

Grade	Domain	Objective	Skill	Subskill	Element	ACT	College Readiness Standards	KENTUCKY
MG	Life Science	Introduction to the Science Classroom				N/A	None	N/A
MG	Life Science	Introduction to the Science Classroom	Classroom rules and laboratory safety			N/A	None	N/A
MG	Life Science	Introduction to the Science Classroom	Use of lab equipment			N/A	None	SC-6-UD-S-2/ SC-6-6-STM-S-1
MG	Life Science	Introduction to the Science Classroom	use of technology in the classroom			N/A	None	N/A
MG	Life Science	Introduction to the Science Classroom	methods of scientific inquiry: scientific method			Science; Biology; Research Summaries	None	SC-6-BC-S-4
MG	Life Science	Introduction to the Science Classroom	collecting data/data analysis			Science; Biology; Data Representation	None	SC-6-BC-S-6/ SC-6-BC-S-4
MG	Life Science	Introduction to the Science Classroom	biological diagrams			Science; Biology; Data Representation	None	SC-6-UD-S-1/ SC-6-UD-S-3
MG	Life Science	Cells				Science; Biology	None	SC-8-UD-S-1
MG	Life Science	Cells	Eukaryotic-presence of nucleus			Science; Biology	None	SC-8-UD-S-1
MG	Life Science	Cells	Eukaryotic-presence of nucleus	animal cells-structure and function		Science; Biology	None	SC-8-UD-S-1
MG	Life Science	Cells	Eukaryotic-presence of nucleus	animal cells-structure and function	lack of cell wall	Science; Biology	None	SC-8-UD-S-1
MG	Life Science	Cells	Eukaryotic-presence of nucleus	animal cells-structure and function	bound by cell membrane	Science; Biology	None	SC-8-UD-S-1
MG	Life Science	Cells	Eukaryotic-presence of nucleus	plant cells-structure and function		Science; Biology	None	SC-H-BC-S-3
MG	Life Science	Cells	Eukaryotic-presence of nucleus	plant cells-structure and function	cell wall present	Science; Biology	None	SC-H-BC-S-3
MG	Life Science	Cells	Eukaryotic-presence of nucleus	plant cells-structure and function	presence of chloroplasts	Science; Biology	None	SC-H-BC-S-3
MG	Life Science	Cells	Prokaryotic-absence of nucleus			Science; Biology	None	N/A
MG	Life Science	Cells	Prokaryotic-absence of nucleus	protists		Science; Biology	None	N/A
MG	Life Science	Cells	Prokaryotic-absence of nucleus	monerans		Science; Biology	None	N/A
MG	Life Science	Cells	Prokaryotic-absence of nucleus	monerans	helpful species	Science; Biology	None	N/A
MG	Life Science	Cells	Prokaryotic-absence of nucleus	monerans	pathogenic species	Science; Biology	None	N/A
MG	Life Science	Heredity				Science; Biology	None	SC-1-UD-S-3/SC-6-BC-S-1
MG	Life Science	Heredity	DNA			Science; Biology	None	SC-6-UD-S-6
MG	Life Science	Heredity	DNA	structure		Science; Biology	None	SC-6-UD-S-6
MG	Life Science	Heredity	DNA	replication		Science; Biology	None	SC-6-UD-S-6
MG	Life Science	Heredity	DNA	protein translation		Science; Biology	None	SC-6-UD-S-6
MG	Life Science	Heredity	DNA	variability		Science; Biology	None	SC-6-UD-S-6
MG	Life Science	Heredity	Genetics			Science; Biology	None	SC-7-UD-S-5/ SC-6-UD-S-5
MG	Life Science	Heredity	Genetics	simple monohybrid Punnett squares		Science; Biology	None	SC-H-UD-S-4
MG	Life Science	Heredity	Genetics	Complex monohybrid Punnett squares		Science; Biology	None	SC-H-UD-S-4
MG	Life Science	Heredity	Genetics	Complex monohybrid Punnett squares	incomplete dominance	Science; Biology	None	SC-H-UD-S-4
MG	Life Science	Heredity	Genetics	Complex monohybrid Punnett squares	codominance	Science; Biology	None	SC-H-UD-S-4
MG	Life Science	Heredity	Genetics	Dihybrid Punnett squares		Science; Biology	None	SC-H-UD-S-4
MG	Life Science	Heredity	Genetics	Chromosomes/mitosis/meiosis		Science; Biology	None	SC-H-UD-S-3
MG	Life Science	Heredity	Chromosomes	Mitosis		Science; Biology	None	SC-8-UD-S-4/SC-7-UD-S-2
MG	Life Science	Heredity	Chromosomes	Meiosis		Science; Biology	None	SC-H-UD-S-3
MG	Life Science	Ecology				Science; Biology	None	SC-H-ET-S-2/ SC-H-ET-S-3
MG	Life Science	Ecology	Population Growth			Science; Biology	None	SC-H-I-S-4
MG	Life Science	Ecology	Population Growth	Arithmetic		Science; Biology	None	SC-H-I-S-4
MG	Life Science	Ecology	Population Growth	Exponential		Science; Biology	None	SC-H-I-S-4
MG	Life Science	Ecology	Population Growth	Logistic		Science; Biology	None	SC-H-I-S-4
MG	Life Science	Ecology	Population Growth	Carrying capacity		Science; Biology	None	SC-H-I-S-4
MG	Life Science	Ecology	Energy Transfer			Science; Biology	None	SC-7-ET-S-1
MG	Life Science	Ecology	Energy Transfer	Trophic pyramids		Science; Biology	None	SC-7-ET-S-3

MG	Life Science	Ecology	Energy Transfer	Trophic pyramids	Producers-Photosynthesis	Science; Biology	None	SC-6-ET-S-2
MG	Life Science	Ecology	Energy Transfer	Trophic pyramids	Consumes-respiration	Science; Biology	None	SC-7-ET-S-3
MG	Life Science	Ecology	Energy Transfer	Food Webs		Science; Biology	None	SC-7-ET-S-3
MG	Life Science	Ecology	Symbiotic Relationships			Science; Biology	None	SC-7-BC-S-1
MG	Life Science	Ecology	Symbiotic Relationships	Mutualism		Science; Biology	None	SC-7-BC-S-1
MG	Life Science	Ecology	Symbiotic Relationships	Parasitism		Science; Biology	None	SC-7-BC-S-1
MG	Life Science	Ecology	Symbiotic Relationships	Commensalism		Science; Biology	None	SC-7-BC-S-1
MG	Life Science	Biomes				Science; Biology	None	N/A
MG	Life Science	Biomes	Types of Biomes			Science; Biology	None	N/A
MG	Life Science	Biomes	Terrestrial			Science; Biology	None	N/A
MG	Life Science	Biomes	Terrestrial	desert		Science; Biology	None	N/A
MG	Life Science	Biomes	Terrestrial	tundra		Science; Biology	None	N/A
MG	Life Science	Biomes	Terrestrial	tropical rain forest		Science; Biology	None	N/A
MG	Life Science	Biomes	Terrestrial	temperate rain forest		Science; Biology	None	N/A
MG	Life Science	Biomes	Terrestrial	coniferous forests		Science; Biology	None	N/A
MG	Life Science	Biomes	Terrestrial	deciduous forests		Science; Biology	None	N/A
MG	Life Science	Biomes	Terrestrial	savanna		Science; Biology	None	N/A
MG	Life Science	Biomes	Aquatic	tidal pool		Science; Biology	None	N/A
MG	Life Science	Biomes	Aquatic	coral reef		Science; Biology	None	N/A
MG	Life Science	Biomes	Aquatic	abyss		Science; Biology	None	N/A
MG	Life Science	Biomes	Aquatic	estuary		Science; Biology	None	N/A
MG	Life Science	Biomes	Aquatic	streams and rivers		Science; Biology	None	N/A
MG	Life Science	Biomes	Aquatic	ponds and lakes		Science; Biology	None	N/A
MG	Life Science	Biomes	Animal/Plant Adaptations to each biome			Science; Biology	None	SC-6-I-S-1
MG	Life Science	Biomes	Abiotic effects on biome			Science; Biology	None	SC-6-I-S-1
MG	Life Science	Biomes	Abiotic effects on biome	temperature		Science; Biology	None	SC-6-I-S-1
MG	Life Science	Biomes	Abiotic effects on biome	rain		Science; Biology	None	SC-6-I-S-1
MG	Life Science	Biomes	Abiotic effects on biome	altitude		Science; Biology	None	SC-6-I-S-1
MG	Life Science	Biomes	Human impact			Science; Biology	None	SC-7-EU-S-6
MG	Life Science	Evolution				Science; Biology	None	SC-8-UD-S-5
MG	Life Science	Evolution	Classification			Science; Biology	None	SC-8-UD-S-5
MG	Life Science	Evolution	Classification	Use of shared characteristics		Science; Biology	None	SC-8-UD-S-5
MG	Life Science	Evolution	Classification	Scientific nomenclature		Science; Biology	None	SC-8-UD-S-5
MG	Life Science	Evolution	Artificial and natural selection			Science; Biology	None	SC-8-UD-S-5
MG	Life Science	Evolution	Genetic variability			Science; Biology	None	SC-6-I-S-1
MG	Life Science	Evolution	Mutation of DNA			Science; Biology	None	SC-6-I-S-1
MG	Life Science	Structure/Function of Plants and Animals				Science; Biology	None	SC-H-BC-S-3
MG	Life Science	Structure/Function of Plants and Animals	Animals			Science; Biology	None	SC-H-BC-S-3
MG	Life Science	Structure/Function of Plants and Animals	Animals	Structure/function		Science; Biology	None	SC-H-BC-S-3
MG	Life Science	Structure/Function of Plants and Animals	Animals	Animal adaptations and habitats		Science; Biology	None	SC-H-BC-S-3
MG	Life Science	Structure/Function of Plants and Animals	Plants			Science; Biology	None	SC-H-BC-S-3
MG	Life Science	Structure/Function of Plants and Animals	Plants	Structure and function		Science; Biology	None	SC-H-BC-S-3
MG	Life Science	Structure/Function of Plants and Animals	Plants	Structure and function	Leaf	Science; Biology	None	SC-H-BC-S-3
MG	Life Science	Structure/Function of Plants and Animals	Plants	Structure and function	Seed	Science; Biology	None	SC-H-BC-S-3
MG	Life Science	Structure/Function of Plants and Animals	Plants	Structure and function	Stems	Science; Biology	None	SC-H-BC-S-3
MG	Life Science	Structure/Function of Plants and Animals	Plants	Plant adaptations		Science; Biology	None	SC-H-BC-S-3
MG	Life Science	The Human Body				Science; Biology	None	N/A
MG	Life Science	The Human Body	Levels of Organization			Science; Biology	None	N/A
MG	Life Science	The Human Body	Levels of Organization	Cellular		Science; Biology	None	N/A
MG	Life Science	The Human Body	Levels of Organization	Tissue		Science; Biology	None	N/A
MG	Life Science	The Human Body	Levels of Organization	Organs		Science; Biology	None	N/A
MG	Life Science	The Human Body	Levels of Organization	System		Science; Biology	None	N/A
MG	Life Science	The Human Body	Body Systems			Science; Biology	None	N/A
MG	Life Science	The Human Body	Body Systems	Skeletal		Science; Biology	None	N/A
MG	Life Science	The Human Body	Body Systems	Digestive		Science; Biology	None	N/A
MG	Life Science	The Human Body	Body Systems	Muscular		Science; Biology	None	N/A
MG	Life Science	The Human Body	Body Systems	Endocrine		Science; Biology	None	N/A
MG	Life Science	The Human Body	Body Systems	Urinary		Science; Biology	None	N/A
MG	Life Science	The Human Body	Body Systems	Circulatory		Science; Biology	None	N/A
MG	Life Science	The Human Body	Body Systems	Integumentary		Science; Biology	None	N/A
MG	Life Science	The Human Body	Body Systems	Nervous		Science; Biology	None	SC-8-UD-S-3
MG	Life Science	The Human Body	Body Systems	Reproductive		Science; Biology	None	N/A
MG	Earth Science	Weather and Climate				Science; Earth/Space Science	None	SC-H-ET-S-13

