

High School (9-12) Science Essential Skills and Concepts

Science as Inquiry (Inquiry)		Earth & Space (Earth)	
#	Description	#	Description
1	Identify questions and concepts that guide scientific investigations.	1	Understand and apply knowledge of Geochemical cycles. Principles include but not limited to:
2	Design and conduct a scientific investigation.	1a	Elements/atoms within Earth reservoirs: Solid Earth, oceans, atmosphere, and organisms
3	Uses technology and mathematics to improve investigations and communications	1b	Movement of elements/atoms between reservoirs
4	Formulates and revises scientific explanations and models using logic and evidence	2	Understand and apply knowledge of origin and evolution of the earth system. Principles include but not limited to:
5	Incorporate mathematics in scientific inquiry	2a	Formation of solar system
6	Think critically and logically to make the relationships between evidence and explanations	2b	Geologic time
7	Recognize and analyze alternative explanations and predictions	2c	Interactions among hydrosphere, lithosphere and atmosphere
8	Communicate and defend procedures and explanations	2d	Life: origin, evolution, and effect on Earth systems
9	Use mathematics in all aspects of scientific inquiry	3	Understand and apply knowledge of origin and evolution of the Universe. Principles include but not limited to:
10	Use appropriate safety procedures when conducting investigations	3a	Age and origin of the universe
		3b	Universe and galaxies
		3c	Star formation
Life Science (Life)		Physical Science (Physical)	
#	Description	#	Description
1	Understand and apply knowledge of the cell. Principles include but not limited to:	1	Understand and apply knowledge of the structure of atoms. Principles include but not limited to:
1a	Structures and functions	1a	Atomic structure
1b	Function and chemical reactions	1b	Atomic nucleus (composition and size)
1c	Cells grow and divide	1c	Isotopes (related to relative mass)
2	Understand and apply knowledge of the molecular basis of heredity. Principles include but not limited to:	1d	Nuclear forces: fission and fusion
2a	DNA, chromosomes, and sexual reproduction	1e	Radioactive isotopes
2b	Basic inheritance patterns	1f	Predictable rates of decay
3	Understand and apply knowledge of biological evolution. Principles include but not limited to:	2	Understand and apply knowledge of the structure and properties of matter
3a	Species evolution	2a	Valence electrons
3b	Natural selection	2b	Chemical bonds
3c	Relations to common ancestor	2c	Periodic table
3d	Biological classification	2d	Periodic trends
4	Understand and apply knowledge of the interdependence of organisms. Principles include but not limited to:	2e	Molecular and ionic structures
4a	Materials cycling	2f	Physical properties of chemical compounds
4b	Energy transformation	2g	States of matter
4c	Organisms interrelationships	2h	Relationship between pressure and volume of gasses
4d	Human modify ecosystems	2i	Hydrocarbon compounds
5	Understand and apply knowledge of interdependence of matter, energy, and organization of living systems. Principles include but not limited to:	3	Understand and apply knowledge of chemical reactions. Principles include but not limited to:
5a	Sunlight energy conversion	3a	Conservation of matter
5b	Limiting factors	3b	Common reactions
5c	Matter and energy flow and conservation	3c	Thermochemistry
6	Understand and apply knowledge of interdependence of the behavior of organisms. Principles include but not limited to:	3d	Types of reactions
6a	Nervous systems and behavior	3e	Acids and bases
6b	The human organism - basic functions	3f	Common reactions in living systems
		3g	Reaction rates and equilibrium
		3h	Motions
		3i	Forces
		3j	Newton's Laws
		4	Understand and apply knowledge of motions and forces. Principles include but not limited to:
		4a	Gravitation
		4b	Mass versus weight
		4c	Electric and magnetic forces
		5	Understand and apply knowledge of energy and increase in disorder. Principles include but not limited to:
		5a	Types of energy
		5b	Energy transformations
		5c	Conservation of energy
		5d	Wave phenomena
		5e	Energy and matter
		5f	Electromagnetic waves

