



Fond du Lac Tribal and Community College
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Unit 2: Lessons in Earth Science

- Reviewing key concepts of Earth Science
- Practicing Lab and Unit write ups for Earth and Space Sciences Lessons method students would like to address
- Incorporating Native American Scientists who have contributed to the field
- Incorporating the Native American culture and how the people help to maintain balance

Unit 3: Lessons in Life Science

- Reviewing key concepts of Life Science
- Practicing Lab and Unit write ups for Life Science Topics

Unit 4: Lessons in Physical Science

- Reviewing key concepts of Physical Science
- Practicing Lab and Unit write ups for Physical Science Topics

Learning Outcomes

Outcomes and Assessments Competencies Across the Curriculum*

Information Literacy: Students will be able to use print and/or non-print tools effectively for the discovery, acquisition, and evaluation of information.

Objective 1: students will have to demonstrate their ability to communicate through written expression weekly in the on-line discussions associated with topics in classroom discussion, current events, lesson plans and cultural assignments. Students will be required to respond to the discussion prompt and then respond to a minimum of two classmates.

Objective 2: students will have to demonstrate their ability to create a unit of their choice from materials they have gathered on topics and the material they have received from class. Students will be graded on completeness, flow and correlation to standards.

Ability to Communicate: Students will be able to listen, read, comprehend, and/or deliver information in a variety of formats to successfully communicate.

Objective 1: students will be given reading assignments out of the text outside of class time and then be expected to discuss the information therein. Students will be evaluated on their knowledge of reading material by classroom discussion and assessments.



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Objective 2: students will be expected to ask questions when they are not understanding or sure of the reading material, they were required to read outside of class time. Students will be evaluated on their knowledge of reading material by classroom discussion and assessments.

Problem Solve: Students will be able to conceptualize, apply, analyze, synthesize, and/or evaluate information to formulate and solve problems.

Objective 1: Students will be able to demonstrate their ability to write and evaluate a laboratory experiment, evaluate primary source articles, and work scientific problems using problem solving skills. Students will be evaluated by their written lesson plans, classroom discussions, and assessments.

Objective 2: Students will demonstrate their ability to identify common scientific misconceptions and how to teach children to let go of said misconceptions through discrepant events and other tools.

Culture: Students will learn to appreciate and consider knowledge of Anishinaabe traditions and culture, knowledge of one's own traditions and cultures, knowledge of others' traditions and cultures, culture of work, culture of academic disciplines and/or respect for global diversity.

Objective 1: Students will be expected to research how native and indigenous cultures make sense of scientific phenomenon and how those stories become part of a tradition and landmarks of a cultural society. Students will be assessed by online student discussion, research and a creation of a diversity scientists.

Objective 2: Students will be expected to incorporate Native American culture into at least one of their lesson plans addressing past, present and future scientific worldviews and phenomenon.

Learning Outcomes:

- Access, interpret and disseminate into their curriculum, the Minnesota state science standards and the Next Generation Science Standards (NGSS) for grades K-6 through classroom curriculum.
- Demonstrate the ability to write effective lesson plans using Minnesota science standards for grades K-6 that will include, but not limited to various inquiry-methods (learning methods) which encompass indigenous peoples and peoples of color and other ethnic backgrounds.
- Demonstrate through classroom work and assessment the ability to



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understand the various pieces of scientific equipment and safety measures and protections required when teaching and conducting scientific investigations.

- Demonstrate the ability to evaluate and reinforce students’ work to give a better understanding of the scientific world and worldview around them by classroom work, projects, and assessments.
- Demonstrate understanding of and evaluate work concerning the scientific method approach to science learning and understanding by working in small groups, classroom assignments and assessments.
- Demonstrate through classroom work and assessment the ability to understand the various pieces of scientific equipment and safety measures and protections required when teaching and conducting scientific investigations.
- Demonstrate the understanding of natural cycles which protect the Earth and how Indigenous peoples have interacted and continue to interact with nature to protect their homes of the past, present and future.

Cultural Standards:

*Each course within the BS in Elementary Education program must meet a minimum of two measurable learning outcomes for three different **Cultural Standards**. If your course does not meet the Cultural Standards, please justify your rationale.*

Cultural Standard (must meet 3 of 7)	Learning Outcomes that Align to Cultural Standards (two for each standard) The student will:	Cultural Assessment Description
<p>2. GWAYAKWAADIZIWIN – Living a Balanced Way To provide teacher candidates the opportunity to recognize the importance of living in harmony with the community and are prepared to use a collective approach to understanding and deciding on a course of action.</p> <p><u>Disposition: Communication and Collaboration</u> Teacher candidates demonstrate professional, interpersonal, and communication skills. These skills are used to promote positive collaborative partnerships with students, families, colleagues, other school professionals, and the global community to support achievement of student learning outcomes.</p> <ul style="list-style-type: none"> • <i>Reflective Collaboration:</i> Uses insights and inspiration of others to improve practice and can occur in: <ul style="list-style-type: none"> ○ Professional Learning Communities ○ Mentoring Programs ○ Peer Observations ○ Critical Friends Groups 	<p>Demonstrate the ability to write effective lesson plans using Minnesota science standards for grades K-6 that will include, but not limited to various inquiry-methods (learning methods) which encompass indigenous peoples and peoples of color and other ethnic backgrounds.</p> <p>Demonstrate the understanding of natural cycles which protect the Earth and how Indigenous peoples have interacted and continue to interact</p>	<p>Students will be writing a full lesson plan on the water cycle and integrating how keeping the water cycle balanced is key to Mother Earth. In this lesson plan students will address how a balanced water cycle affects all humans and living things on Earth.</p> <p>Students will demonstrate this outcome by developing an investigative lab at the upper elementary grades including grading rubrics that show how a balanced water cycle affects people and Mother Earth.</p>



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<ul style="list-style-type: none"> • <i>Community Involvement:</i> Demonstrates positive collaborative skills in interactions with instructors, advisors, students, colleagues, parents/guardians/caregivers, school teams, and those in the wider community. • <i>Communication:</i> Effectively and accurately communicates ideas, thoughts or visions (oral and written) and engages in active listening based on audience and community cultural norms. <p><u>Professional Outcome:</u> <i>Community and Collaboration</i> To develop teachers who are reflective, connected educators who understand the interrelatedness of educating the whole child by including the community.</p>	<p>with nature to protect their homes of the past, present and future.</p>	<p>Students will include how an unbalanced water cycle has consequences for all humans and living things on the planet.</p>
<p>4. AANGWAAMIZIWIN – Diligence and Caution</p> <p>To develop teacher candidates’ capacity to proceed carefully, after identifying, discussing and reflecting on logical and ethical dimensions of political, cultural, social, and personal life.</p> <p><u>Disposition:</u> <i>Ethical Behavior</i> Teacher candidates demonstrate professional integrity through behaviors and actions that reflect state and FDLTCC ethical and cultural standards.</p> <ul style="list-style-type: none"> • Demonstrate professional and ethical conduct with faculty, faculty supervisors, cooperating teachers, students, parents, colleagues, and community. • Practices, complies, and understands the school site and the college and unit policies (e.g., academic honesty), as well as Minnesota Code of Ethics for Teachers. • Adheres to all professional standards, including the use of technologies (e.g., accesses authorized websites, social media and other applications, and uses personal electronic devices as appropriate). <p><u>Professional Outcome:</u> <i>Ethical Practitioner</i></p> <ul style="list-style-type: none"> • To develop teachers’ capacity to be ethically responsive in respecting their role as an educator and understanding community needs. 	<p>Demonstrate through classroom work and assessment the ability to understand the various pieces of scientific equipment and safety measures and protections required when teaching and conducting scientific investigations.</p> <p>Access, interpret and disseminate into their curriculum, the Minnesota state science standards and the Next Generation Science Standards (NGSS) for grades K-6 through classroom curriculum.</p>	<p>Students will be assessed on their ability to create a laboratory exercise on laboratory equipment and use including a student assessment in an elementary classroom and how protecting oneself protects the people. Students will write an age and developmentally appropriate lesson plan on how to work in a science setting that is safe and respectful to the environment and the culture.</p> <p>Students will be assessed on their ability to create an activity for an elementary classroom which includes how to work safely in a science classroom including safety symbols, equipment and protocols. This activity will include a way for teacher candidates to assess their students’ knowledge of the science classroom safety.</p> <p>Students will also be required to include information on how people and companies use safety equipment and protocol to protect the environment and the people as part of the lesson</p>