MG	Earth Science	Weather and Climate	Air Movement			Science; Earth/Space Science	None	N/A
MG	Earth Science	Weather and Climate	Air Movement	Air pressure		Science; Earth/Space Science	None	N/A
MG	Earth Science	Weather and Climate	Air Movement	winds		Science; Earth/Space Science	None	N/A
MG	Earth Science	Weather and Climate	Water Cycle			Science; Earth/Space Science	None	SC-6-ET-S-2
MG	Earth Science	Weather and Climate	Water Cycle	Phases of Matter		Science; Earth/Space Science	None	SC-6-ET-S-2
MG	Earth Science	Weather and Climate	Water Cycle	Relative Humidity		Science; Earth/Space Science	None	SC-6-ET-S-2
MG	Earth Science	Weather and Climate	Seasons			Science; Earth/Space Science	None	SC-6-ET-S-1/ SC-H-ET-S-13
MG	Earth Science	Weather and Climate	Seasons	Causes		Science; Earth/Space Science	None	SC-6-ET-S-1/ SC-H-ET-S-13
MG	Earth Science	Weather and Climate	Climate Zones			Science; Earth/Space Science	None	SC-6-ET-S-1/ SC-H-ET-S-13
MG	Earth Science	Weather and Climate	Human Impact			Science; Earth/Space Science	None	SC-8-I-S-5/ SC-7-EU-S-6
MG	Earth Science	Atmosphere				Science; Earth/Space Science	None	N/A
MG	Earth Science	Atmosphere	Composition			Science; Earth/Space Science	None	N/A
MG	Earth Science	Atmosphere	Structure			Science; Earth/Space Science	None	N/A
MG	Earth Science	Atmosphere	Function			Science; Earth/Space Science	None	N/A
MG	Earth Science	Atmosphere	Human Impact			Science; Earth/Space Science	None	SC-7-EU-S-6
MG	Earth Science	Hydrology				Science; Earth/Space Science	None	N/A
MG	Earth Science	Hydrology	Unique properties of water			Science; Earth/Space Science	None	N/A
MG	Earth Science	Hydrology	Unique properties of water	polarity and uniqueness of as a solvent		Science; Earth/Space Science	None	N/A
MG	Earth Science	Hydrology	Unique properties of water	importance to life		Science; Earth/Space Science	None	N/A
MG	Earth Science	Hydrology	Distribution of water on earth			Science; Earth/Space Science	None	N/A
MG	Earth Science	Hydrology	surface water resources			Science; Earth/Space Science	None	N/A
MG	Earth Science	Hydrology	groundwater resources			Science; Earth/Space Science	None	N/A
MG	Earth Science	Hydrology	Human Impact			Science; Earth/Space Science	None	SC-8-I-S-5
MG	Earth Science	Oceanography				Science; Earth/Space Science	None	N/A
MG	Earth Science	Oceanography	waves			Science; Earth/Space Science	None	N/A
MG	Earth Science	Oceanography	waves	Causes		Science; Earth/Space Science	None	N/A
MG	Earth Science	Oceanography	waves	diagramming and equations		Science; Earth/Space Science	None	N/A
MG	Earth Science	Oceanography	currents			Science; Earth/Space Science	None	N/A
MG	Earth Science	Oceanography	currents	surface currents		Science; Earth/Space Science	None	N/A
MG	Earth Science	Oceanography	currents	density currents		Science; Earth/Space Science	None	N/A
MG	Earth Science	Oceanography	currents	density currents	temperature	Science; Earth/Space Science	None	N/A
MG	Earth Science	Oceanography	currents	density currents	salinity	Science; Earth/Space Science	None	N/A
MG	Earth Science	Oceanography	currents	density currents	sediment	Science; Earth/Space Science	None	N/A
MG	Earth Science	Oceanography	tides			Science; Earth/Space Science	None	N/A
MG	Earth Science	Oceanography	tides	phases of the moon		Science; Earth/Space Science	None	N/A
MG	Earth Science	Oceanography	ocean floor typography			Science; Earth/Space Science	None	N/A
MG	Earth Science	Oceanography	human impact on ocean resources			Science; Earth/Space Science	None	SC-8-I-S-5/SC-7-EU-S-6
MG	Earth Science	Geologic Cycles and Processes				Science; Earth/Space Science	None	SC-8-EU-S-2/SC-6-EU-S-1
MG	Earth Science	Geologic Cycles and Processes	Minerals			Science; Earth/Space Science	None	SC-6-EU-S-1
MG	Earth Science	Geologic Cycles and Processes	Minerals	Formation		Science; Earth/Space Science	None	SC-6-EU-S-1
MG	Earth Science	Geologic Cycles and Processes	Minerals	Identification		Science; Earth/Space Science	None	SC-6-EU-S-1
MG	Earth Science	Geologic Cycles and Processes	Rocks			Science; Earth/Space Science	None	SC-6-EU-S-1
MG	Earth Science	Geologic Cycles and Processes	Rocks	Rock Cycle		Science; Earth/Space Science	None	SC-6-EU-S-1
MG	Earth Science	Geologic Cycles and Processes	Rocks	Weathering		Science; Earth/Space Science	None	SC-6-EU-S-3

MG	Earth Science	Geologic Cycles and Processes	Geologic Time			Science; Earth/Space Science	None	SC-8-EU-S-1/ SC-6-EU-S-3
MG	Earth Science	Geologic Cycles and Processes	Plate Tectonics			Science; Earth/Space Science	None	SC-8-EU-S-2/SC-6-EU-S-3/ SC-H-EU-S-2
MG	Earth Science	Geologic Cycles and Processes	Plate Tectonics	Earthquakes and Volcanoes		Science; Earth/Space Science	None	SC-6-EU-S-3/ SC-H-EU-S-2
MG	Earth Science	Space Science				Science; Earth/Space Science	None	SC-7-EU-S-2/ SC-6-EU-S-2
MG	Earth Science	Space Science	Earth-Moon System			Science; Earth/Space Science	None	SC-7-EU-S-2/ SC-6-EU-S-2
MG	Earth Science	Space Science	Solar System			Science; Earth/Space Science	None	SC-7-EU-S-3/ SC-6-EU-S-2
MG	Earth Science	Space Science	Stars			Science; Earth/Space Science	None	SC-6-EU-S-2
MG	Earth Science	Space Science	Stars	characteristics of stars		Science; Earth/Space Science	None	SC-6-EU-S-2
MG	Earth Science	Space Science	Stars	life cycle		Science; Earth/Space Science	None	SC-6-EU-S-2
MG	Earth Science	Space Science	the Universe			Science; Earth/Space Science	None	SC-7-EU-S-3/ SC-6-EU-S-2
MG	Chemistry	Nature of Science Safety				Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	The scientific method hypothesis			Science; Chemistry; Research Summaries	None	SC-H-BC-S-7
MG	Chemistry	Nature of Science Safety	theory and law			Science; Chemistry; Research Summaries	None	SC-H-BC-S-6
MG	Chemistry	Nature of Science Safety	scientific measurement			Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	scientific measurement	metric system		Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	scientific measurement	metric system	mega	Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	scientific measurement	metric system	kilo	Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	scientific measurement	metric system	deci	Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	scientific measurement	metric system	centi	Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	scientific measurement	metric system	milli	Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	scientific measurement	metric system	micro	Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	scientific measurement	metric system	nano	Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	scientific measurement	metric system	pico	Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	scientific measurement	temperature conversions		Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	scientific measurement	significant figures		Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	scientific measurement	scientific notation		Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	scientific measurement	density		Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	scientific measurement	accuracy and precision		Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	scientific measurement	dimensional analysis		Science; Chemistry	None	N/A
MG	Chemistry	Nature of Science Safety	graphing and calculator skills			Science; Chemistry; Data Representation	None	SC-H-STM-S-13
MG	Chemistry	Nature of Science Safety	graphing and calculator skills	general graphing skills		Science; Chemistry; Data Representation	None	SC-H-STM-S-13
MG	Chemistry	Nature of Science Safety	graphing and calculator skills	calculator graphing skills		Science; Chemistry; Data Representation	None	SC-H-STM-S-13
MG	Chemistry	Nature of Science Safety	graphing and calculator skills	computer graphing skills		Science; Chemistry; Data Representation	None	SC-H-STM-S-13
MG	Chemistry	Classification of Matter				Science; Chemistry	None	SC-8-STM-S-1
MG	Chemistry	Classification of Matter	conservation laws			Science; Chemistry	None	SC-8-STM-S-5/SC-6-STM-S-5
MG	Chemistry	Classification of Matter	classification of matter			Science; Chemistry	None	SC-8-STM-S-1
MG	Chemistry	Classification of Matter	physical/chemical properties and changes			Science; Chemistry	None	SC-8-STM-S-1
MG	Chemistry	Properties of matter and periodic table				Science; Chemistry	None	SC-H-STM-S-10/ SC-H-STM-S-8
MG	Chemistry	Properties of matter and periodic table	atomic theory and atomic structure			Science; Chemistry	None	SC-H-STM-S-8
MG	Chemistry	Properties of matter and periodic table	history of the atom and experiments			Science; Chemistry	None	SC-H-STM-S-8
MG	Chemistry	Properties of matter and periodic table	radioactivity and Rutherford			Science; Chemistry	None	SC-H-STM-S-8
MG	Chemistry	Properties of matter and periodic table	Elements, atoms and isotopes			Science; Chemistry	None	SC-H-STM-S-8
MG	Chemistry	Properties of matter and periodic table	Elements, atoms and isotopes	Emission and absorption		Science; Chemistry	None	SC-H-STM-S-8
MG	Chemistry	Properties of matter and periodic table	Elements, atoms and isotopes	spectra		Science; Chemistry	None	SC-H-STM-S-8
MG	Chemistry	Properties of matter and periodic table	Elements, atoms and isotopes	electron configuration of elements and ions		Science; Chemistry	None	SC-H-STM-S-8
MG	Chemistry	Properties of matter and periodic table	Elements, atoms and isotopes	orbital notation		Science; Chemistry	None	SC-H-STM-S-8
MG	Chemistry	Properties of matter and periodic table	Elements, atoms and isotopes	chemical periodicity		Science; Chemistry	None	SC-H-STM-S-8
MG	Chemistry	Properties of matter and periodic table	Elements, atoms and isotopes	relationship between electron configuration and periodic table		Science; Chemistry	None	SC-H-STM-S-8
MG	Chemistry	Properties of matter and periodic table	Elements, atoms and isotopes	oxidation states		Science; Chemistry	None	SC-H-STM-S-8
MG	Chemistry	Properties of matter and periodic table	Elements, atoms and isotopes	chemical families		Science; Chemistry	None	SC-H-STM-S-8

