

HIGH SCHOOL



Utah State
Board of
Education

Teaching
and
Learning

Family Guide to Student Success

Families are important partners in achieving the Utah State Board of Education’s vision that “each student is prepared to succeed and lead by having knowledge and skills to learn, engage civically, and lead meaningful lives.” The purpose of this document is to help families better understand what their children should learn, when a child may need more help or when a child would benefit from extra challenges. By using these resources, you may find more ways to advance your child’s learning at home while encouraging growth in their communication, critical thinking and problem solving skills.

ENGLISH LANGUAGE ARTS

Essential Learning: ENGLISH LANGUAGE ARTS

9TH AND 10TH GRADE STUDENTS CAN:

- Analyze grade-level literature and informational texts by citing and inferring from textual evidence.
- Determine the theme or main idea of grade-level text and analyze its development over the entirety of the text.
- Provide an objective summary of grade-level text.
- Clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, prefixes and roots.
- Evaluate the effectiveness of how an author structures a text and how this structure enhances textual meaning.
- Evaluate an argument and specific claims from multiple sources and evaluate whether the evidence is relevant and sufficient. Identify false statements and claims.

(Continued from Essential Learning: ENGLISH LANGUAGE ARTS)

- Use the writing process to compose well-organized argumentative, informative and narrative pieces using appropriate grammar, conventions and style.
- Conduct short and more sustained research projects to answer a question or solve a problem.
- Participate in conversations and collaborations with peers about a variety of topics using grade-level appropriate text and vocabulary.

11TH AND 12TH GRADE STUDENTS CAN:

- Analyze grade-level literature and informational texts by citing and inferring from textual evidence.
- Determine two or more themes or main ideas of grade-level text and analyze their development over the text's entirety.
- Provide an objective summary of grade-level text.
- Clarify the meaning of unknown and multiple-meaning words and phrases.
- Analyze the impact of authors' and speakers' specific word choices on meaning, tone and mood.
- Compare the effectiveness of the structures of multiple texts about similar topics or themes.
- Evaluate an argument and specific claims from multiple sources and evaluate whether the evidence is relevant, sufficient and valid.
- Use the writing process to compose well-organized and coherent argumentative, informative and narrative pieces on complex topics or themes using appropriate grammar and conventions.
- Conduct short and more sustained research projects using multiple sources to answer a question or solve a problem.
- Participate in conversations and collaborations with peers about a variety of topics using grade-level appropriate text and vocabulary.

Link to the **English Language Arts** Core Standards:

[Link to the new ELA Standards coming soon!](#)

Home-to-School Connections: ENGLISH LANGUAGE ARTS

9TH AND 10TH GRADE STUDENTS

- Share books and articles with your teen about their favorite topics and hobbies. Have conversations about what they read.
- Read current events together; contrast what you have read with the information shown via TV/cable news or social media. Ask them to distinguish between facts and opinions.
- If your teen is interested in journalism, photography, creative writing or debate, encourage them to sign up for the school newspaper, yearbook, literary magazine or debate club/class.

(Continued from Home-to-School Connections: ENGLISH LANGUAGE ARTS)

11TH AND 12TH GRADE STUDENTS

- Give your teen the opportunity to choose their own reading material. Ask them to share their thoughts about what they are reading.
- Suggest that your teen conduct research on topics, issues and questions that interest them. They may want to write a letter to an elected official calling for change or voicing their support.
- Encourage your teen to self-advocate in the classroom when issues or questions about an assignment arise by speaking to their teachers or composing an email.

FINE ARTS

Essential Learning: DANCE

DANCE: LEVELS 1, 2, 3

- **Create:** Improvise. Apply choreographic devices and dance structures to compose original dances with artistic intent. Revise choreography based on self-reflection and feedback.
- **Perform:** Perform the elements of dance (awareness of space, shapes, locomotor and non-locomotor movement, energy qualities and degrees, body parts, time). Evaluate personal healthful practices in dance including nutrition and injury prevention.
- **Respond:** Identify movements when watching and doing. Use basic dance terminology to describe movement. Describe movement from a culture or genre. Describe why a dance is artistic.
- **Connect:** Identify emotions when watching a dance and connect it to personal life and personal views. Demonstrate movement of a specific topic. Find relationship between dance and culture, historical period, society or community. Connect to visual art. Connect to other Core content.

Essential Learning: MEDIA ARTS

MEDIA ARTS: LEVELS 1, 2, 3

- **Create:** Conceptualize, generate, develop, and organize ideas and work. Complete and refine media art works.
- **Present:** Analyze, interpret, refine and select artistic work for presentation. Convey meaning in the way the art is presented.
- **Respond:** Understand, evaluate and articulate how works of art convey meaning for the observer and the creator.
- **Connect:** Relate artistic skills, ideas, and work with personal meaning and external context.

Essential Learning: MUSIC

GENERAL

- **Create:** Generate simple rhythmic and melodic ideas and phrases.
- **Perform:** Demonstrate an understanding of music elements through observation of a live or recorded performance.
- **Respond:** Identify and discuss how musical elements work to express meaning.
- **Connect:** Experience how music connects us to history, culture, heritage, community and to other academic subjects.

INSTRUMENTAL: LEVELS 1, 2, 3

- **Create:** Improvise/generate and respond to simple melodic ideas and phrases.
- **Perform:** Develop fluency in technical performance skills.
- **Respond:** Consider how the use of music elements helps predict the composer's intent.
- **Connect:** Examine how music relates to personal development and enjoyment of life.

