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

EDCI 553.001: SCIENCE METHODS FOR THE ELEMENTARY CLASSROOM
Spring 2017
Wednesdays 4:30 – 7:10

Instructor: Andrew Gilbert, Ph.D.
Phone: (703) 993-3497
Email: agilbe14@gmu.edu
Office Hours: Anytime by appointment
Office: 1404 Thompson Hall
Course Location: 2020 Thompson Hall

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

COURSE DESCRIPTION

A. Prerequisites/Corequisites

Admission to the Elementary Education program.

B. 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.

C. 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 are 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.

LEARNER OUTCOMES

This course will enable students to:

A. Build pedagogical content knowledge base in science and health through inquiry-based investigation
B. Conceptualize core principles regarding the Nature of Science, ie. how wonder, creativity experimentation, and evidence frame scientific thinking
C. Develop lesson plans demonstrating inquiry-based principles in science and health education including the incorporation of technology
D. Demonstrate age-appropriate safety standards when designing hands-on classroom experiences
E. Examine science and health curricula and methods with respect to "Science for All" and standards documents at local, state, and national levels
F. Develop viable assessment tools for science and health contexts

KEY PROFESSIONAL STANDARDS ADDRESSED FOR PBA ASSESSMENTS

INTASC: *Interstate Teacher Assessment and Support Consortium*, Model Core Teaching 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.

ACEI: *Association for Childhood Education International* - Standards for elementary level teacher preparation:

1.0 Development, Learning, and Motivation--Candidates know, understand, and use the major concepts, principles, theories, and research related to development of children and young adolescents to construct learning opportunities that support individual students' development, acquisition of knowledge, and motivation.

2.2 Science— Candidates know and understand fundamental concepts of physical, life, and earth/space sciences as delineated in the National Science Education Standards. Candidates can design and implement age-appropriate inquiry lessons to teach science, to build student understanding of personal and social applications, and to convey the nature of science. (INTASC #1 Subject Matter Knowledge)

2.6 Health education— Candidates know, understand, and use the major concepts in the subject matter of health education to create opportunities for student development and practice of skills that contribute to good health. (INTASC #1 Subject Matter Knowledge)

3.1 Integrating and applying knowledge for instruction— Candidates plan and implement instruction based on knowledge of students, learning theory, connection across the curriculum, curricular goals, and community. (INTASC #7 Planning)

#4.0 Assessment for Instruction -- Candidates know, understand and use formal and informal assessment strategies to plan, evaluate and strengthen instruction that will promote continuous intellectual, social, emotional, and physical development of each elementary student.

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.

COURSE DELIVERY

Face to face, 100%

REQUIRED TEXTS & READINGS

Bryson, B. (2004). A short history of nearly everything. New York, NY: Broadway Books
(Any edition is fine...just don't buy the abridged version...)

Other required readings will be provided via electronic chapters via Blackboard.

Articles and other materials will be provided throughout the course.

Optional Texts:

Board of Education, Commonwealth of Virginia (2010). *Standards of learning for Virginia Public Schools: Science* Available online:
http://www.doe.virginia.gov/testing/sol/standards_docs/science/complete/stds_sciencek-12.doc

Board of Education, Commonwealth of Virginia (2008). *Standards of learning for Virginia Public Schools: Health.* Available online:
http://www.doe.virginia.gov/testing/sol/standards_docs/health/complete/stds_healthk-10.doc

COURSE ASSIGNMENTS/ASSESSMENTS

1. Wonder Journal [Course outcomes: A & B] 20%

Think about the science that you see in the everyday. Ask yourself questions, feel the movements and forces while you drive, look at the sky, watch your pet, engage with another human, think about your place in this world, go for a long walk and just think...no phone, no worries, just get lost in your thoughts. Remember this is homework so you have an excuse. Over the course of the semester…use a composition book/journal to make note of various things that you observe in the natural world around you and list, sketch, question, observe and record those things that capture your attention and imagination. These wonderings about the natural world are just that…what do you see, feel and think about those things that fascinate and frustrate you to think about. There may be elements from the Bryson reading that trigger your thinking or it might be watching the clouds move while walking your dog…the inspiration doesn't matter, but we will engage deeply with those thoughts we usually discard because we live our lives in a hurry. We will intentionally slow down and use old technology (paper and pencil) to engage with our wonders.