MG	Chemistry	Atomic properties and periodic trends			Science; Chemistry	None	SC-8-STM-S-2
MG	Chemistry	Atomic properties and periodic trends	Lewis dot for atoms and ions		Science; Chemistry	None	VSC-8-STM-S-2
MG	Chemistry	Atomic properties and periodic trends	effective nuclear charge		Science; Chemistry	None	SC-8-STM-S-2
MG	Chemistry	Atomic properties and periodic trends	shielding effect		Science; Chemistry	None	SC-8-STM-S-2
MG	Chemistry	Atomic properties and periodic trends	atomic radii		Science; Chemistry	None	SC-8-STM-S-2
MG	Chemistry	Atomic properties and periodic trends	ionic radii		Science; Chemistry	None	SC-8-STM-S-2
MG	Chemistry	Atomic properties and periodic trends	ionization energies		Science; Chemistry	None	SC-8-STM-S-2
MG	Chemistry	Atomic properties and periodic trends	electron affinity		Science; Chemistry	None	SC-8-STM-S-2
MG	Chemistry	Atomic properties and periodic trends	electronegativity		Science; Chemistry	None	SC-8-STM-S-2
MG	Chemistry	Writing Chemical Formulas			Science; Chemistry	None	N/A
MG	Chemistry	Writing Chemical Formulas	Writing chemical formulas using ionic charges		Science; Chemistry	None	N/A
MG	Chemistry	Writing Chemical Formulas	naming and writing formulas for ionic compounds		Science; Chemistry	None	N/A
MG	Chemistry	Writing Chemical Formulas	naming and writing formulas for binary molecular compounds		Science; Chemistry	None	N/A
MG	Chemistry	Writing Chemical Formulas	naming and writing formulas for acids		Science; Chemistry	None	N/A
MG	Chemistry	Writing Chemical Formulas	naming and writing formulas for organic compounds		Science; Chemistry	None	N/A
MG	Chemistry	Chemical Reactions			Science; Chemistry	None	SC-H-STM-S-6/ SC-7-STM-S-5
MG	Chemistry	Chemical Reactions	parts of an equation		Science; Chemistry	None	SC-H-STM-S-6
MG	Chemistry	Chemical Reactions	endothermic and exothermic reactions		Science; Chemistry	None	SC-H-STM-S-6
MG	Chemistry	Chemical Reactions	balancing chemical equations		Science; Chemistry	None	SC-H-STM-S-6
MG	Chemistry	Chemical Reactions	identifying and predicting products of chemical reactions		Science; Chemistry	None	SC-H-STM-S-6
MG	Chemistry	Chemical Reactions	synthesis, decomposition, single displacement, double replacement, combustion		Science; Chemistry	None	SC-H-STM-S-6
MG	Chemistry	Chemical Bonding			Science; Chemistry	None	SC-H-STM-S-10
MG	Chemistry	Chemical Bonding	binding forces		Science; Chemistry	None	SC-H-STM-S-10
MG	Chemistry	Chemical Bonding	ionic radii		Science; Chemistry	None	SC-H-STM-S-10/ SC-H-STM-S-3
MG	Chemistry	Chemical Bonding	covalent		Science; Chemistry	None	SC-H-STM-S-10/ SC-H-STM-S-3
MG	Chemistry	Chemical Bonding	metallic		Science; Chemistry	None	SC-H-STM-S-10
MG	Chemistry	Chemical Bonding	bonding models		Science; Chemistry	None	SC-H-STM-S-10
MG	Chemistry	Chemical Bonding	valence bond theory		Science; Chemistry	None	SC-H-STM-S-10
MG	Chemistry	Chemical Bonding	Lewis structures for molecules and ions		Science; Chemistry	None	SC-H-STM-S-10
MG	Chemistry	Chemical Bonding	Aqueous solutions and dissolving process		Science; Chemistry	None	SC-H-STM-S-10
MG	Chemistry	Chemical Bonding	electrolytes and nonelectrolytes		Science; Chemistry	None	SC-H-STM-S-10
MG	Chemistry	States of Matter			Science; Chemistry	None	SC-H-STM-S-1
MG	Chemistry	States of Matter	Kinetic-molecular theory		Science; Chemistry	None	SC-7-ET-S-6
MG	Chemistry	States of Matter	Intermolecular forces--London, dipole-dipole		Science; Chemistry	None	N/A
MG	Chemistry	States of Matter	Hydrogen bonding		Science; Chemistry	None	N/A
MG	Chemistry	States of Matter	relationship to states, structures and properties		Science; Chemistry	None	SC-6-STM-S-2
MG	Chemistry	States of Matter	specific heat and energy calculations		Science; Chemistry	None	SC-7-ET-S-3
MG	Chemistry	States of Matter	Thermal expansion		Science; Chemistry	None	SC-7-ET-S-3
MG	Chemistry	States of Matter	water		Science; Chemistry	None	SC-H-STM-11
MG	Chemistry	States of Matter	fluids/Archimedes principle		Science; Chemistry	None	N/A
MG	Chemistry	States of Matter	Pascal/Bernoulli's Gas laws: Theories and calculations		Science; Chemistry	None	N/A
MG	Chemistry	States of Matter	Boyle's, Charles', Gay-Loussac's, Combined, Dalton's		Science; Chemistry	None	N/A
MG	Chemistry	Organic			Science; Chemistry	None	N/A
MG	Chemistry	Organic	Draw and name alkanes		Science; Chemistry	None	N/A
MG	Chemistry	Organic	Draw and name alkenes		Science; Chemistry	None	N/A
MG	Chemistry	Organic	Draw and name alkynes		Science; Chemistry	None	N/A
MG	Chemistry	Organic	Draw and name alcohols		Science; Chemistry	None	N/A
MG	Chemistry	Organic	Draw and name amines		Science; Chemistry	None	N/A
MG	Chemistry	Organic	Draw and name carboxylic		Science; Chemistry	None	N/A
MG	Chemistry	Organic	Draw and name acids		Science; Chemistry	None	N/A

MG	Chemistry	Organic	Isomers			Science; Chemistry	None	N/A
MG	Chemistry	Organic	recognize the importance of biological molecules			Science; Chemistry	None	N/A
MG	Chemistry	Organic	crude oil/polymers			Science; Chemistry	None	N/A
MG	Chemistry	Solutions				Science; Chemistry	None	SC-H-STM-S-9
MG	Chemistry	Solutions	colligative properties			Science; Chemistry	None	N/A
MG	Chemistry	Solutions	boiling point elevation			Science; Chemistry	None	SC-H-STM-S-9
MG	Chemistry	Solutions	freezing point depression			Science; Chemistry	None	SC-H-STM-S-9
MG	Chemistry	Solutions	acids and bases			Science; Chemistry	None	SC-H-STM-S-14
MG	Chemistry	Solutions	properties of acids and bases			Science; Chemistry	None	SC-H-STM-S-14
MG	Chemistry	Solutions	pH of weak acids and weak bases			Science; Chemistry	None	SC-H-STM-S-14
MG	Chemistry	Solutions	relationship between pH and pOH			Science; Chemistry	None	N/A
MG	Chemistry	Solutions	buffer systems			Science; Chemistry	None	N/A
MG	Chemistry	Solutions	soaps, detergents, materials			Science; Chemistry	None	N/A
MG	Physics	Kinematics in One Dimension				Science; Physics	None	N/A
MG	Physics	Kinematics in One Dimension	Frames of reference			Science; Physics	None	N/A
MG	Physics	Kinematics in One Dimension	displacement			Science; Physics	None	N/A
MG	Physics	Kinematics in One Dimension	vectors			Science; Physics	None	N/A
MG	Physics	Kinematics in One Dimension	velocity: average and instantaneous			Science; Physics	None	SC-8-MF-S-1
MG	Physics	Kinematics in One Dimension	acceleration			Science; Physics	None	SC-8-MF-S-1
MG	Physics	Kinematics in One Dimension	kinematics equations			Science; Physics	None	N/A
MG	Physics	Kinematics in One Dimension	motion and acceleration			Science; Physics	None	N/A
MG	Physics	Kinematics in Two Dimensions				Science; Physics	None	N/A
MG	Physics	Kinematics in Two Dimensions	vectors			Science; Physics	None	N/A
MG	Physics	Kinematics in Two Dimensions	vectors	addition		Science; Physics	None	N/A
MG	Physics	Kinematics in Two Dimensions	vectors	subtraction		Science; Physics	None	N/A
MG	Physics	Kinematics in Two Dimensions	vectors	multiplication of vectors by scalars		Science; Physics	None	N/A
MG	Physics	Kinematics in Two Dimensions	vectors	adding vectors by components		Science; Physics	None	N/A
MG	Physics	Motion and Force Dynamics				Science; Physics	None	N/A
MG	Physics	Motion and Force Dynamics	Newton's First Law			Science; Physics	None	SC-8-MF-S-2
MG	Physics	Motion and Force Dynamics	Newton's Second Law			Science; Physics	None	SC-8-MF-S-2
MG	Physics	Motion and Force Dynamics	Newton's Third Law			Science; Physics	None	SC-8-MF-S-2
MG	Physics	Motion and Force Dynamics	Weight: The Force of Gravity and the Normal Force			Science; Physics	None	SC-7-MF-S-8
MG	Physics	Motion and Force Dynamics	Applications Involving Friction			Science; Physics	None	SC-6-MF-S-3
MG	Physics	Motion and Force Dynamics	Inclined Planes			Science; Physics	None	
MG	Physics	Motion and Force Dynamics	Projectile Motion			Science; Physics	None	SC-7-MF-S-2
MG	Physics	Motion and Force Dynamics	Projectile Motion	Objects projected parallel to the ground		Science; Physics	None	SC-7-MF-S-4
MG	Physics	Motion and Force Dynamics	Projectile Motion	Uniform circular motion; centripetal force		Science; Physics	None	SC-7-MF-S-4
MG	Physics	Motion and Force Dynamics	Projectile Motion	Dynamics and uniform circular motion		Science; Physics	None	SC-7-MF-S-4
MG	Physics	Motion and Force Dynamics	Projectile Motion	momentum and its relationship to force		Science; Physics	None	SC-7-MF-S-4
MG	Physics	Work, Power and Energy				Science; Physics	None	SC-7-ET-S-5
MG	Physics	Work, Power and Energy	Work done by a constant force			Science; Physics	None	SC-7-MF-S-5
MG	Physics	Work, Power and Energy	Power			Science; Physics	None	N/A
MG	Physics	Work, Power and Energy	Machines and mechanical advantage			Science; Physics	None	N/A
MG	Physics	Work, Power and Energy	Machines and mechanical advantage	simple machines		Science; Physics	None	N/A
MG	Physics	Work, Power and Energy	kinetic energy and the work-energy principle			Science; Physics	None	SC-7-ET-S-3
MG	Physics	Work, Power and Energy	gravitational potential energy			Science; Physics	None	N/A
MG	Physics	Thermal Energy				Science; Physics	None	N/A
MG	Physics	Thermal Energy	First Law of Thermodynamics			Science; Physics	None	N/A
MG	Physics	Thermal Energy	Second Law of Thermodynamics			Science; Physics	None	N/A

