GEORGE MASON UNIVERSITY
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT
Secondary and Elementary Education Program
(SEED)

SEED 573-001: Teaching Science in the Secondary School
3 credits, Fall 2020
Online synchronous class - Mondays, 4:30 – 7:10 pm

Instructor: Erin Peters-Burton, PhD
Email: epeters1@gmu.edu
Office Hours: Online by appointment
Phone: 703-993-9695

Prerequisites/Corequisites
Students must also complete 15 hours of field experience. It is recommended that students take Methods I in the same semester as they enroll in EDUC 672, Human Development.

University Catalog Course Description
Provides study of methods, materials, content, and organization of science programs. Emphasizes curriculum planning, current methodologies, safety, and trends in secondary schools.

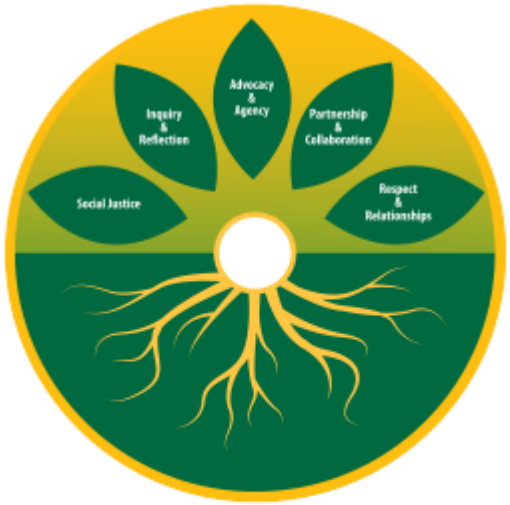
Course Overview
EDCI 573 is the first course in a two-part sequence of science methods courses for pre-service and provisionally licensed science teachers seeking a secondary school teaching license in earth science, biology, chemistry, or physics. The course builds upon students' knowledge of their subject matter and previous education coursework to construct fundamental knowledge of science teaching and learning including standards-based curriculum design and research-based teaching strategies. The course focuses on developing inquiry-based lessons for students to investigate science and assessing student understanding of science and the nature of science. The teachers will plan lessons for students to learn science, implement lessons in a high school classroom, observe students learning, and evaluate their teaching and student outcomes.

Per state guidelines, you are required to complete 15 hours of fieldwork during this class. Please answer the survey set by Dr. Zenkov. If you have missed this survey, go to http://cehd.gmu.edu/endorse/ferf to sign up for your placement.

Course Delivery Method
EDCI 573 is designated as a lecture course; however, students are expected to come to class prepared and actively participate in discussions and other hands-on learning experiences.

Learner Outcomes/Objectives

Below is a list of the major course goals along with their corresponding objectives and assessments.



Goal 1: Build a learning theory and see the value in using it for developing and implementing lessons.

Objective	Assignment
Students will be able to explain why a student-centered approach to learning is effective	Research review
Students will be able to design lessons that clearly reflect their learning theory	Lesson plans

Goal 2: Do science to understand how science is done.

Objective	Assignment
Students will be able to design lessons in which students are actively engaged in hands-on science activities	Lesson plans
Students will be able to explain the epistemic features and unique characteristics of science (NOS)	Nature of science assignment

Goal 3: Recognize that inquiry learning using scientific practices has inherent risks that should be identified and addressed such that students learn to do science in an ethical and safe manner.

Objective	Assignment
Students will be able to describe the major safety and ethical concerns associated with conducting science in the classroom	Safety assignment
Students will be able to describe means to reduce the potential safety risks involved in conducting scientific investigations in the classroom while not compromising the benefit to students of conducting inquires	Safety assignment

Students will be able to design lessons that clearly indicate safety concerns, ways to reduce them, and what to do when accidents happen	Lesson plans

Goal 4: Develop an understanding of how inquiry can develop both scientific thinking and content knowledge.

Objective	Assignment
Students will be able to develop inquiry-based lessons that incorporate scientific practices and advance students' content knowledge	Lesson plans

Goal 5: Understand how to develop effective lessons and units with backwards design.

Objective	Assignment
Students will be able to use the basic organization of backwards design to develop a lesson plan	Lesson plans
Students will be able to write measureable objectives	Lesson plans
Students will be able to design teaching activities that support student achievement of measureable objectives	Lesson plans, microteaching
Students will be able to design assessments that evaluate student achievement of measureable objectives	Lesson plans, microteaching

Goal 6: Develop skills as reflective practitioners.

