaries and educational requirements of at least three careers in the student's interest area; and
- (6) The student demonstrates an understanding of personal financial management. The student is expected to:
- (A) compare the advantages and disadvantages of different types of banking services;
 - (B) simulate opening and maintaining different types of bank accounts;
 - (C) simulate different methods of withdrawals and deposits; and
 - (D) reconcile bank statements, including fees and services.
- (7) The student develops skills for professional success. The student is expected to:
- (A) demonstrate effective verbal, nonverbal, written, and electronic communication skills;
 - (B) evaluate the impact of positive and negative personal choices, including use of electronic communications such as social networking sites;
 - (C) model characteristics of effective leadership, teamwork, and conflict management;
 - (E) explore and model characteristics necessary for professional success such as work ethics, integrity, dedication, perseverance, and the ability to interact with a diverse population; and
 - (F) complete activities using project- and time-management techniques.
- (8) The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to:
- (A) complete actual or virtual labs to simulate the technical skills required in various occupations; and**
 - (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.**



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Texas Essential Knowledge and Skills (TEKS)
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- (1) The student explores one or more career clusters of interest. The student is expected to:
 - (A) **identify the various career opportunities within one or more career clusters; and**
 - (B) identify the pathways within one or more career clusters.
- (3) The student explores programs of study. The student is expected to:
 - (A) **compare levels of education for careers of personal interest;**
 - (B) identify the academic and technical skills needed; and
- (5) The student understands personal financial management and recognizes the value of personal fiscal responsibility. The student is expected to:
 - (A) compare and contrast different types of banking services;
 - (B) open and maintain different types of simulated bank accounts;
 - (C) practice different methods of withdrawing and depositing funds;
 - (E) compare and contrast forms of credit, including credit cards and debit cards;

TEKS: Mathematics

- (1) **Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to:**
 - (A) compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals;
 - (B) select and use appropriate forms of rational numbers to solve real life problems including those involving proportional relationships;
 - (C) approximate (mentally and with calculators) the value of irrational numbers as they arise from problem situations (such as $\sqrt{2}$, $\sqrt{2}$);
 - (E) compare and order real numbers with a calculator.
- (2) **Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to:**
 - (A) select appropriate operations to solve problems involving rational numbers and justify the selections;
 - (B) use appropriate operations to solve problems involving rational numbers in problem situations;
 - (C) evaluate a solution for reasonableness; and



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- (D) use multiplication by a given constant factor (including unit rate) to represent and solve problems involving proportional relationships including conversions between measurement systems.
- (3) **Patterns, relationships, and algebraic thinking.** The student identifies proportional or non-proportional linear relationships in problem situations and solves problems. The student is expected to:
 - (A) compare and contrast proportional and non-proportional linear relationships; and
 - (B) estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates.
- (4) **Patterns, relationships, and algebraic thinking.** The student makes connections among various representations of a numerical relationship. The student is expected to generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description).
- (5) **Patterns, relationships, and algebraic thinking.** The student uses graphs, tables, and algebraic representations to make predictions and solve problems. The student is expected to:
 - (A) predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations; and
 - (B) find and evaluate an algebraic expression to determine any term in an arithmetic sequence (with a constant rate of change).
- (14) **Underlying processes and mathematical tools.** The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. The student is expected to:
 - (A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;
 - (B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;
 - (C) select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem; and
 - (D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.
- (15) **Underlying processes and mathematical tools.** The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models. The student is expected to:
 - (A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and
 - (B) evaluate the effectiveness of different representations to communicate ideas.



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- (16) Underlying processes and mathematical tools. The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to:
- (A) make conjectures from patterns or sets of examples and nonexamples; and
 - (B) validate his/her conclusions using mathematical properties and relationships.

TEKS: Science

- (2) **Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:**
- (A) plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology;
 - (B) design and implement comparative and experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;
 - (C) collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;
 - (D) construct tables and graphs, using repeated trials and means, to organize data and identify patterns; and
 - (E) **analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.**
- (3) Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:
- (B) use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature;



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Blooms (Taxonomy):

X	Knowledge: arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce state.
X	Comprehension: classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate
X	Application: apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.
X	Analysis: analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.
X	Synthesis: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, write
X	Evaluation: appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support

Instructional Strategies:

X	Identifying similarities and differences
X	Summarizing and note taking
X	Reinforcing effort and providing recognition
	Homework and practice
X	Nonlinguistic representations
X	Cooperative learning
X	Setting objectives and providing feedback
X	Generating and testing hypotheses
X	Cues, questions, and advanced organizers



All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

Sixth Grade

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Expressions and Equations	6.EE.6	Use variables to represent numbers and write expressions when solving a real world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
Expressions and Equations	6.EE.7	Solve real world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p , q and x are all nonnegative rational numbers.

Seventh Grade

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Expressions and Equations	7.EE.4.A	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?



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STANDARDS MET
Common Core Math, Grades 6 to 8

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Expressions and Equations	7.EE.4.B	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.



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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

All TEKS listed are impacted by this lesson plan. **Boldfaced** TEKS represent the focus of the lesson plan.

TEKS: Career Investigation

- (2) The student knows how to locate, analyze, and apply career information. The student is expected to:
 - (A) access career information using print and on-line resources to complete an educational and/or training plan for a career pathway;
 - (C) complete career critiques gained through a variety of experiences (for example, shadowing, career study tours, guest speakers, career fairs, videos, CD-ROM, Internet, and simulated work activities); and
- (3) The student knows that many skills are common to a variety of careers and that these skills can be transferred from one career opportunity to another. The student is expected to:
 - (A) compile a list of multiple career options matching interests and aptitudes; and
 - (E) role-play appropriate interviewing techniques for an employment opportunity in the student's interest area.
- (6) The student knows the process of career planning. The student is expected to:
 - (A) list and explain the steps in the decision-making process;
- (8) The student knows the effect change has on society and career opportunities. The student is expected to:
 - (A) cite examples of change in our society;
 - (B) compose a report explaining positive and negative aspects of one of the examples of societal change;

TEKS: Exploring Careers

- 1) The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to:
 - (D) research current and emerging fields related to personal interest areas;
 - (G) research educational options and requirements using appropriate technology.
- (2) The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to:
 - (C) develop and analyze tables, charts, and graphs related to career interests;
 - (D) determine the impact of technology on careers of personal interest; and



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- (E) identify entrepreneurial opportunities within a field of personal interest.
- (4) The student evaluates skills for personal success. The student is expected to:
 - (A) implement effective study skills for academic success;
 - (B) use interpersonal skills to facilitate effective teamwork;
 - (C) use a problem-solving model and critical-thinking skills to make informed decisions;**
 - (D) use effective time-management and goal-setting strategies;
 - (E) effectively use information and communication technology tools; and
 - (F) identify skills that can be transferable among a variety of careers.
- (5) The student recognizes the impact of career choice on personal lifestyle. The student is expected to:
 - (A) prepare a personal budget reflecting the student's desired lifestyle;
 - (B) use appropriate resources to compare and contrast salaries and educational requirements of at least three careers in the student's interest area; and
- (6) The student demonstrates an understanding of personal financial management. The student is expected to:
 - (A) compare the advantages and disadvantages of different types of banking services;
 - (B) simulate opening and maintaining different types of bank accounts;
 - (C) simulate different methods of withdrawals and deposits; and
 - (D) reconcile bank statements, including fees and services.
- (7) The student develops skills for professional success. The student is expected to:
 - (A) demonstrate effective verbal, nonverbal, written, and electronic communication skills;
 - (B) evaluate the impact of positive and negative personal choices, including use of electronic communications such as social networking sites;
 - (C) model characteristics of effective leadership, teamwork, and conflict management;
 - (E) explore and model characteristics necessary for professional success such as work ethics, integrity, dedication, perseverance, and the ability to interact with a diverse population; and
 - (F) complete activities using project- and time-management techniques.
- (8) The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to:
 - (A) complete actual or virtual labs to simulate the technical skills required in various occupations; and**
 - (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.**



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STANDARDS MET
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TEKS: Career Portals

- (1) The student explores one or more career clusters of interest. The student is expected to:
 - (A) identify the various career opportunities within one or more career clusters; and**
 - (B) identify the pathways within one or more career clusters.
- (3) The student explores programs of study. The student is expected to:
 - (A) compare levels of education for careers of personal interest;**
 - (B) identify the academic and technical skills needed; and
- (5) The student understands personal financial management and recognizes the value of personal fiscal responsibility. The student is expected to:
 - (A) compare and contrast different types of banking services;
 - (B) open and maintain different types of simulated bank accounts;
 - (C) practice different methods of withdrawing and depositing funds;
 - (E) compare and contrast forms of credit, including credit cards and debit cards;

TEKS: Mathematics

- (1) **Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to:**
 - (A) compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals;**
 - (B) select and use appropriate forms of rational numbers to solve real life problems including those involving proportional relationships;**
 - (C) approximate (mentally and with calculators) the value of irrational numbers as they arise from problem situations (such as $\sqrt{2}$, $\sqrt[3]{2}$);**
 - (E) compare and order real numbers with a calculator.
- (2) **Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to:**



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- (A) select appropriate operations to solve problems involving rational numbers and justify the selections;
 - (B) use appropriate operations to solve problems involving rational numbers in problem situations;
 - (C) evaluate a solution for reasonableness; and
 - (D) use multiplication by a given constant factor (including unit rate) to represent and solve problems involving proportional relationships including conversions between measurement systems.
- (3) Patterns, relationships, and algebraic thinking. The student identifies proportional or non-proportional linear relationships in problem situations and solves problems. The student is expected to:
- (A) compare and contrast proportional and non-proportional linear relationships; and
 - (B) estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates.
- (4) Patterns, relationships, and algebraic thinking. The student makes connections among various representations of a numerical relationship. The student is expected to generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description).
- (5) Patterns, relationships, and algebraic thinking. The student uses graphs, tables, and algebraic representations to make predictions and solve problems. The student is expected to:
- (A) predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations; and
 - (B) find and evaluate an algebraic expression to determine any term in an arithmetic sequence (with a constant rate of change).
- (14) Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. The student is expected to:
- (A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;
 - (B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;
 - (C) select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem; and
 - (D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.
- (15) Underlying processes and mathematical tools. The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models. The student is expected to:



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- (A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and
 - (B) evaluate the effectiveness of different representations to communicate ideas.
- (16) Underlying processes and mathematical tools. The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to:
- (A) make conjectures from patterns or sets of examples and nonexamples; and
 - (B) validate his/her conclusions using mathematical properties and relationships.

