EDEE 368-001
Teaching Science in Grades 2-8

Instructor: Dr. William Veal
Office: Room 315, 86 Wentworth
School of Education, Health, and Human Performance
Contact information: vealw@cofc.edu 953-8045 (office)
Please use email as a primary form of contact
Office hours: Mondays 2:30-4:30 and Tuesdays 9:00-11:00

Course Description:
This is an introductory course in teaching science at the 2-8 grade levels. In this course you will study
the nature of science, inquiry methods of teaching, science and engineering processes, assessment, and
lesson planning focused within the context of science. As a result, the organization, content, and
delivery of this course will focus on scientific processes and inquiry-based instruction. The course will
provide the candidate with learning experiences in which he/she is engaged in science learning and
instruction. Focus will be on lesson plan development and performance-based instruction.

Course Goals and Objectives:
The successful student will be able to:
• Plan Science Activities
• Understand Certain Scientific Content
• Recognize Inquiry Teaching and Learning
• Comprehend Content Pedagogy
• Appreciate Learner Diversity

It is not the intent of the instructor to make students teach in an inquiry fashion; rather this class will
teach the components of inquiry teaching and constructivist learning using an inquiry approach. This
approach works well with implementing performance-based standards. Ultimately each student must
develop their own style of teaching.

National and State Objectives:

Association for Childhood Education International

2c. Science—Candidates know, understand, and use fundamental concepts in the subject matter of science—including
physical, life, and earth and space sciences—as well as concepts in science and technology, science in personal and
social perspectives, the history and nature of science, the unifying concepts of science, and the inquiry processes
scientists use in discovery of new knowledge to build a base for scientific and technological literacy.

National Middle School Association Standards

PRINCIPLE B: CONTENT

Standard 2: Middle Level Curriculum
Middle level teacher candidates understand and use the central concepts, standards, research, and structures of
content to plan and implement curriculum that develops all young adolescents’ competence in subject
matter. They use their knowledge and available resources to design, implement, and evaluate challenging,
developmentally responsive curriculum that results in meaningful learning outcomes. Middle level teacher
candidates demonstrate their ability to assist all young adolescents in understanding the interdisciplinary
nature of knowledge. They design and teach curriculum that is responsive to all young adolescents’ local,
national, and international histories, language/dialects, and individual identities (e.g., race, ethnicity,
culture, age, appearance, ability, sexual orientation, socioeconomic status, family composition).
Element a. Subject Matter Content Knowledge: Middle level teacher candidates demonstrate a depth and breadth of subject matter content knowledge in the subjects they teach (e.g., English/language arts, mathematics, reading, social studies, health, physical education, and family and consumer science). They incorporate information literacy skills and state-of-the-art technologies into teaching their subjects.

Element b. Middle Level Student Standards: Middle level teacher candidates use their knowledge of local, state, national, and common core standards to frame their teaching. They draw on their knowledge of these standards to design, implement, and evaluate developmentally responsive, meaningful, and challenging curriculum for all young adolescents.

Element c. Interdisciplinary Nature of Knowledge: Middle level teacher candidates demonstrate the interdisciplinary nature of knowledge by helping all young adolescents make connections among subject areas. They facilitate relationships among content, ideas, interests, and experiences by developing and implementing relevant, challenging, integrative, and exploratory curriculum. They provide learning opportunities that enhance information literacy (e.g., critical thinking, problem solving, evaluation of information gained) in their specialty fields (e.g., mathematics, social studies, health).

PRINCIPLE C: INSTRUCTIONAL PRACTICE

Standard 4: Middle Level Instruction and Assessment
Middle level teacher candidates understand, use, and reflect on the major concepts, principles, theories, and research related to data-informed instruction and assessment. They employ a variety of developmentally appropriate instructional strategies, information literacy skills, and technologies to meet the learning needs of all young adolescents (e.g., race, ethnicity, culture, age, appearance, ability, sexual orientation, socioeconomic status, family composition).

Element a. Content Pedagogy: Middle level teacher candidates use their knowledge of instruction and assessment strategies that are especially effective in the subjects they teach.

Element b. Middle Level Instructional Strategies: Middle level teacher candidates employ a wide variety of effective teaching, learning, and assessment strategies. They use instructional strategies and technologies in ways that encourage exploration, creativity, and information literacy skills (e.g., critical thinking, problem solving, evaluation of information gained) so that young adolescents are actively engaged in their learning. They use instruction that is responsive to young adolescents’ local, national, and international histories, language/dialects, and individual identities (e.g., race, ethnicity, culture, age, appearance, ability, sexual orientation, socioeconomic status, family composition).

Element c. Middle Level Assessment and Data-informed Instruction: Middle level teacher candidates develop and administer assessments and use them as formative and summative tools to create meaningful learning experiences by assessing prior learning, implementing effective lessons, reflecting on young adolescent learning, and adjusting instruction based on the knowledge gained.

National Science Teachers Association Standards

NSTA Standard 1: Content Knowledge
Effective teachers of science understand and articulate the knowledge and practices of contemporary science. They interrelate and interpret important concepts, ideas, and applications in their fields of licensure.

Preservice teachers will:
1c) Show an understanding of state and national curriculum standards and their impact on the content knowledge necessary for teaching P-12 students.

NSTA Standard 2: Content Pedagogy
Effective teachers of science understand how students learn and develop scientific knowledge. Preservice teachers use scientific inquiry to develop this knowledge for all students.

Preservice teachers will:
2a) Plan multiple lessons using a variety of inquiry approaches that demonstrate their knowledge and understanding of how all students learn science.
2b) Include active inquiry lessons where students collect and interpret data in order to develop and communicate concepts and understand scientific processes, relationships and natural patterns from empirical experiences. Applications of science-specific technology are included in the lessons when appropriate.

NSTA Standard 3: Learning Environments
Effective teachers of science are able to plan for engaging all students in science learning by setting appropriate goals that are consistent with knowledge of how students learn science and are aligned with state and
The plans reflect the nature and social context of science, inquiry, and appropriate safety considerations. Candidates design and select learning activities, instructional settings, and resources—including science-specific technology, to achieve those goals; and they plan fair and equitable assessment strategies to evaluate if the learning goals are met.