Objective	Assignment
Students will be able to effectively examine classrooms using their learning theory as a lens and student behavior, engagement, and learning (when possible) as evidence	Field experience paper
Students will be able to examine and use assessment data to reflect upon and improve their lessons	Microteaching

Professional Standards

The course focuses on the teaching of science as called for by the state and national science standards and as outlined by the National Council for Accreditation of Teacher Education (NCATE), the National Science Teachers Association (NSTA), and the Interstate New Teacher Assessment and Support Consortium (INTASC). EDCI 573 builds a repertoire of science teaching and assessment strategies to facilitate student learning.

The pre-service and provisionally licensed teacher will:

- Build a repertoire of science teaching and assessment strategies by reading, writing, observing, participating in, and reflecting on the teaching and learning of science; RESEARCH-BASED PRACTICE; SPA STANDARDS 1, 3, 5, 6, 8, 10
- Develop strategies to help students become scientifically literate, think critically and creatively, understand the nature of science, and see the importance of science as a way of knowing; ETHICAL LEADERSHIP; INNOVATION; SPA STANDARDS 2, 3, 4
- Plan standards-based (local, state, and national) units of science study including daily lesson plans for students that reflect research in effective science teaching and learning;

RESEARCH-BASED PRACTICE; SPA STANDARD 5, 6, 8, 10

- Construct science lessons that include alignment of objectives, activities, and assessments that address the needs of a variety of student populations including English language learner, special needs students, and gifted and talented students; ETHICAL LEADERSHIP; SPA STANDARDS 8, 10
- Learn about science laboratory safety and plan teaching activities that highlight safety; ETHICAL LEADERSHIP; SPA STANDARD 9
- Work collaboratively with peers to teach and discuss science and science teaching. COLLABORATION; SPA STANDARD 10
- Incorporate environmental sustainability into teaching paradigms and into daily life. SOCIAL JUSTICE; SPA STANDARD 4

Required Electronic Texts

We will have required readings from an **NSTA class bundle**, consisting of various books and journals (and sometimes webinars) from the National Science Teacher Association (NSTA) – our national organizing body. The purchase of these electronic materials also gives you a membership to NSTA, which opens up a great deal of resources to you. We are doing this instead of having one book for two reasons:

1. NSTA is an important organization to know over the course of your career as a science teacher – they are a premiere organization in professional development- and you should get to know them and get involved as soon as possible
2. NSTA peer-reviews all of their work, so their professional development materials are the best available – and the biggest body of materials as well

We suggest you purchase the year-long course pack ($99) if you plan to take Methods 2 next semester, as that course also uses the course pack. If you want to purchase the course pack for just this semester it is ($79).

Below are instructions for your students to follow in purchasing the NSTA Learning Center (NSTA LC) subscription **AND** NSTA student membership class bundle.

IMPORTANT NOTE for STUDENTS:
Do not purchase Individual or Institutional NSTA Membership. These memberships are sold online for $39, $79, or $99 and do not include the NSTA Learning Center subscription.

*You must purchase the **class bundle*** which *includes the NSTA Learning Center subscription **AND** NSTA student membership available **ONLY** at the web address provided below.*

Students: Follow the steps below in order:
Step 1: Create your NSTA LC account
Step 2: Purchase the NSTA LC subscription/NSTA student membership class bundle

(1) Create your NSTA LC account:
*Go to the Learning Center to create a free account:
http://learningcenter.nsta.org/my_learning_center/register.aspx

*If you already have a Learning Center account you do not need to create a second account for your class.

Use your NSTA LC e-mail address and password to login to the portal.

(2) Purchase the NSTA LC subscription/NSTA student membership class bundle:
After logging-in, you need to purchase the NSTA LC subscription/NSTA student membership class bundle.

To purchase the class bundle for $99 using a credit card, go to the following web address:
http://learningcenter.nsta.org/preservice

Next steps?
Become familiar with the NSTA LC. Below is a list of things to try:
1. Visit your class landing page by clicking the "Class Hub" navigational button *(you will see the Class Hub navigational button after purchasing the class bundle)*.
2. Edit your profile – introduce yourself to the community; tell others about you.
3. Search for resources and add them to your library by clicking the "Explore All Resources" button.
4. Explore the "Forums & User Community." Join the conversation and make a post.
5. Watch the "How to Videos" and create a collection of resources to share with classmates.
6. Check the "Community Update" for latest news and resources in the Learning Center.