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<p>6. ZAAGI' IDIWIN – Loving and Caring To encourage the teacher candidates' development of healthy, caring relationships built on respect for all.</p> <p><u>Disposition: Equity, Social Justice, and Inclusion</u> Teacher candidates demonstrate fairness, empathy and compassion based on their belief that everyone can learn. Candidates actively seek out multiple perspectives and diverse experiences to address the academic, interpersonal, and emotional needs of all students.</p> <ul style="list-style-type: none"> • Demonstrates and appreciation of the languages, communities, and experiences students bring to the classroom. • Advocates for and supports Indigenous and other diverse communities and individuals. • Respects the dignity and essential worth of all individuals. • Interacts with sensitivity to community and cultural norms. • Values and responds to all aspects of a child's developmental well-being (cognitive, emotional, psychological, social, and physical). • Promotes the diversity of opinions, ideas, and backgrounds. <p><u>Professional Outcome: Diversity</u></p> <ul style="list-style-type: none"> • Promote teachers' acceptance and respect of the diversity within their school, community and environment. 	<p>Demonstrate the ability to evaluate and reinforce students' work to give a better understanding of the scientific world and worldview around them by classroom work, projects and assessments.</p> <p>Demonstrate understanding of and evaluate work concerning the scientific method approach to science learning and understanding by working in small groups, classroom assignments and assessments.</p>	<p>component.</p> <p>Students will be assessed on their ability to design a project- based bulletin board that addresses the contribution of black, brown and Native American scientists.</p> <p>Students will be assessed on their ability to create an activity, with a grading rubric, where students create an essay or paper on a Native American scientist and their contribution to science and their people.</p>
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Minnesota Professional Education License and Standards Board Standards (MN PELSB)** listed at the end of the syllabus. (Insert more rows as needed.)

8710.2000 Standards of Effective Practice

MN PELSB SEP Standard Code	8710.2000 Standards of Effective Practice	Learning Opportunities & Assessment *Include the Field Experience hours as applicable for clarity.	Based on the learning opportunities and assessments, the K-6 learner will demonstrate meeting this standard by:	FDLTCC Learning Outcomes	Cultural Standard
4.R.	Identify and apply technology resources to	Website Search One:	Complete an internet search and identify 2-3 technology resources that can be used in the classroom to engage and	Demonstrate the understanding of natural cycles which protect the Earth and	GWAYA KW AADIZI WIN- <i>Living a</i>



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	<p>enable and empower learners with diverse backgrounds, characteristics, and abilities.</p>	<p>Develop a lesson that includes one technology resource.</p> <p>Week 7: Diversity Bulletin Board</p>	<p>motivate students in science. Students will also connect the technology resources on how they empower all students, including those from diverse backgrounds, characteristics, and abilities. In the classroom, students will discuss their findings and explore how technology resources can empower students from diverse backgrounds, characteristics and abilities. Students will learn about free online educational technology sources for surveys, data, vocabulary, etc.</p> <p>The lesson plan will be on the water cycle and integrating how keeping the water cycle balanced is key to Mother Earth. Students will incorporate a form of technology they learned from their website search into their lesson plan. Students will implement the lesson in the classroom as part of a field experience.</p> <p>Students will develop a bulletin board that engages students to the works other cultures have contributed to science and scientific research. Students will be given a choice on how they want to engage students (Ex.) Perhaps they will give them a treasure hunt assignment from people on the bulletin, have them add a person they have researched to add to the bulletin board, etc. These are options for students to consider as they are</p>	<p>how Indigenous peoples have interacted and continue to interact with nature to protect their homes of the past, present, and future.</p> <p>Demonstrate the ability to write effective lesson plans using Minnesota science standards for grades K-6 that will include, but not limited to various inquiry-methods (learning methods) which encompass indigenous peoples and peoples of color and other ethnic backgrounds.</p>	<p><i>balanced way:</i></p>
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			<p>experience and will be recording what inquiry techniques they are using and how they think it went and what could be done better.</p> <p>Questions to stimulate reflection include: What methods of inquiry did you use to engage students in problem-solving and facilitating factual recall? How did you promote risk-taking? How did you promote convergent and divergent thinking? How did you promote student curiosity and help</p>		
9.N.	Use technology resources to collect and analyze data, interpret results, and communicate findings to improve instructional practice and maximize student learning	<p>Chapter 1, page 15: connecting technology to teaching</p> <p>Week 2: chapter 3, pages 41-68</p> <p>Week 3: Current event assignments</p>	<p>The book assignments are designed to give students a starting point for learning about technology and how to use technology responsibly in class.</p> <p>Chapter 2 is learning about lesson planning and how to use standards, sequence and scope.</p> <p>Science is always changing and teachers who teach science need to know how to stay current and using current events is one excellent way to do this. Knowing what publications are good to review and learning to review primary source articles are keys to being able to effectively keep current.</p> <p>Some of the current event articles will allow students</p>	<p>Demonstrate through classroom work and assessment the ability to understand the various pieces of scientific equipment and safety measures and protections required when teaching and conducting scientific investigations.</p> <p>Demonstrate through classroom work and assessment the ability to understand the various pieces of scientific equipment and safety measures</p>	<p>AANGWAA MIZIWIN <i>Diligence and caution</i></p>



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		<p style="text-align: center;">Week 10: Chapter 6 (all)</p>	<p>to use various technology resources, such as but not limited to, laboratory equipment, graphing through word and excel and scientific calculators (upper elementary) to understand the collection and analyzing of data, to helping understand the interpreting of results and communicating findings to empower instructional practice and maximize student learning.</p> <p>Using a technology resource, students will analyze the data and communicate findings in class and discuss how instructional practice could be improved to maximize student learning through new or supporting material they find in current event articles. In the classroom students will discuss technology resources that can be used to collect data. Students will be required to understand the type of data that needs to be collected for each activity.</p> <p>When students are working with scientific data collecting equipment, they will need to learn length is measured in the base unit meter, liquid volume will be measured in L, volume of angular objects will be measured in m³, mass will be measured in grams, force will be measured in Newtons, etc.</p> <p>For instance: in the speed lab, students will be establishing distance in</p>	<p>and protections required when teaching and conducting scientific investigations.</p>	
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			<p>meter and time in second because speed is measured in m/s (or some unit of distance/some unit of time).</p> <p>To analyze data, students need to go back to their hypothesis and determine what they predicted for an outcome and compare their collected data to that hypothesis to be able to conclude, with facts, if their hypothesis was correct or not. The other aspect of analyzing data, is to evaluate where errors may have occurred when taking data measurements or performing calculations.</p> <p>Students will use a technology resource on a lesson and assessment that was implemented in a classroom field experience. Prior to field experience, students will use laboratory equipment and technology used to collect and analyze data. Students will be learning how to use this equipment by performing activities the instructor will set up. These activities will involve what equipment to use when, how to calibrate it if necessary, what units are associated with the equipment and then finally students will be required to use this equipment any time we conduct a lab in this class that requires data collection tools. Students will finally be evaluated on a quiz/test demonstrating their knowledge of the tools as mentioned above.</p>	
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			<p>Book assignments are meant to guide students through the use of technology, scientific tools, data collection, etc so students can fully appreciate the importance of current events and staying current.</p> <p>Chapter 6 is also about how to integrate science into other subjects in school. This is important to help future teachers learn how to show their future students how science is everywhere even in other subjects at school.</p>	
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8710.3200 Elementary Education: Subject Matter:

Subpart 3. **Standard 2, student learning.** A teacher must understand how students learn and develop and must provide learning opportunities that support a student's intellectual, social, and personal development.