Preservice teachers will:

3a) Use a variety of strategies that demonstrate the candidates’ knowledge and understanding of how to select the appropriate teaching and learning activities—including laboratory or field settings and applicable instruments and/or technology—to allow access so that all students learn. These strategies are inclusive and motivating for all students.

3b) Develop lesson plans that include active inquiry lessons where students collect and interpret data using applicable science-specific technology in order to develop concepts, understand scientific processes, relationships and natural patterns from empirical experiences. These plans provide for equitable achievement of science literacy for all students.

3c) Plan fair and equitable assessment strategies to analyze student learning and to evaluate if the learning goals are met. Assessment strategies are designed to continuously evaluate preconceptions and ideas that students hold and the understandings that students have formulated.

International Society for Technology in Education

STANDARD 1: Facilitate and Inspire Student Learning and Creativity: 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.

STANDARD 2: Design and Develop Digital-Age Learning Experiences and Assessments: Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS•S.

STANDARD 3: Model Digital-Age Work and Learning: Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society.

Course Alignment with Common Core Standards

College and Career Readiness Mathematics Practice Standards
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Mathematics Standards
1. Measurement & Data
2. Operations & Algebraic Thinking
3. Expressions & Equations
4. Ratios & Proportional Relationships

College and Career Readiness ELA Standards

Reading. Key ideas and details.
CCSS.ELA-Literacy.RL.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
CCSS.ELA-Literacy.RL.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.
CCSS.ELA-Literacy.RL.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.
CCSS.ELA-Literacy.RL.6.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
CCSS.ELA-Literacy.RI.2.2 Identify the main topic of a multiparagraph text as well as the focus of specific paragraphs within the text.
CCSS.ELA-Literacy.RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea.
CCSS.ELA-Literacy.RI.4.2 Determine the main idea of a text and explain how it is supported by key details; summarize the text.
CCSS.ELA-Literacy.RI.4.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
CCSS.ELA-Literacy.RI.5.2 Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
CCSS.ELA-Literacy.RI.5.3 Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
CCSS.ELA-Literacy.RI.6.2 Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.
CCSS.ELA-Literacy.RI.6.3 Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).
CCSS.ELA-Literacy.RI.7.2 Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.
CCSS.ELA-Literacy.RI.8.1 Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.
CCSS.ELA-Literacy.RI.8.2 Determine a central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text.
CCSS.ELA-Literacy.RI.8.3 Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).

Writing.
CCSS.ELA-Literacy.W.2.2 Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.
CCSS.ELA-Literacy.W.2.3 Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts, and feelings, use temporal words to signal event order, and provide a sense of closure.
CCSS.ELA-Literacy.W.3.2d Provide a concluding statement or section.
CCSS.ELA-Literacy.W.4.1b Provide reasons that are supported by facts and details.
CCSS.ELA-Literacy.W.4.1d Provide a concluding statement or section related to the opinion presented.
CCSS.ELA-Literacy.W.4.2e Provide a concluding statement or section related to the information or explanation presented.
CCSS.ELA-Literacy.W.5.1b Provide logically ordered reasons that are supported by facts and details.
CCSS.ELA-Literacy.W.5.1d Provide a concluding statement or section related to the opinion presented.
CCSS.ELA-Literacy.W.6.1e Provide a concluding statement or section that follows from the argument presented.
CCSS.ELA-Literacy.W.7.1a Introduce claim(s), acknowledge alternate or opposing claims, and organize the reasons and evidence logically.
CCSS.ELA-Literacy.W.7.1b Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.
CCSS.ELA-Literacy.W.8.1a Introduce claim(s), acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
CCSS.ELA-Literacy.W.8.1b Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.

Speaking and Listening.
CCSS.ELA-Literacy.SL.2-8.1 Participate in collaborative conversations with diverse partners about grade 2-8 topics and texts with peers and adults in small and larger groups.
CCSS.ELA-Literacy.SL.3-8.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
CCSS.ELA-Literacy.SL.6.4 Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.
CCSS.ELA-Literacy.SL.7.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.
CCSS.ELA-Literacy.SL.8.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

Language.
CCSS.ELA-Literacy.L.2-8.3 Use knowledge of language and its conventions when writing, speaking, reading, or listening.
CCSS.ELA-Literacy.L.2-8.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 2 reading and content, choosing flexibly from an array of strategies.

Required texts:
There is no textbook required for this course, but there will be an online subscription to the NSTA Learning Center that everyone must purchase. This can be found in the Student Bookstore or bought online. More information will be given in class.

Most readings and articles will be found on the NSTA Learning Center website. All students will become members of the NSTA Learning Center. Activities, readings, and some assignments will be through the NSTA professional development website.

iPads – Students will need to have a handheld DEVICE or computer in-class to be used every day. Activities will be optimized for the iPad so TEDU recommends that students get and use an iPad. Other devices will work, but it will be the student's responsibility to determine how to create the same output from a device other than an iPad. Apps that will need to be downloaded or purchased are Science 360, iMovie, a word processor, and a note taker. Activities and homework assignments using this type of technology will be done in groups so there is no requirement for this class, but it is strongly suggested that you bring your own device. Use this link to apply for an iPad scholarship:

http://ehhp.cofc.edu/student-resources/scholarships.php
OR
http://cofc.qualtrics.com/SE/?SID=SV_3sM3n0vH5YlyiH3

DUE DATES:
Due dates for course assignments, as well as scheduled quizzes and assignments, are listed in the course calendar or are announced in class. No LATE assignments will be accepted. If there is a problem with submitting the assignment on time, please contact the professor ahead of time to ask for an extension (only extenuating circumstances will be allowed).

Field Experience:
Candidates will participate in thirty hours of a designated field experience that takes place in EDEE 382 or 384. You will have to complete one lesson plan in science for EDEE 368 using the classroom as your laboratory. Science lesson plans must be approved by the methods instructor and supervisor prior to teaching them in the classroom.