TEKS: Science

- (2) **Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:**
- (A) plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology;
 - (B) design and implement comparative and experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;
 - (C) collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;
 - (D) construct tables and graphs, using repeated trials and means, to organize data and identify patterns; and
 - (E) **analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.**
- (3) Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:
- (B) use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature;



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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

Blooms (Taxonomy):

X	Knowledge: arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce state.
X	Comprehension: classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate
X	Application: apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.
X	Analysis: analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.
X	Synthesis: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, write.
X	Evaluation: appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support,

Instructional Strategies:

X	Identifying similarities and differences
X	Summarizing and note taking
X	Reinforcing effort and providing recognition
	Homework and practice
X	Nonlinguistic representations
X	Cooperative learning
X	Setting objectives and providing feedback
X	Generating and testing hypotheses
X	Cues, questions, and advanced organizers



All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

Sixth Grade

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Expressions and Equations	6.EE.6	Use variables to represent numbers and write expressions when solving a real world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
Expressions and Equations	6.EE.7	Solve real world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p , q and x are all nonnegative rational numbers.

Seventh Grade

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Expressions and Equations	7.EE.4.A	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?



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STANDARDS MET
Common Core Math, Grades 6 to 8

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Expressions and Equations	7.EE.4.B	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.



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Texas Essential Knowledge and Skills (TEKS)
8th Grade

All TEKS listed are impacted by this lesson plan. **Boldfaced TEKS** represent the focus of the lesson plan.

TEKS: Career Investigation

- (2) The student knows how to locate, analyze, and apply career information. The student is expected to:**
 - (A) access career information using print and on-line resources to complete an educational and/or training plan for a career pathway;**
 - (B) access career information using interviews with business and industry representatives to create a career resource file;
- (6) The student knows the process of career planning. The student is expected to:
 - (B) prepare an oral or written plan describing the specific factors considered in the decision-making process used to solve a simulated career problem;
- (8) The student knows the effect change has on society and career opportunities. The student is expected to:
 - (A) cite examples of change in our society;

TEKS: Exploring Careers

- 1) The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to:
 - (D) research current and emerging fields related to personal interest areas;
 - (F) explore how career choices impact the balance between personal and professional responsibilities; and
- (2) The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to:
 - (C) develop and analyze tables, charts, and graphs related to career interests;
 - (D) determine the impact of technology on careers of personal interest; and
- (4) The student evaluates skills for personal success. The student is expected to:**
 - (A) implement effective study skills for academic success;**
 - (C) use a problem-solving model and critical-thinking skills to make informed decisions;**
 - (D) use effective time-management and goal-setting strategies;**
 - (E) effectively use information and communication technology tools;**
- (5) The student recognizes the impact of career choice on personal lifestyle. The student is expected to:
 - (A) prepare a personal budget reflecting the student's desired lifestyle;
- (7) The student develops skills for professional success. The student is expected to:**
 - (E) explore and model characteristics necessary for professional success such as work ethics, integrity, dedication, perseverance, and the ability to interact with a diverse population; and**
 - (F) complete activities using project- and time-management techniques.**
- (8) The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to:**
 - (A) complete actual or virtual labs to simulate the technical skills required in various occupations; and**



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- (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.

TEKS: Career Portals

- (1) The student explores one or more career clusters of interest. The student is expected to:
(A) identify the various career opportunities within one or more career clusters; and
(B) identify the pathways within one or more career clusters.
- (2) The student explores pathways of interest within one or more career clusters. The student is expected to:
(A) investigate career opportunities within the pathways;
(B) explore careers of personal interest;
- (4) The student explores the professional skills needed for college and career success. The student is expected to:
(E) identify professional associations affiliated with a specified program of study;
(F) employ effective leadership, teamwork, and conflict management;

TEKS: Mathematics

- (1) Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to:
(B) select and use appropriate forms of rational numbers to solve real life problems including those involving proportional relationships;
- (2) Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to:
(A) select appropriate operations to solve problems involving rational numbers and justify the selections;
(B) use appropriate operations to solve problems involving rational numbers in problem situations;
(C) evaluate a solution for reasonableness; and
- (4) Patterns, relationships, and algebraic thinking. The student makes connections among various representations of a numerical relationship. The student is expected to generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description).
- (5) Patterns, relationships, and algebraic thinking. The student uses graphs, tables, and algebraic representations to make predictions and solve problems. The student is expected to:
(A) predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations;
- (14) Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. The student is expected to:
(A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;
(B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;
(D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.



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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

- (15) Underlying processes and mathematical tools. The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models. The student is expected to:
 - (A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and
 - (B) evaluate the effectiveness of different representations to communicate ideas.
- (16) Underlying processes and mathematical tools. The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to:
 - (A) make conjectures from patterns or sets of examples and nonexamples; and
 - (B) validate his/her conclusions using mathematical properties and relationships.

TEKS: Science

- (3) Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:**
 - (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;**
 - (B) use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature;**
 - (C) identify advantages and limitations of models such as size, scale, properties, and materials;**

Blooms (Taxonomy):

X	Knowledge: arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce state.
X	Comprehension: classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate
X	Application: apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.
X	Analysis: analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.
X	Synthesis: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, write.
X	Evaluation: appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support,



PEAK POWER 1
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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

Instructional Strategies:

X	Identifying similarities and differences
X	Summarizing and note taking
X	Reinforcing effort and providing recognition
	Homework and practice
X	Nonlinguistic representations
X	Cooperative learning
X	Setting objectives and providing feedback
X	Generating and testing hypotheses
X	Cues, questions, and advanced organizers



All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

Sixth Grade

Subcategory	Standard ID	Standard Description
Expressions and Equations	6.EE.7	Solve real world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.

Subcategory	Standard ID	Standard Description
Expressions and Equations	7.EE.4.A	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?
Expressions and Equations	7.EE.4.B	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.



PEAK POWER 2
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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

All TEKS listed are impacted by this lesson plan. **Boldfaced TEKS** represent the focus of the lesson plan.

TEKS: Career Investigation

- (2) The student knows how to locate, analyze, and apply career information. The student is expected to:**
 - (A) access career information using print and on-line resources to complete an educational and/or training plan for a career pathway;**
 - (B) access career information using interviews with business and industry representatives to create a career resource file;
- (6) The student knows the process of career planning. The student is expected to:
 - (B) prepare an oral or written plan describing the specific factors considered in the decision-making process used to solve a simulated career problem;
- (8) The student knows the effect change has on society and career opportunities. The student is expected to:
 - (A) cite examples of change in our society;

TEKS: Exploring Careers

- 1) The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to:
 - (D) research current and emerging fields related to personal interest areas;
 - (F) explore how career choices impact the balance between personal and professional responsibilities; and
- (2) The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to:
 - (C) develop and analyze tables, charts, and graphs related to career interests;
 - (D) determine the impact of technology on careers of personal interest; and
- (4) The student evaluates skills for personal success. The student is expected to:**
 - (A) implement effective study skills for academic success;**
 - (B) use interpersonal skills to facilitate effective teamwork;**
 - (C) use a problem-solving model and critical-thinking skills to make informed decisions;**
 - (D) use effective time-management and goal-setting strategies;**
 - (E) effectively use information and communication technology tools;**
 - (F) identify skills that can be transferable among a variety of careers.**
- (7) The student develops skills for professional success. The student is expected to:**
 - (C) model characteristics of effective leadership, teamwork, and conflict management;**
 - (D) recognize the importance of a healthy lifestyle, including the ability to manage stress;**
 - (E) explore and model characteristics necessary for professional success such as work ethics, integrity, dedication, perseverance, and the ability to interact with a diverse population; and**
 - (F) complete activities using project- and time-management techniques.**



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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

(8) The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand.

The student is expected to:

(A) complete actual or virtual labs to simulate the technical skills required in various occupations; and

(B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.

TEKS: Career Portals

(1) The student explores one or more career clusters of interest. The student is expected to:

(A) identify the various career opportunities within one or more career clusters; and

(B) identify the pathways within one or more career clusters.

(2) The student explores pathways of interest within one or more career clusters. The student is expected to:

(A) investigate career opportunities within the pathways;

(B) explore careers of personal interest;

(4) The student explores the professional skills needed for college and career success. The student is expected to:

(E) identify professional associations affiliated with a specified program of study;

(F) employ effective leadership, teamwork, and conflict management;

TEKS: Mathematics

(1) Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to:

(B) select and use appropriate forms of rational numbers to solve real life problems including those involving proportional relationships;

(2) Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to:

(A) select appropriate operations to solve problems involving rational numbers and justify the selections;

(B) use appropriate operations to solve problems involving rational numbers in problem situations;

(C) evaluate a solution for reasonableness; and

(4) Patterns, relationships, and algebraic thinking. The student makes connections among various representations of a numerical relationship. The student is expected to generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description).

(5) Patterns, relationships, and algebraic thinking. The student uses graphs, tables, and algebraic representations to make predictions and solve problems. The student is expected to:

(A) predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations;

(14) Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. The student is expected to:

(A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;



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- (B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;
- (D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.
- (15) Underlying processes and mathematical tools. The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models. The student is expected to:
 - (A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and
 - (B) evaluate the effectiveness of different representations to communicate ideas.
- (16) Underlying processes and mathematical tools. The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to:
 - (A) make conjectures from patterns or sets of examples and nonexamples; and
 - (B) validate his/her conclusions using mathematical properties and relationships.