The teacher must:

MN PELS Content Standard code	8710.3200 Elementary Education: Subject Matter	Learning opportunities and Assessment *Include the Field Experience hours as applicable for clarity.	Based on the learning opportunities and assessments, the K-6 learner will demonstrate meeting this standard by:	FDLTCC Learning Outcomes	Cultural Standard
3.A.1	Understand and apply the research base for and the best practices of kindergarten and elementary level education.	<p>All of chapter 3 from week 2</p> <p>Discovery learning activity on pg. 67</p> <p>Week 4: Chapter 6, pages 111-113 on NGSS</p> <p>Week 7: Appendix A, pg</p>	<p>Chapter 3 is a guide to writing lesson plans and using science standards, sequence, and scope to write effective plans.</p> <p>This activity has students work with the researched based NGSS standards and have several choices to choose from to complete this activity, such as writing a lesson plan which</p>		



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		<p>238-270</p> <p>Week 7: Lesson plan writing for upper and lower elementary for Earth and space science</p> <p>Week 10: Appendix B, pg 271-303</p> <p>Week 10: Lesson plan writing for upper and lower elementary in the life sciences</p> <p>Week 13: appendix C, pgs 303-335</p> <p>Week 13: writing for upper and lower elementary lesson plans in the physical sciences</p>	<p>incorporates some NGSS standards.</p> <p>This is more information about the NGSS.</p> <p>Appendix A is all about writing plans within the Earth and Space Science Scope. This is set up nicely for a person writing a lesson plan on any subject within this science subject. Students will incorporate Appendix A information and adapt and use the unit lesson plan template to design their lesson.</p> <p>Once students look through Appendix A they can choose a topic to create a small lesson plan on Earth and Space Science. Students will use the MN state science standards and create a plan based upon at least one concept covered in an upper and lower elementary grade they choose. Students will use the unit lesson plan template.</p> <p>Appendix B is the life sciences and is set up like appendix A, so it will be used similar to Appendix A, except for the Life Sciences. Students will then use the MN state science standards for an upper and lower elementary grade and write a plan using the unit lesson plan template.</p> <p>Appendix C is the physical sciences. Again, the protocol for appendix A and B will be followed here using the unit lesson plan template.</p>		
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			Again, students will take MN science standards for an upper and lower elementary grade and write a plan for physical science using the unit lesson plan template.		
3.A.5	Understand how to integrate curriculum across subject areas in developmentally appropriate ways.	<p>Classroom discussions</p> <p>Week 4, Chapter 6, pages 114-123</p> <p>Reality check, page 124</p> <p>Going Further, page 126</p> <p>Week 3 Current event assignment, looking for a scientific issue in social studies, politics, economics, etc.</p>	<p>Classroom discussions will include developmentally appropriate ways to integrate science curriculum across subject areas.</p> <p>This chapter of the book demonstrates to students how integrate science with other subjects in the elementary classroom in developmentally appropriate ways</p> <p>The reality check and going further give students the opportunity to practice integrating based upon given parameters.</p> <p>The current event assignment will give students the opportunity to look for current literature that demonstrates how science is integrated into many of the other disciplines.</p>	Demonstrate through classroom work and assessment the ability to understand the various pieces of scientific equipment and safety measures and protections required when teaching and conducting scientific investigations.	ZAA GI' IDI WIN Loving and Caring
3.J.1	Understand science as a human endeavor the nature of scientific knowledge, and the historical perspective of science	<p>Week 6: Page 130-133 in text, history of earth and space science</p> <p>Week 9: Page 165-168 in text, history of life science</p> <p>Week 13: Page 203-207 in text, history of physical</p>	Each of the disciplines in this text have a section that relates careers, key events in the discipline and finally women and men who have made contributions in science. These sections of the chapters will give another resource when	Demonstrate understanding of and evaluate work concerning the scientific method approach to science learning and understanding by working in small	ZAA GI' IDIW IN Loving and Caring



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		<p>sciences</p> <p>Week 7: Diversity bulletin board and paper</p>	<p>making the diversity bulletin board. Students will develop a bulletin board that engages students to the works other cultures have contributed to science and scientific research.</p> <p>The key historical events are listed by date, so students have a starting point for research they may want to research later or research for the diversity bulletin board.</p>	<p>groups, classroom assignments and assessments.</p> <p>Demonstrate the understanding of natural cycles which protect the Earth and how Indigenous Peoples have interacted and continue to interact with nature to protect their homes of the past, present and future.</p>	
3.J.2.a	<p>Identify questions and concepts that can be explored through scientific inquiry</p>	<p>Week 4: Creating a discrepant event</p> <p>Week 4: PPT misconceptions and discrepant events</p> <p>Classroom discussions on how discrepant events can be used to identify and develop questions and concepts using scientific inquiry that can then be applied in the classroom.</p>	<p>Discrepant events are excellent tools to use to help tackle misconceptions students may have picked up during their education program.</p> <p>Students will be taught how to identify several discrepant events and how they can be utilized in the classroom to engage n the classroom to engage students and get them to start asking questions. These events are excellent for scientific inquiry and exploration of new topics.</p> <p>Students will be discussing in class how the discrepant events work and how they might use them in an upper or a lower classroom of their own in the future.</p> <p>Students will be asked to create their own discrepant event in an elementary grade of their choice based upon standards that are covered.</p>	<p>Demonstrate understanding of and evaluate work concerning the scientific method approach to science learning and understanding by working in small groups, classroom assignments and assessments.</p>	<p>GWAYAK W AADIZIW IN <i>Living a balance d way</i></p>



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<p>3.J.2.b</p>	<p>Design and conduct scientific investigations</p>	<p>Week 1: pg. 29, graphing; pg. 39, scientific inquiry process</p> <p>Week 7: making a cloud scientific investigation</p> <p>Week 11: Making a model of the water cycle</p> <p>Week 13: Speed Lab Note: students will be doing a series of lab experiments throughout the semester to see how a lab can be designed, such as the speed lab, and then they are going to be required to design a lab they will conduct during their time in the classroom.</p>	<p>Page 29 has a data table from a scientific experiment and asks students to practice their graphing skills as a part of the scientific inquiry process.</p> <p>Part of the scientific process is trying to understand the world around us, and scientific models help us accomplish this. There are several different types of models that are used in science and physical models are the most used in the elementary classroom. Students will get the experience of creating a physical model so they can not only better understand the importance of physical models when they teach these concepts, but also have prior experience at designing them in the event they ask their own students to do something similar.</p> <p>The speed lab is an easy lab that collects distance and time data which is analyzed into speed. Students will be shown how to make a distance vs time graph where the slope is speed. This lab goes through the entire scientific method. Hands-on experience of conducting experiments such as these help future teachers teach the scientific method process, data collection and analysis process and help them to design their own experiments and activities in their own classroom.</p> <p>Students will be creating a lab-based lesson plan where they are required to design a</p>	<p>Demonstrate understanding of and evaluate work concerning the scientific method approach to science learning and understanding by working in small groups, classroom assignments and assessments.</p>	<p>AANGW AA MIZIWI N <i>Diligence and caution</i></p>
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			lab, conduct it in the classroom and then evaluate their own design when the lesson is concluded.		
3.J.2.c	Use appropriate scientific instrumentation and equipment and mathematics as tools to improve scientific investigations and communications	<p>Week 1: reviewing lab equipment</p> <p>Week 1: pg. 29, graphing; pg. 39, scientific inquiry process</p> <p>Week 13: Speed Lab: collecting and analyzing data</p> <p>Classroom discussion on how to scientific instrumentation and equipment and mathematics as tools to improve scientific investigations and communications throughout semester.</p>	<p>To collect proper data that can be used to explain phenomena, students need a refresher on the lab equipment structure, function and calibration so they can not only maintain equipment in their own classroom but teach students how to use this data collecting equipment.</p> <p>Being able to complete a graphing exercise on paper, students will be shown how to use google sheets or excel to make a graph that can be interpreted.</p> <p>Students will have to use meter sticks and stop watches to collect data for this lab and then use graphing tools to graph the data for analysis and interpretation.</p> <p>Throughout the semester, classroom discussions will be used to give students a format for discussing what works and doesn't work in scientific study. This will also give students the opportunity to brainstorm on how investigations could be done better in future tries.</p>	<p>Demonstrate through classroom work and assessment the ability to understand the various pieces of scientific equipment and safety measures and protections required when teaching and conducting scientific investigations.</p>	<p>AANGWAA MIZIWIN <i>Diligence and caution</i></p> <p>GWAYAKW AADIZIWIN <i>Living a balanced way:</i></p>



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<p>3.J.2.d.</p>	<p>Compare the use of multiple types of inquiry for answering questions;</p>	<p>Week 3: Chapter 4, page 76-80</p> <p>Week 3: 5E PPT and examples</p> <p>Week 1: chapter 1 – inquiry method section</p> <p>Watch: Scientific Inquiry: A Teacher's Guide <u>(13) Scientific Inquiry: A Teacher's Guide - YouTube</u></p> <p>Weekly discussions week 2-15</p>	<p>Again, this section gives students the opportunity to learn various techniques to inquiry and asking questions.</p> <p>The 5E lesson planning is an inquiry approach method that starts students investigating a new topic with a group to pull prior knowledge. The 5E model: Engagement, Exploration, Explanation, Extension, and Evaluation. In the 5E Instructional Model, science instruction is primarily student-led and inquiry-based. The teacher is a facilitator, guiding the student through questions, investigations, experiences, and research.</p> <p>Chapter one is an introduction to learning science. This not only discusses some topics for inquiry method, it also goes into how children learn and real life obstacles that keep students from learning or being engaged.</p> <p>This will reinforce the material covered for scientific inquiry and learning.</p> <p>Discussion throughout the quarter is a crucial avenue for students to think pair and share ideas they have learned and ideas they may want to pursue and get reinforcement from fellow students and the instructor</p>	<p>Demonstrate through classroom work and assessment the ability to understand the various pieces of scientific equipment and safety measures and protections required when teaching and conducting scientific investigations.</p> <p>Demonstrate the ability to write effective lesson plans using Minnesota science standards for grades K-6 that will include, but not limited to various inquiry methods (learning methods) which encompass Indigenous Peoples and peoples of color and other ethnic backgrounds.</p>	<p>AANGWAA MIZIWIN <i>Diligence and caution</i></p> <p>GWAYAKW AADIZIWIN <i>Living a balanced way:</i></p>
<p>3.J.2.e.</p>	<p>Evaluate alternative explanations and models based on evidence, current scientific</p>	<p>Week 10: Current Event Assignment on primary source and secondary source</p> <p>Weekly discussions week 2-</p>	<p>Current event articles are excellent ways for students to find out what is new in the scientific world. This is a vital skill for teachers to</p>	<p>Demonstrate the ability to evaluate and reinforce students' work to give a better</p>	<p>ZAA GI' IDIWIN <i>Loving</i></p>