MG	Physics	Thermal Energy	Thirds Law of Thermodynamics			Science; Physics	None	N/A
MG	Physics	Thermal Energy	Temperature Scales			Science; Physics	None	N/A
MG	Physics	Thermal Energy	Thermal Expansion of gas			Science; Physics	None	N/A
MG	Physics	Thermal Energy	Thermal Expansion of solids and liquids			Science; Physics	None	N/A
MG	Physics	Thermal Energy	Heat and the mechanical equivalent			Science; Physics	None	N/A
MG	Physics	Thermal Energy	specific heat			Science; Physics	None	N/A
MG	Physics	Thermal Energy	latent heat and phase change diagrams			Science; Physics	None	N/A
MG	Physics	Thermal Energy	Heat transfer by conduction, convection, and radiation			Science; Physics	None	SC-7-ET-S-7
MG	Physics	Thermal Energy	Using heat			Science; Physics	None	SC-7-ET-S-7
MG	Physics	Thermal Energy	Using heat	steam engines		Science; Physics	None	SC-7-ET-S-7
MG	Physics	Thermal Energy	Using heat	refrigerators and air conditioners		Science; Physics	None	SC-7-ET-S-7
MG	Physics	Waves and Sound				Science; Physics	None	SC-H-ET-S-4
MG	Physics	Waves and Sound	anatomy of a wave			Science; Physics	None	SC-H-ET-S-4
MG	Physics	Waves and Sound	types of waves: transverse and longitudinal			Science; Physics	None	SC-H-ET-S-4
MG	Physics	Waves and Sound	sound			Science; Physics	None	SC-7-ET-S-4
MG	Physics	Waves and Sound	sound	characteristics (period, frequency, and amplitude)		Science; Physics	None	SC-H-ET-S-4
MG	Physics	Waves and Sound	sound	intensity		Science; Physics	None	SC-H-ET-S-4
MG	Physics	Waves and Sound	sound	sources		Science; Physics	None	SC-7-ET-S-4
MG	Physics	Waves and Sound	sound	interferences		Science; Physics	None	SC-H-ET-S-4
MG	Physics	Waves and Sound	sound	applications of soundwaves: speakers, shockwaves, and sonic booms		Science; Physics	None	SC-H-ET-S-4
MG	Physics	Light				Science; Physics	None	SC-H-ET-S-4
MG	Physics	Light	Dispersion of light and the electromagnetic spectrum			Science; Physics	None	SC-H-ET-S-4
MG	Physics	Light	speed of an electromagnetic wave in a vacuum			Science; Physics	None	SC-H-ET-S-4
MG	Physics	Light	prism dispersion			Science; Physics	None	SC-H-ET-S-4
MG	Physics	Light	list the electromagnetic waves in order of increasing/decreasing wavelength			Science; Physics	None	SC-H-ET-S-4
MG	Physics	Light	light and matter			Science; Physics	None	N/A
MG	Physics	Light	light and matter	color		Science; Physics	None	N/A
MG	Physics	Light	light and matter	pigments		Science; Physics	None	N/A
MG	Physics	Light	light and matter	polarization		Science; Physics	None	N/A
MG	Physics	Light	light and matter	reflection and refraction		Science; Physics	None	N/A
MG	Physics	Light	light and matter	angle of incidence equals the angle of reflection		Science; Physics	None	N/A
MG	Physics	Light	light and matter	Index of refraction and Snell's law of refraction		Science; Physics	None	N/A
MG	Physics	Light	light and matter	mirrors		Science; Physics	None	N/A
MG	Physics	Light	light and matter	reflection from plane, converging, and diverging mirrors		Science; Physics	None	N/A
MG	Physics	Light	light and matter	ray diagrams and the images formed by plane, converging, and diverging mirrors		Science; Physics	None	N/A
MG	Physics	Light	light and matter	lenses		Science; Physics	None	N/A
MG	Physics	Light	light and matter	refraction through converging and diverging lenses		Science; Physics	None	N/A
MG	Physics	Light	light and matter	ray diagrams and the images formed by converging and diverging lenses		Science; Physics	None	N/A
MG	Physics	Electric Currents and Ohm's Law				Science; Physics	None	N/A
MG	Physics	Electric Currents and Ohm's Law	Ohm's Law			Science; Physics	None	N/A
MG	Physics	Electric Currents and Ohm's Law	Electric power			Science; Physics	None	N/A
MG	Physics	Electric Currents and Ohm's Law	steady-state direct current, resistance, power			Science; Physics	None	N/A
MG	Physics	Electric Currents and Ohm's Law	Simple, series, and parallel circuits			Science; Physics	None	N/A

MG	Physics	Electric Currents and Ohm's Law	correct connection and reading of ammeters and voltmeters			Science; Physics	None	N/A
MG	Physics	Magnets and Magnetic Fields				Science; Physics	None	N/A
MG	Physics	Magnets and Magnetic Fields	forces on moving charges in magnetic fields			Science; Physics	None	N/A
MG	Physics	Magnets and Magnetic Fields	right-hand rule for finding the direction of the force acting on a charge moving in a magnetic field			Science; Physics	None	N/A
MG	Physics	Magnets and Magnetic Fields	forces on current-carrying wires			Science; Physics	None	N/A
MG	Physics	Magnets and Magnetic Fields	right-hand rule for finding the direction of the force acting on a current-carrying wire in an external magnetic field			Science; Physics	None	N/A
MG	Physics	Magnets and Magnetic Fields	fields of long current-carrying wires			Science; Physics	None	N/A
MG	Physics	Magnets and Magnetic Fields	right-hand rule for finding the direction of the magnetic field produced by current-carrying wire			Science; Physics	None	N/A
MG	Physics	Magnets and Magnetic Fields	electromagnetism			Science; Physics	None	SC-H-MF-S-5/ SC-H-MF-S-6
MG	Physics	Magnets and Magnetic Fields	electromagnetic induction			Science; Physics	None	SC-H-MF-S-5/ SC-H-MF-S-6
Biology	Biology	Nature of Science				N/A	None	SC-H-BC-S-7
Biology	Biology	Nature of Science	Safety			N/A	None	N/A
Biology	Biology	Nature of Science	Equipment use and identification			N/A	None	N/A
Biology	Biology	Nature of Science	scientific measurement			Science; Biology; Research Summaries	None	N/A
Biology	Biology	Nature of Science	scientific method			Science; Biology; Research Summaries	None	N/A
Biology	Biology	Nature of Science	experimental design			Science; Biology; Research Summaries	None	N/A
Biology	Biology	Nature of Science	analyzing data			Science; Biology; Data Representation	None	SC-H-I-S-6
Biology	Biology	Nature of Science	communicating scientific information			Science; Biology; Data Representation	None	SC-H-BC-S-6
Biology	Biology	Water				Science; Biology	None	SC-H-STM-S-11
Biology	Biology	Water	universal solvent			Science; Biology	None	SC-H-STM-S-11
Biology	Biology	Water	bonding properties			Science; Biology	None	SC-H-STM-S-11
Biology	Biology	Biological molecules				Science; Biology	None	N/A
Biology	Biology	Biological molecules	atomic structure and bonding, carbon emphasis			Science; Biology	None	N/A
Biology	Biology	Biological molecules	hydrolysis and dehydration synthesis			Science; Biology	None	N/A
Biology	Biology	Biological molecules	structure and properties of carbohydrates			Science; Biology	None	N/A
Biology	Biology	Biological molecules	structure and properties of lipids			Science; Biology	None	N/A
Biology	Biology	Biological molecules	structure and properties of proteins			Science; Biology	None	N/A
Biology	Biology	Biological molecules	structure and properties of nucleic acids			Science; Biology	None	N/A
Biology	Biology	Energy				Science; Biology	None	SC-H-ET-S-7/ SC-H-ET-S-5
Biology	Biology	Energy	forms of energy			Science; Biology	None	SC-H-ET-S-7/ SC-H-ET-S-5
Biology	Biology	Energy	ATP structure and function			Science; Biology	None	SC-H-ET-S-7/ SC-H-ET-S-5
Biology	Biology	Enzyme structure and function				Science; Biology	None	SC-H-UD-S-2
Biology	Biology	Enzyme structure and function	Properties of an enzyme			Science; Biology	None	SC-H-UD-S-2
Biology	Biology	Enzyme structure and function	Factors affecting enzyme reaction rates			Science; Biology	None	SC-H-UD-S-2
Biology	Biology	Cells				Science; Biology	None	SC-H-UD-S-1
Biology	Biology	Cells	Microscope use			Science; Biology	None	SC-H-UD-S-1
Biology	Biology	Cells	Microscopic measurement			Science; Biology	None	SC-H-UD-S-1
Biology	Biology	Cells	Cell Theory			Science; Biology	None	SC-H-UD-S-1
Biology	Biology	Cells	Prokaryotic cells			Science; Biology	None	SC-H-UD-S-2
Biology	Biology	Cells	Eukaryotic cells			Science; Biology	None	SC-H-UD-S-2
Biology	Biology	Cell Membranes				Science; Biology	None	SC-H-UD-S-1
Biology	Biology	Cell Membranes	Surface to volume ratio			Science; Biology	None	SC-H-UD-S-1
Biology	Biology	Cell Membranes	Fluid Mosaic Model of membrane structure			Science; Biology	None	SC-H-UD-S-1
Biology	Biology	Cell Membranes	Selective permeability and transport			Science; Biology	None	SC-H-UD-S-1