TEKS: Science

- (3) Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:
 - (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;
 - (B) use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature;
 - (C) identify advantages and limitations of models such as size, scale, properties, and materials;

Blooms (Taxonomy):

X	Knowledge: arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce state.
X	Comprehension: classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate
X	Application: apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.
X	Analysis: analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.
X	Synthesis: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, write.
X	Evaluation: appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support,



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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

Instructional Strategies:

X	Identifying similarities and differences
X	Summarizing and note taking
X	Reinforcing effort and providing recognition
	Homework and practice
X	Nonlinguistic representations
X	Cooperative learning
X	Setting objectives and providing feedback
X	Generating and testing hypotheses
X	Cues, questions, and advanced organizers



All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

Sixth Grade

Subcategory	Standard ID	Standard Description
Expressions and Equations	6.EE.7	Solve real world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.

Subcategory	Standard ID	Standard Description
Expressions and Equations	7.EE.4.A	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?
Expressions and Equations	7.EE.4.B	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.



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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

All TEKS listed are impacted by this lesson plan. **Boldfaced TEKS** represent the focus of the lesson plan.

TEKS: Career Investigation

- (1) The student analyzes the effect of personal interest and aptitudes upon educational and career planning. The student is expected to:
 - (B) match interests and aptitudes to career opportunities; and
- (3) The student knows that many skills are common to a variety of careers and that these skills can be transferred from one career opportunity to another. The student is expected to:
 - (A) compile a list of multiple career options matching interests and aptitudes; and
- (8) The student knows the effect change has on society and career opportunities. The student is expected to:
 - (A) cite examples of change in our society;
 - (B) compose a report explaining positive and negative aspects of one of the examples of societal change;
 - (C) develop a timeline covering the last ten years depicting the change in a selected career choice,

TEKS: Exploring Careers

- 1) The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to:
 - (D) research current and emerging fields related to personal interest areas;
- (4) The student evaluates skills for personal success. The student is expected to:
 - (C) use a problem-solving model and critical-thinking skills to make informed decisions;
 - (F) identify skills that can be transferable among a variety of careers.
- (6) The student demonstrates an understanding of personal financial management. The student is expected to:**
 - (A) compare the advantages and disadvantages of different types of banking services;**
 - (B) simulate opening and maintaining different types of bank accounts;**
 - (C) simulate different methods of withdrawals and deposits; and**
 - (D) reconcile bank statements, including fees and services.
- (8) The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to:**



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STANDARDS MET
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- (A) complete actual or virtual labs to simulate the technical skills required in various occupations; and**
- (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.**

TEKS: Career Portals

- (1) The student explores one or more career clusters of interest. The student is expected to:
 - (A) identify the various career opportunities within one or more career clusters; and
 - (B) identify the pathways within one or more career clusters.
- (2) The student explores pathways of interest within one or more career clusters. The student is expected to:
 - (A) investigate career opportunities within the pathways;
 - (B) explore careers of personal interest;
- (5) The student understands personal financial management and recognizes the value of personal fiscal responsibility. The student is expected to:**
 - (A) compare and contrast different types of banking services;**
 - (B) open and maintain different types of simulated bank accounts;
 - (C) practice different methods of withdrawing and depositing funds;**
 - (D) reconcile bank statements, including fees and services;

TEKS: Mathematics

- (1) Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to:**
 - (A) compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals;
 - (B) select and use appropriate forms of rational numbers to solve real life problems including those involving proportional relationships;**
 - (C) approximate (mentally and with calculators) the value of irrational numbers as they arise from problem situations (such as $\sqrt{2}$);



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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

- (2) **Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to:**
- (A) select appropriate operations to solve problems involving rational numbers and justify the selections;
 - (B) use appropriate operations to solve problems involving rational numbers in problem situations;
 - (C) evaluate a solution for reasonableness; and
 - (D) use multiplication by a given constant factor (including unit rate) to represent and solve problems involving proportional relationships including conversions between measurement systems.
- (3) Patterns, relationships, and algebraic thinking. The student identifies proportional or non-proportional linear relationships in problem situations and solves problems. The student is expected to:
- (A) compare and contrast proportional and non-proportional linear relationships; and
 - (B) estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates.
- (4) Patterns, relationships, and algebraic thinking. The student makes connections among various representations of a numerical relationship. The student is expected to generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description).
- (5) Patterns, relationships, and algebraic thinking. The student uses graphs, tables, and algebraic representations to make predictions and solve problems. The student is expected to:
- (A) predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations; and
 - (B) find and evaluate an algebraic expression to determine any term in an arithmetic sequence (with a constant rate of change).
- (14) Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. The student is expected to:
- (A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;
 - (B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;
 - (C) select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem; and
 - (D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.



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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

- (15) Underlying processes and mathematical tools. The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models. The student is expected to:
 - (A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and
 - (B) evaluate the effectiveness of different representations to communicate ideas.
- (16) Underlying processes and mathematical tools. The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to:
 - (A) make conjectures from patterns or sets of examples and nonexamples; and
 - (B) validate his/her conclusions using mathematical properties and relationships.

TEKS: Science

- (2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:
 - (A) plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology;
 - (B) design and implement comparative and experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;
 - (E) analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.
- (3) Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:
 - (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;
- (7) Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. The student is expected to:
 - (A) model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun causing changes in seasons;
 - (B) demonstrate and predict the sequence of events in the lunar cycle; and



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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
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(C) relate the position of the Moon and Sun to their effect on ocean tides.

Blooms (Taxonomy):

X	Knowledge: arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce state.
X	Comprehension: classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate
X	Application: apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.
X	Analysis: analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.
X	Synthesis: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, write.
X	Evaluation: appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support,

Instructional Strategies:

X	Identifying similarities and differences
X	Summarizing and note taking
X	Reinforcing effort and providing recognition
	Homework and practice
X	Nonlinguistic representations
X	Cooperative learning
X	Setting objectives and providing feedback
X	Generating and testing hypotheses
X	Cues, questions, and advanced organizers



All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

Sixth Grade

Subcategory	Standard ID	Standard Description
The Number System	6.NS.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
The Number System	6.NS.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real world contexts, explaining the meaning of 0 in each situation.
Expressions and Equations	6.EE.6	Use variables to represent numbers and write expressions when solving a real world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
Expressions and Equations	6.EE.7	Solve real world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.

Seventh Grade

Subcategory	Standard ID	Standard Description
Ratios and Proportions	7.RP.3	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.



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STANDARDS MET
Common Core Math, Grades 6 to 8

Subcategory	Standard ID	Standard Description
Expressions and Equations	7.EE.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that “increase by 5%” is the same as “multiply by 1.05.”
Expressions and Equations	7.EE.3	Solve multi-step real life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

Eighth Grade

Subcategory	Standard ID	Standard Description
Expressions and Equations	8.EE.7.B	Solve linear equations in one variable. b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.



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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

TEKS: Career Investigation

- (1) The student analyzes the effect of personal interest and aptitudes upon educational and career planning. The student is expected to:
 - (B) match interests and aptitudes to career opportunities; and
- (3) The student knows that many skills are common to a variety of careers and that these skills can be transferred from one career opportunity to another. The student is expected to:
 - (A) compile a list of multiple career options matching interests and aptitudes; and
- (8) The student knows the effect change has on society and career opportunities. The student is expected to:
 - (A) cite examples of change in our society;
 - (B) compose a report explaining positive and negative aspects of one of the examples of societal change;
 - (C) develop a timeline covering the last ten years depicting the change in a selected career choice,

TEKS: Exploring Careers

- 1) The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to:
 - (D) research current and emerging fields related to personal interest areas;
- (4) The student evaluates skills for personal success. The student is expected to:
 - (C) use a problem-solving model and critical-thinking skills to make informed decisions;
 - (F) identify skills that can be transferable among a variety of careers.
- (6) The student demonstrates an understanding of personal financial management. The student is expected to:**
 - (A) compare the advantages and disadvantages of different types of banking services;**
 - (B) simulate opening and maintaining different types of bank accounts;**
 - (C) simulate different methods of withdrawals and deposits; and**
 - (D) reconcile bank statements, including fees and services.
- (8) The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to:**



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- (A) complete actual or virtual labs to simulate the technical skills required in various occupations; and**
- (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.**

TEKS: Career Portals

- (1) The student explores one or more career clusters of interest. The student is expected to:
 - (A) identify the various career opportunities within one or more career clusters; and
 - (B) identify the pathways within one or more career clusters.
- (2) The student explores pathways of interest within one or more career clusters. The student is expected to:
 - (A) investigate career opportunities within the pathways;
 - (B) explore careers of personal interest;
- (5) The student understands personal financial management and recognizes the value of personal fiscal responsibility. The student is expected to:**
 - (A) compare and contrast different types of banking services;**
 - (B) open and maintain different types of simulated bank accounts;
 - (C) practice different methods of withdrawing and depositing funds;**
 - (D) reconcile bank statements, including fees and services;

TEKS: Mathematics

- (1) Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to:**
 - (A) compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals;
 - (B) select and use appropriate forms of rational numbers to solve real life problems including those involving proportional relationships;**
 - (C) approximate (mentally and with calculators) the value of irrational numbers as they arise from problem situations (such as $\sqrt{2}$);



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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

- (2) **Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to:**
- (A) select appropriate operations to solve problems involving rational numbers and justify the selections;
 - (B) use appropriate operations to solve problems involving rational numbers in problem situations;
 - (C) evaluate a solution for reasonableness; and
 - (D) use multiplication by a given constant factor (including unit rate) to represent and solve problems involving proportional relationships including conversions between measurement systems.
- (3) Patterns, relationships, and algebraic thinking. The student identifies proportional or non-proportional linear relationships in problem situations and solves problems. The student is expected to:
- (A) compare and contrast proportional and non-proportional linear relationships; and
 - (B) estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates.
- (4) Patterns, relationships, and algebraic thinking. The student makes connections among various representations of a numerical relationship. The student is expected to generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description).
- (5) Patterns, relationships, and algebraic thinking. The student uses graphs, tables, and algebraic representations to make predictions and solve problems. The student is expected to:
- (A) predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations; and
 - (B) find and evaluate an algebraic expression to determine any term in an arithmetic sequence (with a constant rate of change).
- (14) Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. The student is expected to:
- (A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;
 - (B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;
 - (C) select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem; and
 - (D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.



