GEORGE MASON UNIVERSITY
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT
GRADUATE SCHOOL OF EDUCATION
Elementary Education Program

ELED 553 DL3: SCIENCE METHODS FOR THE ELEMENTARY CLASSROOM

Spring 2021
Asynchronous, Online

Instructor: Dr. Whitney Keaton
Phone: Please email me to set up a phone call or virtual meeting
Email: wgarret2@gmu.edu
Office Hours: By appointment
Office: Online

This course is only open to students in the Elementary Education program.

COURSE DESCRIPTION

Prerequisites/Corequisites

Admission to the Elementary Education program.

University Catalog Course Descriptions

Develops skills and abilities in science teaching methods, applications of technology, safety practices, and creation of integrated science curricula. Examines science teaching based on contemporary theory, practice, and standards. Prerequisite(s): Admission to elementary education licensure program. **Notes:** Requires field experience in public schools.

Expanded Course Description

The primary goal of this course is to provide you with practical experience, theoretical background, and pedagogical skills that will allow you to be successful in your future career. To this end, there will be two main themes stressed over the duration of the course: 1) to facilitate the development of pedagogical approaches to inquiry-based teaching practice, and 2) to develop confidence and understanding for science and health content. With respect to content, the course will develop your background knowledge with the goal of successful teaching in an elementary science context, meaning that you will need to have a solid understanding of large-scale science topics beyond what is expected of elementary children. The course will also consider the intersection of science, self and society to investigate elements of health-related content such as human body systems, nutrition, emotional health, as well as conceptions of gender and identity.

Most children come to school with a keen interest in the world around them, but often by the end of elementary school only a small percentage of students have retained this interest in science content. This is generally attributed to the ways in which "school science" often ignores the beauty and joy that can come from engaging with science and connecting scientific understanding to the everyday experiences of children. Consequently, we will conceptualize science as a verb where we consider our *wonders, build new knowledge,* and *discover* as opposed to the memorization of 'science facts.' For this reason, we will utilize constructivist approaches to learning and those approaches should help you

scaffold science content that is too often presented as an exercise in the acquisition of vocabulary.

This course plans to provide opportunities for students to enjoy and embrace the ideas that make us wonder about the world and our role within it. In many respects, science can be intimidating to learn in the ways it is presented in schools, media and the general public. Our goal is to unpack those social constructions of science to present science in a more realistic light where scientists are presented as humans struggling to better understand the world (just like the rest of us) as opposed to omnipotent, infallible heroes that society and textbooks wish to portray. This class experience is merely a first step in your evolution toward becoming the kind of educator you wish to be. Lastly, you will be required to bring your curiosity to class for each session. Please make sure to nurture and feed it as we move through our work together.

Course Delivery Method
This course will be delivered online (76% or more) using an asynchronous format via Blackboard Learning Management system (LMS) housed in the MyMason portal. You will log in to the Blackboard (Bb) course site using your Mason email name (everything before @masonlive.gmu.edu) and email password. The course site will be available on January 25th, 2021.

Under no circumstances, may candidates/students participate in online class sessions (either by phone or Internet) while operating motor vehicles. Further, as expected in a face-to-face class meeting, such online participation requires undivided attention to course content and communication.

Technical Requirements

To participate in this course, students will need to satisfy the following technical requirements:

- High-speed Internet access with standard up-to-date browsers. To get a list of Blackboard's supported browsers see: https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support#supported-browsers

  To get a list of supported operation systems on different devices see: https://help.blackboard.com/Learn/Student/Getting_Started/Browser_Support#tested-devices-and-operating-systems
- Students must maintain consistent and reliable access to their GMU email and Blackboard, as these are the official methods of communication for this course.
- Students will need a headset microphone for use with the Blackboard Collaborate web conferencing tool.
- Students may be asked to create logins and passwords on supplemental websites and/or to download trial software to their computer or tablet as part of course requirements.
    - The following software plug-ins for PCs and Macs, respectively, are available for free download:
    - Adobe Acrobat Reader: https://get.adobe.com/reader/
    - Windows Media Player: https://support.microsoft.com/en-us/help/14209/get-windows-media-player
    - Apple Quick Time Player: www.apple.com/quicktime/download/