Note: *A limit for the number of fee-based e-book chapters that each student may add to their library for free has been set at 15.*

To get the readings for the class, search for the COLLECTION - GMU EDCI 473/573 Readings. I have set it as public, so you should all be able to have access to add this in one click. You may also find and save other items to your learning center account – most of the materials are free – including science objects and webinars.

Send your questions to: **learningcenterhelp@nsta.org**

This NSTA class bundle is separate from your Blackboard site, which is all of the assignments and other readings for the course.

Blackboard information

The online site for this course can be found at http://mymasonportal.gmu.edu. Students are expected to routinely check the online course portal for supplemental information, readings, and assignments.

Recommended Online Readings

- Achieve, (2013). Next Generation Science Standards (2013). Achieve, Inc. http://www.nextgenscience.org/next-generation-science-standards
- Commonwealth of Virginia (2010). *Standards of Learning for Virginia Public Schools.* Richmond, Virginia. http://www.doe.virginia.gov/testing/index.shtml
- Commonwealth of Virginia (2003). *Science Standards of Curriculum Framework Guides.* http://www.pen.k12.va.us/VDOE/Instruction/sol.html#science
- National Research Council (1996). *National science education standards*. Washington, DC: National Academy Press. http://www.nap.edu/openbook.php?record_id=4962
- American Association for the Advancement of Science (1993). *Benchmarks for Science Literacy.* http://www.project2061.org/publications/bsl/online/index.php

- McComas, W. F. (1998). *The principle elements of the nature of science: Dispelling the myths.* http://www.pestl.org/images/The_Myths_of_Science_Artide_by_McComas.pdf
- Peters, E. E. (2006). *Why is teaching the nature of science so important?* http://www.auburn.edu/~cgs0013/Schnittka_timeline.pdf
- Dagher, Z. R. & Erduran, S. (2017). Abandoning patchwork approaches to nature of science in science education. Canadian Journal of Science, Mathematics, and Technology Education, 17(1), 46-52. http://dx.doi.org/10.1080/14926156.2016.1271923
- American Chemical Society (2007). *Educators & Students page.* http://www.chemistry.org/portal/a/c/s/1/educatorsandstudents.html
- American Chemical Society (2003). *Safety in Academic Chemistry Laboratories Accident Prevention for Faculty and Administrators*. (800 227-5558) Free single copies or online: https://www.acs.org/content/dam/acsorg/about/governance/committees/chemicalsafety/publications/safety-in-academic-chemistry-laboratories-students.pdf
- U.S. Government Printing Office (2007). *Code of Federal Regulations.* https://www.govinfo.gov/content/pkg/CFR-2007-title45-vol1/pdf/CFR-2007-title45-vol1.pdf
- U.S. Department of Labor (2007). *Occupational Health and Safety Administration.* https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=news_releases&p_id=14123
- American National Standards Institute (2007). *American National Standards Institute Homepage.* http://www.ansi.org/
- Maryland Public Schools (2007). *Legal Aspects of Laboratory Safety.* http://mdk12.org/instruction/curriculum/science/safety/legal.html

Other Recommended Readings

- Barnekow, D. J. (1998). *Graphic organizers for science.* Portland, ME: J. Weston Walsh.
- Bybee, R. W., Powell, J. C., & Trowbridge, L. W. (2008). *Teaching secondary school science: Strategies for developing scientific literacy.* Upper Saddle River, NJ: Pearson.
- Cothron, J. H., Giese, R. N., Rezba, R. J. (2005). *Students and research*. Dubuque, Iowa: Kendall/Hunt.
- Froschauer, L., & Bigelow, M. L. (2012). *Rise and shine: A practical guide for the beginning science teacher*. Arlington, VA: NSTA Press.
- Hassard, J. (2005). *The art of teaching science: Inquiry and innovation in middle school and high school.* New York: Oxford University Press.
- Haysom, J., & Bowen, M. (2010). *Predict, observe, explain: Activities enhancing scientific understanding*. Arlington, VA: NSTA Press.
- Johnson, D. W. & Johnson R. T. (1999). *Learning together and alone: Cooperative, competitive, and individualistic learning.* Boston: Allyn and Bacon.
- Kagan, S. (1994). *Cooperative learning.* San Clemente, CA: Resources for Teachers, Inc.
- Keely, P. (2008). *Science formative assessment: 75 practical strategies for linking assessment, instruction, and learning.* Arlington, VA: National Science Teacher Association Press.
- National Research Council. (2005). *How students learn: Science in the classroom.* Washington, DC: The National Academies Press.
- O'Brien, T. (2010). *Brain-powered science: Teaching and learning with discrepant events*.