- (15) Underlying processes and mathematical tools. The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models. The student is expected to:
- (A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and
 - (B) evaluate the effectiveness of different representations to communicate ideas.
- (16) Underlying processes and mathematical tools. The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to:
- (A) make conjectures from patterns or sets of examples and nonexamples; and
 - (B) validate his/her conclusions using mathematical properties and relationships.

TEKS: Science

- (2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:
- (A) plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology;
 - (B) design and implement comparative and experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;
 - (E) analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.
- (3) Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:
- (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;
- (7) Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. The student is expected to:
- (A) model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun causing changes in seasons;
 - (B) demonstrate and predict the sequence of events in the lunar cycle; and
 - (C) relate the position of the Moon and Sun to their effect on ocean tides.



ELECTRIC FARM 2
in Whyville

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

Blooms (Taxonomy):

X	Knowledge: arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce state.
X	Comprehension: classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate
X	Application: apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.
X	Analysis: analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.
X	Synthesis: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, write.
X	Evaluation: appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support,

Instructional Strategies:

X	Identifying similarities and differences
X	Summarizing and note taking
X	Reinforcing effort and providing recognition
	Homework and practice
X	Nonlinguistic representations
X	Cooperative learning
X	Setting objectives and providing feedback
X	Generating and testing hypotheses
X	Cues, questions, and advanced organizers



All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

Sixth Grade

Subcategory	Standard ID	Standard Description
The Number System	6.NS.2	Fluently divide multi-digit numbers using the standard algorithm.
The Number System	6.NS.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
The Number System	6.NS.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real world contexts, explaining the meaning of 0 in each situation.
Expressions and Equations	6.EE.6	Use variables to represent numbers and write expressions when solving a real world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
Expressions and Equations	6.EE.7	Solve real world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.
Expressions and Equations	6.EE.8	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.



ELECTRIC FARM 2
in Whyville

STANDARDS MET
Common Core Math, Grades 6 to 8

Subcategory	Standard ID	Standard Description
Expressions and Equations	6.EE.9	Use variables to represent two quantities in a real world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.

Seventh Grade

Subcategory	Standard ID	Standard Description
Ratios and Proportions	7.RP.3	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
Expressions and Equations	7.EE.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that “increase by 5%” is the same as “multiply by 1.05.”
Expressions and Equations	7.EE.3	Solve multi-step real life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.



ELECTRIC FARM 2
in Whyville

STANDARDS MET
Common Core Math, Grades 6 to 8

Subcategory	Standard ID	Standard Description
Expressions and Equations	7.EE.4.A	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?
Expressions and Equations	7.EE.4.B	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.

Eighth Grade

Subcategory	Standard ID	Standard Description
Functions	8.F.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.



ELECTRIC FARM 2
in Whyville

STANDARDS MET
Common Core Math, Grades 6 to 8

Subcategory	Standard ID	Standard Description
Functions	8.F.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.
Functions	8.F.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.



ELECTRIC FARM 3
in Whyville

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

TEKS: Career Investigation

- (1) The student analyzes the effect of personal interest and aptitudes upon educational and career planning. The student is expected to:
 - (B) match interests and aptitudes to career opportunities; and
- (3) The student knows that many skills are common to a variety of careers and that these skills can be transferred from one career opportunity to another. The student is expected to:
 - (A) compile a list of multiple career options matching interests and aptitudes; and
- (8) The student knows the effect change has on society and career opportunities. The student is expected to:
 - (A) cite examples of change in our society;
 - (B) compose a report explaining positive and negative aspects of one of the examples of societal change;
 - (C) develop a timeline covering the last ten years depicting the change in a selected career choice,

TEKS: Exploring Careers

- 1) The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to:
 - (D) research current and emerging fields related to personal interest areas;
- (4) The student evaluates skills for personal success. The student is expected to:
 - (C) use a problem-solving model and critical-thinking skills to make informed decisions;
 - (F) identify skills that can be transferable among a variety of careers.
- (6) The student demonstrates an understanding of personal financial management. The student is expected to:**
 - (A) compare the advantages and disadvantages of different types of banking services;**
 - (B) simulate opening and maintaining different types of bank accounts;**
 - (C) simulate different methods of withdrawals and deposits; and**
 - (D) reconcile bank statements, including fees and services.
- (8) The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to:**
 - (A) complete actual or virtual labs to simulate the technical skills required in various occupations; and**



(B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.

TEKS: Career Portals

- (1) The student explores one or more career clusters of interest. The student is expected to:
 - (A) identify the various career opportunities within one or more career clusters; and
 - (B) identify the pathways within one or more career clusters.
- (2) The student explores pathways of interest within one or more career clusters. The student is expected to:
 - (A) investigate career opportunities within the pathways;
 - (B) explore careers of personal interest;
- (5) The student understands personal financial management and recognizes the value of personal fiscal responsibility. The student is expected to:**
 - (A) compare and contrast different types of banking services;**
 - (B) open and maintain different types of simulated bank accounts;
 - (C) practice different methods of withdrawing and depositing funds;**
 - (D) reconcile bank statements, including fees and services;

TEKS: Mathematics

- (1) Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to:**
 - (A) compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals;
 - (B) select and use appropriate forms of rational numbers to solve real life problems including those involving proportional relationships;**
 - (C) approximate (mentally and with calculators) the value of irrational numbers as they arise from problem situations (such as $\sqrt{2}$, $\sqrt[3]{2}$);
- (2) Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to:**



ELECTRIC FARM 3
in Whyville

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

- (A) select appropriate operations to solve problems involving rational numbers and justify the selections;
 - (B) use appropriate operations to solve problems involving rational numbers in problem situations;**
 - (C) evaluate a solution for reasonableness; and**
 - (D) use multiplication by a given constant factor (including unit rate) to represent and solve problems involving proportional relationships including conversions between measurement systems.**
- (3) Patterns, relationships, and algebraic thinking. The student identifies proportional or non-proportional linear relationships in problem situations and solves problems. The student is expected to:
- (A) compare and contrast proportional and non-proportional linear relationships; and
 - (B) estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates.
- (4) Patterns, relationships, and algebraic thinking. The student makes connections among various representations of a numerical relationship. The student is expected to generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description).
- (5) Patterns, relationships, and algebraic thinking. The student uses graphs, tables, and algebraic representations to make predictions and solve problems. The student is expected to:
- (A) predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations; and**
 - (B) find and evaluate an algebraic expression to determine any term in an arithmetic sequence (with a constant rate of change).**
- (14) Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. The student is expected to:
- (A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;
 - (B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;
 - (C) select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem; and
 - (D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.
- (15) Underlying processes and mathematical tools. The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models. The student is expected to:



ELECTRIC FARM 3
in Whyville

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

- (A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and
 - (B) evaluate the effectiveness of different representations to communicate ideas.
- (16) Underlying processes and mathematical tools. The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to:
- (A) make conjectures from patterns or sets of examples and nonexamples; and
 - (B) validate his/her conclusions using mathematical properties and relationships.

TEKS: Science

- (2) Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and field investigations. The student is expected to:
 - (A) plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology;
 - (B) design and implement comparative and experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology;
 - (E) analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.
- (3) Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:
 - (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;
- (7) Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. The student is expected to:
 - (A) model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun causing changes in seasons;
 - (B) demonstrate and predict the sequence of events in the lunar cycle; and
 - (C) relate the position of the Moon and Sun to their effect on ocean tides.



ELECTRIC FARM 3
in **Whyville**

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

Blooms (Taxonomy):

X	Knowledge: arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce state.
X	Comprehension: classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate
X	Application: apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.
X	Analysis: analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.
X	Synthesis: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, write.
X	Evaluation: appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support,



All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

Sixth Grade

Subcategory	Standard ID	Standard Description
The Number System	6.NS.2	Fluently divide multi-digit numbers using the standard algorithm.
The Number System	6.NS.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
The Number System	6.NS.5	Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real world contexts, explaining the meaning of 0 in each situation.
Expressions and Equations	6.EE.6	Use variables to represent numbers and write expressions when solving a real world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
Expressions and Equations	6.EE.7	Solve real world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.
Expressions and Equations	6.EE.8	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
Expressions and Equations	6.EE.9	Use variables to represent two quantities in a real world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.



Seventh Grade

Subcategory	Standard ID	Standard Description
Ratios and Propotions	7.RP.3	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
Expressions and Equations	7.EE.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, $a + 0.05a = 1.05a$ means that “increase by 5%” is the same as “multiply by 1.05.”
Expressions and Equations	7.EE.3	Solve multi-step real life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.
Expressions and Equations	7.EE.4.A	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?



Subcategory	Standard ID	Standard Description
Expressions and Equations	7.EE.4.B	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.

Eighth Grade

Subcategory	Standard ID	Standard Description
Functions	8.F.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.
Functions	8.F.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.
Functions	8.F.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.