Expectations

- Course Week: Our course week will begin on Monday mornings and will end on Sundays at 11:59pm as indicated on the Class Schedule.
- Log-in Frequency: Students must actively check the course Blackboard site and their GMU email for communications from the instructor, class discussions, and/or access to course materials at least 4 times per week. In addition, students must log-in for all scheduled online synchronous meetings.
- Participation: Students are expected to actively engage in all course activities throughout the semester, which includes viewing all course materials, completing course activities and assignments, and participating in course discussions and group interactions.
- Technical Competence: Students are expected to demonstrate competence in the use of all course technology. Students who are struggling with technical components of the course are expected to seek assistance from the instructor and/or College or University technical services.
- Technical Issues: Students should anticipate some technical difficulties during the semester and should, therefore, budget their time accordingly. Late work will not be accepted based on individual technical issues.
- Workload: Please be aware that this course is **not** self-paced. Students are expected to meet *specific deadlines* and *due dates* listed in the **Class Schedule** section of this syllabus. It is the student's responsibility to keep track of the weekly course schedule of topics, readings, activities and assignments due.
- Instructor Support: Students may schedule a one-on-one meeting to discuss course requirements, content or other course-related issues. Those unable to come to a Mason campus can meet with the instructor via telephone or web conference. Students should email the instructor to schedule a one-on-one session, including their preferred meeting method and suggested dates/times.
- Netiquette: The course environment is a collaborative space. Experience shows that even an innocent remark typed in the online environment can be misconstrued. Students must always re-read their responses carefully before posting them, so as others do not consider them as personal offenses. *Be positive in your approach with others and diplomatic in selecting your words.* Remember that you are not competing with classmates but sharing information and learning from others. All faculty are similarly expected to be respectful in all communications.
- Accommodations: Online learners who require effective accommodations to ensure accessibility must be registered with George Mason University Disability Services.

Learner Outcomes

This course will enable students to:

A. Build a pedagogical content knowledge base in science and understand the systems of nature in Earth science, biology, chemistry and through inquiry-based investigation
B. Conceptualize core principles regarding the Nature of Science, i.e., how wonder, creativity experimentation, and evidence frame scientific thinking, as well as how theory is used in predicting and explaining phenomena.
C. Engage in and use scientific practices such as data collection, analysis, modeling, use of evidence, construction of explanations, reliability, self-checking, and identification of limitations to conduct research experiments.
D. Understand the historical development of scientific concepts and the social, cultural, and economic significance of science.

E. Understand and use knowledge, skills, and practices of the four core science disciplines of Earth science, biology, chemistry, and physics to develop lesson plans demonstrating inquiry-based principles in science and health education including the incorporation of technology
F. Demonstrate age-appropriate safety standards when designing hands-on classroom experiences
G. Examine science and health curricula and methods with respect to "Science for All" and standards documents at local, state, and national levels
H. Develop viable assessment tools for science and health contexts
I. Understand the relationship of science to math, the design process, and technology.
J. Understand, possess, and integrate the knowledge, skills, dispositions, and processes needed to support learners' achievement in an interdisciplinary manner in Virginia's Foundation Blocks for Early Learning: Comprehensive Standards for Four-Year-Olds and the Virginia Standards of Learning in English, mathematics, history and social science, science, and computer technology.

Professional Standards
INTASC: *Interstate Teacher Assessment and Support Consortium*, Model Core Teaching Standards
Upon completion of this course, students will have met the following professional standards:

#4. Content Knowledge. The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make the discipline accessible and meaningful for learners to assure mastery of the content.
#5. Application of Content. The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
#6. Assessment. The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
#7. Planning for Instruction. The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
#8. Instructional Strategies. The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

Technology (ISTE NETS): *International Society for Technology in Education / National Educational Technology Standards*

Standard I. Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.