Arlington, VA: NSTA Press.
- Pinto, L. E. (2013). *From discipline to culturally responsive engagement: 45 classroom management strategies*. Thousand Oaks, CA: Corwin Press.
- Ritchhart, R., Church, M. & Morrison, K. (2011). *Making thinking visible: How to promote engagement, understanding, and independence for all learners*. San Francisco: Jossey-Bass.
- Slavin, R. E. (1995). *Cooperative learning.* Boston: Allyn and Bacon.
- Wiggins, G. & McTighe, J. (1998). *Understanding by design.* Alexandria, VA: Association for Supervision and Curriculum Development.
- Wong, H. K., & Wong. R. T. (2009). *The first days of school: How to be an effective teacher (4th ed.)*. Mountain View, CA: Wong Publications.

Course Performance Evaluation

Students are expected to submit all assignments on time in the manner outlined by the instructor (e.g., Blackboard, Tk20, hard copy).

Assignments

Findings from science education research shows that frequent assessment of small amounts of material is most effective for learning science. Therefore, in this class formal and informal assessment will be continuously provided on assignments and class activities. Assessment is a two-way communication loop that informs both learning and teaching. All written assignments must be submitted through Blackboard or Tk20 as indicated. General formatting includes 1" margins, double-spacing, and Times New Roman (or equivalent) font.

Assignment	Points	Due Date
Research Review	10	September 14
Nature of Science Assignment (PBA)	10	September 28
Lesson Critique and Revision	20	October 19
Safety Assignment (PBA)	10	November 16
Original Lesson (Draft Due November 9)	20	December 7
Microteaching and Reflection	20	December 7
Field Experience Paper	10	December 7
Professionalism	10	All Classes
TOTAL	110	

PLEASE USE THE ASSIGNMENT INSTRUCTIONS THAT ARE POSTED ON BLACKBOARD – THE INSTRUCTIONS GIVEN ON THE SYLLABUS ARE FOR DESCRIPTIVE PURPOSES ONLY

Nature of Science Assignment (PBA):

During the early part of the semester, you will be involved in doing scientific investigations. For this assignment, you will provide a 1 to 2 page written reflection highlighting how your experiences have assisted you in addressing the following:

- Understand research and can successfully design, conduct, report, and evaluate investigations in science
- Understand and can successfully use mathematics to process and report data and solve

problems in their field(s) of licensure
- Understand the philosophical tenets, assumptions, goals, and values that distinguish science from technology and from other ways of knowing the world
- Understand the processes, tenets, and assumptions of multiple methods of inquiry

Nature of Science Ideas

1. Science cannot answer all questions.
2. Science employs multiple methods and types of reasoning that share many common factors, habits of mind, and norms.
3. Science produces, demands, and relies on empirical evidence.
4. Scientific knowledge is tentative, durable, and self-correcting.
5. Laws and theories are related but distinct kinds of scientific knowledge and play central roles.
6. Science is a creative endeavor.
7. Social, historical, and cultural factors play a role in the construction of scientific knowledge.
8. Science and technology are not the same but impact one another.
9. Science has a subjective element.

Science and Engineering Practices

1. Asking questions/defining problems
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations/designing solutions
7. Engaging in argument from evidence
8. Obtaining, evaluating, & communicating information

Research Review:

For this assignment, identify three peer-reviewed research articles related to student-centered and inquiry-based science teaching. Relevant articles can be found via Google Scholar (http://scholar.google.com) and/or the Mason library search engine (http://library.gmu.edu). You will then write a review of the articles, including (1) a description of the research questions, participants, methodology, and measures, (2) a synopsis of the findings, and (3) a discussion of how the findings can/should influence your classroom practice. Be sure to provide APA citations for each article. Submit the assignment via Blackboard.

