DISTRICT 110 SCIENCE CURRICULUM
Grade 8 – Earth Science

Strand: **The Nature of Science and Engineering**
Student Performance Benchmarks:
Evaluate the reasoning in arguments in which fact and opinion are intermingled or when conclusions do not follow logically from the evidence given.

Use logical reasoning and imagination to develop descriptions, explanations, predictions, and models based on evidence.

Describe examples of important contributions to the advancement of science, engineering, and technology made by individuals representing different groups and cultures at different times in history.

Explain how scientific laws and engineering principles, as well as economic, political, social, and ethical expectations must be taken into account in designing engineering solutions or conducting scientific investigations.

Understand that scientific knowledge is always changing as new technologies and information enhance observations and analysis of data.

Provide examples of how advances in technology have impacted the ways in which people live, work, and interact.

Use maps, satellite images, and other data sets to describe patterns and make predictions about local and global systems in Earth science contexts.

Determine and use appropriate safety procedures, tools, measurements, graphs, and mathematical analyses to describe and investigate natural and designed systems in earth and physical science contexts.

Strand: **Physical Science**
Student Performance Benchmarks:
Distinguish between a mixture and a pure substance, and use physical properties including color, solubility, density, melting point, and boiling point to separate mixtures and identify pure substances.

Use physical properties to distinguish between metals and non-metals.

Identify evidence of chemical changes, including color change, generation of a gas, solid formation, and temperature change.

Distinguish between chemical and physical changes in matter.

Use the particle model of matter to explain how mass is conserved during physical and chemical changes in a closed system.

Recognize that acids are compounds whose properties include a sour taste, characteristic color changes with litmus and other acid/base indicators, and the tendency to react with bases to produce a salt and water.

Explain how seismic waves transfer energy through the layers of the earth and across its surface.

Strand: **Earth and Space Science**
Student Performance Benchmarks:
Recognize that land and water use practices can affect natural processes, and that natural processes interfere and interact with human systems.

Describe how mineral and fossil fuel resources have formed over millions of years, and explain why these resources are finite and non-renewable over human time frames.

Use the predictable motions of the earth around its own axis and around the sun, and of the moon around the earth, to explain day length, the phases of the moon, and eclipses.

Compare and contrast the sizes, locations, and compositions of the planets and moons in our solar system.

Recognize that gravitational force exists between any two objects, and describe how the masses of the objects and distance between them affect the force.

Describe how gravity and inertia keep most objects in the solar system in regular and predictable motion.

Recognize that the Sun is a medium-sized star, one of billions of stars in the Milky Way Galaxy, and the closest star to Earth.

Describe how the water cycle distributes materials and purifies water.

Describe the location, composition, and use of major water reservoirs on the earth, and the transfer of water among them.

Relate global weather patterns to patterns in regional and local weather.

Analyze changes in wind direction, temperature, humidity, and air pressure and relate them to fronts and pressure systems.

Describe how the composition and structure of the earth's atmosphere affects energy absorption, climate, and the distribution of particulates and gases.

Explain how heating of the earth's surface and atmosphere by the sun drives convection within the atmosphere and hydrosphere producing winds, ocean currents and the water cycle, as well as influencing global climate.

Recognize that oceans have a major effect on global climate because water in the oceans holds a large amount of heat.

Explain how the combination of the earth's tilted axis and revolution around the sun causes the progression of seasons.

Relate rock composition and texture to physical conditions at the time of formation of igneous, sedimentary, and metamorphic rock.

Classify and identify rocks and minerals using characteristics including, but not limited to, density, hardness and streak for minerals; and texture and composition for rocks.

Interpret successive layers of sedimentary rocks and their fossils to infer relative ages of rock sequences, past geologic events, changes in environmental conditions, and the appearance and extinction of life forms.

Explain the role of weathering, erosion, and glacial activity in shaping Minnesota's current landscape.

Explain how landforms result from the processes of crustal deformation, volcanic eruptions, weathering, erosion, and deposition of sediment.

Recognize that major geological events, such as earthquakes, volcanic eruptions, and mountain building result from the slow movement of tectonic plates.

Correlate the distribution of ocean trenches, mid-ocean ridges, and mountain ranges to volcanic and seismic activity.

Recognize that the Earth is composed of layers, and describe the properties of the layers, including the lithosphere, mantle, and core.