Biology	Biology	Osmosis and Diffusion			Science; Biology	None	SC-H-UD-S-7
Biology	Biology	Osmosis and Diffusion	Cellular homeostasis		Science; Biology	None	SC-H-UD-S-7
Biology	Biology	Osmosis and Diffusion	Diffusion and factors affecting its rate		Science; Biology	None	SC-H-UD-S-7
Biology	Biology	Osmosis and Diffusion	Osmosis		Science; Biology	None	SC-H-UD-S-7
Biology	Biology	Osmosis and Diffusion	Endocytosis		Science; Biology	None	SC-H-UD-S-7
Biology	Biology	Osmosis and Diffusion	Exocytosis, phagocytosis, pinocytosis		Science; Biology	None	SC-H-UD-S-7
Biology	Biology	Cell Organelle			Science; Biology	None	SC-H-UD-S-2
Biology	Biology	Cell Organelle	Structure and function of cell organelles		Science; Biology	None	SC-H-UD-S-2
Biology	Biology	Cell Organelle	compare plant and animal cell		Science; Biology	None	SC-H-UD-S-2
Biology	Biology	Cell cycle			Science; Biology	None	SC-H-UD-S-8
Biology	Biology	Cell cycle	events of the cell cycle		Science; Biology	None	SC-H-UD-S-8
Biology	Biology	Cell cycle	purpose of mitosis		Science; Biology	None	SC-H-UD-S-8
Biology	Biology	Cell cycle	events of mitosis		Science; Biology	None	SC-H-UD-S-8
Biology	Biology	Cell cycle	cytokinesis		Science; Biology	None	SC-H-UD-S-8
Biology	Biology	Cell Energy			Science; Biology	None	SC-H-UD-S-2
Biology	Biology	Cell Energy	Respiration		Science; Biology	None	SC-H-UD-S-2
Biology	Biology	Cell Energy	Fermentation		Science; Biology	None	SC-H-UD-S-2
Biology	Biology	Cell Energy	Chlorophyll		Science; Biology	None	SC-H-UD-S-2
Biology	Biology	Cell Energy	Light reactions of photosynthesis		Science; Biology	None	SC-H-ET-S-6/ SC-H-UD-S-2
Biology	Biology	Cell Energy	Dark reactions of photosynthesis		Science; Biology	None	SC-H-ET-S-6/ SC-H-UD-S-2
Biology	Biology	Meiosis			Science; Biology	None	SC-H-UD-S-3
Biology	Biology	Meiosis	Purpose of meiosis		Science; Biology	None	SC-H-UD-S-3
Biology	Biology	Meiosis	Events of meiosis		Science; Biology	None	SC-H-UD-S-3
Biology	Biology	Meiosis	compare mitosis and meiosis		Science; Biology	None	SC-H-UD-S-3
Biology	Biology	Meiosis	karyotyping		Science; Biology	None	SC-H-UD-S-3
Biology	Biology	Meiosis	mendel		Science; Biology	None	SC-H-UD-S-3
Biology	Biology	Meiosis	Mendelian Laws		Science; Biology	None	SC-H-UD-S-3
Biology	Biology	Meiosis	Monohybrid Crosses		Science; Biology	None	SC-H-UD-S-3
Biology	Biology	Meiosis	Dihybrid Crosses		Science; Biology	None	SC-H-UD-S-3
Biology	Biology	Meiosis	Inheritance patterns, Mendelian traits versus linkage		Science; Biology	None	SC-H-UD-S-3
Biology	Biology	DNA to Proteins			Science; Biology	None	SC-H-UD-S-6
Biology	Biology	DNA to Proteins	DNA Structure		Science; Biology	None	SC-H-UD-S-6
Biology	Biology	DNA to Proteins	Replication		Science; Biology	None	SC-H-UD-S-6
Biology	Biology	DNA to Proteins	RNA Structure		Science; Biology	None	SC-H-UD-S-6
Biology	Biology	DNA to Proteins	Types of RNA and purpose		Science; Biology	None	SC-H-UD-S-6
Biology	Biology	DNA to Proteins	Transcription		Science; Biology	None	SC-H-UD-S-6
Biology	Biology	DNA to Proteins	Translation		Science; Biology	None	SC-H-UD-S-6
Biology	Biology	DNA to Proteins	Operon theory		Science; Biology	None	SC-H-UD-S-6
Biology	Biology	DNA to Proteins	Types of mutations		Science; Biology	None	SC-H-BC-S-1/ SC-H-UD-S-5
Biology	Biology	Biotechnology			Science; Biology	None	N/A
Biology	Biology	Biotechnology	Fundamentals of electrophoresis		Science; Biology	None	N/A
Biology	Biology	Biotechnology	Recombinant DNA		Science; Biology	None	N/A
Biology	Biology	Biotechnology	Restriction enzymes		Science; Biology	None	N/A
Biology	Biology	Evolution			Science; Biology	None	SC-H-BC-S-2
Biology	Biology	Evolution	Microevolution-changing the Allelic frequency of the gene pool		Science; Biology	None	SC-H-BC-S-1/ SC-H-BC-S-2
Biology	Biology	Evolution	Charles Darwin		Science; Biology	None	SC-H-BC-S-2
Biology	Biology	Evolution	Darwinian Theory of Evolution		Science; Biology	None	SC-H-BC-S-2
Biology	Biology	Evolution	Natural Selection		Science; Biology	None	SC-H-BC-S-2
Biology	Biology	Evolution	Macroevolution-Speciation		Science; Biology	None	SC-H-BC-S-2
Biology	Biology	Taxonomy			Science; Biology	None	SC-H-UD-S-9
Biology	Biology	Taxonomy	Examining the taxonomic hierarchy		Science; Biology	None	SC-H-UD-S-9
Biology	Biology	Taxonomy	viruses		Science; Biology	None	SC-H-UD-S-10/ SC-H-UD-S-9
Biology	Biology	Taxonomy	monereans (archae bacteria and eubacteria)		Science; Biology	None	SC-H-UD-S-9
Biology	Biology	Taxonomy	fungi		Science; Biology	None	SC-H-UD-S-9
Biology	Biology	Taxonomy	protista		Science; Biology	None	SC-H-UD-S-9
Biology	Biology	Taxonomy	plantae		Science; Biology	None	SC-H-UD-S-9
Biology	Biology	Taxonomy	animalia		Science; Biology	None	SC-H-UD-S-9
Biology	Biology	Plants			Science; Biology	None	SC-H-BC-S-3
Biology	Biology	Plants	plant structures and functions		Science; Biology	None	SC-H-BC-S-3
Biology	Biology	Plants	transport		Science; Biology	None	SC-H-BC-S-3
Biology	Biology	Plants	hormones		Science; Biology	None	SC-H-BC-S-3

Biology	Biology	Plants	reproduction			Science; Biology	None	SC-H-BC-S-3
Biology	Biology	Animals				Science; Biology	None	SC-H-BC-S-3
Biology	Biology	Animals	evolutionary trends			Science; Biology	None	SC-H-BC-S-3
Biology	Biology	Animals	digestive system			Science; Biology	None	SC-H-BC-S-3
Biology	Biology	Animals	circulatory system			Science; Biology	None	SC-H-BC-S-3
Biology	Biology	Animals	excretory system			Science; Biology	None	SC-H-BC-S-3
Biology	Biology	Animals	muscular/skeletal system			Science; Biology	None	SC-H-BC-S-3
Biology	Biology	Animals	respiratory system			Science; Biology	None	SC-H-BC-S-3
Biology	Biology	Animals	immune system			Science; Biology	None	SC-H-BC-S-3
Biology	Biology	Animals	endocrine system			Science; Biology	None	SC-H-BC-S-3
Biology	Biology	Animals	nervous system			Science; Biology	None	SC-H-BC-S-3
Biology	Biology	Populations and environment				Science; Biology	None	SC-H-I-S-4
Biology	Biology	Populations and environment	Population Growth			Science; Biology	None	SC-H-I-S-4
Biology	Biology	Populations and environment	biomes			Science; Biology	None	SC-H-BC-S-3
Biology	Biology	Communities, energy flow, and nutrient cycles				Science; Biology	None	N/A
Biology	Biology	Communities, energy flow, and nutrient cycles	energy pyramids			Science; Biology	None	SC-H-ET-S-11
Biology	Biology	Communities, energy flow, and nutrient cycles	food webs/chains			Science; Biology	None	N/A
Biology	Biology	Communities, energy flow, and nutrient cycles	nutrient cycles			Science; Biology	None	N/A
Chemistry	Chemistry	Introductory Concepts				N/A	None	N/A
Chemistry	Chemistry	Introductory Concepts	Safety			N/A	None	N/A
Chemistry	Chemistry	Introductory Concepts	scientific measurement			Science; Chemistry; Research Summaries	None	N/A
Chemistry	Chemistry	Introductory Concepts	scientific measurement	Metric system		Science; Chemistry; Research Summaries	None	N/A
Chemistry	Chemistry	Introductory Concepts	scientific measurement	Difference between base units and derived units		Science; Chemistry	None	N/A
Chemistry	Chemistry	Introductory Concepts	scientific measurement	significant figures		Science; Chemistry	None	N/A
Chemistry	Chemistry	Introductory Concepts	scientific measurement	scientific notation		Science; Chemistry	None	SC-H-EU-S-9
Chemistry	Chemistry	Introductory Concepts	scientific measurement	density		Science; Chemistry	None	SC-H-STM-S-9
Chemistry	Chemistry	Introductory Concepts	scientific measurement	temperature conversions			None	N/A
Chemistry	Chemistry	Introductory Concepts	scientific measurement	dimensional analysis		Science; Chemistry	None	N/A
Chemistry	Chemistry	Introductory Concepts	graphing and calculator skills			Science; Chemistry; Data Representation	None	SC-H-STM-S-13
Chemistry	Chemistry	Introductory Concepts	graphing and calculator skills	general graphing skills		Science; Chemistry; Data Representation	None	SC-H-STM-S-13
Chemistry	Chemistry	Introductory Concepts	graphing and calculator skills	calculator graphing skills		Science; Chemistry; Data Representation	None	SC-H-STM-S-13
Chemistry	Chemistry	Introductory Concepts	graphing and calculator skills	computer graphing skills		Science; Chemistry; Data Representation	None	SC-H-STM-S-13
Chemistry	Chemistry	Introductory Concepts	accuracy and precision			Science; Chemistry	None	N/A
Chemistry	Chemistry	Introductory Concepts	accuracy and precision	matter, change and energy		Science; Chemistry	None	N/A
Chemistry	Chemistry	Introductory Concepts	accuracy and precision	scientific method-hypothesis, theory and law		Science; Chemistry	None	SC-H-BC-S-6
Chemistry	Chemistry	Introductory Concepts	accuracy and precision	classification of matter		Science; Chemistry	None	SC-H-STM-S-1
Chemistry	Chemistry	Introductory Concepts	accuracy and precision	conservation laws		Science; Chemistry	None	SC-H-ET-S-3
Chemistry	Chemistry	Introductory Concepts	accuracy and precision	interpreting a potential energy diagram for exothermic and endothermic reactions		Science; Chemistry	None	N/A
Chemistry	Chemistry	Introductory Concepts	accuracy and precision	specific heat calculations		Science; Chemistry	None	N/A
Chemistry	Chemistry	Introductory Concepts	accuracy and precision	First Law of Thermodynamics		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	accuracy and precision			Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure			Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	history of the atom and experiments		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	Atomic models (Dalton, Thomson, Rutherford, Bohr)		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	Atomic mass, average atomic mass		Science; Chemistry	None	N/A

Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	Atomic number and mass number; isotopes		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	Quantum mechanical model		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	Quantum mechanical model	electron configuration of elements and ions; exceptions	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	Quantum mechanical model	orbital notation	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	Quantum mechanical model	quantum numbers-- assigning values	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	Quantum mechanical model	emission and absorption spectra	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	Quantum mechanical model	Lewis dot for atoms and ions	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	chemical periodicity		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	chemical periodicity	relationship between electron configuration and periodic table	Science; Chemistry	None	SC-H-STM-S-10
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	chemical periodicity	effective nuclear charge	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	chemical periodicity	shielding effect	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	chemical periodicity	atomic radii	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	chemical periodicity	ionic radii	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	chemical periodicity	ionization energies	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	chemical periodicity	electron affinity	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	chemical periodicity	electronegativity	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	chemical periodicity	oxidation states	Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	chemical periodicity	chemical families	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	nuclear chemistry		Science; Chemistry	None	SC-H-ET-S-1
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	nuclear chemistry	types of nuclear decay including alpha, beta, gamma	Science; Chemistry	None	SC-H-ET-S-1
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	nuclear chemistry	writing and balancing nuclear equations	Science; Chemistry	None	SC-H-ET-S-1
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	nuclear chemistry	nuclear stability	Science; Chemistry	None	SC-H-ET-S-1
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	nuclear chemistry	half-life calculations	Science; Chemistry	None	SC-H-ET-S-1
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	nuclear chemistry	fission and fusion	Science; Chemistry	None	SC-H-ET-S-1
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	nuclear chemistry	nuclear reactor	Science; Chemistry	None	SC-H-ET-S-1
Chemistry	Chemistry	Structure of Matter	atomic theory and atomic structure	nuclear chemistry	chemical applications: radioisotopes and tracers in nuclear medicine	Science; Chemistry	None	SC-H-ET-S-4
Chemistry	Chemistry	Structure of Matter	Chemical bonding			Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical bonding	Binding forces		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical bonding	Binding forces	ionic	Science; Chemistry	None	SC-H-STM-S-3/ SC-H-STM-S-4
Chemistry	Chemistry	Structure of Matter	Chemical bonding	Binding forces	covalent--bond energies	Science; Chemistry	None	SC-H-STM-S-3/ SC-H-STM-S-4
Chemistry	Chemistry	Structure of Matter	Chemical bonding	Binding forces	metallic	Science; Chemistry	None	

Chemistry	Chemistry	Structure of Matter	Chemical bonding	Binding forces	intermolecular forces--London, dipole-dipole, Hydrogen bonding	Science; Chemistry	None	SC-H-STM-S-9
Chemistry	Chemistry	Structure of Matter	Chemical bonding	Binding forces	relationship to states, structures, and properties	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical bonding	Binding forces	polarity of bonds, electronegativities	Science; Chemistry	None	SC-H-STM-S-9
Chemistry	Chemistry	Structure of Matter	Chemical bonding	Bonding models		Science; Chemistry	None	SC-H-STM-S-10
Chemistry	Chemistry	Structure of Matter	Chemical bonding	Bonding models	valence bond theory	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical bonding	Bonding models	Lewis structures for molecules, ions including exception to the octet rule	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical bonding	Bonding models	resonance, hybridization	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical bonding	Bonding models	VSEPR/Molecular geometry	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical bonding	Bonding models	Bond angles	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical bonding	Bonding models	Sigma and pi bonds	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical bonding	Molecular polarity		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical nomenclature			Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical nomenclature	Writing chemical formulas using ionic charges		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical nomenclature	naming and writing formulas for ionic compounds		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical nomenclature	naming and writing formulas for binary molecular compounds		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical nomenclature	naming and writing formulas for acids		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical nomenclature	naming and writing formulas for organic compounds		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical nomenclature	naming and writing formulas for complex ions		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical equations			Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical equations	balancing chemical equations		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical equations	identifying and predicting products of chemical reactions		Science; Chemistry	None	SC-H-STM-S-5
Chemistry	Chemistry	Structure of Matter	Chemical equations	synthesis, decomposition, single displacement, double replacement, combustion		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical equations	net ionic equations		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Chemical equations	use of solubility rules		Science; Chemistry	None	SC-H-STM-S-9
Chemistry	Chemistry	Structure of Matter	Stoichiometry			Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Stoichiometry	calculations of molar mass		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Stoichiometry	mole conversions with molar mass, Avogadro's number and molar volume		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Stoichiometry	percent composition		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Stoichiometry	percent composition	empirical formula calculations	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Stoichiometry	percent composition	molecular formula calculations	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Stoichiometry	percent composition	mass-mass calculations	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Stoichiometry	percent composition	mass-volume calculations	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Stoichiometry	percent composition	volume-volume calculations	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Stoichiometry	percent composition	percent yield	Science; Chemistry	None	N/A

Chemistry	Chemistry	Structure of Matter	Stoichiometry	percent composition	limiting reactant calculations	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Stoichiometry	percent composition	thermochemical calculations	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	States of Matter			Science; Chemistry	None	SC-H-STM-S-1
Chemistry	Chemistry	Structure of Matter	States of Matter	gases		Science; Chemistry	None	SC-H-STM-S-7
Chemistry	Chemistry	Structure of Matter	States of Matter	gases	kinetic-molecular theory	Science; Chemistry	None	SC-H-STM-S-2
Chemistry	Chemistry	Structure of Matter	States of Matter	gases	Avogadro's hypothesis	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	States of Matter	gases	Gas laws: theories and calculations	Science; Chemistry	None	SC-H-STM-S-7
Chemistry	Chemistry	Structure of Matter	States of Matter	gases	Boyle's, Charles', Gay-Lussac's, Dalton's, Graham's, Ideal Gas, Henry's	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	States of Matter	Liquids		Science; Chemistry	None	SC-H-STM-S-1
Chemistry	Chemistry	Structure of Matter	States of Matter	Liquids	equilibrium vapor pressure	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	States of Matter	Liquids	phase changes and phase change diagrams	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	States of Matter	solids		Science; Chemistry	None	SC-H-STM-S-1
Chemistry	Chemistry	Structure of Matter	States of Matter	solids	amorphous	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	States of Matter	solids	crystalline solids	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	States of Matter	solids	analyzing heating curves with calculations	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Solutions			Science; Chemistry	None	SC-H-STM-S-1
Chemistry	Chemistry	Structure of Matter	Solutions	properties of water		Science; Chemistry	None	SC-H-STM-S-11
Chemistry	Chemistry	Structure of Matter	Solutions	aqueous solutions and dissolving process		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Solutions	electrolytes and nonelectrolytes		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Solutions	solution vs colloids vs suspensions		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Solutions	solubility graphs		Science; Chemistry	None	SC-H-STM-S-9
Chemistry	Chemistry	Structure of Matter	Solutions	concentration calculations		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Solutions	colligative properties		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Solutions	colligative properties	boiling point elevation, freezing point depression, Raoult's law	Science; Chemistry	None	SC-H-STM-S-9
Chemistry	Chemistry	Structure of Matter	Solutions	colligative properties	determination of molar mass using colligative properties	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	kinetics			Science; Chemistry	None	SC-H-STM-S-2
Chemistry	Chemistry	Structure of Matter	kinetics	factors that effect rate: temperature, nature of reactants, state of subdivision, concentration, catalysts		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	kinetics	determining rate and order of the reaction from given data		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	kinetics	activation energy and the role of the catalyst		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	kinetics	using mechanisms to predict order for a reaction		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	acids and bases			Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	acids and bases	properties of acids and bases		Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	acids and bases	theories: Arrhenius, Bronsted-Lowry, Lewis		Science; Chemistry	None	SC-H-STM-S-14

Chemistry	Chemistry	Structure of Matter	acids and bases	theories: Arrhenius, Bronsted-Lowry, Lewis	identifying conjugate acid-base pairs	Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	acids and bases	strengths of acids and bases		Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	acids and bases	equilibrium		Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	acids and bases	equilibrium	LeChantelier' principle and predicting shifts in equilibrium	Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	acids and bases	equilibrium	Law of mass action	Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	acids and bases	equilibrium	ionization of water	Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	acids and bases	equilibrium	ionization of water	Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	acids and bases	equilibrium	Ka, Kb, Ksp calculations	Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	acids and bases	equilibrium	Ka, Kb, Ksp calculations	Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	acids and bases	Relationship between pH and pOH		Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	acids and bases	Buffer systems		Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	acids and bases	Salt hydrolysis reactions		Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	acids and bases	Titration curves and calculations		Science; Chemistry	None	SC-H-STM-S-14
Chemistry	Chemistry	Structure of Matter	thermodynamics			Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	thermodynamics	calculate and interpret the value of pH using tables of standard values, Hess' law, calorimetry and bond energy		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	thermodynamics	predict the sign of the entropy change in chemical reactions		Science; Chemistry	None	SC-H-ET-S-9
Chemistry	Chemistry	Structure of Matter	thermodynamics	calculate and interpret the value of $\Delta S$ from tables of standard values		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	thermodynamics	calculate and interpret the value of $\Delta G$ using tables of standard values and Gibb's equation		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Redox reactions			Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Redox reactions	assigning oxidation numbers		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Redox reactions	balancing redox reactions using the half-reaction method for acids and bases		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Redox reactions	electrochemistry		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Redox reactions	electrochemistry	voltaic cells: identify components and calculate cell potentials	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Redox reactions	electrochemistry	batteries, fuel cells, and storage batteries	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Redox reactions	electrochemistry	electrochemical cells vs voltaic cells	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Organic			Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Organic	draw and name: alkanes, alkenes, alkynes, alkadienes, cyclic aliphatic...		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Organic	isomers		Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Organic	isomers	draw and recognize and name: structural, geometric, and optical isomers	Science; Chemistry	None	N/A
Chemistry	Chemistry	Structure of Matter	Organic	recognize the importance of biological molecules		Science; Chemistry	None	N/A
Physics	Physics	Kinematics 1-D and 2-D				N/A	None	N/A
Physics	Physics	Kinematics 1-D and 2-D	Units of Measure			Science; Physics; Research Summaries	None	N/A