Lesson Critique and Revision:

Many of your best lessons will come from colleagues, websites, or other resources. However, it is critical that you customize these activities to your own style, purpose, students, and – most importantly – teaching philosophy. For this assignment, you will find a lesson plan from your licensure area, critique it with the provided form, and then improve it to more closely align with best practices. Submit the original and revised lessons as well as the critique form via

Blackboard.

Safety Assignment (PBA):
A safety plan is necessary for the health and safety of your students and yourself, as well as for legal reasons. For this assignment, you will design a science safety plan, which will include (1) a list of safety rules/procedures relevant to your subject area, (2) a one-page (front and back, if necessary) safety contract that must be signed and dated by parents and students, (3) an evaluation of a science lesson for safety issues, (4) an engaging, safety-related assignment that teaches students the importance of safety, and (5) active maintenance of safety equipment in the classroom. The rubric can be found at the end of the syllabus.

Lesson Plan:
It is important that teacher candidates demonstrate their ability to design an effective lesson plan with specific, performance-based learning objectives that meet the learning needs of their students. Lesson planning can be guided by four basic questions: (adapted from Spencer, 2003, p. 251).

1. Who am I teaching? The number of learners, their academic level and prior knowledge.
2. What am I teaching? The content or subject, the type of learning (knowledge, skills, behaviors).
3. How will I teach it? Teaching models, learning strategies, length of time available, materials, technology resources, differentiation/modifications, etc.
4. How will I know if the students understand? Informal and formal assessments, formative and summative, higher order questioning techniques, feedback from learners, etc.

You might also want to ask:

- What do students know already?
- Where have students come from and what are they going on to next?
- How can I build in sufficient flexibility cope with emergent needs?

A lesson plan must be developed for each teaching session. During the internship and when teaching new content or grade levels, your lesson plans will be detailed. As you gain pedagogical content knowledge and are proficient, your lesson planning becomes less detailed. Part of the planning process includes considering the following tasks:

- list content and key concepts, (research more if needed)
- define your aims and identify specific learning outcomes or objectives
- create assessments that are aligned to your specific objectives
- think about the structure of the lesson, pacing, and transitions
- identify adaptations/modifications/extensions needed to meet student needs
- determine “best practice” and learning strategies aligned to the learning outcomes
- identify learning resources and support materials

For this assignment, you will write an original lesson that aligns with best practices. The lesson should be designed for 90 minutes of instruction and use the provided lesson plan template. Submit all files via Tk20. The detailed instructions and rubric can be found at the end of the syllabus.

Microteaching and Reflection:
Research shows that the most effective teachers inform their practice by analyzing and reflecting on their teaching. Toward the end of the semester, you will teach a 30-minute lesson that you have designed with your partner(s). After teaching, you will submit a reflection about the experience via Blackboard.

Prior to the day of the lesson:
1. Identify any resources you need to teach your lesson and put in a request for what you cannot obtain to determine if it is available. Please do this at least two (2) weeks prior to the day you teach to ensure materials will be available.

Day of the lesson:
2. Give a one-minute overview in which you will describe to the class the setting of this lesson (subject, grade level, standards, and objectives).
3. For the remainder of the time, you will engage your classmates in an **inquiry lesson** that teaches both specific science concepts and nature of science ideas.
4. Be sure to conduct a **formative assessment** so you have data to determine whether or not students achieve the objectives.

After the lesson:
5. Examine the formative assessments, summarizing the results and determining from this data whether the objectives were achieved.
6. Write a 5-page paper that examines what happened during your lesson, focusing on how the activities might have influenced student learning (positively and negatively). The paper should be organized as follows:
    a. Identify the assessments used during lesson to evaluate the lesson objectives. Describe the results of the assessments of these objectives (e.g., percentage of the students achieved each objective).
    b. Examine the lesson in detail to determine what happened in the classroom that might have influenced the results of the assessments and what could be done to improve student achievement. Where/how could students think more deeply about the objective? Where/how could they be more explicit (either as a class or individually) about what they had learned before the assessment? Further, you should conduct a critical review of the assessment as to whether it is a valid measure of the lesson objectives. Use evidence from assessments to draw your conclusions about your lesson.
    c. Examine the specific actions you undertook as a teacher (mannerisms, answering questions, etc.) and categorize these into those actions that might help with student learning and those that might hinder student learning. In each category, explain how it might influence student learning.

Field Experience Project:
The purpose of the field experience is to provide you with the opportunity to (1) connect the goals of the course, science education theories, and research findings to classroom/school practice, (2) be exposed to a variety of classroom/school communities, and (3) promote critical,

self-reflection about your future teaching practice.