There are no real rules here. Well, I lied, there are three rules…1) you will need to complete 10 entries total (more is fine); 2) at least three entries must address a topic from the Bryson readings; 3) we will turn in our journals **April, 19** in class.

Your wonders are yours and unique to how you envision the world around you. "Dance like nobody is watching" while you build your entries.

Bryson Text

Introduction
Chapter 1 - How to Build a Universe
Chapter 2 - Welcome to the Solar System
Chapter 9 - The Mighty Atom
Chapter 12 - The Earth Moves
Chapter 24 - Cells
Chapter 21 - Life Goes On
Chapter 26 - The Stuff of Life
Optional
Chapter 5 - The Stone Breakers
Chapter 6 - Science Red in Tooth and Claw

2. Reading Logs [Course goals: A, B, E, F] 15%

You will analyze each Science reading in terms of the reading and its connection to your school site and your unit. Record these responses in your longitudinal reading log for the readings below. Use the template provided in Bb. Your reflection should…

1. be completed before the class period begins on days those readings are listed in the calendar
2. be brief, yet thoughtful, and demonstrate genuine consideration of the text
3. be accessible during <u>each</u> class session.

These will help in the construction and support of both your science unit and differentiation plan. Complete a log for each of the following readings:

Reading Logs are only needed for the following Science readings posted on Bb
Ready, Set, Science.
How to teach elem. Science. Ch. 2
Teaching Science for all children p. 5-24.
Llewellyn – Ch. 7. (5E's).
Assessment of science inquiry, ch. 4

3. Inquiry-Based Unit Project (PBA) [Course goals: A-F] 40%

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-lesson sequence 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 as part of the TBA.

All unit plans will include:

A. Learning Theory/Teaching Philosophy (one to two pages)

This description of your learning theory and rationale for your <u>teaching</u> approach in your classroom. It should clearly relate to student learning and be reflected throughout your lessons in the unit plan. *Must include references in support of your claims for your approach.*

B. Overview (two-three pages)

Theme/Topic:

Give insight into the content and include several key content ideas and 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.

Unit Question

What is the overarching or guiding question that the students will be investigating about the theme/unit.

Standards of Learning

List the main standards from the Virginia SOLs. Be sure to include both the content and inquiry standards.

Objectives

List the major objectives that would represent what students should learn through the unit. Objectives should be written in such a way that they represent a measureable behavior.

Assessment Plan Overview

After examining the objectives, articulate the formative assessments you may use throughout the unit and what you hope to glean from those assessments. Then identify the major summative assessment/s that you will use to assess achievement of each objective. There should be at least two assessments for each objective. Some assessments may assess multiple objectives (for instance a final project may assess many of the objectives), while others may be specific for a particular objective (for an essay may address only one objective). References will strengthen this section as well.

Schedule

Include a one-page overview/list showing the science content being studied each day during the unit. This could be displayed as a calendar.

C. 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. 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.

D. Final Assessment

You should develop 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.

E. 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**.

F. References Cited section

4. Wonder Investigation [Course goals: A, B, E, F] 20%

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 something, 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 public presentation (preferably a poster, museum display or other visual of some sort)
- the visual will highlight:

a) the wonder itself

b) the information identified to make more sense of that wonder (diagrams, sketches, etc.)

c) list key scientific concepts behind that wonder (definitions, models, etc.),

d) list further questions related to that wonder,

e) how might you design an experiment or process to answer those further wonders,
f) and lastly be provided a few ways you might consider using wonder in a classroom context

5. Participation **[Course goals: A-F]** **5%**

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 over the duration of the course 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. We will intentionally unplug ourselves and engage with our thoughts and ideas while avoiding the temptation for quick answers via the Internet. I have found this approach leads to increased science confidence and builds classroom community. 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. Also remember that this class is a two way street. If there is a topic or idea that you would like to further investigate or need additional support…bring it up in class.

