North Mac Intermediate School

Curriculum Guide

**Teacher** – Dawn Roesch

**Grade Level** -4th Grade

**Subject** – Science

**Course Aims** –This course aims to create a desire to learn through development of critical thinking skills and use of the scientific method in multiple hands-on experiments. The students will be challenged to formulate answers to questions, by applying their knowledge and understanding of the content.

**Course Description**-Fourth grade Science will use the scientific method to learn about physical science (i.e., the nature of matter, energy and motion in the forms of sound, light, heat, waves, and electric current), earth science (rocks and minerals, processes that shape the Earth, and the atmosphere) and life science (structure and function of plants and animals, organization and process for responding to stimuli, and adaptations).

**Textbook**

Title: Science (Life Science, Earth Science, Physical Science)

ISBN: LS=13 978 0-618-69205-0 & 10 0-618-59205-9

ES=13 978-0-618-59208-1 & 10 0-618-59208-3

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Authors: Badders, Carnine, Feliciani, Jeanpierre, Sumners, Valentino

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QUARTER: 1 COURSE: Science

| *Content* | *Assessment* | *National Science Education Standards/ Next Generation Science Standards* | *Essential Questions* | *Resources* |
|---|---|---|---|---|
| **The Nature of Science**<br>*Inquiry<br>*Experiment Design<br>Lab Safety | Notes/Vocabulary Development<br>Experiment Design<br>Daily Journaling<br>Labs/Projects<br>Tests<br>Group Presentations | NSES-4.A.<br>*Abilities Necessary To Do Scientific Inquiry<br>*Understanding About Scientific Inquiry<br>*Abilities of Technological Design<br>NGSS-3-5-ETS1-1, 2, 3 *Engineering Design | 1.How do scientists think?<br>2.What do scientists do?<br>3.What are the steps to scientific inquiry? the scientific method??<br>4.What is a variable & how do I control for it?<br>5. What does it take to be an inventor?<br>6. How can I use the nature of science to make data-based decisions?<br>7.What do I need to know to be safe in a lab or when conducting an experiment?<br>********** | Textbooks<br>Promethean<br>Computer<br>Science Equipment<br>Discussion<br>Science Notebook<br>Black Box Kit |
| **Unit A Organization of Living Things**<br>Ch. 1 Life Processes<br>Ch. 2 Human Body Systems<br>Ch. 3 Life Cycles<br>Ch. 4 Responses of Living Things | Notes/Vocabulary Development<br>Experiment Design<br>Daily Journaling<br>Labs/Projects<br>Tests<br>Group Presentations | NSES-Life Science Content C & F<br>NGSS-4-PS4-2, LS1-1 & 2 | 1.What are the life processes?<br>2. How are complex living organisms organized?<br>3. What is the function of the different organ systems and how do they interact?<br>4. How are the life cycles of plants and animals alike and different?<br>5. How do organisms detect and respond to stimuli?<br>6. What are the functions of the different internal and external structures of plant and animals in relation to survival, growth, behavior and reproduction? | Textbooks<br>Promethean<br>Computer<br>Science Equipment<br>Discussion<br>Science Notebook<br>Black Box Kit |

QUARTER: 2 COURSE: Science

| *Content* | *Assessment* | *National Science Education Standards/ Next Generation Science Standards* | *Essential Questions* | *Resources* |
|---|---|---|---|---|
| **Unit C: The Solid Earth**<br>Ch. 8 Forces That Shape the Earth<br>Ch. 9 Managing Earth's Resources | Notes/Vocabulary Development<br>Experiment Design<br>Daily Journaling<br>Labs/Projects<br>Tests<br>Group Presentations<br>Observation | NSES-Earth and Space Science Content D<br>*Properties of earth materials<br>*Objects in sky<br>*Changes in Earth and sky<br>NGSS-4ESS1-1<br>*History of Planet Earth-rock layers<br>NGSS-4ESS2-1<br>*Earth Materials & Systems-natural forces that have shaped earth<br>NGSS-4ESS2-2<br>*Use maps to observe patterns in Earth's features.<br>NGSS-4ESS3-1<br>*Learn about energy and fuels from natural resources, their uses and effects on the environment.<br>NGSS-4ESS3-2<br>*Living things affect the physical characteristics of their region. | 1.What is the rock cycle?<br>2. What are some properties by which rocks can be classified?<br>3.Describe the Earth's layers in detail.<br>4.What are some rapid changes to the earth's surface?<br>5. What are some causes of slow changes to earth's surface?<br>6. How is water renewed by the water cycle?<br>7. Why is soil and water conservation important?<br>8. Where do humans fit in to resource conservation? | Textbooks<br>Promethean<br>Computer<br>Science Equipment<br>Discussion<br>Science Notebook<br>Rock Collection<br>Rock Box Trailer from IDNR<br>Teacher Resources<br>Soil Samples from Geologist |