REQUIRED TEXTS & READINGS

Required readings will be provided electronically via Blackboard throughout the course.

COURSE ASSIGNMENTS/ASSESSMENTS

Assignment	Total Points Possible
Participation	15
Weekly Journal	15
Curriculum Design and Assessment Synthesis	15
Inquiry-Based Mini Unit Project	30
Wonder Investigation and Presentation	15
Clinical Group Debriefs	10
Total	**100**

1. Participation [Course goals: A-F] 15%

Success in the course is predicated on being an active participant in the learning process. To this end, there will be a number of class-based assignments, discussions and activities in each weekly module that will also be included in your overall participation. My expectation is that active and engaged students stand the most to gain from the approaches we will use in class. Consequently, you are expected to be present, actively involve yourself in class activities, and treat classmates with respect. The hope is to create a joyful context where laughing, lively discussion, raising questions and engaging with your group members are the norm. I strongly encourage you to consider how your individual role can positively impact our time together. I fully expect that each participant will participate each week and communicate ahead of time if that is going to be impacted.

2. Weekly Journal [Course outcomes: A & B] 15%

Over the course of the semester, we will use a collaborative document to reflect on your relationship with science and to make note of various things that you observe in the natural world around you. Regularly, you will be asked to list, sketch, question, observe and record those things that capture your attention and imagination. You will be required to complete one prompt per week, but this will be a place for you to jot down thoughts and questions that you have all semester. I will interact with you regularly in this format by giving feedback and challenging you to think more deeply.

3. Curriculum Design and Assessment Synthesis [course outcome: A & B] 15%

Learning Theory/Teaching and Assessment discussion (two pages)

This serves as a description for your understanding of learning theory and rationale based on the course readings. The goal is to synthesize the readings and your understanding for processes related to inquiry models and pedagogy. *Must include references in support of your claims for your approach.*

4. Inquiry-Based Mini-Unit Project (PBA) [Course goals: A-F] 30%

The goal of this project is construct and teach an inquiry-based unit within your field site. We will design this work around the 5 E model of lesson planning. The unit will entail building a detailed and well-supported narrative description for the approach that will be employed. The five-E sequence (generally taught over three class sessions) will build science content understanding in engaging and dynamic ways for students within your field site and provide some key theoretical and research-based support for the content, approach and activities constructed. The unit will be comprised of the following components and scored via the rubric provided later in the syllabus.

All unit plans will include:

A. Overview

Theme/Topic:

Give insight into the overall content concepts and provide an overarching description of the unit and goals. Consider it the "movie trailer" of the unit where you set the stage and excite the reader for what lies ahead.

Teacher Background knowledge:

This section highlights the facts that teachers should be familiar with this can/should include some resources and/or sources…also list some common misconceptions (or naïve conceptions) children and adults may hold concerning the topic.

Description of Students:

Provide brief overview, describing the audience for which the unit is designed.

B. Detailed Lesson Plans

The unit will follow the 5 E model and as such your lessons should span the 5E process. These will generally be one E per lesson and would require 5 detailed lessons for the unit (*See Bb site for lesson template*). However, in some cases you may get more or less time and the enactment of the unit is up to the amount of time you have allotted in your class context. We will discuss this more in class. The unit should include a final assessment that would evaluate whether your students achieved the objectives at the end of the unit. This final assessment should include the questions/tasks the students are required to do and indicate what objectives are being assessed and how they are being assessed. For instance, posters, investigations, debates, etc. should align with original unit objectives.

C. Assessment

Your assessment efforts across your unit should include diagnostic, formative and summative assessments that are directly linked to your unit goals and daily objectives. These approaches should work to innovatively engage children in meaningful approaches that also comprise the spirit of inquiry and investigation as depicted in the readings.