POWER PLANNER 1
in Whyville

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

TEKS: Career Portals

- (1) The student explores one or more career clusters of interest. The student is expected to:
 - (A) identify the various career opportunities within one or more career clusters; and
 - (B) identify the pathways within one or more career clusters.
- (2) The student explores pathways of interest within one or more career clusters. The student is expected to:
 - (A) investigate career opportunities within the pathways;
 - (B) explore careers of personal interest;
- (4) The student explores the professional skills needed for college and career success. The student is expected to:
 - (E) identify professional associations affiliated with a specified program of study;
 - (F) **employ effective leadership, teamwork, and conflict management;**

TEKS: Career Investigation

- (2) The student knows how to locate, analyze, and apply career information. The student is expected to:
 - (A) access career information using print and on-line resources to complete an educational and/or training plan for a career pathway;
 - (B) access career information using interviews with business and industry representatives to create a career resource file;
- (6) The student knows the process of career planning. The student is expected to:
 - (B) prepare an oral or written plan describing the specific factors considered in the decision-making process used to solve a simulated career problem;
- (8) The student knows the effect change has on society and career opportunities. The student is expected to:
 - (A) cite examples of change in our society;

TEKS: Exploring Careers

- 1) The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to:
 - (D) research current and emerging fields related to personal interest areas;
 - (F) explore how career choices impact the balance between personal and professional responsibilities; and
- (2) The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to:
 - (C) develop and analyze tables, charts, and graphs related to career interests;
 - (D) determine the impact of technology on careers of personal interest; and
- (4) The student evaluates skills for personal success. The student is expected to:
 - (A) implement effective study skills for academic success;



POWER PLANNER 1

in Whyville

STANDARDS MET

Texas Essential Knowledge and Skills (TEKS)
8th Grade

- (C) use a problem-solving model and critical-thinking skills to make informed decisions;**
- (D) use effective time-management and goal-setting strategies;**
- (E) effectively use information and communication technology tools;**
- (5) The student recognizes the impact of career choice on personal lifestyle. The student is expected to:
 - (A) prepare a personal budget reflecting the student's desired lifestyle;
- (7) The student develops skills for professional success. The student is expected to:**
 - (E) explore and model characteristics necessary for professional success such as work ethics, integrity, dedication, perseverance, and the ability to interact with a diverse population; and**
 - (F) complete activities using project- and time-management techniques.**
- (8) The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to:**
 - (A) complete actual or virtual labs to simulate the technical skills required in various occupations; and**
 - (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.

TEKS: Mathematics

See also Teacher Preparation section above for a matrix of core math content vs. Whyville activities.

- (1) Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to:
 - (A) compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals;
 - (B) select and use appropriate forms of rational numbers to solve real life problems including those involving proportional relationships;
- (2) Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to:
 - (A) select appropriate operations to solve problems involving rational numbers and justify the selections;
 - (B) use appropriate operations to solve problems involving rational numbers in problem situations;
 - (D) use multiplication by a given constant factor (including unit rate) to represent and solve problems involving proportional relationships including conversions between measurement systems.**
- (3) The student identifies proportional or non-proportional linear relationships in problem situations and solves problems. The student is expected to:
 - (B) estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates.**
- (5) Patterns, relationships, and algebraic thinking. The student uses graphs, tables, and algebraic representations to make predictions and solve problems. The student is expected to:
 - (A) predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations;**
- (9) The student uses indirect measurement to solve problems. The student is expected to:
 - (B) use proportional relationships in similar two-dimensional figures or similar three-dimensional figures to find missing measurements.**



POWER PLANNER 1
in **Whyville**

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

- (14) Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. The student is expected to:
- (A) **identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;**
 - (B) **use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;**
 - (C) select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem; and
 - (D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.
- (15) Underlying processes and mathematical tools. The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models. The student is expected to:
- (A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and
- (16) Underlying processes and mathematical tools. The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to:
- (A) make conjectures from patterns or sets of examples and nonexamples; and
 - (B) validate his/her conclusions using mathematical properties and relationships.

TEKS: Science

- (3) Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:
- (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;
 - (B) use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature;
 - (C) identify advantages and limitations of models such as size, scale, properties, and materials;



POWER PLANNER 1
in Whyville

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

Blooms (Taxonomy):

X	Knowledge: arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce state.
X	Comprehension: classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate
X	Application: apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.
X	Analysis: analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.
X	Synthesis: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, write.
X	Evaluation: appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support,

Instructional Strategies:

X	Identifying similarities and differences
X	Summarizing and note taking
X	Reinforcing effort and providing recognition
	Homework and practice
X	Nonlinguistic representations
X	Cooperative learning
X	Setting objectives and providing feedback
	Generating and testing hypotheses
X	Cues, questions, and advanced organizers



All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

Sixth Grade

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Ratios and Proportions	6.RP.1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”
Ratios and Proportions	6.RP.2	Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $3/4$ cup of flour for each cup of sugar.” “We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger.”
Ratios and Proportions	6.RP.3.A	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. a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
Ratios and Proportions	6.RP.3.B	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. 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?
Ratios and Proportions	6.RP.3.C	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. c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.



POWER PLANNER 1
in Whyville

STANDARDS MET
Common Core Math, Grades 6 to 8

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Expressions and Equations	6.EE.7	Solve real world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p , q and x are all nonnegative rational numbers.

Seventh Grade

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Ratios and Proportions	7.RP.2.C	Recognize and represent proportional relationships between quantities. c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p , the relationship between the total cost and the number of items can be expressed as $t = pn$.
Expressions and Equations	7.EE.3	Solve multi-step real life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.
Expressions and Equations	7.EE.4.A	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?



POWER PLANNER 1
in Whyville

STANDARDS MET
Common Core Math, Grades 6 to 8

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Expressions and Equations	7.EE.4.B	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.

Eighth Grade

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Expressions and Equations	8.EE.7.B	Solve linear equations in one variable. b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.



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STANDARDS MET
Common Core Math, Grades 6 to 8

Covered in Power Planner Activity #	TEKS Reporting Category	Texas College Readiness Standard?	Texas Standard #	Description
1, 3	QUANTITATIVE REASONING	YES	8.1A	compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals; Readiness Standard
1, 3	QUANTITATIVE REASONING	NO	8.1B	select and use appropriate forms of rational numbers to solve real-life problems including those involving proportional
3	QUANTITATIVE REASONING	NO	8.1C	approximate (mentally [and with calculators]) the value of irrational numbers as they arise from problem situations (such as π , 2);
	QUANTITATIVE REASONING	NO	8.1D	(D) express numbers in scientific notation, including negative exponents, in appropriate problem situations.
1, 3	QUANTITATIVE REASONING	NO	8.2A	select appropriate operations to solve problems involving rational numbers and justify the selections; Supporting Standard
1, 3	QUANTITATIVE REASONING	YES	8.2B	use appropriate operations to solve problems involving rational numbers in problem situations; Readiness Standard
3	QUANTITATIVE REASONING	NO	8.2C	evaluate a solution for reasonableness; and Supporting Standard
1	QUANTITATIVE REASONING	NO	8.2D	use multiplication by a given constant factor (including unit rate) to represent and solve problems involving proportional relationships including conversions between measurement systems.
1, 3	ALGEBRAIC REASONING	YES	8.3B	estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates. Readiness Standard
2	ALGEBRAIC REASONING	YES	8.4A	(A) generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description). Readiness Standard
ALL	ALGEBRAIC REASONING	YES	8.5A	(A) predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations; and
1	MEASUREMENT	YES	8.9B	(B) use proportional relationships in similar two-dimensional figures or similar three-dimensional figures to find missing measurements.
2	PROBABILITY& STATISTICS	YES	8.11A	(A) find the probabilities of dependent and independent events; and
2, 3	PROBABILITY& STATISTICS	NO	8.11B	(B) use theoretical probabilities and experimental results to make predictions and decisions. Supporting Standard
2	PROBABILITY& STATISTICS	NO	8.12A	(A) use variability (range, including interquartile range (IQR)) and select the appropriate measure of central tendency to describe a set of data and justify the choice for a particular situation;
2, 3	PROBABILITY& STATISTICS	NO	8.12B	draw conclusions and make predictions by analyzing trends in scatterplots; and Supporting Standard
ALL	UNDERLYING PROCESSES & TOOLS	NO	8.14A	identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;
ALL	UNDERLYING PROCESSES & TOOLS	NO	8.14B	use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;
ALL	UNDERLYING PROCESSES & TOOLS	NO	8.14C	select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem; and
ALL	UNDERLYING PROCESSES & TOOLS	NO	8.14D	select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.
ALL	UNDERLYING PROCESSES & TOOLS	NO	8.15A	(A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models.
ALL	UNDERLYING PROCESSES & TOOLS	NO	8.16A	make conjectures from patterns or sets of examples and nonexamples; and
ALL	UNDERLYING PROCESSES & TOOLS	NO	8.16B	validate his/her conclusions using mathematical properties and relationships.



POWER PLANNER 2
in Whyville

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

TEKS: Career Portals

- (1) The student explores one or more career clusters of interest. The student is expected to:
 - (A) identify the various career opportunities within one or more career clusters; and
 - (B) identify the pathways within one or more career clusters.
- (2) The student explores pathways of interest within one or more career clusters. The student is expected to:
 - (A) investigate career opportunities within the pathways;
 - (B) explore careers of personal interest;
- (4) The student explores the professional skills needed for college and career success. The student is expected to:
 - (E) identify professional associations affiliated with a specified program of study;
 - (F) employ effective leadership, teamwork, and conflict management;

TEKS: Career Investigation

- (2) The student knows how to locate, analyze, and apply career information. The student is expected to:
 - (A) access career information using print and on-line resources to complete an educational and/or training plan for a career pathway;
 - (B) access career information using interviews with business and industry representatives to create a career resource file;
- (6) The student knows the process of career planning. The student is expected to:
 - (B) prepare an oral or written plan describing the specific factors considered in the decision-making process used to solve a simulated career problem;
- (8) The student knows the effect change has on society and career opportunities. The student is expected to:
 - (A) cite examples of change in our society;

TEKS: Exploring Careers

- 1) The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to:
 - (D) research current and emerging fields related to personal interest areas;
 - (F) explore how career choices impact the balance between personal and professional responsibilities; and
- (2) The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to:
 - (C) develop and analyze tables, charts, and graphs related to career interests;
 - (D) determine the impact of technology on careers of personal interest; and
- (4) The student evaluates skills for personal success. The student is expected to:**
 - (A) implement effective study skills for academic success;**



POWER PLANNER 2 in Whyville

STANDARDS MET Texas Essential Knowledge and Skills (TEKS) 8th Grade

- (C) use a problem-solving model and critical-thinking skills to make informed decisions;
- (D) use effective time-management and goal-setting strategies;
- (E) effectively use information and communication technology tools;
- (5) The student recognizes the impact of career choice on personal lifestyle. The student is expected to:
 - (A) prepare a personal budget reflecting the student's desired lifestyle;
- (7) The student develops skills for professional success. The student is expected to:
 - (E) explore and model characteristics necessary for professional success such as work ethics, integrity, dedication, perseverance, and the ability to interact with a diverse population; and
 - (F) complete activities using project- and time-management techniques.
- (8) The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to:
 - (A) complete actual or virtual labs to simulate the technical skills required in various occupations; and
 - (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.