Grading and Assignments
Late submissions of assignments are unacceptable under normal circumstances. Please do not attempt to submit any assignments after the due date. I will NOT accept any late work.

Any written assignment submitted is considered a final product that will be graded on both what is written (clarity, depth, and insight) and how it is written (the form of the written work). Therefore, it is crucial to realize that correct grammar and spelling, proper punctuation, adherence to assignment guidelines, and neatness will affect your grade. As an educator, you will be expected to demonstrate competency not only in verbal but also in written communication with parents, administrators, and other educators. Please use the resources around you to proofread and to edit your work. Rubrics for all assignments are provided on OAKS to assist you.
I encourage you to take advantage of the Writing Lab in the Center for Student Learning (Addlestone Library, first floor). Trained writing consultants can help with writing for all courses; they offer one-to-one consultations that address everything from brainstorming and developing ideas to crafting strong sentences and documenting sources. 843.953.5635 or http://csl.cofc.edu/labs/writing-lab/.

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<tr>
<th>Assignment</th>
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<tr>
<td>Participation</td>
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<tr>
<td>5-E Learning Cycle Lesson Plan – Seasons (Group)</td>
<td>9/23</td>
<td>50</td>
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<td>Midterm Exam</td>
<td>9/30</td>
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<td>Website Comparison (pairs) or iMovie (pairs)</td>
<td>10/14</td>
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<td>5-E Inquiry LP (groups)</td>
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<td>Assessment Portfolio (groups)</td>
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<td>Science Notebooks (can be electronic with Google docs)</td>
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<td>Online Content Assessment</td>
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<td>Final Exam –</td>
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<td>TOTAL POINTS*</td>
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*Points will change due to the questions used for the MidTerm and Final exams.

**GRADING SCALE:**

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**Participation:** Each teacher candidate is expected to participate in classroom discussions and group work. You will not be allowed to text, phone, or email during class. These are all aspects of your professionalism and dispositions. Tardies and absences are also considered part of this assignment.

**Quiz and Exams:**
There will be one Quiz and one Final Exam. The first Quiz will cover content all PowerPoint presentations to that date. A Final Exam will cover information learned over the course; readings, in-class discussions, class notes. The Final will include short answer and multiple choice questions and 5-E lesson plan development. A test blueprint will be given for the final exam.

**PROFESSIONAL BEHAVIOR/DISPOSITIONS:** Students are responsible for all content and assignments for each class. They will be expected to demonstrate professional behaviors consistent with the following dispositions:
- The belief that all students can learn.
- Value and respect for difference.
- Value of positive human interaction.
- Intellectual curiosity and willingness to learn new knowledge.
- A commitment to inquiry, reflection and self-assessment.
- Value of responsible, collaborative, and cooperative work.
- Sensitivity to community and cultural context.
- Responsible and ethical practice

**ATTENDANCE:**
Class attendance and punctuality are expected professional behaviors. A candidate may be dropped from a course for excessive absences. Two absences for ANY reason will be allowed; however, you may not submit assignments if you are absent. Upon the third absence, a course participation grade will take into effect and reduce the candidate’s score by 3% points. Upon a fourth absence, the candidate will automatically be withdrawn from a course with the grade of WA/F. I will work with you, but it is your responsibility to contact me by phone or email ahead of time.

**ABSENCES:**
- Go to 67 George Street (white house next to Stern Center) to discuss absences and fill out the appropriate forms.
- Forms are online at: http://www.cofc.edu/studentaffairs/general_info/absence and they also can be faxed to the office at 953-2290.
- You will need documentation for health, personal or emergency situations.

**MAKE-UP EXAMINATIONS, PRESENTATIONS, AND QUIZZES:**
If an examination, presentation, or quiz (other than the final examination) was missed for a legitimate reason, as determined by the professor, the professor has the discretion to administer a make-up session. It is the responsibility of the student to contact the professor within 48 hours and make arrangements for the make-up. This is to be done as soon as possible after the missed examination, presentation, or quiz.

**FINAL EXAMS:** The final exam for the course (which may be in the form of an examination, performance, or project) will only take place during the period scheduled for the final exam for the course. (Students who have more than two finals scheduled on the same day may arrange for an alternate time for one final exam through the Office of the Undergraduate Dean).
PAPERS: Papers will be word processed using the style of the Publication Manual of the American Psychological Association (Fifth Edition, 2001).

HONOR SYSTEM:
Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved. Incidents where the instructor determines the student’s actions are related more to a misunderstanding will be handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed by both the instructor and the student, will be forwarded to the Dean of Students and placed in the student’s file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student’s transcript for two years after which the student may petition for the X to be expunged. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration—working together without permission—is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information stored on a cell phone), copying from others’ exams, fabricating data, and giving unauthorized assistance.

Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor.

Students can find the complete Honor Code and all related processes in the Student Handbook at http://www.cofc.edu/generaldocuments/handbook.pdf

As EDEE is a dual program, in that we certify candidates for teacher certification, professors reserve the right to document violations that would impact student certification (e.g., attendance problems in field experiences and clinical practice, professionalism in schools, etc.).

ADA Accommodations:
In compliance with the Americans Disabilities Act (ADA), all qualified students are entitled to “reasonable accommodations.” Any students requiring accommodations should contact the Center for Disability Services (953-1431) and provide me with documentation of needed accommodations within the first two weeks of the course or as soon as they find out about potential accommodations if determined mid semester.

Center for Student Learning: I encourage you to utilize the Center for Student Learning’s (CSL) academic support services for assistance in study strategies and course content. They offer tutoring, Supplemental Instruction, study skills appointments, and workshops. Students of all abilities have become more successful using these programs throughout their academic career and the services are available to you at no additional cost. For more information regarding these services please visit the CSL website at http://csl.cofc.edu or call (843)953-5635.
Required Technology:
Enrollment in this course requires you to utilize the following computer applications: PowerPoint, Excel, Internet/WWW, OAKS via Internet, e-mail, and Word Processing. These computer applications are available in the College of Charleston managed computer labs located in JC Long, the Library, and various other campus locations. If you do not have reliable access to these applications you should plan to use the campus computer laboratories. (See iPad item above.)

