Coal City Unit District #1
Eighth Grade
Science Curriculum

SC.8:1 **Students will demonstrate understanding of the molecular scale changes when thermal energy is added or removed. (MS-PS1-4)**

- SC.8:1-1 Identify the states of matter and the kinetic energy of the molecules in each state.
- SC.8:1-2 Explain the kinetic energy of molecules as thermal energy is added or removed.
- SC.8:1-3 Explain what is happening to temperature as thermal energy is added or removed, particularly during a change of state.
- SC.8:1-4 Construct a model to demonstrate what will happen when thermal energy is added or removed to different states of matter.

SC.8:2 **Students will develop models to describe the atomic composition of simple molecules and extended structures. (MS-PS1-1)**

- SC.8:2-1 Identify the characteristics of the boxes on the periodic table.
- SC.8:2-2 Identify parts of an atom.
- SC.8:2-3 Identify elements based on their atomic structures, including their isotopes.
- SC.8:2-4 Develop models of atoms based on atomic structure and periodic table squares.
- SC.8:2-5 Construct models of molecules based on molecular formulas and different bonds.
- SC.8:2-6 Compare models to describe how the behavior of bulk substances depends on their molecular structures.

SC.8:3 **Students will develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. (MS-PS1-5)**

- SC.8:3-1 Differentiate between reactants and products.
- SC.8:3-2 Explain the conservation of mass.
- SC.8:3-3 Model the rearrangement of atoms in a chemical reaction.

SC.8:4 **Students will analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. (MS-PS1-2)**

SC.8:4-1	Differentiate between physical and chemical properties.
SC.8:4-2	Identify physical changes and chemical reactions.
SC.8:4-3	Analyze property data before and after a change.
SC.8:4-4	Defend analysis using characteristic properties.

SC.8:5 **Students will demonstrate understanding of the design process in a project that deals with endothermic and exothermic reactions. (MS-PS1-6)**

SC.8:5-1	Differentiate between endothermic and exothermic reactions.
SC.8:5-2	While following constraints and criteria, design a device that can be used to release thermal energy by a chemical reaction.
SC.8:5-3	Test the device for its ability to meet the criteria.
SC.8:5-4	Based on collected data, revise the design of the device to improve it relative to the criteria and constraints.

SC.8:6 **Students will determine how synthetic materials made from natural resources affect the environment. (MS-PS1-3, MS-ESS3-4, MS-ETS1-1,2,3,4)**

SC.8:6-1	Identify different examples of synthetic materials that are used regularly (e.g. polymers, medicine, foods, alternative fuels).
SC.8:6-2	Analyze how the mining/drilling and use of oil, coal, gas, and minerals impacts the environment.
SC.8:6-3	Explain how the production and use of synthetic materials have negative and positive impacts on society or the earth.
SC.8:6-4	Design an environmentally friendly bioplastic to fulfill given constraints and criteria.

SC.8:7 **Students will use evidence to construct a scientific explanation for how the geologic time scale is used to organize Earth's history. (MS-ESS1-4)**

SC.8:7-1	Use Steno's laws that relate to rock formation to identify the ages of different rock formations.
SC.8:7-2	Explain how radioactive dating can be used to identify the age of igneous rocks, but not necessarily sedimentary or metamorphic.
SC.8:7-3	Explain how fossils are used to help identify the age of sedimentary rocks.

SC.8:8 **Students will demonstrate understanding of past plate motions. (MS-ESS2-3)**

SC.8:8-1 Analyze data on fossil distribution, mountain ranges, and seafloor shelves to provide evidence for continental drift.
SC.8:8-2 Describe how plate movement affects Earth's surface, both the building of land and recycling of it.
SC.8:8-4 Explain the forces behind the movement of the continents.

SC.8:9 **Students will construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. (MS-ESS2-2)**

SC.8:9-1 Develop a timeline of different geologic events that have shaped the earth as we know it today.
SC.8:9-2 Explain how specific geologic locations were formed.

SC.8:10 **Students will analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. (MS-ESS3-2)**

SC.8:10-1 Identify natural hazards.
SC.8:10-2 Describe the processes that cause earthquakes and tsunamis.
SC.8:10-3 Describe the processes that cause volcanic eruptions.
SC.8:10-4 Identify how scientists monitor faults and volcanoes.
SC.8:10-5 Compile data needed to predict earthquakes and tsunamis, including long-term forecasting and short-term predictions.
SC.8:10-6 Compile data needed to predict volcanoes, including long-term forecasting and short-term predictions.
SC.8:10-7 Identify technologies that are used to help monitor active faults and volcanic zones.
SC.8:10-8 Use data to predict areas that are at risk.
SC.8:10-9 Identify technologies that are used to mitigate the effects of earthquakes and volcanic eruptions.

SC.8:11 **Students will describe the cycling of Earth's materials and the flow of energy that drives this process. (MS-ESS2-1)**

SC.8:11-1	Describe the processes of melting crystallization, weathering, deformation, sedimentation, and erosion and the movement of energy for each.
SC.8:11-2	Explain how the processes of melting, crystallization, weathering, deformation, sedimentation, and erosion cause the formation of rocks.
SC.8:11-3	Differentiate between the types of rocks and their formation.
SC.8:11-4	Identify the requirements for substances to be considered minerals.
SC.8:11-5	Explain the processes that result in mineral formation.
SC.8:11-6	Identify minerals based on properties.
SC.8:11-7	Develop a model to demonstrate how one rock type can turn into another including the flow of energy.

SC.8:12 **Students will demonstrate understanding that the uneven distribution of natural resources are the result of geoscience processes. (MS-ESS3-1)**

SC.8:12-1	Explain the formation of oil, coal, natural gas, and minerals and why they are considered non-renewable.
SC.8:12-2	Analyze data identifying the oil producing countries.
SC.8:12-3	Research how new drilling techniques are opening up new or dried up oil/gas reserves.

SC.8:13 **Students will demonstrate knowledge of how the body systems work together and how they help maintain homeostasis. (MS-LS1-3,7,8)**

SC.8:13-1	Identify how homeostasis helps to maintain a healthy body.
SC.8:13-2	Explain how body systems function with one another.
SC.8:13-3	Identify the functions of the body systems and how they work.