D. Support Materials *(all materials for the daily lesson plans)*

For the daily lesson plans, you will develop all support materials that the teacher and students will use. For teaching and learning activities **include each sheet of paper distributed to the students to carry out the daily lesson plans - laboratory experiments, activities, worksheets, instructions, assessments, rubrics, etc.** Attach these to the appropriate lesson plan. **Other teaching aids** (ie. instructions for teacher demo or photos of experiment set up, etc.) used during the unit should also be included. Be sure that your unit plan can illustrate the following three aspects of teaching: **introducing new content, hands-on assignments, and assessment of student learning**. These activities should focus on the essential science concepts and connections, assess higher order thinking skills, and target different learning styles. Checking for understanding should be included daily. Include diagnostic, formative,

and summative assessment. Your 'evaluation' portion of the unit should **include major assessment instruments and grading criteria for the unit**.

E. References Cited section

5. Wonder Investigation and Presentation [Course goals: A, B, C, E, F] 15%

This project is designed to evoke and engage future teachers in the possibilities that science content holds for elementary contexts as well as for yourselves. Science often generates negative feelings associated with memorization and mind-numbing procedural approaches (think about lab reports or 'if – then' statements), which is not the norm in typical/real science contexts. The goal of this project is to pursue an idea that **you** find interesting. You will choose a topic from your wonder journal (or a new and different wonder) and pursue some answers, ideas and most importantly further questions related to that wonder. The goal is not necessarily to prove one single answer, but to understand something to a greater degree and then consider all the new questions that come along with that wondering and investigating.

The project will entail the following:
-A presentation (in video format) that will highlight:
a) the wonder itself
b) the information identified to make more sense of that wonder (diagrams, sketches, etc.)
c) create a wonder map
d) list key scientific concepts behind that wonder (definitions, models, etc.),
e) list further questions and hypotheses related to that wonder,
f) how might you design an experiment or process to answer those further wonders,
g) and lastly be provided a few ways you might consider using wonder in a classroom context.

6. Clinical Group Debriefs [course goals: D - G] 10%

Candidates will collaborate with group members synchronously and asynchronously to develop a debrief of their clinical experience. The purpose of this is to model and practice the deliberative skills needed for Professional Learning Communities and other collaborative professional growth for faculty in schools. You will also use this opportunity to reflect on the science techniques you are observing and find any similarities from your group members or anomalies. This is a way for you to benefit from a variety of mentor teachers by sharing what each of you has observed and learned with your group. You will ultimately create two Group Debriefs which will be in the form of an animated video, screencast, podcast, or an interactive image.

COURSE GRADING SCALE:

Grade	GRADING	Grade Points	Interpretation
A	94-100	4.00	Represents mastery of the subject through effort beyond basic requirements.
A-	90-93	3.67	
B+	85-89	3.33	Reflects an understanding of and the ability to apply theories and principles at a basic level
B	80-84	3.00	
C*	70-79	2.00	Denotes an unacceptable level of understanding and application of the basic elements of the course
F*	<69	0.00	

Note: "C" is not satisfactory for a licensure course
"F" does not meet requirements of the Graduate School of Education

WORK TIMELINESS EXPECTATIONS:

It is expected that all class assignments will be submitted on time. Therefore, **All assignments are to be completed by the date listed in the syllabus. Written work will not be accepted after the due date unless prior arrangements have been made with the instructor.** Credit will not be given for late assignments. All assignments must be submitted by 11:59pm (Eastern standard time) on the due date stated within the syllabus (see below) and should only be submitted via **Blackboard**.

If you are unable to complete an assignment due to an emergency or difficult circumstance, communication must be made with the instructor via email or in person. In situations that are deemed an emergency or a difficult circumstance, I will work with you to set a new submission date that will not be considered late.