TEKS: Mathematics

Update with TEKS

- (1) Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to:
 - (A) compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals;
 - (B) select and use appropriate forms of rational numbers to solve real life problems including those involving proportional relationships;
- (2) Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to:
 - (A) select appropriate operations to solve problems involving rational numbers and justify the selections;
 - (B) use appropriate operations to solve problems involving rational numbers in problem situations;
 - (D) use multiplication by a given constant factor (including unit rate) to represent and solve problems involving proportional relationships including conversions between measurement systems.**
- (3) The student identifies proportional or non-proportional linear relationships in problem situations and solves problems. The student is expected to:
 - (B) estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates.**
- (5) **Patterns, relationships, and algebraic thinking.** The student uses graphs, tables, and algebraic representations to make predictions and solve problems. The student is expected to:
 - (A) predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations;**
- (9) The student uses indirect measurement to solve problems. The student is expected to:
 - (B) use proportional relationships in similar two-dimensional figures or similar three-dimensional figures to find missing measurements.**



POWER PLANNER 2
in **Whyville**

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

- (14) Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. The student is expected to:
- (A) **identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;**
 - (B) **use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;**
 - (C) select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem; and
 - (D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.
- (15) Underlying processes and mathematical tools. The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models. The student is expected to:
- (A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and
- (16) Underlying processes and mathematical tools. The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to:
- (A) make conjectures from patterns or sets of examples and nonexamples; and
 - (B) validate his/her conclusions using mathematical properties and relationships.

TEKS: Science

- (3) Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:
- (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;
 - (B) use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature;
 - (C) identify advantages and limitations of models such as size, scale, properties, and materials;



POWER PLANNER 2
in **Whyville**

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

Blooms (Taxonomy):

X	Knowledge: arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce state.
X	Comprehension: classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate
X	Application: apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.
X	Analysis: analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.
X	Synthesis: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, write.
X	Evaluation: appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support,

Instructional Strategies:

X	Identifying similarities and differences
X	Summarizing and note taking
X	Reinforcing effort and providing recognition
	Homework and practice
X	Nonlinguistic representations
X	Cooperative learning
X	Setting objectives and providing feedback
	Generating and testing hypotheses
X	Cues, questions, and advanced organizers



All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

Sixth Grade

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
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.
Statistics and Probability	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.
Statistics and Probability	6.SP.3	Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.
Statistics and Probability	6.SP.4	Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
Statistics and Probability	6.SP.5.A	Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations.
Statistics and Probability	6.SP.5.B	Summarize numerical data sets in relation to their context, such as by: b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
Statistics and Probability	6.SP.5.C	Summarize numerical data sets in relation to their context, such as by: 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.



POWER PLANNER 2
in Whyville

STANDARDS MET
Common Core Math, Grades 6 to 8

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Statistics and Probability	6.SP.5.D	Summarize numerical data sets in relation to their context, such as by: 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.

Seventh Grade

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Expressions and Equations	7.EE.3	Solve multi-step real life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.
Expressions and Equations	7.EE.4.A	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?
Statistics and Probability	7.SP.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.



POWER PLANNER 2
in Whyville

STANDARDS MET
Common Core Math, Grades 6 to 8

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Statistics and Probability	7.SP.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.
Statistics and Probability	7.SP.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

Eighth Grade

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Expressions and Equations	8.EE.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.



POWER PLANNER 3 in Whyville

STANDARDS MET Texas Essential Knowledge and Skills (TEKS) 8th Grade

All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

TEKS: Career Portals

- (1) The student explores one or more career clusters of interest. The student is expected to:
 - (A) identify the various career opportunities within one or more career clusters; and
 - (B) identify the pathways within one or more career clusters.
- (2) The student explores pathways of interest within one or more career clusters. The student is expected to:
 - (A) investigate career opportunities within the pathways;
 - (B) explore careers of personal interest;
- (4) The student explores the professional skills needed for college and career success. The student is expected to:
 - (E) identify professional associations affiliated with a specified program of study;
 - (F) **employ effective leadership, teamwork, and conflict management;**

TEKS: Career Investigation

- (2) The student knows how to locate, analyze, and apply career information. The student is expected to:
 - (A) access career information using print and on-line resources to complete an educational and/or training plan for a career pathway;
 - (B) access career information using interviews with business and industry representatives to create a career resource file;
- (6) The student knows the process of career planning. The student is expected to:
 - (B) prepare an oral or written plan describing the specific factors considered in the decision-making process used to solve a simulated career problem;
- (8) The student knows the effect change has on society and career opportunities. The student is expected to:
 - (A) cite examples of change in our society;

TEKS: Exploring Careers

- 1) The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to:
 - (D) research current and emerging fields related to personal interest areas;
 - (F) explore how career choices impact the balance between personal and professional responsibilities; and
- (2) The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to:
 - (C) develop and analyze tables, charts, and graphs related to career interests;
 - (D) determine the impact of technology on careers of personal interest; and



POWER PLANNER 3
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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

- (4) The student evaluates skills for personal success. The student is expected to:**
(A) implement effective study skills for academic success;
(C) use a problem-solving model and critical-thinking skills to make informed decisions;
(D) use effective time-management and goal-setting strategies;
(E) effectively use information and communication technology tools;
- (5) The student recognizes the impact of career choice on personal lifestyle. The student is expected to:
(A) prepare a personal budget reflecting the student's desired lifestyle;
- (7) The student develops skills for professional success. The student is expected to:**
(E) explore and model characteristics necessary for professional success such as work ethics, integrity, dedication, perseverance, and the ability to interact with a diverse population; and
(F) complete activities using project- and time-management techniques.
- (8) The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to:**
(A) complete actual or virtual labs to simulate the technical skills required in various occupations; and
(B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.

TEKS: Mathematics

Update with TEKS

- (1) Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to:
(A) compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals;
(B) select and use appropriate forms of rational numbers to solve real life problems including those involving proportional relationships;
- (2) Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to:
(A) select appropriate operations to solve problems involving rational numbers and justify the selections;
(B) use appropriate operations to solve problems involving rational numbers in problem situations;
(D) use multiplication by a given constant factor (including unit rate) to represent and solve problems involving proportional relationships including conversions between measurement systems.
- (3) The student identifies proportional or non-proportional linear relationships in problem situations and solves problems. The student is expected to:
(B) estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates.
- (5) **Patterns, relationships, and algebraic thinking.** The student uses graphs, tables, and algebraic representations to make predictions and solve problems. The student is expected to:
(A) predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations;



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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

- (9) The student uses indirect measurement to solve problems. The student is expected to
- (B) use proportional relationships in similar two-dimensional figures or similar three-dimensional figures to find missing measurements.
- (14) Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. The student is expected to:
- (A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;
 - (B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;
 - (C) select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem; and
 - (D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.
- (15) Underlying processes and mathematical tools. The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models. The student is expected to:
- (A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and
- (16) Underlying processes and mathematical tools. The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to:
- (A) make conjectures from patterns or sets of examples and nonexamples; and
 - (B) validate his/her conclusions using mathematical properties and relationships.

TEKS: Science

- (3) Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:
- (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;
 - (B) use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature;
 - (C) identify advantages and limitations of models such as size, scale, properties, and materials;



POWER PLANNER 3
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STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

Blooms (Taxonomy):

X	Knowledge: arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce state.
X	Comprehension: classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate
X	Application: apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.
X	Analysis: analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.
X	Synthesis: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, write.
X	Evaluation: appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support,

Instructional Strategies:

X	Identifying similarities and differences
X	Summarizing and note taking
X	Reinforcing effort and providing recognition
	Homework and practice
X	Nonlinguistic representations
X	Cooperative learning
X	Setting objectives and providing feedback
	Generating and testing hypotheses
X	Cues, questions, and advanced organizers



All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

Sixth Grade

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Ratios and Proportions	6.RP.3.C	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. c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.
Expressions and Equations	6.EE.7	Solve real world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.

Seventh Grade

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Ratios and Proportions	7.RP.2.B	Recognize and represent proportional relationships between quantities. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.



POWER PLANNER 3
in Whyville

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Expressions and Equations	7.EE.3	Solve multi-step real life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.
Expressions and Equations	7.EE.4.A	Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

Eighth Grade

<i>Subcategory</i>	<i>Standard ID</i>	<i>Standard Description</i>
Expressions and Equations	8.EE.7.B	Solve linear equations in one variable. b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.