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

Other expectations

Attendance: It is your responsibility to attend all class sessions. You are held accountable for all information from each class session whether you are present or not. Absences must be reported to the instructor in writing (via email) before our class session begins.

Tardiness: It is your responsibility to be on time for each class session.

Assignments: All assignments are to be turned in to your instructor on time. Late work will not be accepted for full credit. If the student makes prior arrangements with the instructor, assignments turned in late will receive a 10% deduction from the grade per late day or any fraction thereof (including weekends and holidays).

BLACKBOARD REQUIREMENTS

TK20/Performance-Based Assessment(s) Submission Requirement

Every student registered for any Elementary Education course with a required Tk20 performance-based assessment (designated as such in the syllabus) must submit this/these assessment(s) to Tk20 through ***'Assessments'*** in Blackboard (*Inquiry-based Science unit).* Failure to submit the assessment(s) to Tk20 (through Blackboard) will result in the course instructor reporting the course grade as Incomplete (IN). Unless this grade is changed upon completion of the required Tk20 submission, the IN will convert to an F nine weeks into the following semester.

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

PROPOSED FALL 2016 CLASS SCHEDULE
TENTATIVE CLASS SCHEDULE

Session	Topic/Learning Experiences	Readings & Assignments
FALL	**Wednesdays, 4:30 PM – 7:10 PM**	
Wednesday, Jan. 25	• What is Science? Nature of Science? Checks activity • What do you wonder about?	--Begin wonder project
Wednesday Feb. 1	• Designing simple experiments and demos • Teaching on the cheap • Water on a penny activity/motion demos	Work on readings and wonder journals **Reading due:** Llewellyn (5E's) Ch. 7
Wednesday, Feb. 8	5E process – video highlighting process - science activity- Mystery of the cans • How might we best teach science to children? Virginia SOL's	**Reading due:** Ready, Set, Science & Teaching Science for all children p. 5-24.
Wednesday, Feb. 15	• Unit construction…**bring unit topic to class** • Writing learning objectives, planning for inquiry, • Physical Science – Aluminum foil boats	**Reading due:** How to teach elem. Science. Ch. 2
Wednesday, Feb. 22	• The role of wonder in science • Air pressure • Discussion on unit progress	**Reading Due -** Assessment of science inquiry, ch. 4 **Reading logs due**
Wednesday, March 1	• Discussion on unit progress • Conceptualizing wonder project • Warm and cold fronts • Sound - Physical Science	**Reading Due -** Bryson Intro (*no reading logs for Bryson*) Ch. 1 & Ch. 2
Wednesday, March 8	• Lesson peer review and Unit Q&A • Group discussion and planning / making progress • Forces - Paper planes / data collection/fair testing	**Reading Due –** Bryson Ch. 9 & 12 -- continue work developing unit plans, including dates for teaching in your field site
Wednesday, March 15 **No Class**	• Spring Break…. **NO CLASS**	

Wednesday, March 22	• Brief updates regarding Bryson progress • Earth History - Earth Science • Discussion on unit project	- continue work on units **Reading Due -** Bryson Ch. 21 & 24
Wednesday, March 29	• Return units and articulate action plan for carrying out in schools • Fossils - Earth Science/Biology • Optimizing materials and building a science program	--Unit Due...turn in via Blackboard by 4:30 PM **WED. MARCH 29**
Wednesday, April 5	• Seasons - Earth Science • Sun, Moon and Earth - Earth Science	**Reading Due -** Bryson Ch. 26
Wednesday, April 12	• Life cycles, ecosystems – Biology • Introduction of Health and intersection with Biology	--work on wonder investigation **FCPS SPRING BREAK**
Wednesday, April 19	• Nutrition - Health (Co-taught with Deanna Lavanty - Registered Dietitian) • Constructions of gender - Health	-- work on wonder investigation
Wednesday, April 26	• **Online class meeting…no face to face class** • Group discussion surrounding Health SOL's	--work on wonder investigation
Wednesday, May 3	• Body systems - Health • peer to peer discussions regarding health units • Last day of class... Q&A on health unit	--work wonder investigation **Wonder journals Due**
Wednesday, May 10	• Final exam session – presentations of wonder projects	**--Wonder Investigation project due**