OTHER EXPECTATIONS

All written papers are **expected to be double-spaced, with 1" margins, and in 12-point font** (Times New Roman, Calibri, or Arial). **APA format is expected**. If you do not have a 7th Edition APA manual, the OWL at Purdue is an excellent resource: http://owl.english.purdue.edu/owl/resource/560/01/

***Please Note:** The GMU Writing Center offers online support via email. They will provide feedback on your writing within one hour. Graduate and professional writing can be difficult; I encourage you to take advantage of this service. http://writingcenter.gmu.edu/?page_id=177

Professional Dispositions

Students are expected to exhibit professional behaviors and dispositions at all times (See Elementary Education Program Handbook).

Core Values Commitment

The College of Education and Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles: http://cehd.gmu.edu/values/.

GMU Policies and Resources for Students

Policies

- Students must adhere to the guidelines of the Mason Honor Code (see http://oai.gmu.edu/the-mason-honor-code/).
- Students must follow the university policy for Responsible Use of Computing (see http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/).
- Students are responsible for the content of university communications sent to their Mason email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students **solely** through their Mason email account.
- Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see http://ods.gmu.edu/).
- Students must follow the university policy stating that all sound emitting devices shall be silenced during class unless otherwise authorized by the instructor.

Campus Resources

- Support for submission of assignments to Tk20 should be directed to tk20help@gmu.edu or https://cehd.gmu.edu/aero/tk20. Questions or concerns regarding use of Blackboard should be directed to http://coursessupport.gmu.edu/.
- The Writing Center provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing (see http://writingcenter.gmu.edu/).
- The Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance (see http://caps.gmu.edu/).
- The Student Support & Advocacy Center staff helps students develop and maintain healthy lifestyles through confidential one-on-one support as well as through interactive programs and resources. Some of the topics they address are healthy relationships, stress management, nutrition, sexual assault, drug and alcohol use, and sexual health (see http://ssac.gmu.edu/). Students in need of these services may contact the office by phone at 703-993-3686. Concerned students, faculty and staff may also make a referral to express concern for the safety or well-being of a Mason student or the community by going to http://ssac.gmu.edu/make-a-referral/.

- For information on student support resources on campus, see https://ctfe.gmu.edu/teaching/student-support-resources-on-campus

Notice of mandatory reporting of sexual assault, interpersonal violence, and stalking: As a faculty member, I am designated as a "Responsible Employee," and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason's Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason's confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-380-1434 or Counseling and Psychological Services (CAPS) at 703-993-2380. You may also seek assistance from Mason's Title IX Coordinator by calling 703-993-8730, or emailing titleix@gmu.edu.

For additional information on the College of Education and Human Development, please visit our website http://cehd.gmu.edu/.

For additional information on the College of Education and Human Development, Graduate School of Education, please visit our website [See **http://gse.gmu.edu/**]
http://cehd.gmu.edu/values/

EMERGENCY PROCEDURES

You are encouraged to sign up for emergency alerts by visiting the website https://alert.gmu.edu. There are emergency posters in each classroom explaining what to do in the event of crises. Further information about emergency procedures exists on http://gmu.edu/service/cert

SPRING 2021 CLASS SCHEDULE

**This schedule is subject to change. If changes are made, you would be notified via Blackboard.*

Date	Topics/Agenda Science Methods Topic Science Content Topic	Assignments Due (by 11:59pm EST on Sunday)
Week #1 Jan 25 – Jan 31	○ Introduction of course setup, requirements, instructor, and peers ○ Nature of Science ○ Earth Science topic ○ Introduction to Clinical Group Debriefs ○ Introduction to Weekly Journals ○ Contact clinical field mentor teachers and schedule hours	○ All participation activities in this week's module. ○ Journal Entry #1
Week #2 Feb 1 – Feb 7	○ 5E Process ○ Biology topic ○ Introduction to Inquiry-Based Mini Unit Project ○ Begin working on Inquiry-Based Mini Unit Overview ○ Meeting #1 with clinical group	○ All participation activities in this week's module. ○ Journal Entry #2 ○ Schedule meeting #1 with Clinical Group