School of Education Mission:
The mission of the School of Education at the College of Charleston is the development of educators and health professionals to lead a diverse community of learners toward an understanding of and active participation in a highly complex world. In pursuit of this mission, faculty and students will demonstrate:

- intellectual curiosity and rigor;
- reflective, research-based practice;
- collaboration and consensus building;
- field-oriented service and community outreach;
- and cultural sensitivity and understanding.

MAKE THE TEACHING AND LEARNING CONNECTION

Element of Teacher Competency 1: Understand and value the learner.
Standard I: Evidence theoretical and practical understanding of the ways learners develop.

Element of Teacher Competency 2: Know what and how to teach and assess and how to create an environment in which learning occurs.
Standard II: Demonstrate understanding and application of the critical attributes and pedagogy of the major content area.
Standard III: Evidence a variety of strategies that optimize student learning.
Standard VI: Demonstrate an understanding of the continuous nature of assessment and its role in facilitating learning.

Element of Teacher Competency 3: Understand oneself as a professional
Standard IV: Participate in informed personal and shared decision making that has as its focus the enhancement of schooling and the profession.
Standard V: Communicate effectively with students, parents, colleagues, and the community.
Standard VII: Show an understanding of the culture and organization of schools and school systems and their connection to the larger society.
5-E LP Directions and Rubric

The purpose of this activity is to have candidates develop a 5-E lesson plan and understand all of the components of it. In addition, the candidates will add a set of accommodations to certain places in the lesson plan for a learning disabled student, a technology source or devise, and a graphic organizer. Because science content is difficult, the lesson plan should include teacher notes for the explain portion of the plan and any handouts.

The lesson plan should follow the C of C order for a lesson plan and follow the items below:

- Title
- Standard
- Indicator
- Objective
- Materials
- Assessment
- Procedure (This section should be broken up into the 5-E’s)
- Accommodations

This is a more detailed description of what is expected in the lesson plan for each section. The rubric was developed from these descriptions.

Objective: This should be some type of observable and performance based objective. More than one is acceptable.

Materials: Please list all the science materials and disposable items that you as a teacher will need to prepare ahead of time.

Assessment: This can be a simple explanation of what you would like to assess since we haven’t really discussed assessment types yet. Be creative if possible and make it relevant to

Procedure: (This section should be broken up into the 5-E’s)

- Engage: Student centered, engages student, no direct instruction
- Explore: Student centered, hands-on, activity oriented
- Explain: Teacher centered, coherent approach of content, teacher notes
- Elaborate: application and examples of content to new situations other than what was done in the explore phase
- Evaluate: a re-cap of the content from the explain or explore sections

Accommodations: develop a description of the student and the learning characteristics, and describe how accommodations will be made and where in the lesson plan they will occur.

Technology: include the use of technology (e.g., video) and how and when it will be used.

Graphic Organizer: include how this will be used. Make sure there are clear directions for how the students will complete the GO.

Handouts/ Resources: If there are any handouts, pictures, cartoons, directions, etc., then please include them.
## Rubric for 5-E Lesson Plan

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<th>Criterion</th>
<th>5 pts.</th>
<th>3 pts.</th>
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| **Accommodations AMLE 4** | Describes student with disability
Lists two ways to accommodate disability | Describes student with disability
Lists one way to accommodate disability | Describes student with disability |
| **Technology ISTE 2; ACEI 2c** | Uses more than one PPT. or video for content.
Is integrated well with lesson plan.
Is placed well in the order of the lesson. | Uses one PPT. or video for content.
Is placed well in the order of the lesson. | Provides technology in the form of a video or PPT. |
| **Graphic Organizer PS 7** | Selects an appropriate GO for the content.
GO is used appropriately in the sequence of the lesson.
Directions are given for completing GO.
Model or completed GO is provided. | Selects an appropriate GO for the content.
Directions are given for completing GO.
Model or completed GO is provided. | Selects an appropriate GO for the content. |
| **Engage NSTA 2a; AMLE 2; PS 5** | Is student-centered and focuses on student interest and background knowledge.
Engages student.
No direct instruction of content.
Transition to Explore. | Engages student.
No direct instruction of content.
Transition to Explore. | Engages student. |
| **Explore NSTA 3b; AMLE 4; PS 5** | Is student-centered and involves interaction with items or resources.
Activity is hands-on.
Describes a question or problem to solve. | Involves interaction with items or resources.
Activity is hands-on. | Activity is hands-on. |
| **Explain AMLE 2; ACEI 2c** | Teacher-centered.
Lists content necessary for students to learn.
Explains “how” teacher gets content to students.
Logical flow of content and ideas. | Teacher-centered.
Lists content necessary for students to learn.
Logical flow of content and ideas. | Teacher-centered.
Lists content necessary for students to learn. |
| **Elaborate NSTA 3a; AMLE 2; ACEI 2c** | Applies knowledge to more than one situation.
Students develop the external applications and examples.
Teacher provides models of applications and examples.
Applies to new context. | Applies knowledge to more than one situation.
Teacher provides models of applications and examples.
Applies to new context. | Teacher provides models of applications and examples. |
| **Evaluate NSTA 3c; AMLE 4** | Instrument or activity is provided and summarizes content learned.
Directions and key are provided. | Instrument is provided.
Directions and key are provided. | Instrument is provided. |
| **Handouts/ Resources ACEI 2c** | Hand-outs are provided, appropriate, and connected to content. | Hand-outs are provided, and connected to content. | Hand-outs are provided. |
| **Teacher Notes NSTA 1c; ACEI 2c** | Teacher content notes are provided and relate directly to state indicators.
Content explains possible misconceptions of students. | Teacher content notes are provided and relate directly to state indicators. | Teacher content notes are provided. |
Website Comparison (50 pts.)