In this course you will spend 15 hours in area classroom(s) with teachers instructing subject(s) and grade level(s) for which you are being licensed. Many of these hours will be spent observing these teachers' instruction, but you will also be expected to engage with students individually, in small groups, and in whole groups, as your mentor teacher determines. As part of this experience, you will be reflecting on how teachers design instruction to meet the needs of students and you will consider suggestions as to how you might do things similarly and/or differently.

You should spend a *minimum* of 5 days observing teachers, with each day being a *maximum* of 3 hours. The purpose of the field experience is to provide you with the opportunity to (1) connect the goals of your methods I class, education theories relevant to your subject matter, and concepts and research findings related to classroom/school practice, (2) study and begin to develop your pedagogical practices in a variety of classroom/school communities, and (3) promote critical, self-reflection about your current and future teaching practices.

Your **Clinical Experience Summary Project** should address all of the elements described on the **Clinical Experience Observation Protocol and Critical Incidents Reflection** Form:

1. your class's demographics
2. your classroom's layout and the teacher and student movements and interactions it enables or inhibits
3. your observations regarding your mentor teacher's and classroom's:
    a. teaching processes and practices
    b. student-teacher interactions
    c. student-student interactions
    d. teaching and learning with technology
    e. interactions with students with special needs
    f. interactions with diverse populations (e.g., ELLs or underrepresented racial/ethnic minority students)
4. critical teaching/learning incidents
5. burning issues/questions
6. "best practice" teaching tips

Consider your Protocol and Reflection Forms as well as any other relevant data you collected and prepare your Clinical Experience Summary and Analysis Project. This report will be submitted through Blackboard and consists of 4-5 page description and analysis of what you have learned. Be sure to reflect on the intersections and tensions between what you have encountered in our Methods I class, our course readings and activities, your own school experiences in similar classes, and your clinical experience observations. Finally, detail implications of this clinical experience, what you observed, and your analyses for your future teaching practices.

Note: Be sure to provide the Methods I Clinical Experience Introductory Letter to your mentor teacher, and discuss expectation for hours, Observation Protocol elements, Reflection Form content, and this Summary and Analysis Project with your mentor teacher early in your clinical experience.

Professionalism:
Learning depends on the active engagement of the participant and frequent checking by the instructor as to the progress of the learner. Your classmates depend on your comments to extend their learning. Preparation, attendance, and participation are necessary for each class.

Other Requirements

Every student registered for any Secondary Education course with a required TK20 performance-based assessment (designated as such in the syllabus) must submit this/these assessment(s) (**Original Lesson Plan** assignments) to TK20 through ***'Assessments'*** in Blackboard (regardless of whether a course is an elective, a one-time course or part of an undergraduate minor). 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.

Grading

High quality work and participation is expected on all assignments and in class. Attendance at all classes for the entire class is a course expectation. For each unexcused absence, the course grade will be reduced by 5% points. All assignments are graded and are due at the beginning of class on the day they are due. Late assignments will automatically receive a ten percent grade reduction (one full letter grade lower).

A = 95-100%;
A- = 90-94%;
B+ = 87-89%;
B = 83-86%;
B- = 80-82%;
C = 70-79%;
F = Below 70%

If circumstances warrant, a written contract (there is a form that CEHD provides) for an incomplete must be provided to the instructor for approval prior to the course final examination date. Requests are accepted at the instructor's discretion, provided your reasons are justified and that 80% of your work has already been completed. Your written request should be regarded as a contract between you and the instructor and must specify the date for completion of work. This date must be at least two weeks prior to the university deadline for changing incompletes to letter grades.

Professional Dispositions

Students are expected to exhibit professional behaviors and dispositions at all times.
See https://cehd.gmu.edu/students/polices-procedures/

Class Schedule

Faculty reserves the right to alter the schedule, as necessary, with notification to students.