Week #3 Feb 8 – Feb 14	○ Inquiry – Part 1 ○ Chemistry topic ○ Complete Inquiry-Based Mini Unit Overview ○ Asynchronously work on Clinical Group Debrief #1	○ All participation activities in this week's module. ○ Journal Entry #3 ○ Inquiry-Based Mini Unit Overview Due
Week #4 Feb 15 – Feb 21	○ Inquiry – Part 2 ○ Physics topic ○ Introduction to Curriculum Design and Assessment Synthesis ○ Meeting #2 with clinical group	○ All participation activities in this week's module. ○ Journal Entry #4 ○ Schedule meeting #2 with Clinical Group
Week #5 Feb 22 – Feb 28	○ Differentiation – What and Why? ○ Health topic ○ Introduction to Wonder Investigation ○ Work on Curriculum Design and Assessment Synthesis ○ Asynchronously work on Clinical Group Debrief #1	○ All participation activities in this week's module. ○ Journal Entry #5 ○ Wonder Investigation Proposal and Timeline Due
Week #6 Mar 1 – Mar 7	○ Differentiation – How? ○ Earth Science topic ○ Work on Curriculum Design and Assessment Synthesis ○ Work on Wonder Investigation ○ Complete Clinical Group Debrief #1	○ All participation activities in this week's module. ○ Journal Entry #6 ○ Clinical Group Debrief #1 Due
Week #7 Mar 8 – Mar 14	○ Assessment - Summative ○ Biology topic ○ Complete Curriculum Design and Assessment Synthesis ○ Work on Wonder Investigation	○ All participation activities in this week's module. ○ Journal Entry #7 ○ Curriculum Design and Assessment Synthesis Due
Week #8 Mar 15 – Mar 21	○ Assessment - Formative ○ Chemistry topic ○ Create a concept map for your Inquiry-Based Mini Unit ○ Work on Wonder Investigation	○ All participation activities in this week's module. ○ Journal Entry #8 ○ Mini Unit Lesson and Assessment Concept Map Due ○
Week #9 Mar 22 – Mar 28	○ Instructional Technology ○ Physics topic ○ Begin working on Inquiry-Based Mini Unit Lesson plans and Assessments ○ Work on Wonder Investigation ○ Meeting #3 with clinical group	○ All participation activities in this week's module. ○ Journal Entry #9 ○ Schedule meeting #3 with Clinical Group
Week #10 Mar 29 – Apr 4	○ Interdisciplinary STEM Education–Part 1 ○ Health topic ○ Continue working on Inquiry-Based Mini Unit Lesson plans and Assessments ○ Work on Wonder Investigation ○ Asynchronously work on Clinical Group Debrief #2	○ All participation activities in this week's module. ○ Journal Entry #10
Week #11 Apr 5 – Apr 11	○ Interdisciplinary STEM Education-Part 2 ○ Earth Science topic ○ Complete Inquiry-Based Mini Unit Lesson plans and Assessments	○ All participation activities in this week's module. ○ Journal Entry #11