POWER PLANNER 3

in Whyville

STANDARDS MET

Texas Essential Knowledge and Skills (TEKS)
8th Grade

Covered in Power Planner Activity #	TEKS Reporting Category	Texas College Readiness Standard?	Texas Standard #	Description
1, 3	QUANTITATIVE REASONING	YES	8.1A	compare and order rational numbers in various forms including integers, percents, and positive and negative fractions and decimals; Readiness Standard
1, 3	QUANTITATIVE REASONING	NO	8.1B	select and use appropriate forms of rational numbers to solve real-life problems including those involving proportional
3	QUANTITATIVE REASONING	NO	8.1C	approximate (mentally [and with calculators]) the value of irrational numbers as they arise from problem situations (such as π , 2);
	QUANTITATIVE REASONING	NO	8.1D	(D) express numbers in scientific notation, including negative exponents, in appropriate problem situations.
1, 3	QUANTITATIVE REASONING	NO	8.2A	select appropriate operations to solve problems involving rational numbers and justify the selections; Supporting Standard
1, 3	QUANTITATIVE REASONING	YES	8.2B	use appropriate operations to solve problems involving rational numbers in problem situations; Readiness Standard
3	QUANTITATIVE REASONING	NO	8.2C	evaluate a solution for reasonableness; and Supporting Standard
1	QUANTITATIVE REASONING	NO	8.2D	use multiplication by a given constant factor (including unit rate) to represent and solve problems involving proportional relationships including conversions between measurement systems.
1, 3	ALGEBRAIC REASONING	YES	8.3B	estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates. Readiness Standard
2	ALGEBRAIC REASONING	YES	8.4A	(A) generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description). Readiness Standard
ALL	ALGEBRAIC REASONING	YES	8.5A	(A) predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations; and
1	MEASUREMENT	YES	8.9B	(B) use proportional relationships in similar two-dimensional figures or similar three-dimensional figures to find missing measurements.
2	PROBABILITY& STATISTICS	YES	8.11A	(A) find the probabilities of dependent and independent events; and
2, 3	PROBABILITY& STATISTICS	NO	8.11B	(B) use theoretical probabilities and experimental results to make predictions and decisions. Supporting Standard
2	PROBABILITY& STATISTICS	NO	8.12A	(A) use variability (range, including interquartile range (IQR)) and select the appropriate measure of central tendency to describe a set of data and justify the choice for a particular situation;
2, 3	PROBABILITY& STATISTICS	NO	8.12B	draw conclusions and make predictions by analyzing trends in scatterplots; and Supporting Standard
ALL	UNDERLYING PROCESSES & TOOLS	NO	8.14A	identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;
ALL	UNDERLYING PROCESSES & TOOLS	NO	8.14B	use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;
ALL	UNDERLYING PROCESSES & TOOLS	NO	8.14C	select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem; and
ALL	UNDERLYING PROCESSES & TOOLS	NO	8.14D	select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.
ALL	UNDERLYING PROCESSES & TOOLS	NO	8.15A	(A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models.
ALL	UNDERLYING PROCESSES & TOOLS	NO	8.16A	make conjectures from patterns or sets of examples and nonexamples; and
ALL	UNDERLYING PROCESSES & TOOLS	NO	8.16B	validate his/her conclusions using mathematical properties and relationships.



All TEKS listed are impacted by this lesson plan. **Boldfaced TEKS** represent the focus of the lesson plan.

TEKS: Career Investigation

- (2) The student knows how to locate, analyze, and apply career information. The student is expected to:**
 - (A) access career information using print and on-line resources to complete an educational and/or training plan for a career pathway;**
 - (B) access career information using interviews with business and industry representatives to create a career resource file;
- (6) The student knows the process of career planning. The student is expected to:
 - (B) prepare an oral or written plan describing the specific factors considered in the decision-making process used to solve a simulated career problem;

TEKS: Exploring Careers

- 1) The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to:**
 - (D) research current and emerging fields related to personal interest areas;**
 - (F) explore how career choices impact the balance between personal and professional responsibilities; and
- (2) The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to:**
 - (C) develop and analyze tables, charts, and graphs related to career interests;
 - (D) determine the impact of technology on careers of personal interest; and**
- (4) The student evaluates skills for personal success. The student is expected to:**
 - (A) implement effective study skills for academic success;**
 - (C) use a problem-solving model and critical-thinking skills to make informed decisions;**
 - (D) use effective time-management and goal-setting strategies;**
 - (E) effectively use information and communication technology tools; and**
- (5) The student recognizes the impact of career choice on personal lifestyle. The student is expected to:
 - (A) prepare a personal budget reflecting the student's desired lifestyle;
- (7) The student develops skills for professional success. The student is expected to:**
 - (E) explore and model characteristics necessary for professional success such as work ethics, integrity, dedication, perseverance, and the ability to interact with a diverse population; and**
 - (F) complete activities using project- and time-management techniques.**
- (8) The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to:**
 - (A) complete actual or virtual labs to simulate the technical skills required in various occupations; and**
 - (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.



POWERLINE 1
in **Whyville**

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

TEKS: Career Portals

- (1) The student explores one or more career clusters of interest. The student is expected to:
 - (A) identify the various career opportunities within one or more career clusters; and
 - (B) identify the pathways within one or more career clusters.
- (2) The student explores pathways of interest within one or more career clusters. The student is expected to:
 - (A) investigate career opportunities within the pathways;
 - (B) explore careers of personal interest;
- (4) The student explores the professional skills needed for college and career success. The student is expected to:
 - (E) identify professional associations affiliated with a specified program of study;
 - (F) employ effective leadership, teamwork, and conflict management;

TEKS: Mathematics

- (1) Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to:
 - (B) select and use appropriate forms of rational numbers to solve real-life problems including those involving proportional relationships;
- (2) Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to:
 - (A) select appropriate operations to solve problems involving rational numbers and justify the selections;
 - (B) use appropriate operations to solve problems involving rational numbers in problem situations;
 - (C) evaluate a solution for reasonableness; and
- (4) Patterns, relationships, and algebraic thinking. The student makes connections among various representations of a numerical relationship. The student is expected to generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description).
- (5) Patterns, relationships, and algebraic thinking. The student uses graphs, tables, and algebraic representations to make predictions and solve problems. The student is expected to:
 - (A) predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations; and
- (14) Underlying processes and mathematical tools. The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. The student is expected to:
 - (A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;
 - (B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;
 - (D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.
- (15) Underlying processes and mathematical tools. The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models. The student is expected to:



POWERLINE 1
in Whyville

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

- (A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and
- (B) evaluate the effectiveness of different representations to communicate ideas.
- (16) Underlying processes and mathematical tools. The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to:**
 - (A) make conjectures from patterns or sets of examples and nonexamples; and
 - (B) validate his/her conclusions using mathematical properties and relationships.

TEKS: Science

- (3) Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:**
 - (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;
 - (B) use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature;
 - (C) identify advantages and limitations of models such as size, scale, properties, and materials;

Blooms (Taxonomy):

X	Knowledge: arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce state.
X	Comprehension: classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate
X	Application: apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.
X	Analysis: analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.
X	Synthesis: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, write.
X	Evaluation: appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support,



POWERLINE 1
in **Whyville**

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

Instructional Strategies:

X	Identifying similarities and differences
X	Summarizing and note taking
X	Reinforcing effort and providing recognition
	Homework and practice
X	Nonlinguistic representations
X	Cooperative learning
X	Setting objectives and providing feedback
X	Generating and testing hypotheses
X	Cues, questions, and advanced organizers



All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

Sixth Grade

Subcategory	Standard ID	Standard Description
The Number System	6.NS.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
Expressions and Equations	6.EE.2.C	Write, read, and evaluate expressions in which letters stand for numbers. c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving wholenumber exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.
Expressions and Equations	6.EE.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
Expressions and Equations	6.EE.7	Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.
Expressions and Equations	6.EE.9	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.



Seventh Grade

Subcategory	Standard ID	Standard Description
The Number System	7.NS.2.A	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
The Number System	7.NS.2.C	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. c. Apply properties of operations as strategies to multiply and divide rational numbers.
The Number System	7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers.
Expressions and Equations	7.EE.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.



POWERLINE 1
in **Whyville**

STANDARDS MET
Common Core Math, Grades 6 to 8

Subcategory	Standard ID	Standard Description
Expressions and Equations	7.EE.4.A	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?



POWERLINE 1
in Whyville

STANDARDS MET
Common Core Math, Grades 6 to 8

Eighth Grade

Subcategory	Standard ID	Standard Description
Functions	8.F.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.



All TEKS listed are impacted by this lesson plan. **Boldfaced TEKS** represent the focus of the lesson plan.

TEKS: Career Investigation

- (2) The student knows how to locate, analyze, and apply career information. The student is expected to:**
 - (A) access career information using print and on-line resources to complete an educational and/or training plan for a career pathway;**
 - (B) access career information using interviews with business and industry representatives to create a career resource file;
- (6) The student knows the process of career planning. The student is expected to:
 - (A) list and explain the steps in the decision-making process;
 - (B) prepare an oral or written plan describing the specific factors considered in the decision-making process used to solve a simulated career problem;
- (7) The student knows the importance of productive work habits and attitudes. The student is expected to:**
 - (B) list characteristics of an effective team member;
 - (C) work on a team to accomplish an assigned task; and**
 - (D) write job scenarios demonstrating positive and negative employee/customer relations.

TEKS: Exploring Careers

- 1) The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to:**
 - (D) research current and emerging fields related to personal interest areas;**
 - (F) explore how career choices impact the balance between personal and professional responsibilities; and
- (2) The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to:**
 - (C) develop and analyze tables, charts, and graphs related to career interests;
 - (D) determine the impact of technology on careers of personal interest; and**
- (4) The student evaluates skills for personal success. The student is expected to:**
 - (A) implement effective study skills for academic success;**
 - (C) use a problem-solving model and critical-thinking skills to make informed decisions;**
 - (D) use effective time-management and goal-setting strategies;**
 - (E) effectively use information and communication technology tools; and**
- (5) The student recognizes the impact of career choice on personal lifestyle. The student is expected to:
 - (A) prepare a personal budget reflecting the student's desired lifestyle;
- (7) The student develops skills for professional success. The student is expected to:**
 - (E) explore and model characteristics necessary for professional success such as work ethics, integrity, dedication, perseverance, and the ability to interact with a diverse population; and**
 - (F) complete activities using project- and time-management techniques.**



POWERLINE 2
in **Whyville**

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

- (8) The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand.**
The student is expected to:
(A) complete actual or virtual labs to simulate the technical skills required in various occupations; and
(B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.