CHOIR: LEVELS 1, 2, 3

- **Create:** Sing "call and response" musical phrases.
- **Perform:** Demonstrate technical performance skills by singing correct pitches and rhythms with appropriate tone.
- **Respond:** Consider how the use of music elements helps predict the composer's intent.
- **Connect:** Examine how music relates to personal development and enjoyment of life.

THEORY/COMPOSITION

- **Create:** Generate rhythmic, melodic and harmonic phrases.
- **Perform:** Identify and implement strategies for improving the technical accuracy and expressive aspects of works.
- **Respond:** Consider how the use of music elements helps predict the composer's intent.
- **Connect:** Examine how music relates to personal development and enjoyment of life.

Essential Learning: THEATRE

THEATRE: LEVELS 1, 2, 3

- **Create:** Use correct form and structure to create a scene or play with a beginning, middle and end that includes full character development, believable dialogue and logical plot outcomes.

(Continued from Essential Learning FINE ARTS: THEATRE)

- **Perform:** Interpret the character, setting and essential events in a story or script that make up the dramatic structure in a drama/theatre work. Use body and voice to communicate meaning.
- **Respond:** Formulate understanding and appreciation of a drama/theatre work by considering its specific and intended purpose.
- **Connect:** Examine historical and contemporary social, cultural or global issues through different forms of theatre work.

Essential Learning: VISUAL ARTS

VISUAL ARTS: LEVELS 1, 2, 3

- **Create:** Generate artistic work with personal meaning by conceptualizing, organizing and completing artistic ideas. Refine original work through persistence, reflection and evaluation. Write an artist statement.
- **Present:** Develop skills and concepts to refine artistic work for presentation by analyzing and evaluating methods for preparing and presenting art.
- **Respond:** Evaluate and articulate how works of art convey meaning for the observer as well as the creator.
- **Connect:** Relate artistic skills, ideas, and work with personal meaning and external context.

Link to the Utah **Fine Arts** Core Standards:

<https://www.schools.utah.gov/file/d1fde2c5-7463-4892-9d23-8584924537a7>

Utah Arts and Museums Parent Community Handbook:

https://artsandmuseums.utah.gov/wp-content/uploads/2019/04/parent-community-handbook-insides_2PRESS.pdf

Home-to-School Connections: FINE ARTS

- **Provide materials to create:**
 - Old clothes and hats for costumes.
 - Space for creating dance, music, theatre, and visual art.
 - Stage areas.
 - Props, musical instruments, puppets, art supplies, filming equipment, etc.
- **Use arts for parties and celebrations:**
 - Go to a live arts performance.
 - Use a handheld video camera and create art.
 - Go to museums.
 - Gather art supplies and make a mural.
- **Consider a variety of arts activities:**
 - Organize performances and arts activities.
 - Support individual arts development.
 - Encourage individual practice.
 - Create homemade birthday, holiday cards, etc.

(Continued from Home-to-School Connections: FINE ARTS)

- Use a smartphone to make a short video.
- Create a film piece from a storybook.
- Take children to see a variety of films and movies.
- Organize neighborhood field trips.

HEALTH EDUCATION

Essential Learning: HEALTH EDUCATION

- **Health Foundations and Protective Factors of Healthy Self:** Use SMART goal criteria to design and implement a plan for positive lifelong habits. Develop resiliency skills. Communicate personal boundaries and show respect for the boundaries of others. Model strategies to prevent, manage or resolve interpersonal conflict in healthy ways.
- **Mental and Emotional Health:** Apply stress management techniques to a personal stressor. Explore ways to understand, accept and reduce the stigma of mental health disorders. Research risk factors and warning signs of suicide and know how to seek help when needed.
- **Safety and Disease Prevention:** Demonstrate high-quality hands-on CPR, AED, and appropriate first aid. Practice safe online behaviors. Research preventative measures for chronic and infectious health conditions.
- **Substance Abuse Prevention:** Explore risk and protective factors for making healthy decisions about substance use. Evaluate the physical, mental, emotional, social, legal and financial impacts of substance use. Identify community resources available to support individuals impacted by substance abuse and addiction.
- **Nutrition:** Develop lifelong strategies for maintaining nutrition and physical activity. Explain the effects of eating disorders and disordered eating on healthy growth and development. Assess the relationship between food and culture.
- **Human Development:**

Note: Parental consent is required prior to sex education instruction.

Understand the function of reproductive anatomy. Describe the anatomy and physiology of the reproductive system. Describe the benefits of practicing sexual abstinence. Understand the process of conception, pregnancy, practices for a healthy pregnancy, pregnancy prevention, parenting responsibilities and Utah's Newborn Safe Haven Law. Identify common reproductive conditions and diseases including cancers, STIs, and STI prevention and treatment options. Identify accurate and credible sources of information about sexual health. Recognize characteristics of healthy and unhealthy relationships. Recognize harassment, abuse, discrimination, and relationship violence prevention and reporting strategies.-

Link to the full Utah **Health Education** Core Standards:

<https://schools.utah.gov/file/ed906f78-eaf5-44fa-892f-984e28c4c2a7>

Home-to-School Connections: HEALTH EDUCATION

- Discuss the importance of setting and accepting others' personal boundaries. Discuss factors that contribute to one's personal boundaries such as family values and religion.
- Discuss together the importance of seeking help for mental health concerns and when it is necessary seek help for others who having mental health issues, including suicide.
- Discuss your family values and expectations around substance use and consequences of decisions.
- Talk with your child about the importance of abstaining from sexual activity and how to report harassment or sexual assault.

MATHEMATICS EDUCATION

Essential Learning: MATHEMATICS

- **STANDARDS FOR MATHEMATICAL PRACTICE** describe the mathematical habits of mind that teachers should seek to develop in their students. Students become mathematically proficient in engaging with mathematical content and concepts as they learn, experience and apply these skills and attitudes.

