TREYNOR COMMUNITY SCHOOL DISTRICT
CURRICULUM FRAMEWORK

Subject: **Science**
Course: **Grade 4 Science**
Grade Level(s): **4**
Prerequisites: **None**

Course Description: In fourth-grade science, students will use quantitative and qualitative data to formulate arguments about evidence, develop models, analyze and interpret data from maps, and construct explanations related to the transfer of matter and energy on earth, in physical interactions, and in organisms. Students will engage in learning activities and investigations designed to formulate answers to questions such as "What are waves and what are some things they can do? " "What is energy and how is it related to motion?"

Examples of Four Graders' Work at School:

- Describe how the internal and external structures of different plants and animals function to support survival, growth, behavior, and reproduction.
- Plan and conduct investigations to explore how light and sight are related.
- Design a device that uses an electrical current to produce motion, sound, light or heat.
- Explore wave properties and discover how waves can cause objects to move.
- Use patterns of rock formations and fossils to construct an explanation of how environments change over time.
- Make observations or take measurements to determine the effects of weathering and erosion on shaping the land.

Content Standards: In order that our students may achieve the maximum benefit from their talents and abilities, the fourth graders of the Treynor Community School who demonstrate understanding can . . .

I. Physical Science

1. Energy

1) Use evidence to construct an explanation relating the speed of an object to the energy of that object.
2) Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.
3) Ask questions and predict outcomes about the changes in energy that occur when objects collide.
4) Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

2. **Waves and Their Applications in Technologies for Information Transition**
    1) Develop a model of waves to describe patterns in terms of amplitude and wavelength and tat waves can cause objects to move.
    2) Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.
    3) Generate and compare multiple solutions that use patterns to transfer information.

II. Life Science

1. **From Molecules to Organisms: Structures and Processes**
    1) Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
    2) Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

III. Earth and Space Science

1. **Earth's Place in the Universe**
    1) Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.
2. **Earth's Systems**
    1) Make observations and/or measurement to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
    2) Analyze and interpret data from maps to describe patterns of Earth's features.
3. **Earth and Human Activity**
    1) Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.
    2) Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

IV. Engineering, Technology, and Application of Science

1. **Engineering Design**
    1) Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
    2) Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
    3) Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.