ASSESSMENT RUBRICS:

Rubric for EDCI 553's PBA: Unit Projects (You must earn at least 2 for all items or you will be required to resubmit)

PBA TASK: Science Unit Rubric (40% 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 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 – 3**	**Meets Expectations – 2**	**Does Not Meet Expectations – 1**	**Does Not Meet Expectations – 0**
A. Lesson Framework (pedagogical process & procedure, narrative description) INTASC: # 8 ACEI: #1.0 (10 pts)	Utilizes inquiry-based lesson model (5E's), clearly describes pedagogical process that embodies inquiry. Clearly described, highly usable and innovative ideas with original elements; uses a myriad of excellent and well-respected sources properly referenced within narrative descriptions.	Utilizes inquiry-based lesson model (5E's), clearly describes pedagogical process that embodies inquiry. Effectively describes, usable and effective ideas; uses dependable sources that properly referenced within narrative descriptions.	Difficult to use; does not have complete components; and/or is not self-explanatory. Does not utilize reputable sources within narrative descriptions and/or more needed clarity within narrative.	No consistent format nor serious professional commitment to student needs.
B. Aligned Standards, Objectives, Activities & Resources INTASC: # 7; ACEI: #3.1 (5 pts)	All are student-oriented objectives and stated in observable student learning outcomes; spans all levels of student thinking; all are appropriate for the lesson. Standards, objectives and lesson activities all seamlessly align and support one another.	All are student-oriented objectives and stated in observable student learning outcomes; covers some levels of student thinking; most are clearly connected directly to lesson activities; there exists alignment between standards, objectives and activities.	A mix of student- and teacher-oriented objectives or not stated in terms of observable student learning outcomes; has only minimal levels of student thinking; has way too little or many objectives; and/or some are inappropriate for lesson. Standards, objectives and activities not clearly aligned.	Missing
C. Assessment INTASC: #6 ACEI #4 (5 pts)	Innovative, well-supported assessment strategies clearly linked to objectives; demonstrates all stated objectives, copies of assessments included. Will include diagnostic, formative and summative approaches throughout the unit.	Assessment clearly linked to objectives; demonstrates nearly all stated objectives, copies of written assessments are attached. Will include 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 include all three types of assessment.	Missing

D. Science Content (Earth science, space science, life science, physical science) INTASC: #4 ACEI #2.2 (10 pts)	Content utilized in lesson plan is accurate, complete (as defined by listed standards); incorporates innovative, exciting and scientifically accurate approaches; multiple connections are made to students everyday lives and accessible.	Content utilized in lesson plan is accurate, complete (as defined by listed standards); incorporates These approaches make attempts to connect to students everyday lives.	Content utilized in lesson plan is inaccurate in some places, key content is not addressed (as defined by listed standards); incorporates mostly scientifically accurate approaches; little effort to connect to students everyday lives.	Missing
E. Nature of Science and Safety INTASC Content #5 ACEI #2.2 (5 pts)	Lesson supports essential enactment of science processes consistent with accepted notions of NOS. These include wonder, evidence, investigation, testing, concluding based on findings, etc. These approaches are well-supported with research literature. There also exists keen attention to issues that could arise and clearly provides appropriate safety measures.	Lesson supports enactment of science processes consistent with accepted notions of NOS. These include wonder, evidence, investigation, testing, concluding based on findings, etc. There also exists keen attention to issues that could arise and clearly provides appropriate safety measures.	Lesson tries to support enactment of science processes consistent with accepted notions of NOS, but misses on key approaches or those approaches are absent. (including wonder, evidence, investigation, testing, concluding based on findings, etc.) There is not enough attention paid to issues that could arise and do not clearly provide appropriate safety measures.	Missing
F. Technology Plan INTASC #5 ISTE: #I (5 pts)	Provides excellent description for technology use that connects subject matter with multiple forms technology that advance student learning through creative, and innovative ways.	Strong description for technology use that connects subject matter with technology approaches that advance student learning through creative, and innovative ways.	Description for technology lacks specifics and does not clearly offer ways to advance student learning in creative, innovative and meaningful ways.	Missing