Students will:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

9TH-12TH GRADE STANDARDS FOR MATHEMATICS

The Utah Core Standards for Mathematics describe the significant areas of learning and should be developed in tandem with the Standards for Mathematical Practice.

In grades nine through 12, students will build their mathematical understanding.

Students will:

- Create, interpret, manipulate and solve algebraic equations.
- Understand, compare and represent functions (defined by rates of change, multiple representations and building functions).
- Describe characteristics of functions (definition of a functions, transformations, features of functions).
- Understand, apply and prove congruence and similarity as defined in terms of geometric transformations.

(Continued from MATHEMATICS)

Link to the full Utah **Mathematics** Core Standards

<https://www.schools.utah.gov/curr/mathematics/core?mid=4514&tid=1>

Major work of the Grade Secondary Mathematics I

<https://www.schools.utah.gov/file/ebcf5ee5-fb78-449e-ac39-2df081f7cd72>

Major work of the Grade Secondary Mathematics II

<https://www.schools.utah.gov/file/b7ae7b8b-40f1-40ae-9e30-3eb99b5c4cc3>

Major work of the Grade Secondary Mathematics III

<https://www.schools.utah.gov/file/6809fc86-7df4-484c-8b9b-1078ee9401e0>

Home-to-School Connections: MATHEMATICS

Families of Utah Secondary Mathematics student(s) are in a unique position to show the value and importance of deep mathematical thinking.

- Encourage your student to play mathematical puzzles and games.
- Encourage your student to take mathematical risks and find value in the learning process by honoring the logic in student(s) thinking even when the answer is incorrect.
- Associate mathematical success with flexibility with numbers—not speed.
- Allow your student to build his/her/their own mathematical identity by remaining neutral when mathematical topics come up in conversation.
- Encourage and model number sense and flexibility through everyday mathematical reasoning (use mental mathematics to figure out: the money you will save on a sale at a store, how long you can drive on a tank of gas during a road trip, how to efficiently double a recipe's ingredients, talking about the mathematical representation of a thrown or kicked ball's trajectory, etc.).
- Encourage a growth mindset by understanding that all students have unlimited mathematical potential and that mathematical achievement involves working hard and taking risks.
- Understand that mathematical proficiency is more than fact fluency and recall; it includes five interwoven components: adaptive reasoning, strategic competence, conceptual understanding, productive disposition and procedural fluency. (Kilpatrick, et. al, 2001)

Adapted from Advice for Parents

<https://www.youcubed.org/wp-content/uploads/2017/03/Parent-Night-Handout-vF-1-2.pdf>

References

Kilpatrick, J., Swafford, J., Findell, B., & National Research Council (U.S.). (2001). *Adding it up: Helping children learn mathematics*. Washington, DC: National Academy Press.

PHYSICAL EDUCATION

Essential Learning: PHYSICAL EDUCATION

FITNESS FOR LIFE

- **Motor Skills and Movement Patterns:** Participate in and demonstrate proficiency in two or more lifetime activities that promote health-related fitness.
- **Attain Efficient Movement and Performance:** Identify concepts, including terminology, regarding the structure and function of the human body and safe exercise practices.
- **Components to Maintain Health and Fitness:** Design and implement a fitness plan that includes:
 - The five components of fitness (body composition, flexibility, muscular strength, muscular endurance and cardiorespiratory endurance)
 - Adaptations related to aging
 - Overload, progression, specificity and reversibility
 - Frequency, intensity, time and type (FIIT)
 - Nutritional plan, including snacks and hydration
- **Develop Cooperative Skills:** Identify appropriate risks and safety factors in the selection of fitness activities and the precautions to take during training. Identify benefits and dangers to various dietary supplements, understand the effects of weight loss and weight gain on personal health, and develop a healthy self concept.
- **Personal Value of Physical Activity:** Analyze the mental, social and psychological health benefits of a self-selected physical activity.

INDIVIDUAL LIFETIME ACTIVITIES

- **Motor Skills and Movement Patterns:** Participate in and demonstrate proficiency in three or more lifetime activities such as dance, outdoor recreation, net games, aquatics or individual performance activities.
- **Attain Efficient Movement and Performance:** Participate in a number of individual activities demonstrating advanced strategies and rules.
- **Components to Maintain Health and Fitness:** Use measures such as blood pressure, heart rate, body mass, pedometers, rates of perceived exertion or pacing to assess and track activity readiness. Explain how age affects activity performance and strategies for a life-long fitness plan. List the benefits of activity and proper nutrition for a life-long healthy lifestyle. Explain how physical activity increases longevity and quality of life through stress reduction.
- **Develop Cooperative Skills:** Accept differences between personal characteristics and body image. Understand the role the media can portray in unrealistic body image and athletic eliteness.
- **Personal Value of Physical Activity:** Participate in lifetime activities that are personally relevant.

(Continued from Essential Learning: PHYSICAL EDUCATION)

PARTICIPATION, SKILLS AND TECHNIQUES

- **Motor Skills and Movement Patterns:** Demonstrate individual competency in one or more cardiovascular and strength training skills that promote health-related fitness.
- **Attain Efficient Movement and Performance:** Participate in a number of individual and team activities, demonstrating strategies and rules.
- **Components to Maintain Health and Fitness:** Analyze and compare health and fitness benefits from participation in a variety of activities, including how to calculate and apply target heart rate. Describe how proper nutrition and exercise are necessary for a lifelong healthy lifestyle.
- **Develop Cooperative Skills:** Exhibit proper etiquette, respect for others, and teamwork while engaging in physical activity and/or social dance.
- **Personal Value of Physical Activity:** Analyze the mental, social, and psychological health benefits of a self-selected physical activity.