Physics	Physics	Kinematics 1-D and 2-D	Units of Measure	SI units and the metric system		Science; Physics; Research Summaries	None	N/A
Physics	Physics	Kinematics 1-D and 2-D	Making and recording measurements			Science; Physics; Research Summaries	None	N/A
Physics	Physics	Kinematics 1-D and 2-D	Making and recording measurements	accuracy and precision		Science; Physics; Research Summaries	None	N/A
Physics	Physics	Kinematics 1-D and 2-D	Making and recording measurements	significant figures		Science; Physics; Research Summaries	None	N/A
Physics	Physics	Kinematics 1-D and 2-D	Making and recording measurements	scientific notation		Science; Physics; Research Summaries	None	SC-H-EU-S-9
Physics	Physics	Kinematics 1-D and 2-D	Solving problems			Science; Physics; Data Representation	None	N/A
Physics	Physics	Kinematics 1-D and 2-D	Solving problems	data, equations, and graphs		Science; Physics; Data Representation	None	SC-H-MF-S-3/ SC-H-MF-S-4
Physics	Physics	Kinematics 1-D and 2-D	Solving problems	problem-solving strategies		Science; Physics; Data Representation	None	SC-H-MF-S-1
Physics	Physics	Kinematics 1-D and 2-D	Kinematics (including vectors, graphical addition of vectors, components..)			Science; Physics	None	N/A
Physics	Physics	Kinematics 1-D and 2-D	Kinematics (including vectors, graphical addition of vectors, components..)	motion in one direction		Science; Physics	None	N/A
Physics	Physics	Kinematics 1-D and 2-D	Kinematics (including vectors, graphical addition of vectors, components..)	motion in two dimensions (with emphasis on the independence...		Science; Physics	None	N/A
Physics	Physics	Newton's Law of Motion				Science; Physics	None	SC-H-MF-S-2
Physics	Physics	Newton's Law of Motion	Static equilibrium (first law) (including friction and centripetal force)			Science; Physics	None	SC-H-MF-S-2
Physics	Physics	Newton's Law of Motion	Static equilibrium (first law) (including friction and centripetal force)	forces acting on an object is zero		Science; Physics	None	SC-H-MF-S-2
Physics	Physics	Newton's Law of Motion	Static equilibrium (first law) (including friction and centripetal force)	constant velocity (including a velocity of zero)		Science; Physics	None	SC-H-MF-S-2
Physics	Physics	Newton's Law of Motion	Dynamics of a single particle (second law)			Science; Physics	None	SC-H-MF-S-2
Physics	Physics	Newton's Law of Motion	Dynamics of a single particle (second law)	a net force acting on an object causes the object to accelerate in the direction of the force.		Science; Physics	None	SC-H-MF-S-2
Physics	Physics	Newton's Law of Motion	Systems of two of more bodies (third law)			Science; Physics	None	SC-H-MF-S-2
Physics	Physics	Newton's Law of Motion	Systems of two of more bodies (third law)	action and reaction forces		Science; Physics	None	SC-H-MF-S-2
Physics	Physics	Work Energy and Power				Science; Physics	None	SC-H-ET-S-11
Physics	Physics	Work Energy and Power	Work and work-energy theorem			Science; Physics	None	SC-H-ET-S-11
Physics	Physics	Work Energy and Power	Work and work-energy theorem	Work is the scalar product of force and displacement		Science; Physics	None	SC-H-ET-S-11
Physics	Physics	Work Energy and Power	Work and work-energy theorem	Work is a transfer of energy		Science; Physics	None	SC-H-ET-S-11
Physics	Physics	Work Energy and Power	Conservative forces and potential energy			Science; Physics	None	N/A
Physics	Physics	Work Energy and Power	Conservative forces and potential energy	work done on a system can change its potential energy		Science; Physics	None	N/A
Physics	Physics	Work Energy and Power	Conservation of energy			Science; Physics	None	SC-H-MF-S-3
Physics	Physics	Work Energy and Power	Conservation of energy	the total amount of energy in a system remains constant		Science; Physics	None	N/A
Physics	Physics	Work Energy and Power	Power			Science; Physics	None	N/A
Physics	Physics	Work Energy and Power	Power	power is the rate at which work is done		Science; Physics	None	N/A
Physics	Physics	Momentum, Impulse, and Conservation of Momentum				Science; Physics	None	N/A
Physics	Physics	Momentum, Impulse, and Conservation of Momentum	Center of Mass			Science; Physics	None	N/A
Physics	Physics	Momentum, Impulse, and Conservation of Momentum	Center of Mass	estimate the location of the center of mass of an object		Science; Physics	None	N/A
Physics	Physics	Momentum, Impulse, and Conservation of Momentum	Center of Mass	the total mass of an object can be considered to be concentrated at its center of mass		Science; Physics	None	N/A
Physics	Physics	Momentum, Impulse, and Conservation of Momentum	Impulse and momentum			Science; Physics	None	N/A
Physics	Physics	Momentum, Impulse, and Conservation of Momentum	Impulse and momentum	impulse is the product of force and time		Science; Physics	None	N/A
Physics	Physics	Momentum, Impulse, and Conservation of Momentum	Impulse and momentum	momentum is the product of mass and velocity		Science; Physics	None	N/A

Physics	Physics	Momentum, Impulse, and Conservation of Momentum	Impulse and momentum	an impulse changes the momentum of an object		Science; Physics	None	N/A
Physics	Physics	Momentum, Impulse, and Conservation of Momentum	conservation of linear momentum, collisions			Science; Physics	None	N/A
Physics	Physics	Momentum, Impulse, and Conservation of Momentum	conservation of linear momentum, collisions	in the absence of external forces, the total momentum of a system remains constant		Science; Physics	None	SC-H-MF-S-9
Physics	Physics	Momentum, Impulse, and Conservation of Momentum	conservation of linear momentum, collisions	typical examples include elastic collisions, inelastic collisions, and recoil.		Science; Physics	None	N/A
Physics	Physics	Circular Motion, Oscillations, and Gravitation				Science; Physics	None	SC-H-MS-7
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Uniform circular motion			Science; Physics	None	N/A
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Uniform circular motion	period and frequency		Science; Physics	None	N/A
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Uniform circular motion	velocity, centripetal force, and acceleration vectors		Science; Physics	None	N/A
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Torque and rotational statics			Science; Physics	None	N/A
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Torque and rotational statics	torque is the vector sum of force and displacement (radius)		Science; Physics	None	N/A
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Torque and rotational statics	if the vector sum of the torques is zero, the object is in equilibrium		Science; Physics	None	N/A
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation			Science; Physics	None	SC-H-EU-S-5
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	simple harmonic motion (dynamics and energy relationships)		Science; Physics	None	N/A
	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	simple harmonic motion (dynamics and energy relationships)	oscillating pendulum and mass oscillating on a spring	Science; Physics	None	N/A
	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	simple harmonic motion (dynamics and energy relationships)	the sum of the potential and kinetic energies is constant during a full oscillation	Science; Physics	None	N/A
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	mass on a spring		Science; Physics	None	N/A
	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	mass on a spring	period, frequency, mass, amplitude	Science; Physics	None	N/A
	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	mass on a spring	relate the force and displacement (stretch) to the spring constant (Hooke's Law)	Science; Physics	None	N/A
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	Pendulums and other oscillations		Science; Physics	None	N/A
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	Pendulums and other oscillations	period, frequency, mass, amplitude and length of a pendulum	Science; Physics	None	N/A
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	Pendulums and other oscillations	experimental discovery that the period of pendulum depends only on the length of the pendulum	Science; Physics	None	N/A

Physics	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	Pendulums and other oscillations	other examples of oscillations include waves, sound, and atomic and molecular vibrations	Science; Physics	None	N/A
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	Newton's law of gravity		Science; Physics	None	SC-H-MF-S-2
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	Newton's law of gravity	the gravitational forces between two masses depends on the product of the masses and the square of the distance between them	Science; Physics	None	SC-H-MF-S-2
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	Newton's law of gravity	Newton's law of gravity is an inverse square law	Science; Physics	None	SC-H-MF-S-2
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	Orbits of planets and satellites (circular)		Science; Physics	None	SC-H-EU-S-5
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	Orbits of planets and satellites (circular)	the gravitational forces is a centripetal force keeping a mass in circular orbit around a larger mass	Science; Physics	None	SC-H-EU-S-5
Physics	Physics	Circular Motion, Oscillations, and Gravitation	Oscillations and gravitation	Orbits of planets and satellites (circular)	the velocity of an orbiting satellite depends on its period and the radius of the orbit	Science; Physics	None	SC-H-EU-S-5
Physics	Physics	Thermal Physics				Science; Physics	None	SC-H-ET-S-3
Physics	Physics	Thermal Physics	Temperature and heat			Science; Physics	None	SC-H-ET-S-3
Physics	Physics	Thermal Physics	Temperature and heat	mechanical equivalent of heat		Science; Physics	None	SC-H-ET-S-3
Physics	Physics	Thermal Physics	Temperature and heat	mechanical equivalent of heat	heat is the energy transferred between two substances at different temperatures, and mechanical energy can be converted to heat	Science; Physics	None	SC-H-ET-S-3
Physics	Physics	Thermal Physics	Temperature and heat	heat transfer and thermal expansion		Science; Physics	None	SC-H-ET-S-3
Physics	Physics	Thermal Physics	Temperature and heat	heat transfer and thermal expansion	heat is the energy transferred from a hotter body to a colder body	Science; Physics	None	SC-H-ET-S-3
Physics	Physics	Thermal Physics	Temperature and heat	heat transfer and thermal expansion	types of heat transfer are conduction, convection, and radiation	Science; Physics	None	SC-H-ET-S-3
Physics	Physics	Thermal Physics	Temperature and heat	heat transfer and thermal expansion	most substances expand when heated	Science; Physics	None	SC-H-ET-S-3
Physics	Physics	Thermal Physics	Kinetic Theory and Thermodynamics			Science; Physics	None	SC-H-STM-S-7
Physics	Physics	Thermal Physics	Kinetic Theory and Thermodynamics	Gas Laws		Science; Physics	None	SC-H-STM-S-7
Physics	Physics	Thermal Physics	Kinetic Theory and Thermodynamics	Gas Laws	Kinetic model	Science; Physics	None	SC-H-STM-S-2