Science Website Evaluation

For this assignment, you will have to evaluate, compare, and contrast two opposing websites on the same topic. For example, you will look at a government website on logging and deforestation and compare that site to a website put out by the "Friends of the Trees." After having decided upon a topic and two opposing websites generated by different viewpoints, you will have to evaluate each website on the criteria below, and then compare the websites on content accuracy, similarities and differences in content, and applicability for use in a middle or high school classroom. For each criterion, determine a rating and give a 1 sentence reason why you assigned that value. You may download a hard copy of this table also. For the final paper to turn in, you must cut and paste the URL for each website at the top of each table.

Criteria for website evaluation: (1 point for each assigned value and 1 point for each reason; Complete the table for each website.)

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The source and information of the site are valid?</td>
<td>Yes Mostly No</td>
</tr>
<tr>
<td>2. The content and scientific information was primary, secondary?</td>
<td>Yes No</td>
</tr>
<tr>
<td>3. The method for gathering information was clear and present?</td>
<td>Yes Mostly No</td>
</tr>
<tr>
<td>4. Opinions and comments are objective?</td>
<td>Objective - Subjective</td>
</tr>
<tr>
<td>5. Language and graphics are free from sensationalism?</td>
<td>Inflaming - Neutral</td>
</tr>
<tr>
<td>6. Website negatively targets a particular group?</td>
<td>Targets - Neutral</td>
</tr>
<tr>
<td>7. Opposing viewpoints are acknowledged?</td>
<td>Opposing – Their Own</td>
</tr>
</tbody>
</table>

These are the criteria and questions for contrasting and comparing the two websites above. Each question should be answered with a paragraph. Each paragraph should have a heading. (6 pts. each)

1. What 2 topics and ideas are portrayed differently between the websites? Give specific examples from the website.
2. What topics and ideas are similarly portrayed by the two websites?
3. Using three of the attributes of Scientific Knowledge (e.g., tentative, empirically based, etc.) or of the Scientific Enterprise (e.g., honest, parsimonious, etc.) specifically explain how the attribute is integrated or exemplified with the content of the websites? Develop a paragraph for each attribute. (Give specific examples from the website.)

Criteria for report: (6 pts. each)

1. Explain how one of these websites might increase your students’ scientific literacy. State the literacy definition you are referencing. Develop a paragraph.
2. Explain how you as a science teacher would use the websites to develop your content knowledge. Develop a paragraph.
3. What are the crosscutting concepts in these websites? What are the state standards that apply to this topic? List the NGSS and SC state identification labels or numbers only.
Criteria for website evaluation:

Criteria scaling (1 pt.) and rationale (1 pt.) for all 7 questions.
CCSS.ELA-Literacy.L; CCSS.ELA-Literacy.SL; CCSS.ELA-Literacy.W

Contrasting and Comparing Websites: Written response to questions will be graded using the rubric below.

The paper you submit to the Instructor via email as an attachment, hard copy in class, or through OAKS and include the 13 scales and rationales for each website and the written paragraph contrasting and comparing the websites.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent (6 pts.)</th>
<th>Satisfactory (4 pts.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differences ISTE 1; ACEI 2c; AMLE 2; CCSS.ELA-Literacy.RL; CCSS.ELA-Literacy.RI</td>
<td>Differences between websites are discussed in depth with examples.</td>
<td>Differences between websites are not fully explained.</td>
</tr>
<tr>
<td>Similarities ISTE 1; ACEI 2c; CCSS.ELA-Literacy.RL; CCSS.ELA-Literacy.RI</td>
<td>Similarities between websites are discussed in depth with examples.</td>
<td>Similarities between websites are not fully explained.</td>
</tr>
<tr>
<td>Nature of Science NSTA 5b; ACEI 2c; CCSS.ELA-Literacy.SL</td>
<td>Nature of Science attributes are related to website criteria with thorough explanations and connections based upon the 7 attributes of the NOS.</td>
<td>Nature of Science attributes are discussed but not necessarily tied to website criteria.</td>
</tr>
</tbody>
</table>

Report Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent (6 pts.)</th>
<th>Satisfactory (4 pts.)</th>
<th>Unsatisfactory (2 pts.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific Literacy ISTE 3; NSTA 3a; AMLE 2; ACEI 2c; CCSS.ELA-Literacy.W</td>
<td>Explains how scientific concepts can be learned using this assignment and how this knowledge can be used for personal, communal, and cultural reasons. References definition of scientific literacy.</td>
<td>Explains how scientific concepts can be used for personal, communal, and cultural reasons.</td>
<td>Does not explain how scientific concepts can be used for personal, communal, and cultural reasons.</td>
</tr>
<tr>
<td>Teachers ISTE 2; NSTA 3b; AMLE 4</td>
<td>Explains how teachers could use the websites for activities, projects, and pedagogically. Focuses on how students can learn information and use website.</td>
<td>Explains how teachers could use the websites for activities, projects, and pedagogically. Little mention of a student focus.</td>
<td>Does not explain how teachers could use the websites for activities, projects, and pedagogically.</td>
</tr>
<tr>
<td>Unifying Concepts NSTA 1c; CCSS.ELA-Literacy.RI</td>
<td>Lists the unifying concepts of the website and how they are aligned with state or national standards.</td>
<td>Lists unifying concepts.</td>
<td>Lists only topics and concepts.</td>
</tr>
</tbody>
</table>
Assessment Portfolios in Science

Purpose: The purpose of this assignment is to introduce candidates to the world of assessment by evaluating and analyzing a cooperating teacher’s unit plan for assessment.

Objective: Candidates must ask for any and all assessment instruments from the teacher that he/she would use in a unit of science. This will be done in a group using GoogleDocs.

Procedure:
1. Ask cooperating teacher for any and all assessment instruments for a science unit for his/her grade level. If your cooperating teacher does not provide instruments, ask your methods instructor.
2. Assessment instruments can include any homework sheets/problems and directions, quizzes, tests, worksheets, assignments, projects, etc. In other words, you must collect anything that gives the teacher a point value that counts toward a grade for the student.
3. Compile chronologically all of the instruments into one folder and label each assessment.
4. For each individual problem or item, place the indicator number next to it. (e.g., 4-3.6)
5. Provide a Key or answer sheet for each assessment instrument and for each item. Make sure there is a point value associated with each question/item on each assessment instrument. If the teacher has not done this, then you need to develop the Key and provide a point value.
6. **Develop a table** that includes each assessment instrument, the points possible, percent for each instrument out of the total possible points, the type of assessment instrument, and the indicators evaluated in that assessment instrument. Follow the table exactly as outlined below.