Link to the full Utah **Physical Education** Core Standards

<https://www.schools.utah.gov/file/6192280d-2ab2-4ff1-b5dd-a9c2f95c1b11>

Home-to-School Connections: PHYSICAL EDUCATION

FITNESS FOR LIFE

- Plan time to be physically active together, this could be at a recreation center, outdoors or in the home.
- Create a fitness and nutritional plan at home that supports a healthy lifestyle.
- Discuss the benefits and dangers of nutritional supplements. Research the validity of supplements together before purchasing and using them.
- Discuss how physical activity can improve mental and social health.

The Fitness for Life class may **NOT** be substituted for athletic participation as stated in R277-700 and as outlined in the document Physical Education Guidelines at <https://schools.utah.gov/file/58c8b43b-0fea-4632-af17-0d96a16cbb16>.

INDIVIDUAL LIFETIME ACTIVITIES

- Plan time to be physically active together, this could be at a recreation center, outdoors or in the home.
- Discuss how long term healthy eating and physical activity work together in promoting a healthy lifestyle and how aging can impact both.
- Reinforce positive self-talk and the impact the media can have on body image and unrealistic expectations about appearance and performance.
- Share experiences with participation in lifetime activities that are enjoyable.

The Individual Lifetime Activities class has four supplemental standards that may fulfill the graduation requirement. These supplemental courses are: Dance, Outdoor

(Continued from Home-to-School Connections: PHYSICAL EDUCATION)

Recreation, Strength and Conditioning, and Yoga. The standards for these can be found in the Utah Physical Education Core Standards beginning on page 73.

The Individual Lifetime Activities class may be substituted for athletic participation in collaboration with the local education agency and under the guidance of R277-700 as outlined in the document Physical Education Guidelines at <https://schools.utah.gov/file/58c8b43b-0fea-4632-af17-0d96a16cbb16>.

PARTICIPATION, SKILLS AND TECHNIQUES

- Plan time to exercise together, both for cardiovascular health and strength training.
- Discuss how long term healthy eating and physical activity work together in promoting a healthy lifestyle.
- Model respect for others during games, physical activities, and viewing sporting events.
- Talk about the benefits of physical activity to mental health.

This Participation, Skills and Techniques class may be substituted for athletic participation in collaboration with the local education agency and under the guidance of R277-700 as outlined in this document: Physical Education Guidelines at <https://schools.utah.gov/file/58c8b43b-0fea-4632-af17-0d96a16cbb16>

SCIENCE

Essential Learning: BIOLOGY

- **INTERACTIONS WITH ORGANISMS AND THE ENVIRONMENT:**
 - **Plan and carry out an investigation to analyze and interpret data** to determine how biotic and abiotic factors can affect the stability and change of a population.
 - **Develop and use a model** to explain cycling of matter and flow of energy among organisms in an ecosystem.
 - **Analyze and interpret data** to determine the effects of photosynthesis and cellular respiration on the scale and proportion of carbon reservoirs in the carbon cycle.
 - **Develop an argument from evidence** for how ecosystems maintain relatively consistent numbers and types of organisms in stable conditions.
 - **Design a solution** that reduces the impact caused by human activities on the environment and biodiversity.
- **STRUCTURE AND FUNCTION OF LIFE:**
 - **Construct an explanation** based on evidence that all organisms are primarily composed of carbon, hydrogen, oxygen, and nitrogen, and that the matter

(Continued from Essential Learning SCIENCE: BIOLOGY)

taken into an organism is broken down and recombined to make macromolecules necessary for life functions.

- **Ask questions to plan and carry out an investigation** to determine how (a) the structure and function of cells, (b) the proportion and quantity of organelles and (c) the shape of cells result in cells with specialized functions.
- **Develop and use a model** to illustrate the cycling of matter and flow of energy through living things by the processes of photosynthesis and cellular respiration.
- **Plan and carry out an investigation** to determine how cells maintain stability within a range of changing conditions by the transport of materials across the cell membrane.
- **Construct an explanation** about the role of mitosis in the production, growth, and maintenance of systems within complex organisms.
- **Ask questions to develop an argument** for how the structure and function of interacting organs and organ systems, that make up multicellular organisms, contribute to homeostasis within the organism.
- **Plan and carry out an investigation** to provide evidence of homeostasis and that feedback mechanisms maintain stability in organisms.

■ **GENETIC PATTERNS:**

- **Construct an explanation** for how the structure of DNA is replicated, and how DNA and RNA code for the structure of proteins which regulate and carry out the essential functions of life and result in specific traits.
- **Use computational thinking** and patterns to make predictions about the expression of specific traits that are passed in genes on chromosomes from parents to offspring.
- **Engage in argument from evidence** that inheritable genetic variation is caused during the formation of gametes.
- **Plan and carry out an investigation** and **use computational thinking** to explain the variation and patterns in distribution of the traits expressed in a population.
- Evaluate **design solutions** where biotechnology was used to identify and/or modify genes in order to solve (effect) a problem.

■ **EVOLUTIONARY CHANGE:**

- **Obtain, evaluate and communicate information** to identify the patterns in the evidence that support biological evolution.
- **Construct an explanation** based on evidence that natural selection is a primary cause of evolution.
- **Analyze and interpret data** to identify patterns that explain the claim that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.
- **Engage in argument from evidence** that changes in environmental conditions may cause increases in the number of individuals of some species,

(Continued from Essential Learning SCIENCE: BIOLOGY)

the emergence of new species over time, and/or the extinction of other species.