Physics	Physics	Thermal Physics	Kinetic Theory and Thermodynamics	Gas Laws	Combined Gas Law	Science; Physics	None	SC-H-STM-S-7
Physics	Physics	Thermal Physics	Kinetic Theory and Thermodynamics	Laws of Thermodynamics		Science; Physics	None	N/A
Physics	Physics	Thermal Physics	Kinetic Theory and Thermodynamics	Laws of Thermodynamics	First Law	Science; Physics	None	N/A
Physics	Physics	Thermal Physics	Kinetic Theory and Thermodynamics	Laws of Thermodynamics	Second Law	Science; Physics	None	N/A
Physics	Physics	Thermal Physics	Kinetic Theory and Thermodynamics	Laws of Thermodynamics	Entropy	Science; Physics	None	N/A
Physics	Physics	Electrostatics				Science; Physics	None	N/A
Physics	Physics	Electrostatics	Charge, field, and potential			Science; Physics	None	N/A
Physics	Physics	Electrostatics	Coulomb's law and field and potential of point charges			Science; Physics	None	N/A
Physics	Physics	Electrostatics	Coulomb's law and field and potential of point charges	the electric force between two charges depends on the product of the charges and the square of the distance between them.		Science; Physics	None	N/A
Physics	Physics	Electrostatics	Coulomb's law and field and potential of point charges	Coulomb's law is an inverse square law		Science; Physics	None	N/A
Physics	Physics	Electrostatics	Coulomb's law and field and potential of point charges	electric field due to a point charge is an inverse square law		Science; Physics	None	N/A
Physics	Physics	Electrostatics	Coulomb's law and field and potential of point charges	electric potential is related to work done on a charge in moving it to a particular location		Science; Physics	None	N/A
Physics	Physics	Electrostatics	Fields and potentials of planar charge distributions			Science; Physics	None	N/A
Physics	Physics	Electrostatics	Fields and potentials of planar charge distributions	electrostatics with conductors		Science; Physics	None	N/A
Physics	Physics	Electrostatics	Fields and potentials of planar charge distributions	electrostatics with conductors	charge distributed on a flat conducting plane and a conducting sphere	Science; Physics	None	N/A
Physics	Physics	Electric Circuits				Science; Physics	None	N/A
Physics	Physics	Electric Circuits	steady-state direct current, resistance, power			Science; Physics	None	N/A
Physics	Physics	Electric Circuits	simple series and parallel circuits			Science; Physics	None	N/A
Physics	Physics	Electric Circuits	correct connection and reading of ammeters and voltmeters			Science; Physics	None	N/A
Physics	Physics	Magnetostatics				Science; Physics	None	N/A
Physics	Physics	Magnetostatics	forces on moving charges in magnetic fields			Science; Physics	None	N/A
Physics	Physics	Magnetostatics	forces on moving charges in magnetic fields	right-hand rule for finding the direction of the force acting on a charge moving in a magnetic field		Science; Physics	None	N/A
Physics	Physics	Magnetostatics	forces on current-carrying wires			Science; Physics	None	N/A
Physics	Physics	Magnetostatics	forces on current-carrying wires	right-hand rule for finding the direction of the force acting on a current-carrying wire in an external magnetic field		Science; Physics	None	N/A
Physics	Physics	Magnetostatics	fields of long current-carrying wires			Science; Physics	None	N/A
Physics	Physics	Magnetostatics	fields of long current-carrying wires	right-hand rule for finding the direction of the magnetic field produced by a current-carrying wire		Science; Physics	None	N/A
Physics	Physics	Magnetostatics	Electromagnetism			Science; Physics	None	SC-H-MF-S-5/ SC-H-MF-S-6
Physics	Physics	Magnetostatics	Electromagnetism	Electromagnetic induction		Science; Physics	None	SC-H-MF-S-8/ SC-H-MF-S-9
Physics	Physics	Magnetostatics	Electromagnetism	Electromagnetic induction	a changing magnetic field can produce a voltage in a wire (Faraday's Law)	Science; Physics	None	SC-H-MF-S-8/ SC-H-MF-S-9

Physics	Physics	Magnetostatics	Electromagnetism	Electromagnetic induction	the voltage produced in a conductor by electromagnetic induction always opposes the change that produced it (Lenz's Law)	Science; Physics	None	SC-H-MF-S-8/ SC-H-MF-S-9
Physics	Physics	Waves and Sound				Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Waves and Sound	Wave motion (including sound)			Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Waves and Sound	Wave motion (including sound)	properties of traveling waves		Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Waves and Sound	Wave motion (including sound)	properties of traveling waves	period, frequency, and amplitude	Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Waves and Sound	Wave motion (including sound)	properties of traveling waves	the relationship between speed, frequency, and wavelength	Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Waves and Sound	Wave motion (including sound)	properties of traveling waves	reflection, refraction, diffraction, and interference of waves	Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Waves and Sound	Wave motion (including sound)	properties of standing waves		Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Waves and Sound	Wave motion (including sound)	properties of standing waves	interference of two waves traveling in opposite directions in the same medium	Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Waves and Sound	Wave motion (including sound)	properties of standing waves	resonance	Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Waves and Sound	Wave motion (including sound)	properties of standing waves	nodes and antinodes	Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Waves and Sound	Wave motion (including sound)	Doppler effect		Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Waves and Sound	Wave motion (including sound)	Doppler effect	apparent change in frequency of a wave due to relative motion between a wave source and an observer	Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Waves and Sound	Wave motion (including sound)	Superposition		Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Waves and Sound	Wave motion (including sound)	Superposition	the displacements of two interfering waves at a point can be added to obtain the resultant wave	Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Physical and Geometrical Optics				Science; Physics	None	N/A
Physics	Physics	Physical and Geometrical Optics	Interference and diffraction			Science; Physics	None	N/A
Physics	Physics	Physical and Geometrical Optics	Interference and diffraction	single-slit and double-slit diffraction		Science; Physics	None	N/A
Physics	Physics	Physical and Geometrical Optics	Interference and diffraction	nodes and antinodes		Science; Physics	None	N/A
Physics	Physics	Physical and Geometrical Optics	Interference and diffraction	measuring the wavelength of light using an interference pattern (Young's experiment)		Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Physical and Geometrical Optics	Dispersion of light and the electromagnetic spectrum			Science; Physics	None	N/A
Physics	Physics	Physical and Geometrical Optics	Dispersion of light and the electromagnetic spectrum	speed of an electromagnetic wave in a vacuum		Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Physical and Geometrical Optics	Dispersion of light and the electromagnetic spectrum	prism dispersion		Science; Physics	None	N/A

Physics	Physics	Physical and Geometrical Optics	Dispersion of light and the electromagnetic spectrum	list the electromagnetic waves in order of increasing/decreasing wavelength		Science; Physics	None	SC-H-ET-S-4
Physics	Physics	Physical and Geometrical Optics	Geometric optics			Science; Physics	None	N/A
Physics	Physics	Physical and Geometrical Optics	Geometric optics	reflection and refraction		Science; Physics	None	N/A
Physics	Physics	Physical and Geometrical Optics	Geometric optics	reflection and refraction	angle of incidence equals the angle of refraction	Science; Physics	None	N/A
Physics	Physics	Physical and Geometrical Optics	Geometric optics	reflection and refraction	index of refraction and Snell's law of refraction	Science; Physics	None	N/A
Physics	Physics	Physical and Geometrical Optics	Geometric optics	mirrors		Science; Physics	None	N/A
Physics	Physics	Physical and Geometrical Optics	Geometric optics	mirrors	reflection from a plane, converging, and diverging mirrors	Science; Physics	None	N/A
Physics	Physics	Physical and Geometrical Optics	Geometric optics	mirrors	ray diagrams and the images formed by a plane, converging, and diverging mirrors	Science; Physics	None	N/A
Physics	Physics	Physical and Geometrical Optics	Geometric optics	lenses		Science; Physics	None	N/A
Physics	Physics	Physical and Geometrical Optics	Geometric optics	lenses	refraction through converging and diverging lenses	Science; Physics	None	N/A
Physics	Physics	Physical and Geometrical Optics	Geometric optics	lenses	ray diagrams and the images formed by converging and diverging lenses	Science; Physics	None	N/A
Physics	Physics	Atomic and Nuclear Physics				Science; Physics	None	N/A
Physics	Physics	Atomic and Nuclear Physics	Atomic physics and quantum effects			Science; Physics	None	N/A
Physics	Physics	Atomic and Nuclear Physics	Atomic physics and quantum effects	photons and photoelectric effect		Science; Physics	None	N/A
Physics	Physics	Atomic and Nuclear Physics	Atomic physics and quantum effects	photons and photoelectric effect	dual nature of light	Science; Physics	None	N/A
Physics	Physics	Atomic and Nuclear Physics	Atomic physics and quantum effects	photons and photoelectric effect	photons of light are absorbed by electrons, giving the electrons enough kinetic energy to be released from the metal	Science; Physics	None	N/A
Physics	Physics	Atomic and Nuclear Physics	Atomic physics and quantum effects	Atomic energy levels		Science; Physics	None	N/A
Physics	Physics	Atomic and Nuclear Physics	Atomic physics and quantum effects	Atomic energy levels	Bohr model of the atom	Science; Physics	None	N/A
Physics	Physics	Atomic and Nuclear Physics	Atomic physics and quantum effects	Atomic energy levels	absorption and emission of photons due to an electron changing energy levels	Science; Physics	None	N/A
Physics	Physics	Atomic and Nuclear Physics	Atomic physics and quantum effects	Atomic energy levels	atomic spectra	Science; Physics	None	N/A
Physics	Physics	Atomic and Nuclear Physics	Atomic physics and quantum effects	wave-particle duality		Science; Physics	None	N/A
Physics	Physics	Atomic and Nuclear Physics	Atomic physics and quantum effects	wave-particle duality	matter waves and the de Broglie wavelength of a moving particle	Science; Physics	None	N/A
Physics	Physics	Atomic and Nuclear Physics	Atomic physics and quantum effects	wave-particle duality	the quantum model for the atom	Science; Physics	None	N/A
Physics	Physics	Atomic and Nuclear Physics	Nuclear physics			Science; Physics	None	SC-H-MF-S-8

Physics	Physics	Atomic and Nuclear Physics	Nuclear physics	nuclear reactions (including conservation of mass number and charge)		Science; Physics	None	SC-H-ET-S-1/ SC-H-MF-S-8
Physics	Physics	Atomic and Nuclear Physics	Nuclear physics	nuclear reactions (including conservation of mass number and charge)	atomic number and mass number of the elements	Science; Physics	None	SC-H-ET-S-1/ SC-H-MF-S-8
Physics	Physics	Atomic and Nuclear Physics	Nuclear physics	nuclear reactions (including conservation of mass number and charge)	radioactive decay equations (alpha, beta, and gamma emission)	Science; Physics	None	SC-H-ET-S-1/ SC-H-MF-S-8
Physics	Physics	Atomic and Nuclear Physics	Nuclear physics	nuclear reactions (including conservation of mass number and charge)	nuclear fission and fusion	Science; Physics	None	SC-H-ET-S-1/ SC-H-MF-S-8
Physics	Physics	Atomic and Nuclear Physics	Nuclear physics	Mass-energy equivalence		Science; Physics	None	SC-H-ET-S-1/ SC-H-MF-S-8
Physics	Physics	Atomic and Nuclear Physics	Nuclear physics	Mass-energy equivalence	$E = mc^2$	Science; Physics	None	SC-H-ET-S-1/ SC-H-MF-S-8
Physics	Physics	Atomic and Nuclear Physics	Nuclear physics	Mass-energy equivalence	Nuclear binding energy	Science; Physics	None	SC-H-ET-S-1/ SC-H-MF-S-8