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	<p>understanding, and logic;</p>	<p>15</p> <p>Week 7: making a cloud scientific investigation observing and evaluating a scientific model</p> <p>Week 11: Making a model of the water cycle: observing and evaluating a scientific model</p> <p>Week 13: Speed Lab: making conclusions based upon hypothesis and data</p>	<p>acquire who teach science. Current events allow students a chance to see new techniques that are being tried in science and a way to increase their ability to read and analyze scientific data.</p> <p>Models in science are valuable to understanding concepts that are not necessarily tangible. There are several different types of scientific models, but at the elementary level, physical models are very important tools for students to learn how to use and even how to make to show their understanding of scientific concepts. Both the making a cloud and the water cycle model are physical models.</p> <p>The speed lab is an actual lab using the entire scientific method that allows students to follow the method, collect data, use data to support a hypothesis or idea and then analyze the data to be able to clearly visualize the outcome of the experiment.</p> <p>Scientific investigations allow students the ability to see the logic behind the scientific process.</p> <p>Students will be required to keep current with science news. Students will be asked to evaluate the current event articles and evaluate alternative explanations for the science being discussed. Scientific investigations and keeping current with science news allow students to investigate how science encourages alternative</p>	<p>understanding of the scientific world and worldview around them by classroom work, projects and assessments.</p>	<p><i>and Caring</i></p>
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			explanation through testing, data collecting and peer review.		
3.J.2.f.	Communicate and defend a scientific argument.	<p>Week 3 Current event, current event in politics</p> <p>Classroom Discussion: Students will be asked to work in small groups and defend a scientific argument.</p>	<p>Students will be investigating a current event article that is highly politicized, for example, climate change. This gives students the understanding of how important it is for teachers to teach future voters the importance of how to evaluate scientific research and what is junk science and what is real science.</p> <p>Students will be asked to defend their current event topic in the class and to present data for or against the topic they selected.</p> <p>Then students will be given the opportunity to discuss the importance of scientific argument and how it can be used to keep science in check and allow students to learn to use facts that are supported when arguing a scientific point.</p>	<p>Demonstrate the ability to evaluate and reinforce students' work to give a better understanding of the scientific world and worldview around them by classroom work, projects and assessments.</p> <p>Demonstrate understanding of and evaluate work concerning the scientific method approach to science learning and understanding by working in small groups, classroom assignments and assessments.</p>	<p>ZAA GI' IDIW IN <i>Loving and Caring</i></p>
3.J.3.	Know and make connections across the domains of science and technology, and between science and other school subjects.	<p>Week 4, Chapter 6, pages 114-123</p> <p>Reality check, page 124</p> <p>Going Further, page 126</p>	<p>Chapter six teaches and gives students examples of how to integrate science and technology into the other disciplines of the elementary classroom.</p> <p>The reality check and going further give specific tasks students can do to practice integrating science into other disciplines.</p>	<p>Demonstrate the ability to evaluate and reinforce students' work to give a better understanding of the scientific world and worldview around them by classroom work, projects and assessments.</p>	<p>GWAYAK W AADIZIW IN <i>Living a balanced way:</i></p> <p>AANGW AA MIZIWI N <i>Diligence</i></p>



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		<p>Week 3 Current event assignment, looking for a scientific issue in social studies, politics, economics, etc.</p> <p>Week 10 Website search on websites available to teachers to stay current with new technologies and best practices, especially across subject lines.</p>	<p>Searching for current literature or scientific investigation that demonstrates the connections between science and other disciplines is a good tool to practice helping students become well rounded teachers.</p> <p>The website search will give students the opportunity to find free resources that incorporate science, technology to other disciplines.</p>	<p>Demonstrate the ability to write effective lesson plans using Minnesota science standards for grades K-6 that will include, but not limited to various inquiry methods (learning methods) which encompass Indigenous Peoples and peoples of color and other ethnic backgrounds.</p>	<i>and caution</i>
3.J.4.	Use scientific understandings and abilities when making decisions about personal and society issues.	<p>Week 8: Personal and societal issues in the earth and space sciences; pg. 134</p> <p>Week 9: Personal and societal issues in the life sciences; pg. 170-171</p> <p>Week 15: Personal and societal issues in the physical sciences; pg. 208</p> <p>Weekly discussions weeks 2-15</p>	<p>The beginning of each part two through four gives students a look at some of the societal and personal issues that each of the disciplines face or provide. Part two is issues in earth/space science, part three is the life sciences and part four the physical sciences. Each has a unique set of issues.</p> <p>Class discussion surrounding these topics can be helpful in showing perspective teachers there are good things to science and consequences brought on by technology. Making students aware of these issues will help them to guide their own students on ways that science/technology</p>	<p>Demonstrate the ability to write effective lesson plans using Minnesota science standards for grades K-6 that will include, but not limited to various inquiry methods (learning methods) which encompass Indigenous Peoples and peoples of color and other ethnic backgrounds.</p> <p>Demonstrate the understanding of natural cycles which protect the /earth and how Indigenous peoples have interacted and</p>	GWAYAK W AADIZIW IN <i>Living a balanc ed way:</i>



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		<p>Week 11: water cycle project and Mother Earth and environmental implications</p>	<p>make life easier, but it comes with a price and the responsibility of being a good steward.</p> <p>A water cycle shows the different pathways of where water is supposed to go and how it is supposed to keep circulating throughout the cycle.</p> <p>Humans have interrupted this cycle in many ways that makes valuable water unavailable. Students will have to extend this project into ways humans can remedy water issues or avoid them altogether by good stewardship.</p>	<p>continue to interact with nature to protect their homes of the past, present and future.</p>	
3.J.8.a	<p>Content standards under chapter 3501 for recommendations regarding curriculum, instruction, assessment, professional development, and program development:</p>	<p>Week 7: Appendix A, pg. 238-270</p> <p>Week 7: Lesson plan writing for upper and lower elementary for Earth and space science and aligning with state standards</p> <p>Week 10: Appendix B, pg. 271-303</p> <p>Week 10: Lesson plan writing for upper and lower elementary in the life sciences and aligning with state standards</p> <p>Week 13: appendix C, pgs. 303-335</p>	<p>The appendices for earth/space, life and physical sciences help to put content in action. In these appendices are ideas of lessons that can be created in each of the disciplines. Students will be tasked with merging content from these appendixes with MN state standards at the grade level they wish to write a lesson for and design a lesson. Students will be asked to write a plan for one subject at lower elementary and one at an upper elementary grade level.</p> <p>In addition to writing lesson plans, students will be shown how to inter- connect the standards and content throughout a time frame such as a quarter or semester so they can get the</p>	<p>Access, interpret and disseminate into their curriculum, the Minnesota state science standards, and the Next Generation Science Standards (NGSS) for grades K-6 through classroom curriculum.</p>	<p>AANGW AA MIZIWI N <i>Diligence and caution</i></p>