- Evaluate **design solutions** that can best solve a real-world problem caused by natural selection and adaptation of populations.

Link to the full **Utah Science with Engineering Education (SEEd)** Core Standards <https://www.schools.utah.gov/file/f4cb6568-bb85-4908-a1f6-45feb98b9ebc>

Home-to-School Connections: BIOLOGY

- Go on a hike or visit an area that has not been developed by humans to estimate what percentage of living things are plants, herbivores (animals that eat only plants), or predators (animals that eat animals). Build a food web for the area.
- Plan and carry out an investigation to build a terrarium in a sealed container that contains all the right type and number of organisms to survive for several weeks/months.
- Obtain information about Henrietta Lacks and why her cells are still living today when she passed away more than 50 years ago.
- Look for patterns in different heritable traits between family members, using pictures if necessary, to track how genes are passed in families.
- Investigate an invasive species found in Utah (zebra mussels, phragmites or other) and see how it has affected an area(s) near your home.

Essential Learning: CHEMISTRY

- **THE STRUCTURE AND PROPERTIES OF ATOMS:**
 - **Obtain, evaluate and communicate information** regarding the structure of the atom on the basis of experimental evidence.
 - **Analyze and interpret data** to identify patterns in the stability of isotopes and predict likely modes of radioactive decay.
 - **Use mathematics and computational thinking** to relate the rates of change in quantities of radioactive isotopes through radioactive decay (alpha, beta and positron) to ages of materials or persistence in the environment.
 - **Construct an explanation** about how fusion can form new elements with greater or lesser nuclear stability.
 - **Use** the periodic table as **a model** to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.
- **THE STRUCTURE AND PROPERTIES OF MOLECULES:**
 - **Analyze data** to predict the type of bonding most likely to occur between two elements using the patterns of reactivity on the periodic table.
 - **Plan and carry out an investigation** to compare the properties of substances at the bulk scale and relate them to molecular structures.

(Continued from Essential Learning SCIENCE: CHEMISTRY)

- **Engage in argument supported by evidence** that the functions of natural and designed macromolecules are related to their chemical structures.
 - Evaluate **design solutions** where synthetic chemistry was used to solve a problem (cause and effect).
- **STABILITY AND CHANGE IN CHEMICAL SYSTEMS:**
- **Use mathematics and computational thinking** to analyze the distribution and proportion of particles in solution.
 - **Analyze data** to identify patterns that assist in making predictions of the outcomes of simple chemical reactions.
 - **Plan and carry out an investigation** to observe the change in properties of substances in a chemical reaction to relate the macroscopically observed properties to the molecular level changes in bonds and the symbolic notation used in chemistry.
 - **Use mathematics and computational thinking** to support the observation that matter is conserved during chemical reactions and matter cycles.
 - **Develop solutions** related to the management, conservation and utilization of mineral resources (matter).
 - **Construct an explanation** using experimental evidence for how reaction conditions affect the rate of change of a reaction.
 - **Design a solution** that would refine a chemical system by specifying a change in conditions that would produce increased or decreased amounts of a product at equilibrium.
 - **Obtain, evaluate and communicate information** regarding the effects of designed chemicals in a complex real-world system.
- **ENERGY IN CHEMICAL SYSTEMS:**
- **Construct an argument from evidence** about whether a simple chemical reaction absorbs or releases energy.
 - **Construct an explanation** of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.
 - **Design** a device that converts energy from one form into another to solve a problem.
 - **Use models** to describe the changes in the composition of the nucleus of the atom during nuclear processes, and compare the energy released during nuclear processes to the energy released during chemical processes.
 - **Develop an argument from evidence** to evaluate a proposed solution to societal energy demands based on prioritized criteria and trade-offs that account for a range of constraints that could include cost, safety, reliability, as well as possible social, cultural and environmental impacts.

Link to the full **Utah Science with Engineering Education (SEEd)** Core Standards
<https://www.schools.utah.gov/file/f4cb6568-bb85-4908-a1f6-45feb98b9ebc>

Home-to-School Connections: CHEMISTRY

- Watch a documentary or read an article about the “Radium Girls” to identify the effects of radioactive materials on humans and why it took so long to identify the effects they were having.
- Investigate and explain why some household substances can dissolve in water and others cannot.
- Obtain and evaluate information to explain why salt is added on roads and sidewalks to melt snow. Identify other things that could affect the rate that snow melts.
- Investigate how hard water buildup (white substance on showers, sinks and faucets) are affected by soaking them in vinegar. Obtain, evaluate and communicate information about what causes hard water to build up, what hard water buildup is made of and what vinegar contains that affects it.
- Identify the materials inside chemical hand warmers or cold packs and investigate what causes them to change temperature.

Essential Learning: EARTH AND SPACE SCIENCE

■ MATTER AND ENERGY IN SPACE:

- **Develop a model** based on evidence to illustrate the life span of the sun and the role of nuclear fusion releasing energy in the sun’s core.
- **Construct an explanation** of the Big Bang theory based on astronomical evidence of electromagnetic radiation, motion of distant galaxies and composition of matter in the universe.
- **Develop a model** to illustrate the changes in matter occurring in a star’s life cycle.
- **Design a solution** to a space exploration challenge by breaking it down into smaller, more manageable problems that can be solved through the structure and function of a device.