QUARTER: 3 COURSE: Science

| *Content* | *Assessment* | *National Science Education Standards/ Next Generation Science Standards* | *Essential Questions* | *Resources* |
|---|---|---|---|---|
| **Unit D The Atmosphere and Beyond**<br>Ch. 11 Looking at the Universe<br>**Unit B Ecosystems**<br>Ch. 6 Matter and Energy in Ecosystems | Notes/Vocabulary Development<br>Experiment Design<br>Daily Journaling<br>Labs/Projects<br>Tests<br>Group Presentations | NSES-Earth and Space Content D<br>*Objects in the sky<br><br>NGSS-4PS3-2 Energy can be transferred from place to place by sound, light, heat, and electric currents | 1. How does the Sun heat Earth's surface?<br>2. How does energy from the Sun affect Earth?<br>3.What causes the seasons of the year?<br>4. What are the phases of the moon and what causes them?<br>5. Describe the flow of energy through a food chain, web, and the role of predator/prey relationship.<br>6. Explain how to use variables in a controlled experiment. | Textbooks<br>Promethean<br>Computer<br>Science Equipment<br>Discussion<br>Science Notebook<br>Star Lab & materials<br>Teacher resources<br>Bill Nye Video |
| **Unit F- Energy and Motion**<br>Ch. 15 Electricity and Magnetism | Notes/Vocabulary Development<br>Experiment Design<br>Daily Journaling<br>Labs/Projects<br>Tests<br>Group Presentations | NSES-Physical Science Content B<br>*Light, Heat, Electricity, and Magnetism<br><br>NGSS-4PS3-2 Energy can be transferred from place to place by sound, light, heat, and electric currents<br>NGSS-4PS3-4 Design, test, and refine a device that converts energy from one form to another | 1. What is static electricity?<br>2. Explain positive and negative charges and how they interact.<br>3. What are the different types of circuits? How do you know?<br>4. Describe a magnetic field and explain how Earth's magnetic field creates the Aurora Borealis.<br>5. Construct, test, and refine a simple electromagnet. | Textbooks<br>Promethean<br>Computer<br>Science Equipment<br>Discussion<br>Science Notebook<br>Teacher resources<br>Electricity Kit<br>Magnet Kit<br>Discovery Channel Video |

QUARTER: 4 COURSE: Science

| *Content* | *Assessment* | *National Science Education Standards/ Next Generation Science Standards* | *Essential Questions* | *Resources* |
|---|---|---|---|---|
| **Unit F Energy and Motion**<br>Ch. 14 Energy Changes<br>Ch. 16 Motion and Machines | Notes/Vocabulary Development<br>Experiment Design<br>Daily Journaling<br>Labs/Projects<br>Tests<br>Group Presentations | NSES-Physical Science Content B<br>*Position and motion of objects<br>*Light & heat<br>NGSS-4PS3-1<br>*Use evidence to explain speed of an object and its energy<br>NGSS-4PS3-3<br>*Ask questions and predict outcomes about the changes in energy that occur when objects collide<br>NGSS-4PS4-1<br>*Develop a model to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move<br>NGSS-4PS4-2<br>*Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.<br>NGSS-4PS4-3<br>*Generate and compare multiple solutions that use patterns to transfer information | 1. Describe changes and distinguish between kinetic and potential energy.<br>2. Explain how an increase in potential energy results in an increase in kinetic energy.<br>3. How does light behave? Include reflection, refraction, absorption, and colors.<br>4. How does sound behave? Describe frequency (pitch), amplitude (volume), and how the ear transmits sound to the brain.<br>5. How does water interact at different temperatures?<br>6. What ways can thermal energy be transferred? | Textbooks<br>Promethean<br>Computer<br>Science Equipment<br>Discussion<br>Science Notebook<br>Simple Machines Kits |