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		<p>Weekly discussion through weeks 2-15 on how to stay current in your license with professional development opportunities.</p>	<p>practice of developing a program for a portion of a school year. Students will use the unit lesson plan template that includes what state standards will be taught in each lesson.</p> <p>Students will be assessed on their lesson plan and assessment and how it relates to MN graduation standards.</p> <p>Discussion will be a vital portion of these topics, so students know where to go to find reliable sources to help them keep current and keep up their professional development surrounding science instruction. Discussions will also include curriculum development, assessments and how staying current in the field leads to innovative program development. Students will be made aware of science and professional organizations that also provide these types of services.</p>		
<p>3.J.8.b.</p>	<p>how to teach scientific inquiry in a developmentally appropriate manner.</p>	<p>Week 7: Appendix A, pgs. 238-270</p> <p>Week 7: Lesson plan writing for upper and lower elementary for Earth and space science and aligning with state standards</p> <p>Week 10: Appendix B, pgs. 271-303</p> <p>Week 10: Lesson plan writing for upper and lower elementary in the life sciences and aligning with</p>	<p>Elementary grade levels not only have different content standards, but also are at different developmental stages. The appendices in the book offer ideas from lesson plan writing that can be modified to meet certain grade levels. Students will be given the opportunity to write a lesson for a younger elementary classroom and then modify the plan to fit an upper classroom level.</p>	<p>Access, interpret and disseminate into their curriculum, the Minnesota state science standards and the Next Generation Science Standards (NGSS) for grades K- 6 through classroom curriculum.</p>	<p>AANGWAA MIZIWIN <i>Diligence and caution</i></p>



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		<p>state standards.</p> <p>Week 13: appendix C, pgs 303-335</p> <p>Week 13: writing for upper and lower elementary lesson plans in the physical sciences and aligning with state standards</p> <p>Week 4 and 5: creating discrepant events that are age appropriate and tackle misconception</p>	<p>As part of creating lessons, teachers want to have engaging activities including discrepant events. Students will be given the opportunity to design demonstration or events that fit the appropriate age and developmental level of the students in a particular elementary classroom.</p>	<p>Demonstrate the ability to write effective lesson plans using Minnesota science standards for grades K-6 that will include, but not limited to various inquiry methods (learning methods) which encompass Indigenous Peoples and peoples of color and other ethnic Backgrounds.</p>	
3.J.8.c.	<p>common student misconceptions in science and developmentally appropriate strategies to elicit students' misconceptions and help them move to accepted scientific understandings;</p>	<p>Week 4: Misconceptions and discrepant events PPT</p> <p>Week 4 and 5: Creating age-appropriate discrepant events</p>	<p>As a part of an inquiry method of teaching, students need to become aware of tools that can be used to tackle common misconceptions students may have about certain scientific phenomena. For example: Stars and constellations appear in the same place in the sky every night. The sun rises exactly in the east and sets exactly in the west every day. The moon can only be seen during the night. Dinosaurs and cavemen lived at the same time etc. Identifying misconceptions and then creating or using a demonstration or discrepant</p>	<p>Demonstrate understanding of and evaluate work concerning the scientific method approach to science learning and understanding by working in small groups, classroom assignments and assessments.</p>	<p>AANGW AA MIZIWI N Diligence and caution</p>



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			<p>event allows students to question their own beliefs and understandings and help to shape their knowledge in logical thinking about scientific understanding.</p> <p>The web article provides strategies on how to explore and address misconceptions in science.</p>		
3.J.8. d.i	State and national legal responsibilities and safety guidelines for teaching science.	<p>Week 5: lab equipment and safety videos</p> <p>Week 5: lab safety PPT</p> <p>Week 5: Laboratory safety assignment</p> <p>Week 6: Laboratory safety lesson plan, age and culturally appropriate, environmental appropriate</p>	<p>Students need to be given the opportunity to research specific standards and guidelines for the state of Minnesota regarding lab safety. This will just be one component of the four activities list here.</p> <p>Students will have to research the specific guidelines for handling chemicals and disposal for their area.</p> <p>Students will write an age and developmentally appropriate lesson plan on how to work in a science setting that is safe and respectful to the environments and the culture.</p>	<p>Access, interpret and disseminate into their curriculum, the Minnesota state science standards and the Next Generation Science Standards (NGSS) for grades K- 6 through classroom curriculum.</p> <p>Demonstrate through classroom work and assessment the ability to understand the various pieces of scientific equipment and safety measures and protections required when teaching and conducting scientific investigations.</p>	<p>AANGW AA MIZIWI N Diligence and caution</p>
3.J.8. d.ii.	how to establish and enforce recognized safety procedures during science learning experiences	<p>Week 5: lab equipment and safety videos</p> <p>Classroom discussion on how to establish and enforce safety procedures at various grade levels in K-6.</p>	<p>Another component of these activities is to give students the opportunity to learn how to set up a safety plan for their future classroom that involves student training and enforcement and being able to recognize safety hazards based upon the activity they will be doing. This will involve classroom discussion and</p>	<p>Demonstrate through classroom work and assessment the ability to understand the various pieces of scientific equipment and safety measures and protections required when</p>	<p>AANGW AA MIZIWI N Diligence and caution</p>



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			practice	teaching and conducting scientific investigations.	
3.J.8. d.iii.	how to use required safety equipment for classroom, field, and laboratory settings including goggles, fire extinguishers, fire blanket, eye wash, and chemical shower;	<p>Week 5: lab equipment and safety videos</p> <p>Week 5: lab safety PPT</p> <p>Week 5: Laboratory safety assignment</p> <p>Week 6: Laboratory safety lesson plan, age and culturally appropriate, environmental appropriate</p>	<p>Students need to have the opportunity to learn about safety equipment and appropriate PPE (personal protective equipment) needed during activities. Every science activity that is about to be carried out needs to be evaluated for safety hazards and the tools that might be needed to keep students safe.</p> <p>The lesson plan will demonstrate how students have learned how to use the equipment and teach how to use equipment, when necessary, for scientific activities. Students will be able to get the ability to use this material in one of their plans used while they are in their field experience.</p>	Demonstrate through classroom work and assessment the ability to understand the various pieces of scientific equipment and safety measures and protections required when teaching and conducting scientific investigations.	AANGWAA MIZIWIN Diligence and caution
3.J.8. d.iv.	how to manage, maintain, and utilize science supplies and equipment.	<p>Week 5: lab safety PPT</p> <p>Week 5: Laboratory safety assignment</p> <p>Week 6: Laboratory safety lesson plan aligned to state and local standards, age and culturally appropriate, environmental appropriate</p>	<p>Students will be given the opportunity to learn about science and safety supply companies for the acquisition of supplies. These supply companies also provide much guidance and assistance of maintenance, use, and disposal of science supplies and equipment.</p>	Demonstrate through classroom work and assessment the ability to understand the various pieces of scientific equipment and safety measures and protections required when teaching and conducting scientific investigations.	AANGWAA MIZIWIN Diligence and caution
3.J.8. d.v.	state and national guidelines and plan for the care, storage,	Week 5: lab equipment and safety videos	Another portion of these two weeks of safety training, students will be given the	Demonstrate through classroom work and	AANGWAA MIZIWIN



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		<p>Week 5: lab equipment and safety videos</p> <p>Week 5: lab safety PPT</p> <p>Week 5: Laboratory safety assignment</p> <p>Week 6: Laboratory safety lesson plan aligned to state and local standards, age and culturally appropriate, environmental appropriate</p>	<p>Students will be given the opportunity to show their understanding of this requirement through their lab safety assignment.</p> <p>If students will address this in their lesson plan</p> <p>It will be important for students to understand that Chemical hygiene standards and programs involve not only chemical and physical hazards for students, but also live and preserved specimens that may be used in scientific investigations and activities. Sometimes a science teacher will collect organisms from the wild, like minnows, worms, rollie pollies, etc. It is important how these get treated and released back.</p> <p>These are common themes in science textbooks of how to handle live and preserved specimens so you can teach students to be respectful.</p>		
3.J.8. d.vii.	The ethics of and restrictions on the use of live organisms, and how to acquire, care, handle and dispose of organisms.	<p>Week 5: lab equipment and safety videos</p> <p>Week 5: lab safety PPT</p> <p><u>Collection of Scientific Specimens: Benefits for Biodiversity Sciences and Limited Impacts on Communities of Small Mammals BioScience Oxford Academic (oup.com)</u></p>	If scientific activity involves the use of live specimens, students will be given the opportunity to learn where to find information and resources as to how specimens can be acquired, should be handled, and then properly disposed of once the activity is completed,	Demonstrate through classroom work and assessment the ability to understand the various pieces of scientific equipment and safety measures and protections required when teaching and conducting scientific	AANG WAA MIZIW IN <i>Diligence and caution</i>



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		<p>Week 5: Laboratory safety assignment</p> <p>Week 6: Laboratory safety lesson plan aligned to state and local standards, age and culturally appropriate, environmental appropriate</p>	<p>Students will be given the opportunity to show their knowledge of the above information through their lab safety assignment and may incorporate this information into their lesson if so desired.</p> <p>Students will be expected to discuss appropriate handling of live and preserved specimens in class. This will also apply to any animals that are pets in the classroom.</p>	<p>investigations.</p>	
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Course Requirements & Assessment descriptions:

Students will be able to:

- Demonstrate understanding of scientific principles, research protocols, theories and laws
- Demonstrate the ability to complete a laboratory equipment and lab safety lesson plan with an assessment
- Demonstrate the ability to write a lesson plan in various formats especially for the FDLTCC department of elementary ed format.
- Demonstrate the ability to identify common scientific misconceptions and how to help correct them.
- Demonstrate the ability to understand and interpret the different types of scientific standards for grades K-6 and NGSS.
- Demonstrate the ability to complete a thorough current event assignment with an appropriate citation.
- Demonstrate the ability to find reference material to supplement and support their scientific knowledge



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Course Assignments:

Each week you will be given a new reading assignment and perhaps some lesson plan. Students are expected to ask questions when they do not understand the material they are being requested to read. Reading material will be assessed in online quizzes, midterms and final exam.