	○ Work on Wonder Investigation ○ Meeting #4 with clinical group	○ Schedule meeting #4 with Clinical Group ○ Inquiry-Based Mini Unit Lesson Plans and Assessments Due ○
Week #12 Apr 12 - Apr 18	○ Modeling and Representation ○ Biology topic ○ Begin creating all support materials and make edits to Inquiry-Based Mini Unit ○ Work on Wonder Investigation ○ Asynchronously work on Clinical Group Debrief #2	○ All participation activities in this week's module. ○ Journal Entry #12
Week #13 Apr 19 – Apr 25	○ Diversity, Equity and Social Justice ○ Chemistry topic ○ Finish creating all support materials and make edits to Inquiry-Based Mini Unit ○ Work on Wonder Investigation ○ Complete Clinical Group Debrief #2	○ All participation activities in this week's module. ○ Journal Entry #13 ○ Clinical Group Debrief #2 Due ○ Final Inquiry-Based Mini Unit Project Due
Week #14 Apr 26 – May 2	○ Wonder Investigation Presentations and Peer Feedback	○ All participation activities in this week's module. ○ Journal Entry #14 ○ Wonder Investigation Presentations (must be posted by 11:59pm on Wednesday 4/28/21) ○ Peer Feedback to Wonder Investigations (comments posted by 11:59pm on Sunday 5/2/21)

ASSESSMENT RUBRICS:

PBA TASK: Science Unit Rubric (30% of total grade)

Assessment Summary: The project is meant to facilitate your understanding for the design and teaching of an inquiry-based science unit. This will require research into both inquiry-based lesson planning and science content. The goal is to bring powerful learning theory to life in classrooms and design science experiences that both excite and engage elementary children.

Description and standard addressed	**Exceeds Expectations – 4**	**Meets Expectations – 3**	**Does Not Meet Expectations – 2**	**Does Not Meet Expectations – 1**
A. Overview (Background; content and context description) INTASC: #4, 5, 7; (5 pts)	Give excellent insight into key content ideas, provides powerful description of unit goals. Excellent listing and engagement for the content background teachers would need to know to carry out lesson goals. Excellent description of school and students that the unit is designed.	Give insight into the content and include several key content ideas. Lists and engages the content background teachers would need to know to carry out lesson goals. Provides a solid description for the school and students that the unit is designed.	Does not provide insight into the content and include several key content ideas. Does not completely provide the content background for teachers. Does not provide a detailed description of the school and students.	Missing
B. Detailed Lesson plans (Lesson Framework, pedagogical process & procedure) INTASC: #5, 7, 8 (12 pts)	Standards, objectives and lesson activities all seamlessly align and support one another. Utilizes inquiry-based lesson model (5E's), clearly describes pedagogical process that embodies inquiry. Clearly described, highly usable and innovative ideas with original elements; addresses issues of safety	There exists alignment between standards, objectives and they support lesson approach. Utilizes inquiry-based lesson model (5E's), clearly describes pedagogical process that embodies inquiry. Effectively describes, usable and effective ideas; addresses issues of safety	Standards, objectives and activities not clearly aligned or appropriate for the lesson. Difficult to use; does not have complete components; and/or is not self-explanatory. Does not address safety.	No consistent format nor serious professional commitment to student needs.

C. Assessment INTASC: #6 (5 pts)	Innovative, well-supported assessment strategies clearly linked to objectives; demonstrates all stated objectives, copies of assessments included. Includes diagnostic, formative and summative approaches throughout the unit.	Assessment clearly linked to objectives; demonstrates nearly all stated objectives, copies of written assessments are attached. Includes diagnostic, formative and summative approaches throughout the unit.	Assessment is not clearly linked to objectives; demonstrates some stated objectives, and/or copies of written assessments are not attached. Does not provide differing types of assessment strategies.	Missing
D. Support materials INTASC: #4, 5, 8 (5 pts)	Innovative materials used throughout that incorporates engaging, developmentally appropriate and scientifically accurate approaches; multiple connections are made to students' everyday lives and accessible.	Some innovative materials used throughout that incorporates engaging, developmentally appropriate and scientifically accurate approaches. These approaches make attempts to connect to students' everyday lives.	Lacks innovation and does not include activities that support inquiry. Activities might contain some scientific inconsistencies; little effort to connect to students everyday lives.	Missing
E. References cited. (3 pts)	Uses well-respected sources properly referenced with no errors.	Uses well-respected sources properly referenced, but with a few small errors.	Mistakes in formatting and does not utilize well-respected reference materials.	Missing