TEKS: Career Portals

- (1) The student explores one or more career clusters of interest. The student is expected to:**
(A) identify the various career opportunities within one or more career clusters; and
(B) identify the pathways within one or more career clusters.
- (2) The student explores pathways of interest within one or more career clusters. The student is expected to:**
(A) investigate career opportunities within the pathways;
(B) explore careers of personal interest;
- (4) The student explores the professional skills needed for college and career success. The student is expected to:**
(E) identify professional associations affiliated with a specified program of study;
(F) employ effective leadership, teamwork, and conflict management;

TEKS: Mathematics

- (1) Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to:**
(B) select and use appropriate forms of rational numbers to solve real-life problems including those involving proportional relationships;
- (2) Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to:**
(A) select appropriate operations to solve problems involving rational numbers and justify the selections;
(B) use appropriate operations to solve problems involving rational numbers in problem situations;
(C) evaluate a solution for reasonableness; and
- (3) Patterns, relationships, and algebraic thinking. The student identifies proportional or non-proportional linear relationships in problem situations and solves problems. The student is expected to:**
(A) compare and contrast proportional and non-proportional linear relationships; and
(B) estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates.
- (4) Patterns, relationships, and algebraic thinking. The student makes connections among various representations of a numerical relationship. The student is expected to generate a different representation of data given another representation of data (such as a table, graph, equation, or verbal description).**
- (5) Patterns, relationships, and algebraic thinking. The student uses graphs, tables, and algebraic representations to make predictions and solve problems. The student is expected to:**
(A) predict, find, and justify solutions to application problems using appropriate tables, graphs, and algebraic equations; and



POWERLINE 2
in **Whyville**

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

- (14) **Underlying processes and mathematical tools.** The student applies Grade 8 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. The student is expected to:
 - (A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;
 - (B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;
 - (D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems.
- (15) **Underlying processes and mathematical tools.** The student communicates about Grade 8 mathematics through informal and mathematical language, representations, and models. The student is expected to:
 - (A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models; and
 - (B) evaluate the effectiveness of different representations to communicate ideas.
- (16) **Underlying processes and mathematical tools.** The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to:
 - (A) make conjectures from patterns or sets of examples and nonexamples; and
 - (B) validate his/her conclusions using mathematical properties and relationships.

TEKS: Science

- (3) **Scientific investigation and reasoning.** The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. The student is expected to:
 - (A) in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student;
 - (B) use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature;
 - (C) identify advantages and limitations of models such as size, scale, properties, and materials;

Blooms (Taxonomy):

X	Knowledge: arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce state.
X	Comprehension: classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate
X	Application: apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.
X	Analysis: analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.
X	Synthesis: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, write.



POWERLINE 2
in Whyville

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

X	Evaluation: appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support,
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Instructional Strategies:

X	Identifying similarities and differences
X	Summarizing and note taking
X	Reinforcing effort and providing recognition
	Homework and practice
X	Nonlinguistic representations
X	Cooperative learning
X	Setting objectives and providing feedback
X	Generating and testing hypotheses
X	Cues, questions, and advanced organizers



All standards listed are impacted by this lesson plan. **Boldfaced** standards represent the focus of the lesson plan.

Sixth Grade

Subcategory	Standard ID	Standard Description
The Number System	6.NS.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
Expressions and Equations	6.EE.2.C	Write, read, and evaluate expressions in which letters stand for numbers. c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving wholenumber exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.
Expressions and Equations	6.EE.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
Expressions and Equations	6.EE.7	Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.
Expressions and Equations	6.EE.9	Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.



Seventh Grade

Subcategory	Standard ID	Standard Description
The Number System	7.NS.2.A	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
The Number System	7.NS.2.C	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. c. Apply properties of operations as strategies to multiply and divide rational numbers.
The Number System	7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers.
Expressions and Equations	7.EE.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional $\frac{1}{10}$ of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar $9\frac{3}{4}$ inches long in the center of a door that is $27\frac{1}{2}$ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.



POWERLINE 2
in Whyville

STANDARDS MET
Common Core Math, Grades 6 to 8

Subcategory	Standard ID	Standard Description
Expressions and Equations	7.EE.4.A	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?



POWERLINE 2
in Whyville

STANDARDS MET
Common Core Math, Grades 6 to 8

Eighth Grade

Subcategory	Standard ID	Standard Description
Functions	8.F.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.



ENERGY CAREERS
in Whyville

STANDARDS MET
Texas Essential Knowledge and Skills (TEKS)
8th Grade

All TEKS listed are impacted by this lesson plan. **Boldfaced TEKS** represent the focus of the lesson plan.

TEKS: Career Investigation

- (2) The student knows how to locate, analyze, and apply career information. The student is expected to:
 - (A) access career information using print and on-line resources to complete an educational and/or training plan for a career pathway;
- (3) The student knows that many skills are common to a variety of careers and that these skills can be transferred from one career opportunity to another. The student is expected to:
 - (A) compile a list of multiple career options matching interests and aptitudes; and
- (6) The student knows the process of career planning. The student is expected to:
 - (A) list and explain the steps in the decision-making process;
 - (C) identify high school courses related to specific career choices in the student's interest area;**
 - (E) list and explain educational and/or training alternatives after high school; and**
 - (F) prepare an educational and career plan that begins with entry into high school and continues through a postsecondary educational and/or training program. prepare an educational and career plan that begins with entry into high school and continues through a postsecondary educational and/or training program.

TEKS: Exploring Careers

- 1) The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to:
 - (B) explore the career clusters as defined by the U.S. Department of Education;
 - (C) summarize the career opportunities in a cluster of personal interest;
 - (D) research current and emerging fields related to personal interest areas;**
 - (E) determine academic requirements in career fields related to personal interest areas;**
 - (G) research educational options and requirements using appropriate technology.**
- (2) The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to:
 - (A) create a personal career portfolio;
 - (B) make oral presentations that fulfill specific purposes using appropriate technology;



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- (C) develop and analyze tables, charts, and graphs related to career interests;
 - (D) determine the impact of technology on careers of personal interest; and
 - (E) identify entrepreneurial opportunities within a field of personal interest.
- (3) The student analyzes college and career opportunities. The student is expected to:
- (A) determine academic requirements for transition from one learning level to the next;
 - (B) explore opportunities for earning college credit in high school such as advanced placement courses, International Baccalaureate courses, dual credit, and local and statewide articulated credit;
 - (E) demonstrate decision-making skills related to school and community issues, programs of study, and career planning; and
- (4) The student evaluates skills for personal success. The student is expected to:
- (C) use a problem-solving model and critical-thinking skills to make informed decisions;
 - (E) effectively use information and communication technology tools; and
 - (F) identify skills that can be transferable among a variety of careers.
- (6) The student demonstrates an understanding of personal financial management. The student is expected to:
- (A) compare the advantages and disadvantages of different types of banking services;
 - (B) simulate opening and maintaining different types of bank accounts;
 - (C) simulate different methods of withdrawals and deposits; and
- (8) The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to:
- (A) complete actual or virtual labs to simulate the technical skills required in various occupations; and
 - (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.



TEKS: Career Portals

- (1) The student explores one or more career clusters of interest. The student is expected to:**
 - (A) identify the various career opportunities within one or more career clusters; and**
 - (B) identify the pathways within one or more career clusters.**
- (2) The student explores pathways of interest within one or more career clusters. The student is expected to:**
 - (A) investigate career opportunities within the pathways;**
 - (B) explore careers of personal interest;**
 - (C) research the academic requirements for careers of personal interest;**
 - (D) research the certification or educational requirements for careers of personal interest; and
 - (E) describe the technical-skill requirements for careers of personal interest.
- (3) The student explores programs of study. The student is expected to:**
 - (A) compare levels of education for careers of personal interest;**
 - (B) identify the academic and technical skills needed; and**
 - (C) develop a personal program of study for at least one career.
- (4) The student explores the professional skills needed for college and career success. The student is expected to:**
 - (A) articulate the importance of strong academic skills to meet personal academic and career goals;
 - (B) explore the importance of curricular, extracurricular, career preparation, and extended learning experiences;
 - (C) develop a personal six- or eight-year achievement plan that incorporates rigorous academic and relevant enrichment courses;
 - (D) explore the steps required to participate in a variety of career and educational opportunities, including, but not limited to, entry-level employment, military service, apprenticeships, community and technical colleges, and universities;
 - (E) identify professional associations affiliated with a specified program of study;
- (6) The student explores labor market information. The student is expected to:**
 - (A) analyze national, state, regional, and local labor market information;
 - (B) cite evidence of high-skill, high-wage, or high-demand occupations based on analysis of labor market information; and



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Texas Essential Knowledge and Skills (TEKS)
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Blooms (Taxonomy):

X	Knowledge: arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce state.
X	Comprehension: classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate
X	Application: apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write.
X	Analysis: analyze, appraise, calculate, categorize, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.
X	Synthesis: arrange, assemble, collect, compose, construct, create, design, develop, formulate, manage, organize, plan, prepare, propose, set up, write.
X	Evaluation: appraise, argue, assess, attach, choose compare, defend estimate, judge, predict, rate, core, select, support,

Instructional Strategies:

X	Identifying similarities and differences
X	Summarizing and note taking
X	Reinforcing effort and providing recognition
	Homework and practice
X	Nonlinguistic representations
X	Cooperative learning
X	Setting objectives and providing feedback
X	Generating and testing hypotheses
X	Cues, questions, and advanced organizers