“Lesson Plan” and “methods” assignments (10 points each) will be given to students to be conducted in and outside of the classroom.

In the first half of the semester, as well as the second half, students will be required to complete one current event assignment and one website review. These assignments will be assigned at the beginning of the semester and after the midterm. Students will be able to complete the assignments any time during the half-semester.

Quizzes, Midterm and Final:

25-point quizzes will be posted on D2L and will be due on or before the due date. Students will be given one hour to complete the quiz.

A 100-point (each) midterm and final exam will be assigned on D2L. Students will be given two hours of class time to complete each exam.

Weekly Participation:

Students will be given a weekly discussion topic on the Monday of the week pertaining to the weekly classroom topic. Students will be expected to post one original discussion post each week by 11:59 pm the Wednesday of the week and reply to a minimum of one other classmate’s original posts on or before Sunday 11:59 pm. Students who do not post by the original Wednesday post will lose half credit for your weekly discussion.

Due Dates and handing in work: Students are expected to hand in their work on or before due dates either by submitting them to D2L or via email (enter email).

Assignments handed in one day late will accrue a 10% deduction from the total score, two days late a 20% deduction, three days late a 50% deduction. Any work four or more days late will receive a “0”.



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Criteria	Points	Due
1. Quizzes (25 pts each)	125	
2. Unit Tests (50 points each)	150	
3. Website Searches	125	
4. Current Event Articles	120	
5. Weekly Discussions-participation	140	
6. Lesson Plan Writing	140	
7. Midterm	100	
8. Final Exam	100	
Total Points:	1000	

Course Schedule:

Week	Class Topic and Activity	Assignment and Due Date
Week 1	Introduce Unit 1: Teaching through inquiry	Chapter 1 and 2 Discussion: Introduction Starting and establishing a science notebook Pg 29: scientific graphing exercise Pg 39: scientific inquiry process Classroom technology introduction: Infinite campus, canvas, google classroom.
Week 2	Unit planning with science standards Lesson Planning to align with standards	Chapters 3 Discussion: teaching indigenous children through their culture Website Search



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		Discovery learning activity on pg 67 Week 4: Chapter 6, pages 111-113 on NGSS
Week 3	The inquiry environment incorporating science, technology and engineering. Incorporating other disciplines	Chapter 4 and 5 Practice Lesson Plans- Reality check, page 124; Going Further, page 126 Current Event: science in social studies 5E introduction PPT 5E examples Watch: Scientific Inquiry: A Teacher's Guide <u>(13) Scientific Inquiry: A Teacher's Guide - YouTube</u>
Week 4	Misconceptions and discrepant events Science Standards	Chapter 6 Discussion Quiz 2
Week 5	Laboratory Equipment and Laboratory Safety	Laboratory Safety Assignment Lab equipment review lab Discrepant Event Unit 1 test
Week 6	Introduction to Unit 2 Earth and Space Science – important scientist, impact on society, careers	Read pages 130-134 Read pages 134-end of chapter Read Page 135 nature of science Discussion Lesson Plans with Assessment for lab equipment and safety
Week 7	Earth and Space Topics and teaching tactics Writing Lower elementary plans Writing Upper elementary plans	Read Chapter 7 Diversity Bulletin Board Lab-Making a model of a cloud Real teaching pg 144-145 clouds Discussion Appendix A: pg 238-270 Quiz 3
Week 8	The cosmos Assigning Projects and using rubrics Personal and Societal issues	Read Chapter 8 Discussion Lesson plans to include a lab based plan. Pg 134 text



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Week 9	Introduction to Unit 3 Life Science – important scientist, impact on society, careers	Read pages 165-170 Lesson Plans Societal and personal reading pg 170-171
Week 10	Life Science Topics and teaching tactics Writing Lower elementary plans Writing Upper elementary plans	Discussion Read Chapter 9 and 10 Appendix B, pgs 271-303 Lesson plans Website Search and Review Current Event
Week 11	Life science lesson plan writing Cells Water Cycle	Discussion Real teaching pg 186-7 Lab: making a model of a water cycle Quiz 4 Lesson plans
Week 12	Food chains and webs Environmental Science Personal and Societal issues	Discussion Unit 3 Test Personal and societal issues pg 169-170
Week 13	Unit 4 Physical Science Topics and teaching tactics Writing Lower elementary plans Writing Upper elementary plans	Discussion Lesson Plan writing Appendix C, pgs 303-335 Real teaching pg 209-210; 219-221; and 229-230
Week 14	Compass Newton's Laws	Discussion Quiz 5 Lesson Plans
Week 15	Matter Density Personal and Societal Issues Enhancing scientific knowledge through professional development and scientific resources	Discussion Creating a Density Assignment Lesson Plans Personal and societal issues pg 208 Investigate NSTA and other sites that offer science professional development so students can pursue classes. Website, podcasts, etc that help to keep the science teacher current.



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Week 16	Final Exam	
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NOTE: during this semester long course, students will be completing classroom, field experience. During this field experience students will be practicing and self-evaluating:

Technology that can be used in the classroom for grades and LMS, such as but not limited to google classroom, canvas, Schoology and the grading system Infinite campus. Students will also get a chance to use computer technology to graph, scientific calculators to help analyze data and laboratory equipment to conduct scientific investigations.

Requirements and Points:

To meet the program requirements, students must pass the course with 70% or above.

Grade	%	Points
A	100-90	1000-900
B	89-80	899-800
C	79-70	799-700
D	69-60	699-600

Students will be able to create and deliver one of their lesson plans they have created. Depending upon where they are placed and at what grade level, will determine the age-related science content that will be expected in their plans.

Students will be able to utilize inquiry science that promotes student discussion, encouraging student questioning, higher order thinking and student engagement. Further students will be practicing ways to help students articulate their ideas and thinking processes, promoting productive risk-taking and problem-solving, facilitating factual recall, encouraging convergent and divergent thinking, stimulating curiosity, and helping students to question.

Instructor Responsibilities - You can expect your instructor to:

- Attend every class period and arrive at class on time. If I am not there, please WAIT. If I cannot make class due to illness or unexpected events, I will contact you through D2L and will try to give you as much notice as possible.
- Come to class with a good attitude



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- Be respectful of your ideas and value the diversity you bring to the classroom
- Be open to dialogue that challenges me
- Answer any appropriate questions you may have
- Use a variety of teaching techniques and modalities to accommodate different learning styles
- Return written assignments in class and online in a timely fashion and provide helpful feedback
- Be present during my stated office hours, by phone, email or text
- Minimize disruptions and distractions in the classroom so that everyone has the best possible opportunity to learn

Office Hours and contact information:

My office hours will be Tuesday and Thursday from 4:45-5:45. I prefer you use my FDLTCC email to reach me and can do so anytime; heidi.ojibway@fdltcc.edu or you can reach me by text at 218-310-7969, this is my cell phone.

FDLTCC Competencies Across the Curriculum (CAC)

Information Literacy – the ability to use print and/or non-print tools effectively for the discovery, acquisition, and evaluation of information.

Ability to Communicate – the ability to listen, read, comprehend, and/or deliver information in a variety of formats.

Problem Solving – The ability to conceptualize, apply, analyze, synthesize, and/or evaluate information to formulate and solve problems.

Culture – knowledge of Anishinaabe traditions and culture, knowledge of one's own traditions and culture, knowledge of others' traditions and cultures, culture of work, culture of academic disciplines and/or respect for global diversity.

Conceptual Framework

Vision

The vision of the FDLTCC Education Unit is to be transformational leaders in culturally responsive pedagogy and Indigenous knowledge by embracing Niindaa'iwedaa o'o gikendaasowin, which means sending knowledge into the future by embedding Anishinaabe knowledge, culture, and traditions into the curriculum and instilling these teaching practices in our future educators.