Sample Table of Assessment

<table>
<thead>
<tr>
<th>Assessment Instrument</th>
<th>Points Possible</th>
<th>% of Total Points</th>
<th>Type of Assessment</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worksheet 5.4</td>
<td>20</td>
<td>13</td>
<td>Traditional worksheet</td>
<td>5-4.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5-4.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5-4.8</td>
</tr>
<tr>
<td>Lab – Chemical Reactions</td>
<td>25</td>
<td>17</td>
<td>Hands-on laboratory</td>
<td>5-4.6</td>
</tr>
<tr>
<td>Reaction Mechanism Project</td>
<td>65</td>
<td>50</td>
<td>Authentic</td>
<td>5-4.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5-4.7</td>
</tr>
</tbody>
</table>

7. **Develop another table** that includes the points possible and the indicators evaluated in that assessment instrument. Follow the table exactly as outlined below.

Sample Table of Indicators Assessed

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Points Possible</th>
<th>% of Total Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-4.5: Explain how the solute and the solvent in a solution determine the concentration.</td>
<td>38</td>
<td>30</td>
</tr>
<tr>
<td>5-4.6: Explain how temperature change, particle size, and stirring affect the rate of dissolving.</td>
<td>44</td>
<td>35</td>
</tr>
<tr>
<td>5-4.7: Illustrate the fact that when some substances are mixed together, they chemically combine to form a new substance that cannot easily be separated.</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>5-4.8: Explain how the mixing and dissolving of foreign substances is related to the pollution of the water, air, and soil.</td>
<td>30</td>
<td>24</td>
</tr>
</tbody>
</table>
Answer the following questions. Use the data in the tables to answer and support your answers:

a. Why do you think certain types of assessment instruments were used? Is there a pattern as to the type used and when they are used? What would you do differently?

b. How does the teacher or you compile a grade or evaluate the student for this unit based upon the assessment items? What would you do differently?

c. How are all of the indicators assessed? Are they of equal value? How do the assessment instruments cover or not adequately cover the content? Is this equal and fair?

d. What would you do differently to assess student understanding for this unit focusing specifically on these indicators? Be specific about your potential assessment types, the point values, and number of assessment instruments.

**Rubric for Assessment Portfolio in Science**

<table>
<thead>
<tr>
<th>Criterion</th>
<th>5 points</th>
<th>3 points</th>
<th>1 point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment Folder NSTA 3c; AMLE 4</td>
<td>Folder contains a minimum of 5 items arranged chronologically.</td>
<td>Folder contains less than 5 items and is not arranged chronologically.</td>
<td>Folder does not contain any appropriate assessment instruments.</td>
</tr>
<tr>
<td>Types of Assessments NSTA 3c; AMLE 4</td>
<td>The type of assessment for each instrument is labeled.</td>
<td>Some instruments are mislabeled.</td>
<td>All instruments are mislabeled.</td>
</tr>
<tr>
<td>Key and Point Values ACEI 2c</td>
<td>Each assessment item contains a Key with point values on each question or project.</td>
<td>Some assessment items contain a Key with point values on each question or project.</td>
<td>Few assessment items contain a Key with point values on each question or project.</td>
</tr>
<tr>
<td>Table of Assessment NSTA 3c; AMLE 4</td>
<td>The table provides each assessment instrument with the point values, percentage, and type of assessment.</td>
<td>The table provides each assessment instrument with the point values and percentage.</td>
<td>The table provides each assessment instrument with the point values.</td>
</tr>
<tr>
<td>Indicators NSTA 1c; AMLE 2</td>
<td>Indicators are aligned with the questions for all assessments.</td>
<td>Most of the questions on the assessments are aligned with the Indicators.</td>
<td>Few questions are aligned with Indicators.</td>
</tr>
<tr>
<td>Table of Indicator Alignment NSTA 1c; AMLE 2</td>
<td>Table provides a clear alignment of the standards and indicators that are assessed throughout the unit. An explanation evaluates the extent of indicator and content coverage.</td>
<td>Table provides a clear alignment of the standards and indicators that are assessed throughout the unit. An explanation discusses content coverage.</td>
<td>Table shows an alignment of the standards and indicators. No explanation is given.</td>
</tr>
<tr>
<td>Why NSTA 3c</td>
<td>Explanation is 1 paragraph and details a developmental reason for the type and sequence of instruments.</td>
<td>Explanation is 1 paragraph and details a practical reason for the type and sequence of instruments.</td>
<td>Explanation is 1 paragraph and mentions some reasons for the type.</td>
</tr>
<tr>
<td>Grade AMLE 2</td>
<td>An explanation is given as to how the grade for the student is compiled.</td>
<td>A nebulous reason for grade assignment is given.</td>
<td>No real reason is given.</td>
</tr>
</tbody>
</table>
Inquiry Lesson Plan
(In groups, pairs, or alone)

Objective: In this assignment you will develop a lesson plan for a science topic that follows the 5-E Learning Cycle approach that incorporates INQUIRY.

Directions:
- Select a science topic (performance-content standard) from the state standards
- Develop or modify an existing lesson plan for that science topic so that the format fits the 5-E Learning Cycle approach.
- The Lesson Plan should have the following components:
  1. Engage – This component is a hook, activity, demonstration, puzzle, comic, illustration, or other attention grabbing pedagogical tool to orient the students to the topic at hand. This should be student centered, extract students’ prior conceptions, and doesn’t give away too much content information.
  2. Explore – The engagement tool should naturally lead into an activity in which the students are participating in a hands-on activity. This activity should be student-centered and include a focus on the students’ cognitive level, the use of manipulatives, multiple levels of solving the problem, and inquiry pedagogy. The transition from the engagement item to the hands-on experience should be smooth and related conceptually. There should be a goal with multiple ways to solve a problem or get to the goal. A second aspect of inquiry can be the finding, collection, and analysis of data related to a question.
  3. Explain – There should be some pedagogical tool to help explain the content and or processes of the activity for the students. The content should be conveyed to the students in some fashion.
  4. Elaborate – The content should be related to practical applications in the everyday lives of the students. Good examples could comment on the nature of science, personal and social perspectives, and/or technology.
  5. Evaluation – The assessment device should evaluate the learned knowledge and experiences of the students.