■ PATTERNS IN EARTH’S HISTORY AND PROCESSES:

- **Analyze and interpret data** to construct an explanation for the changes in Earth’s formation and 4.6 billion year history.
- **Develop and use a model** based on evidence of Earth’s interior and describe the cycling of matter by thermal convection.
- **Construct an explanation** for how plate tectonics results in patterns on Earth’s surface. Emphasize past and current plate motions.
- **Develop and use a model** to illustrate how Earth’s internal and surface processes operate at different spatial and temporal scales.
- **Engage in argument from evidence** for how the simultaneous coevolution of Earth’s systems and life on Earth led to periods of stability and change over geologic time.
- Evaluate **design solutions** that reduce the effects of natural disasters on humans.

(Continued from Essential Learning: EARTH AND SPACE SCIENCE)

- **SYSTEM INTERACTIONS: ATMOSPHERE, HYDROSPHERE AND GEOSPHERE:**
 - **Plan and carry out an investigation** of the properties of water and its effects on Earth materials and surface processes.
 - **Construct an explanation** of how heat (energy) and water (matter) move throughout the oceans causing patterns in weather and climate.
 - **Construct an explanation** for how energy from the sun drives atmospheric processes and how atmospheric currents transport matter and transfer energy.
 - **Analyze and interpret patterns in data** about the factors influencing weather of a given location.
 - **Develop and use** a quantitative **model** to describe the cycling of carbon among Earth's systems.
 - **Analyze and interpret data** from global climate records to illustrate changes to Earth's systems throughout geologic time and make predictions about future variations using modern trends.
 - **Engage in argument from evidence** to support the claim that one change to Earth's surface can create climate feedback loops that cause changes to other systems.

- **STABILITY AND CHANGE IN NATURAL RESOURCES:**
 - **Construct an explanation** for how the availability of natural resources, the occurrence of natural hazards, and changes in climate affect human activity.
 - **Use computational thinking** to explain the relationships between the sustainability of natural resources and biodiversity within Earth systems.
 - Evaluate **design solutions** for developing, managing and utilizing energy and mineral resources based on cost-benefit ratios on large and small scales.
 - Evaluate **design solutions** for a major global or local environmental problem based on one of Earth's systems.

Link to the full **Utah Science with Engineering Education (SEEd)** Core Standards
<https://www.schools.utah.gov/file/f4cb6568-bb85-4908-a1f6-45feb98b9ebc>

Home-to-School Connections: EARTH AND SPACE SCIENCE

- All stars appear to twinkle in the night sky; on a clear night, look for patterns in the colors you see in each star. Then use a star identification app to identify the star and its properties to explain why it looks the way it does.
- Use a program like Google Earth to identify different volcanoes around the globe and look for patterns and what may cause them to form in each location.
- Investigate one of the times that a container of floating objects like toys or shoes fell off a ship and where those floating objects moved around the ocean. Compare that movement to the known ocean surface currents.

(Continued from Home-to-School Connections: EARTH AND SPACE SCIENCE)

- Observe the color of the sky at sunrise, mid-day, sunset and night; and obtain information to explain the colors that can be observed at those times.
- Obtain information about water availability over the past ten to 100 years. Identify what is causing the changes to occur.
- Many necessary minerals are mined in Utah; obtain information about what materials are mined in Utah, their uses and why they are found in Utah.

Essential Learning: PHYSICS

■ FORCES AND INTERACTIONS:

- **Analyze and interpret data** to determine the cause and effect relationship between the net force on an object and its change in motion as summarized by Newton's Second Law of Motion.
- **Use mathematics and computational thinking** to support the claim that the total momentum of a system is conserved when there is no net force acting on the system.
- **Design a solution** that has the function of minimizing the impact force on an object during a collision.

■ ENERGY:

- **Analyze and interpret data** to track and calculate the transfer of energy within a system.
- **Plan and conduct an investigation** to provide evidence that the transfer of thermal energy—when two components of different temperatures are combined within a closed system—results in a more uniform energy distribution among the components in the system.
- **Develop and use models** on the macroscopic scale to illustrate that energy can be accounted for as a combination of energies associated with the motion of objects and energy associated with the relative positions of objects.
- **Design a solution** by constructing a device that converts one form of energy into another form of energy to solve a complex real-life problem.
- **Design a solution** to a major global problem that accounts for societal energy needs and wants.

■ FIELDS

- **Use mathematics and computational thinking** to compare the scale and proportion of gravitational and electric fields using Newton's Law of Gravitation and Coulomb's Law.
- **Plan and conduct an investigation** to provide evidence that an electric current causes a magnetic field and that a changing magnetic field causes an electric current.
- **Analyze and interpret data** to compare the effect of changes in position of interacting objects on electric and gravitational forces and energy.
- **Develop and use a model** to evaluate the effects on a field as characteristics of its source and surrounding space are varied.

(Continued from Essential Learning SCIENCE: PHYSICS)

■ WAVES:

- **Analyze and interpret data** to derive both qualitative and quantitative relationships based on patterns observed in frequency, wavelength and speed of waves traveling in various media.
- **Engage in argument based on evidence** that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations, one model better explains interactions within a system than the other.
- **Evaluate information** about the effects that different frequencies of electromagnetic radiation have when absorbed by biological materials.
- **Ask questions and construct an explanation** about the stability of digital transmission and storage of information and their impacts on society.
- **Obtain, evaluate and communicate information** about how devices use the principles of electromagnetic radiation and their interactions with matter to transmit and capture information and energy.

Link to the full **Utah Science with Engineering Education (SEEd)** Core Standards
<https://www.schools.utah.gov/file/f4cb6568-bb85-4908-a1f6-45feb98b9ebc>

■ Home-to-School Connections: PHYSICS

- Most people use a phone case to protect their phone if it falls. Investigate the properties of an effective phone case that help minimize damage after a fall.
- Investigate what happens to a sealed bag of air when placed in colder or hotter temperatures and explain why the changes occur.
- On a clear night with limited light pollution, identify satellites orbiting Earth; plan and carry out an investigation to measure how fast they are moving to estimate how far or close to Earth they are.
- When a balloon is filled with air and tied, it can be charged by rubbing it on someone's hair or a cloth. Using a charged balloon, identify the charges of other objects as they either attract or repel the balloon.
- In a thunderstorm, use your understanding of light and sound waves to determine if the storm is moving toward you or away from you.