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Mission

The mission of the FDLTCC Education Unit is to work within our communities to prepare caring, competent educators by promoting equitable, inclusive, and transformative educational practices that are based on Anishinaabe knowledge, traditions, and culture.

Cultural Standards Woven Together with Professional Outcomes

The unit has adopted the cultural standards of the WINHEC accredited American Indian Programs and adapted them to meet the specific needs of the education unit. Professional outcomes were developed from the cultural standards. Both the cultural standards and the professional outcomes flow from the unit's vision and mission to provide a unique perspective on teaching and learning. The cultural standards and professional outcomes direct the unit's thinking, planning, actions, and initiatives (see figure 1).

GIKENDAASOWIN – Knowing Knowledge

To prepare our teacher candidates to be problem solvers who strive for continuous learning and growth.

Disposition: Integrates Content and Pedagogical Knowledge

Teacher candidates demonstrate their ability to integrate content and pedagogical knowledge by weaving the following into their teaching:

- Technology: Use technology effectively to improve student learning.
- Theory to Practice: Applies current theory, research, and best practices to improve one's professional practice as a teacher.
- Critical and Connected Thinking: Engages in critical thinking that reflects analysis, problem solving, and incorporates world views and community knowledge to create culturally relevant instruction.
- Reflective Practice: Demonstrates self-reflection and incorporates professional feedback to adjust for continuous improvement in professional practices and effective instruction.

Professional Outcome: Content and Pedagogical Knowledge

- To develop teachers who value and utilize knowledge, learning, and critical thinking that is central to Indigenous and other ways of knowing.

GWAYAKWAADIZIWIN – Living a Balanced Way



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To provide teacher candidates the opportunity to recognize the importance of living in harmony with the community and are prepared to use a collective approach to understanding and deciding on a course of action.

Disposition: **Communication and Collaboration**

Teacher candidates demonstrate professional interpersonal and communication skills. These skills are used to promote positive collaborative partnerships with students, families, colleagues, other school professionals, and the global community to support achievement of student learning outcomes.

- **Reflective Collaboration:** Uses insights and inspiration of others to improve practice and can occur in:
 - Professional Learning Communities
 - Mentoring Programs
 - Peer Observations
 - Critical Friends Groups
- **Community Involvement:** Demonstrates positive collaborative skills in interactions with instructors, advisors, students, colleagues, parents/guardians/caregivers, school teams, and those in the wider community.
- **Communication:** Effectively and accurately communicates ideas, thoughts or visions (oral and written) and engages in active listening based on audience and community cultural norms.

Professional Outcome: **Community and Collaboration**

- To develop teachers who are reflective, connected educators who understand the interrelatedness of educating the whole child by including the community.

ZOONGIDE'EWIN – Strong Hearted

To provide a foundation on which we build and strengthen each teacher candidate's resilience, innovation, and passion.

Disposition: **Vision and Leadership**

Teacher candidates demonstrate the vision and skills necessary to lead and manage classrooms and schools as complex, adaptive systems in a changing world.

- Demonstrates skills and qualities that lead to meaningful change.
- Models and fosters respect for all cultures, identities, and perspectives in words and actions and considers historical pasts to prepare for the future.



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- Listens and responds to community needs and understands cultural norms as opportunities for growth and development.

Professional Outcome: **Transformational Leadership**

- To increase the teachers' leadership capacity to live and walk with a strong heart, respectful and open to new ideas and courageous enough to confront the accepted truths of history and society.

AANGWAAMIZIWIN – Diligence and Caution

To develop teacher candidates' capacity to proceed carefully, after identifying, discussing and reflecting on logical and ethical dimensions of political, cultural, social, and personal life.

Disposition: **Ethical Behavior**

Teacher candidates demonstrate professional integrity through behaviors and actions that reflect state and FDLTCC ethical and cultural standards.

- Demonstrate professional and ethical conduct with faculty, faculty supervisors, cooperating teachers, students, parents, colleagues, and community.
- Practices, complies, and understands the school site and the college and unit policies (e.g., academic honesty), as well as Minnesota Code of Ethics for Teachers.
- Adheres to all professional standards, including the use of technologies (e.g., accesses authorized websites, social media and other applications, and uses personal electronic devices as appropriate).

Professional Outcome: **Ethical Practitioner**

- To develop teachers' capacity to be ethically responsive in respecting their role as an educator and understanding community needs.

DEBWEWIN – Honesty and Integrity

Encourage teacher candidates to develop a deeper appreciation of their own worldview and the worldview of others.

Disposition: **Data-Informed Practice**

Teacher candidates demonstrate the ability to make data-driven decisions as they plan, implement, and evaluate instruction.

- Uses student data to plan and implement instructional strategies and activities.



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- Uses assessment data to identify student strengths and deficiencies and adjusts practice based on results.
- Uses formal and informal assessment strategies to evaluate and ensure the continuous intellectual and social development of the student.

Professional Outcome: [Assessment and Use of Data](#)

- To expand teachers' potential to think and act with honesty and integrity as they use multiple types of assessment strategies to evaluate student progress and guide student learning and development.

ZAAGI' IDIWIN – Loving and Caring

To encourage the teacher candidates' development of healthy, caring relationships built on respect for all.

Disposition: [Equity, Social Justice, and Inclusion](#)

Teacher candidates demonstrate fairness, empathy and compassion based on their belief that everyone can learn. Candidates actively seek out multiple perspectives and diverse experiences to address the academic, interpersonal, and emotional needs of all students.

- Demonstrates and appreciation of the languages, communities, and experiences students bring to the classroom.
- Advocates for and supports Indigenous and other diverse communities and individuals.
- Respects the dignity and essential worth of all individuals.
- Interacts with sensitivity to community and cultural norms.
- Values and responds to all aspects of a child's developmental well-being (cognitive, emotional, psychological, social, and physical).
- Promotes the diversity of opinions, ideas, and backgrounds.

Professional Outcome: Diversity

Promote teachers' acceptance and respect of the diversity within their school, community and environment.

ZHAWENINDIWIN – Compassion

To encourage teacher candidates to develop an empathetic appreciation of the arts and humanities as a way to understand the human experience.

Disposition: Life-long Learner



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Teacher candidates engage in professional growth and encourage curiosity and inquiry as reflective agents of change by sharing knowledge responsibly and participating as a community resource.

- Demonstrates commitment to professional development and intellectual curiosity.
- Practices current skills while demonstrating ability to adapt and develop new skills.
- Actively participates or fosters the positive professional learning environment within the school community as well as the school- home relationships.
- Analyzes various professional contexts, resulting in more informed decision-making about professional practice.

Professional Outcome: Generation of New Knowledge

To expand teachers' knowledge of the human condition and cultures, and the importance of compassion especially in relation to behavior, ideas, and values.

MN PELSB Standards of Effective Practice (SEP) and/or Content Standards

SEP: *8710.2000 Standards of Effective Practice*

Subp. 4. Standard 3, diverse learners. A teacher must understand how students differ in their approaches to learning and create instructional opportunities that are adapted to students with diverse backgrounds and exceptionalities. The teacher must:

R. identify and apply technology resources to enable and empower learners with diverse backgrounds, characteristics, and abilities.

Subp. 7. Standard 6, communication. A teacher must be able to use knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom. The teacher must:

J. know how to ask questions and stimulate discussion in different ways for particular purposes, including probing for learner understanding, helping students articulate their ideas and thinking processes, promoting productive risk-taking and problem-solving, facilitating factual recall, encouraging convergent and divergent thinking, stimulating curiosity, and helping students to question

Subp. 9. Standard 8, assessment. A teacher must understand and be able to use formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the student. The teacher must:

N. use technology resources to collect and analyze data, interpret results, and communicate findings to improve instructional practice and maximize student



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Content Standards: 8710.3200 *Elementary Education*

Subp. 3. **Subject matter standards, elementary education.** A candidate must complete a preparation program for licensure under subpart 2, item C, that must include the candidate's demonstration of the knowledge and skills in items A to L.

A. teacher of children in kindergarten through grade 6 must:

(1) understand and apply the research base for and the best practices of kindergarten and elementary level education;

(5) understand how to integrate curriculum across subject areas in developmentally appropriate ways.