Additional Components:
These are additional items that will need to go into your lesson plan either before or after the 5-E procedure and explanation.
- State Content Standards
- Materials
- Safety (if applicable)
- Handouts for the students
- Any assessment items with an answer key
- Goal or product for the students to complete and turn in.
Inquiry LP Rubric

Assessment: the following rubric will be used to assess the quality of your lesson plan. It is worth 50 pts. (1 point for your name).

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Standards</th>
<th>7 Excellent</th>
<th>6 Target</th>
<th>5 Acceptable</th>
<th>3 Needs Improvement</th>
<th>1 Unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engage: Attention Directing Tool</td>
<td>ETC 2.III, ACEI 2.2c, AMLE 2</td>
<td>Engagement reflects how science can be related to the needs of students, the local community, and society at large. Students are motivated. Students’ prior knowledge and misconceptions are obtained.</td>
<td>Engagement connects to some aspect to students’ lives. Students’ prior knowledge and misconceptions are obtained.</td>
<td>Activity introduces students to the concept and relates broadly to their lives. The engagement is mostly teacher centered.</td>
<td>Activity barely relates to the lives of the students and is completely teacher centered.</td>
<td>Activity does not relate to the students’ lives and is teacher centered.</td>
</tr>
<tr>
<td>Explore: Transition</td>
<td>ETC 2.III, ACEI 2c; AMLE 2</td>
<td>The transition smoothly uses instructional ideas that center on students’ prior understanding and connects to the new process.</td>
<td>The transition prepares students for the activity by using engaging instructional ideas.</td>
<td>The transition is teacher directed and connects the engagement ideas with the next activity.</td>
<td>The transition is choppy and not focused on the student.</td>
<td>The transition is not apparent.</td>
</tr>
<tr>
<td>Explore: Problem solving</td>
<td>ETC 2.II, ACEI 2c</td>
<td>The instructional strategies are based upon effective teaching strategies, such as activating prior knowledge and encouraging exploration. Problem solving should start with a student idea.</td>
<td>Problem solving is determined by the student. Some connection to prior knowledge is activated.</td>
<td>Problem solving is agreed upon by teacher and student. Some connection to prior knowledge.</td>
<td>Problem solving is determined by the teacher. No connection to prior knowledge.</td>
<td>There is no apparent problem to solve and teacher must make up something.</td>
</tr>
<tr>
<td>Explore: Use of inquiry principles</td>
<td>ETC 2.III, ACEI 2c, AMLE 4</td>
<td>The process is student centered and created. A final product is achievable. Lesson acts upon the prior knowledge of students. There is not preset direction for problem solving.</td>
<td>The process is student centered, but teacher helps create process. The teacher helps guide student to achieve final product through problem solving algorithms.</td>
<td>The process is co-created by teacher and student. Instruction allows student some flexibility in the problem solving process.</td>
<td>The process is teacher determined. Student must follow a certain process to achieve end product.</td>
<td>The process is teacher directed. Students follow a traditional type activity.</td>
</tr>
<tr>
<td>Explain: Content</td>
<td>ETC 2.II, ACEI 2c, AMLE 2, ISTE 1</td>
<td>The content is based upon the students’ experiences in the activity, relates to their processes, is collected and discussed individually and in groups, and integrates literacy and technology skills. The content conveys understanding of concepts in one of the four science areas.</td>
<td>The content is based upon general experiences and processes. The content is discussed individually and as a group. Literacy and technology skills are used. The content conveys understanding of concepts in one of the four science areas.</td>
<td>The content is conveyed to the students. The teacher summarizes the processes. Some literacy and technology skills are reviewed. Science concepts are conveyed.</td>
<td>The content and processes conveyed are teacher centered. All skills learned are summarized and determined by the teacher in a whole class setting.</td>
<td>The content is given to the students and may not apply to the activity at hand.</td>
</tr>
<tr>
<td>Elaborate: Application</td>
<td>ETC 2.II, ACEI 2c, AMLE 2</td>
<td>The discussion and application of content applies to other fields of science, the local environment, and students’ lives. It is student centered. Relevant and multiple examples are elicited.</td>
<td>The discussion and application of content applies to science and students’ lives. It is student centered. Relevant and multiple examples are provided.</td>
<td>The discussion and application of content using examples is teacher generated and relates to the lives of students.</td>
<td>The discussion and application of content is teacher generated.</td>
<td>There is no discussion and application of content.</td>
</tr>
<tr>
<td>Evaluation: Assessment device</td>
<td>ETC2.VI, ACEI 2c, AMLE 4</td>
<td>The type of assessment given highlights the students’ prior knowledge, misconceptions, and processes from the activity. The type of assessment is developmentally appropriate, and related to students’ learning experiences and subject matter.</td>
<td>The type of assessment given reflects students’ prior understandings of content and processes. The assessment is developmentally appropriate and related to the subject matter.</td>
<td>The type of assessment given reflects students’ prior understandings of content and processes. The assessment is related to the subject matter.</td>
<td>The type of assessment given tests content knowledge and processes.</td>
<td>The assessment is a standard test with little connection to the students’ experiences in the activities.</td>
</tr>
</tbody>
</table>
Online Science Content Assessment and Work
(50 pts.)

**Purpose:** The purpose of this assignment is to get candidates to explore the resources and professional development opportunities online in the NSTA Learning Center.