Behavioral Sciences (Behavior) (pg 3)	Economics (pg 13)
# Description	# Description
1 Understand the historical development of the behavioral sciences and the changing nature of society.	1 Understand the function of common financial instruments.
2 Understand the influences on individual and group behavior and group decision making.	2 Understand the role of scarcity and economic trade-offs and how economic conditions impact people's lives.
3 Understand the appropriate research procedures and skills of the behavioral scientist.	3 Understand the functions of economic institutions.
4 Understand current social issues to determine how the individual is able to formulate opinions and respond to those issues.	4 Understand how governments throughout the world influence economic behavior.
5 Understand how social status, social groups, social change, and social institutions influence individual and group behaviors.	5 Understand how universal economic concepts present themselves in various types of economics throughout the world.
6 Understand the process of how humans develop, learn, adapt to their environment, and internalize their culture.	6 Understand the local, state, regional, national, and international factors that create patterns of interdependence in the global economy.
7 Understand how personality and agents of socialization impact the individual.	7 Understand the impact of advancing technologies on the global economy.
Geography (pg 23)	History (pg 31)
# Description	# Description
1 Understand the use of geographic tools to locate and analyze information about people, places, and environments.	1 Understand historical patterns, periods of time and the relationships among these elements.
2 Understand how physical and human characteristics create and define regions.	2 Understand how and why people create, maintain, or change systems of power, authority, and governance.
3 Understand how human factors and the distribution of resources affect the development of society and the movement of populations.	3 Understand the role of culture and cultural diffusion on the development and maintenance of societies.
4 Understand how physical and human processes shape the Earth's surface and major ecosystems.	4 Understand the role of individuals and groups within a society as promoters of change or the status quo.
5 Understand how human actions modify the environment and how the environment affects humans.	5 Understand the effect of economic needs and wants on individual and group decisions.
6 Understand how culture affects the interaction of human populations through time and space.	6 Understand the effects of geographic factors on historical events.
7 Understand how cultural factors influence the design of human communities.	7 Understand the role of innovation on the development and interactions of societies.
	8 Understand cause and effect relationships and other historical thinking skills in order to interpret events and issues.
Political Science/Civic Literacy (Poli Sci)** (pg 43)	
# Description	
1 Understand the rights and responsibilities of each citizen and demonstrate the value of lifelong civic action.	
2 Understand how the government established by the Constitution embodies values and principles of democracy and republicanism.	
3 Understand the purpose and function of each of the three branches of government established by the US Constitution.	
4 Understand the differences among the complex levels of local, state and national government and their inherent, expressed, and implied powers.	
5 Understand strategies for effective political action that impacts local, state and national governance.	
6 Understand how law and public policy are established at the local, state, and national levels of government.	
7 Understand how various political systems throughout the world define the rights and responsibilities of the individual.	
8 Understand the role of the United States in current world affairs.	
**The essentials concepts and skills listed in social studies - Political Science/Civic Literacy are the same as the essential concepts and skills listed in 21st Century Skills - Civic Literacy.	

High School (9-12) Literacy Essential Skills and Concepts

Reading (pg 10)	Writing (pg 46)
# Description	# Description
1 Independently read a significant number of books and texts each year. This includes reading both fiction and nonfiction in a variety of genres.	1 Use an effective writing process.
2 Read for a variety of purposes and across content areas.	2 Use knowledge of purpose, audience, format, and medium in developing written communication.
3 Use a variety of skills and strategies to comprehend complex nonfiction and informational text.	3 Apply writing skills and strategies to effectively communicate in a variety of genres with various audiences.
4 Use a variety of strategies and skills to comprehend and interpret complex literature.	4 Use writing as a tool for learning.
5 Read with fluency silently and aloud to support comprehension.	5 Engage in the information literacy process: access, evaluate, and communicate information and ideas.
6 Use a variety of strategies to understand unfamiliar vocabulary found in narrative text, technical reading, and literary text.	6 Write on demand.
	7 Adhere to conventions generally established in spelling, punctuation, grammar, usage, syntax and style.
	8 Incorporate technology as a tool to enhance writing.
Speaking (pg 81)	Listening (pg 101)
# Description	# Description
1 Consider audience and variables in the speaking situation.	1 Listen for information and understanding.
2 Produce a coherent message.	2 Listen for interpretation, analysis, and evaluation.
3 Participate in a variety of communication situations.	3 Listen to establish, maintain, and enhance relationships.
4 Use appropriate content and conventions for purpose, audience, occasion and context.	
5 Demonstrate control of delivery skills.	
6 Participate appropriately in one-on-one situations and group settings	
7 Recognize the role of evaluation in oral communication.	
8 Recognize the role of response in oral communication.	
Viewing (pg 117)	
# Description	
1 Analyze the effects of visual media on society and culture.	
2 Use a range of strategies to interpret visual media.	
3 Apply a variety of criteria to evaluate informational media.	
4 Understand how literacy forms can be represented in visual narratives.	

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