J. A teacher of children in kindergarten through grade 6 must demonstrate a fundamental knowledge of scientific perspectives, scientific connections, science in personal and social perspectives, the domains of science, and the methods and materials for teaching science and scientific inquiry. The teacher must:

(1) understand science as a human endeavor, the nature of scientific knowledge, and the historical perspective of science;

(2) know and apply the understandings and abilities of scientific inquiry including the ability to:

(a) identify questions and concepts that can be explored through scientific inquiry;

(b) design and conduct scientific investigations;

(c) use appropriate scientific instrumentation and equipment and mathematics as tools to improve scientific investigations and communications;

(d) compare the use of multiple types of inquiry for answering questions;

(e) evaluate alternative explanations and models based on evidence, current scientific understanding, and logic; and

(f) communicate and defend a scientific argument;



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(3) know how to make connections across the domains of science, between science and technology, and between science and other school subjects;

(4) use scientific understandings and abilities when making decisions about personal and societal issues;

(5) know and apply the fundamental concepts and principles of physical science concerning properties of and changes in matter; position, motion, and force; light, heat, electricity, and magnetism; and kinds of and ways to transfer energy;

(6) know and apply the fundamental concepts and principles of life science concerning the characteristics of organisms, the life cycle of organisms, the interrelationships of organisms and environments, structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems and their interrelationships, and diversity and adaptations of organisms;

(7) know and apply the fundamental concepts and principles of earth and space science concerning properties of earth materials; objects in the sky; changes in earth and sky; structure of the earth system, including hydrosphere, biosphere, atmosphere, and lithosphere; history of the earth; and earth in the solar system; and

(8) know and apply pedagogy and classroom management in science and scientific inquiry including understanding:

- a. content standards under chapter 3501 for recommendations regarding curriculum, instruction, assessment, professional development, and program development
- b. how to teach scientific inquiry in a developmentally appropriate manner;
- c. common student misconceptions in science and developmentally appropriate strategies to elicit students' misconceptions and help them move to accepted scientific understandings; and
- d. how to implement safe environments for learning science through knowing:
 - i. state and national legal responsibilities and safety guidelines for teaching science;
 - ii. how to establish and enforce recognized safety procedures during the science learning experience;
 - iii. how to use required safety equipment for classroom, field, and laboratory settings including goggles, fire extinguisher, fire blanket, eye wash, and chemical shower;
 - iv. how to manage, maintain, and utilize science supplies and equipment;
 - v. state and national guidelines and plan for the care, storage, use, and disposal of chemicals and equipment used to teach science;
 - vi. the ethics of and restrictions on making and maintaining collections of



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- scientific specimens and data; and
- vii. the ethics of and restrictions on the use of live organisms, and how to acquire, care, handle, and dispose of organisms

(J) A teacher of children in kindergarten through grade 6 must demonstrate a fundamental knowledge of scientific perspectives, scientific connections, science in personal and social perspectives, the domains of science, and the methods and materials for teaching science and scientific inquiry. The teacher must:

- (1) understand science as a human endeavor, the nature of scientific knowledge, and the historical perspective of science;
- (2) know and apply the understandings and abilities of scientific inquiry including the ability to:
 - a. identify questions and concepts that can be explored through scientific inquiry;
 - b. design and conduct scientific investigations;
 - c. use appropriate scientific instrumentation and equipment and mathematics as tools to improve scientific investigations and communications;
 - d. compare the use of multiple types of inquiry for answering questions;
 - e. evaluate alternative explanations and models based on evidence, current scientific understanding, and logic; and
 - f. communicate and defend a scientific argument;
- (3) know how to make connections across the domains of science, between science and technology, and between science and other school subjects;
- (4) use scientific understandings and abilities when making decisions about personal and societal issues;
- (5) know and apply the fundamental concepts and principles of physical science concerning properties of and changes in matter; position, motion, and force; light, heat, electricity, and magnetism; and kinds of and ways to transfer energy;
- (6) know and apply the fundamental concepts and principles of life science concerning the characteristics of organisms, the life cycle of organisms, the interrelationships of organisms and environments, structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems and their interrelationships, and diversity and adaptations of organisms;
- (7) know and apply the fundamental concepts and principles of earth and space science concerning properties of earth materials; objects in the sky; changes in earth and sky; structure of the earth system, including hydrosphere, biosphere, atmosphere, and lithosphere; history of the earth; and earth in the solar system; and
- (8) know and apply pedagogy and classroom management in science and scientific inquiry including understanding:
 - a. content standards under chapter 3501 for recommendations regarding



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- curriculum, instruction, assessment, professional development, and program development;
- b. how to teach scientific inquiry in a developmentally appropriate manner;
 - c. common student misconceptions in science and developmentally appropriate strategies to elicit students' misconceptions and help them move to accepted scientific understandings; and
 - d. how to implement safe environments for learning science through knowing:
 - i. state and national legal responsibilities and safety guidelines for teaching science;
 - ii. how to establish and enforce recognized safety procedures during the science learning experience;
 - iii. how to use required safety equipment for classroom, field, and laboratory settings including goggles, fire extinguisher, fire blanket, eye wash, and chemical shower;
 - iv. how to manage, maintain, and utilize science supplies and equipment;
 - v. state and national guidelines and plan for the care, storage, use, and disposal of chemicals and equipment used to teach science;
 - vi. the ethics of and restrictions on making and maintaining collections of scientific specimens and data; and
 - vii. the ethics of and restrictions on the use of live organisms, and how to acquire, care, handle, and dispose of organisms.

Reference List

Teaching Children Science: A Discovery Approach, with Enhanced Pearson eText -- Access Card Package, Derosa and Abruscato, 9th Edition, 2019, Pearson, 10-

0134691792 or 13-9780134691794

Integrated Science; Sixth Edition Bill Tillery, Eldon D. Enger and Frederick C Ross; McGraw Hill; 2011



Fond du Lac Tribal and Community College
Elementary Education Program



Earth, Portrait of a Planet, 4th Edition, Stephen Marshak, W. W. Norton & Company, 2011

Chemistry-Structure and Properties, Nivaldo J. Tro, Pearson, 2015

Environmental Chemistry-a global perspective, 3rd edition, Gary W VanLoon and Stephen J Duffy, Oxford University Press, 1999.

Physics, 4th edition, James S. Walker, 4th edition, Addison-Wesley, 2019

Principles of Biochemistry, 5th edition, Moran, Horton, Scrimgeor, and Perry, Person, 2010

Chemistry in Context Applying Chemistry to Society, 8th Edition, McGraw Hill, 2015

Introduction to Organic Chemistry, 4th Edition, William Brown and Thomas Poon, John Wiley & Sons, 2011

Prescott's Microbiology, 9th edition, Wiley, Sherwood, Wolverton, McGraw Hill, 2013

Fundamentals of Anatomy and Physiology, Fredric Martini, Prentice Hall, 1998 Study Guide", F Martini, Prentice Hall, 1998

Lab Manual", F Martini, Prentice Hall, 1998

Fundamentals of Anatomy and Physiology-Applications Manual, Fredric Martini, Prentice Hall, 1998

The Anatomy Coloring Book, W. Kapit and L. Elson, Addison-Wesley, 1993

*Musculoskeletal Anatomy Coloring Book, Muscolino, Joseph, Mosby, Inc., 2010
Coloring Guide to Regional Human Anatomy", Twietmeyer and McCracken, Lea & Febiger, 1988*

Biology Principles and Explorations, Annotated Teacher Edition, Holt, Rinehart and Winston, Harcourt Classroom Education Company, 2001

Conceptual Physics, Paul G. Hewitt, Prentice Hall, 2002

Physics: A Conceptual World View, 7th Edition, Kirkpatrick and Francis, Brooks/Cole, 2010



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*Inquire Within: Implementing Inquiry-and Argument Based Science Standards in
Grades 3-8, 3rd edition (Llewellyn - Sage), Corwin, 2013*

Websites:

NSTA, National Science Teachers Association; www.nsta.org

Department of Interdisciplinary Studies, www.montana.edu

AAAS, The American Association of the Advancement of Science; www.aaas.org

NASA, National Aeronautics and Space Administration; www.nasa.gov

NOAA, National Oceanic and Atmospheric Administration, www.noaa.gov

USGS, U.S. Geological Survey; www.usgs.gov

ACS, American Chemical Society; www.acs.org

AIP, American Institute of Physics; www.aip.org

AAPT, American Association of Physics Teachers; www.aapt.org

YouTube, www.YouTube.com

Next Generation Science Standards; www.nextgenscience.org

MnDOE, Minnesota Department of Education, Minnesota Science standards and benchmarks;
<https://education.mn.gov/MDE/dse/stds/sci/>

Podcasts:

Gimlet media, "Science vs."

AAAS-TWIS: "This week in science"

Videos:

Watch: Scientific Inquiry: A Teacher's Guide

[\(13\) Scientific Inquiry: A Teacher's Guide - YouTube](#)