**Expectations:** What is in the NSTA Learning Center? What are the expectations?

- Candidates should take the pre-test as soon as possible on one of the content areas provided. If student scores above 50%, then he/she should look or find another science content area. **This must be done during the first three weeks of class.**
- Candidates should search and study the content in the Learning Center for that particular topic. You should collect more than 250 points for the resources you find and use.
- The NSTA Learning Center has podcasts, book chapters, journal articles, science objects, SciPacks, SciGuides, Symposia, and Web Seminars that can be used to learn more content.
- Students submit a 2-page document that includes the following:
  - NSTA Learning Center items used (reference list),
  - 1-paragraph reflection about the online learning process to acquire science content,
  - 1-paragraph reflection on the professional impact for content and pedagogy, and
  - The pre- and post-test scores.

### Grading Rubric

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent (10 pts.)</th>
<th>Good (9 pts.)</th>
<th>Marginal (7 pts.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content Test Scores</td>
<td>Science content scores improved more than 70%.</td>
<td>Science content scores improved by 40%.</td>
<td>Science content scores did not improve much.</td>
</tr>
<tr>
<td>NSTA Learning Center Items</td>
<td>Candidate used more than 7 different Learning Center items.</td>
<td>Candidate used between 3-7 different Learning Center items.</td>
<td>Candidate used less than 4 different Learning Center items.</td>
</tr>
<tr>
<td>References</td>
<td>References are complete with title, align with date used, and match content.</td>
<td>References are complete with title and match content.</td>
<td>References are incomplete and do not match content.</td>
</tr>
<tr>
<td>Reflection: Process</td>
<td>Reflection is detailed and insightful about how the process of online learning of science content was completed. <em>Specific examples are used to support assertions.</em></td>
<td>Reflection discusses how the process of online learning of science content was completed.</td>
<td>Reflection is generic in nature and does not focus on online learning of science content.</td>
</tr>
<tr>
<td>Reflection: Professionally</td>
<td>Reflection is detailed and insightful about how the online learning would impact teaching of content and pedagogy. <em>Specific examples are used to support assertions.</em></td>
<td>Reflection discusses how the online learning would impact the teaching of content and pedagogy.</td>
<td>Reflection is generic in nature and does not focus on how online learning impacts teaching.</td>
</tr>
</tbody>
</table>
Science Notebooks
(50 pts.)

Purpose: The purpose of this assignment and activity is to have candidates model what they can do in their own classroom focused on science content learning and development over time. Candidates will have to keep a science notebook throughout the semester, and record and document aspects of the course and their work in the course.

The Science Notebook should be a marble composition notebook or individual sheets of paper in a 3-ring binder. The marble composition book is the best and preferred method for this assignment. Any loose sheets of paper collected in class or out of class can be pasted or taped into the notebook.

Expectations: What is to be included in the notebook? What are the expectations?

- Class note taking should be completed on the right hand side of the notebook for each class meeting.
- Class reflections of 1 paragraph in length should be added after each week starting with week 2 (6 total). Reflections should focus on the content and pedagogical processes learned. Are they good, bad, would you use them, how and what did you learn? (8/26, 9/9, 9/23, 10/14, 10/28, 11/18)
- Each reflection should be a different page and referenced in the Table of Contents.
- Any papers passed out in class should be attached, glue or tape, to the left side of the notebook.
- PowerPoints should not be copied into the notebook. Additional notes learned from the PPTs. can be added to the notebook.
- The first two pages should be left blank so a Table of Contents can be developed.
- The format of the notebook should be sequential based upon date.
- In-class activities should be written in the notebook. Data collection and organization and literacy items should be placed in the notebook.
- At the end of each class session, the notes you take should include; activity name, science content learned, pedagogical approach used, and the purpose of the session.

Reflection Starters. The following is a list of questions that you can answer that will help you with your reflections. Make assertions or conclusions and then support them with data, evidence, or logic.

- What did you learn in terms of content this week?
- What pedagogical skills did you learn?
- How might you use these skills when you teach?
- How were math and literacy, writing, reading, and Common Core ELA standards integrated?

Science Notebooks will be due Friday, October 31 or after class on the 28th, and include content from the October 28th class.
# Rubric for Science Notebook

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent (10 pts.)</th>
<th>Good (9 pts.)</th>
<th>Needs some work (6 pts.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format</td>
<td>The notebook has a chronological Table of Contents and content that include: page numbers, class notes, PPT notes, written content from classroom activities, reflections, and homework assignments should be in chronological order and match the TOC.</td>
<td>The notebook has most of the items in chronological order.</td>
<td>The notebook is lacking most of the required items in chronological order.</td>
</tr>
<tr>
<td>Content</td>
<td>Each class session contains: activity name, the purpose, content learned, and pedagogical approach used.</td>
<td>Most class sessions contains all of the items.</td>
<td>Some of the class sessions contain some of the items.</td>
</tr>
<tr>
<td>Reflections</td>
<td>Notebook should have 6 reflective essays on work done during those weeks’ classes. Essays are longer than 1-paragraph in length and respond to the analysis of how literacy, math, and science are integrated. Content should also focus on the application of learned content to specific teaching pedagogies. Assertions are made and supported with data.</td>
<td>Notebook has 3-5 reflective essays on work done during those weeks’ classes. Essays are 1-paragraph in length and respond to the integration of literacy, math, and science. Content focuses on the application of learned content to teaching. Assertions are made and supported with data.</td>
<td>Notebook has 1-3 reflective essays on work done during those weeks’ classes. Essays are 1-paragraph in length and are generic in nature.</td>
</tr>
<tr>
<td>In-Class Activities</td>
<td>All data collected and organized are recorded. Written reflections about data and conclusions made are insightful and tie together content and pedagogy.</td>
<td>All data collected and organized are recorded. Written reflections about data and conclusions made.</td>
<td>Not all of the activities are recorded in notebook.</td>
</tr>
<tr>
<td>Readings</td>
<td>Readings from outside sources are integrated into the class sessions and activities through written examples. The reflection and description of the class session contains information related to readings.</td>
<td>Readings from outside sources are outlined in the notebook. These are found as independent notes.</td>
<td>Readings from outside sources are sometimes outlined in the notebook.</td>
</tr>
</tbody>
</table>