SOCIAL STUDIES

■ Essential Learning: WORLD GEOGRAPHY (9th–10th)

Students will:

- Describe the significant forces that influence the physical environment, such as plate tectonics, erosion, climate, and natural disasters, and explain how the effects of physical processes vary across regions of the world.
- Use geographic reasoning to propose actions that mitigate or solve issues, such as natural disasters, pollution, climate change and habitat loss.

(Continued from Essential Learning SOCIAL STUDIES: WORLD GEOGRAPHY)

- Investigate the effects of significant patterns of human movement that shape urban and rural environments over time, such as mass urbanization, immigration and the movement of refugees.
- Identify and describe the essential defining characteristics and functions of culture.
- Explain how cooperation and conflict have many causes, such as differing ideas regarding boundaries, resource control and land use, as well as ethnic, tribal and national identities.
- Describe and compare the function and distribution of economic activities in primary, secondary and tertiary sectors.

Utah Core Standards for **Social Studies** Grades 7 through 12

<https://www.schools.utah.gov/file/4a897eb8-f6c6-4025-8b7e-6666f10a8dec>

Home-to-School Connections: WORLD GEOGRAPHY

- World geography is the study of physical and human characteristics of the Earth's people, places and environments. Students will develop geographic thinking skills by studying the "why of where" as they examine the interactions, interconnections and implications of forces shaping our world today.
- Civic engagement is one of the fundamental purposes of education, and geographically-informed students can better participate in their communities and the world in a responsible, informed and civically minded way. The skills and habits of mind that students develop as they study the world through geography will nurture their sense of citizenry, as well as civic and global awareness.
- Of particular importance in a geography course is developing the skill of asking geographic questions. Geography students use evidence to make inferences about the interconnections and interactions between people and places. They also use spatial thinking to identify patterns and processes occurring at various scales.
- Students should also have opportunities to develop and demonstrate values that sustain America's democratic republic, such as open-mindedness, engagement, honesty, problem-solving, responsibility, diligence, resilience, empathy, self-control and cooperation, many referenced in the Utah Portrait of a Graduate at <https://schools.utah.gov/file/bccb96eb-e6a6-47cf-9745-cf311675ad8b>.

Essential Learning: WORLD HISTORY (9th–10th)

Students will:

- Use geographic concepts to explain the factors that led to the development of civilization, and compare and contrast the environmental impact of civilizations, pastoralists and hunter-gatherers.
- Identify and explain patterns in the development and diffusion and syncretism of world religions and philosophies, including Judaism, Hinduism, Greek philosophy, Confucianism, Buddhism, Christianity and Islam.

(Continued from Essential Learning SOCIAL STUDIES: WORLD HISTORY)

- Evaluate historians' interpretations regarding the patterns in the development of civilizations in the Americas compared to other places in the world.
- Compile and corroborate primary sources as evidence to explain the impact of global exchange and colonization.
- Identify the key ideas and characteristics of current political, economic, and intellectual revolutions such as a contemporary revolution, a social movement or an independence movement.
- Make a case for the most significant social, political and economic consequences of 20th century global conflicts and crises, such as human migration, genocide, poverty, epidemics, the creation of social welfare systems, the rise of dictators, the nuclear arms race and human rights violations.
- Identify a pressing global problem and select the most promising political, technological, medical or scientific advances being created to address those problems

Utah Core Standards for **Social Studies** Grades 7 through 12

<https://www.schools.utah.gov/file/4a897eb8-f6c6-4025-8b7e-6666f10a8dec>

Home-to-School Connections: WORLD HISTORY

- One of the fundamental purposes for public schools is the preparation of young people for civic engagement in solving local and global problems, and world history classrooms are an ideal location to foster civic virtue, consider current issues, learn how to act civilly toward others, and build a civic identity and an awareness of global issues.
- Your student should have ample opportunities to engage in deliberative, collaborative and civil dialogue regarding historical and current issues.
- Your student should be able to identify national and international problems, engage with solutions to these problems, and share their ideas with appropriate public and/or private stakeholders.
- Your student should also have opportunities to develop and demonstrate values that sustain America's democratic republic, such as open-mindedness, engagement, honesty, problem-solving, responsibility, diligence, resilience, empathy, self-control and cooperation, many referenced in the Utah Portrait of a Graduate at <https://schools.utah.gov/file/bccb96eb-e6a6-47cf-9745-cf311675ad8b>.

Essential Learning: U.S. HISTORY II (10th–11th)

Students will:

- Assess how innovations in transportation, science, agriculture, manufacturing, technology, communication and marketing transformed America in the 19th and early 20th centuries.
- Use primary and secondary sources to identify and explain the conditions that led to the rise of reform movements, such as organized labor, suffrage and temperance.

(Continued from Essential Learning SOCIAL STUDIES: U.S. HISTORY II)

- Examine and evaluate the role of the media and propaganda in promoting involvement in foreign affairs, using events such as the Spanish American War and World War I.
- Identify the civil rights objectives held by various groups, assess the strategies used, and evaluate the success of the various civil rights movements in reaching their objectives, paying specific attention to American Indian, women, and other racial and ethnic minorities.
- Investigate how individual and institutional decisions made during the 1920s, such as over-production, buying on credit, poor banking policies and stock market speculation helped lead to the boom of the 1920s and then the Great Depression.
- Cite and compare historical arguments from multiple perspectives regarding the use of “total war” in World War II, focusing on the changing objectives, weapons, tactics and rules of war, such as carpet bombing, civilian targets, the Holocaust, and the development and use of the atom bomb.
- Use evidence to demonstrate how technological developments (such as television and social media), government policies (such as Supreme Court decisions), trends (such as rock ‘n’ roll or environmental conservation), and/or demographic changes (such as the growth of suburbs and modern immigration) have influenced American culture.
- Students will select the most historically significant events of the 21st century and defend their selection.

Link to Utah Core Standards for Grades 7–12 Social Studies

<https://www.schools.utah.gov/file/4a897eb8-f6c6-4025-8b7e-6666f10a8dec>

Home-to-School Connections: U.S. HISTORY II

- United States History II addresses the making of modern America, highlighting the events and issues in United States history from the late Industrial Revolution to modern times. Contextualizing the study of modern America by helping students make connections across the span of U.S. history can enrich and deepen their understanding of their own place in the American story.
- Civic engagement is one of the fundamental purposes of education, and U.S. history classrooms are the ideal locations to foster civic virtue, consider current issues, learn how to act civilly toward others, and build a civic identity and an awareness of global issues.
- Your student should have ample opportunities to engage in deliberative, collaborative and civil dialogue regarding historical and current issues, and share these experiences with you.
- Of particular importance in a United States history course is developing the reading, thinking and writing skills of historians. These skills include the ability to think critically about evidence, use diverse forms of evidence to construct interpretations and defend these interpretations through argumentative historical writing. Students will corroborate their sources of evidence and place their interpretations within historical contexts.

(Continued from Home-to-School Connections SOCIAL STUDIES: U.S.HISTORY II)

- Your student should also have opportunities to develop and demonstrate values that sustain America’s democratic republic, such as open-mindedness, engagement, honesty, problem-solving, responsibility, diligence, resilience, empathy, self-control and cooperation, many referenced in the Utah Portrait of a Graduate at <https://schools.utah.gov/file/bccb96eb-e6a6-47cf-9745-cf311675ad8b>.

Essential Learning: U.S. GOVERNMENT AND CITIZENSHIP (11th–12th)

Students will:

- Explain how documents, challenges, events and ideas such as the rule of law, the social contract, compromise, the Declaration of Independence, the Articles of Confederation, Shays’ Rebellion and the Federalist Papers significantly influenced the United States Constitution.
- Examine various perspectives on a current rights-related issue; take a position; defend that position using the Constitution and Bill of Rights, historical precedents, Supreme Court decisions and other relevant resources; and share that position, when possible, with relevant stakeholders.
- Explain the purpose and importance of fulfilling civic responsibilities, including serving on juries; voting; serving on boards, councils and commissions; remaining well-informed; contacting elected officials; and other duties associated with active citizenship.
- Explain the processes and motivations for how and why people organize to participate in civic society, such as developing political affiliations, joining political parties, and supporting special interest groups and other non-governmental or non-partisan civic organizations, and evaluate the political impact of those affiliations.
- Examine the fiscal decisions governmental agencies must make and the economic philosophies that guide those decisions.
- Propose and defend budget priorities at either the local, state, tribal or federal level; and share their findings with appropriate stakeholders.

Link to Utah Core Standards for Grades 7–12 Social Studies

<https://www.schools.utah.gov/file/4a897eb8-f6c6-4025-8b7e-6666f10a8dec>

Home-to-School Connections: U.S. GOVERNMENT AND CITIZENSHIP (11th–12th)

- The goal of this course is to foster informed, responsible participation in public life. This course should nurture desirable dispositions including a commitment to the American ideals of liberty, equality, opportunity and justice for all.
- Civic engagement is one of the fundamental purposes of education. U.S. government classrooms are the ideal locations to foster civic virtue, consider current issues, learn how to act civilly toward others, and build a civic identity and an awareness of global issues.

(Continued from Home-to-School Connections SOCIAL STUDIES: U.S. GOVERNMENT AND CITIZENSHIP)

- Your student should have ample opportunities to engage in deliberative, collaborative and civil dialogue regarding historical and current issues, and share these experiences with you.
- Your student should also have opportunities to develop and demonstrate values that sustain America's democratic republic, such as open-mindedness, engagement, honesty, problem-solving, responsibility, diligence, resilience, empathy, self-control and cooperation, many referenced in the Utah Portrait of a Graduate at <https://schools.utah.gov/file/bccb96eb-e6a6-47cf-9745-cf311675ad8b>.

PARTNER WITH YOUR CHILD'S TEACHER(S)

Productive relationships between families and teachers are essential to learning. You can facilitate development of a respectful relationship with your child's teacher(s) by:

- Introducing yourself.
- Asking about the best means to communicate effectively regarding your child's learning (for example: emails, notes, phone calls).
- Sharing anything that would be important to consider when planning for your child's learning experiences (for example: strengths, areas for growth, goals and/or any other special considerations).
- Attending parent teacher conferences and identifying ways you can support your child's development, growth and learning.
- Asking your child about what they are learning and reinforcing their learning at home by maintaining focus on the learning process rather than outcomes and celebrating both successes and failures.
- Acknowledging the positive contributions of educators on your child's development, growth and learning.

5Es FOR FAMILIES

To support your child in developing the characteristics found in [Utah's Portrait of a Graduate](#), you will find [Utah's 5Es for Families](#) to be another helpful resource. By using the 5Es for Families, your home environment can support and enrich your child's learning.