Date	Topic(s)	Recommended Reading Due	Assignment Due
Aug 24 ONLINE	Intro to Course Why teach science? Social Justice	Look over the Blackboard Website	
Aug 31 ONLINE	Nature of science	*NSTA class bundle* – ▪ Teaching and Assessing the Nature of Science (Clough) Using Metacognition to Develop Understanding of the Role of Evidence in Science (Peters-Burton)	
Sept 7 – No Class – Labor Day Holiday			
Sept 14 ONLINE	Conceptual Modeling	*NSTA class bundle* – ▪ Conceptualizing Moon Phases (Wilcox & Kruse) ES ▪ Models that Matter (Hitt & Townsend) CHEM ▪ Modeling Natural Selection (Bogiages & Lotter) BIO ▪ Reasoning from Models (Demir, Wade-Jaimes & Qureshi) PHY ▪	Research Review
Sept 21 ONLINE	Conceptual Modeling and Argumentation in Science	*NSTA class bundle* – ▪ A Scaffolding Suite to Support Evidence-Based Modeling and Argumentation (Reinhart, Duncan, & Chinn) ▪ Promoting and supporting scientific argumentation in the classroom—The evaluate-alternatives instructional model (Sampson & Grooms) ▪ Inquiry, Argumentation, and the Phases of the Moon (Hall & Sampson)	
Sept 28 ONLINE	Lesson Plans, Lesson Objectives and Backwards Design	*NSTA class bundle* – ▪ A Backward Approach to Inquiry (Hendrickson) ▪ Understanding by Design meets Integrated Science (Want & Allen) ▪	NOS Assignment

Oct 5 ONLINE	Formative Assessment	*NSTA class bundle* – ▪ Formative Assessment Guideposts (Ayala) ▪ Formative Assessment Probes (Keeley, Eberle, & Farrin) ▪ Using Graphic Organizers as Formative Assessment (Strubel) ▪ Assessing Scientific Inquiry (Peters)	
Oct 12 – Monday classes meet Tuesday for Columbus day ONLINE	Summative Assessment	*NSTA class bundle* – ▪ The ABCs of Assessment (Wright) ▪ Reaching the Zone of Optimal Learning: The Alignment of Curriculum, Instruction, and Assessment (Farenga,. Joyce, & Ness) ▪ Reforming Cookbook Labs (Peters)	
Oct 19 ONLINE	Managing the Inquiry Classroom	*NSTA class bundle* – ▪ Maximizing Student Time on Task (Peters) ▪ Managing Group Work (McGlynn & Kelly)	Lesson Critique and Revision
Oct 26 ONLINE	Safety	*NSTA class bundle* – ▪ Safer Science: NSTA Portal to Science Safety (Roy) Lab Safety: More than Just Goggles	
• **Nov 2 –Work on Lesson plans – no class**			
Nov 9 ONLINE	Peer Review of Lesson		Original Lesson Draft
November 16 ONLINE	Microteaching		• Safety Assignment
November 23 ONLINE	Microteaching		
Nov 30	Work on assignments		
Dec 7	No CLASS – Remaining assignments due		• Microteaching Reflection • Clinical Experience Paper

			• Final Lesson Plan

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 https://catalog.gmu.edu/policies/honor-code-system/).
- 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 https://ds.gmu.edu/).
- Students must silence all sound emitting devices 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/.
- For information on student support resources on campus, see https://ctfe.gmu.edu/teaching/student-support-resources-on-campus

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

Assignment Rubrics

Nature of Science Assignment (PBA)

Standard	Accomplished	Target	Acceptable	Unsatisfactory
Understand research and can successfully design, conduct, report, and evaluate investigations in science (1d)	Product provided is an independent investigation in which the candidate identifies the question, designs and implements the methods for investigating the questions, and reports the findings.	Product provided is a classroom assignment in which the candidate is given a question but designed and implemented the methods for investigating the question as well as reports on the findings.	Product provided is a classroom assignment in which the candidate was given the question and methods for investigating the question but candidate conducts the investigation and reports on the findings.	Produce submitted is not an example of scientific inquiry.
Understand and can successfully use mathematics to process and report data and solve problems in their field(s) of licensure (1e)	The mathematics used when reporting findings or solving the problem are appropriate and independently determined by the candidate.	The mathematics used when reporting findings or solving the problem are appropriate and largely determined by the candidate.	The mathematics used when reporting findings or solving the problem were largely determined by the instructor.	There are no or inappropriate examples of mathematics used to report findings or solve problems.
Understand the philosophical tenets, assumptions, goals, and values that distinguish science from technology and from other ways of knowing the world (2b)	Candidate fully explains all of the following aspects of the nature of science AND connects them to the investigations: 1. science cannot answer all questions 2. science produces, demands, and relies on empirical evidence 3. science and technology are not the same but impact one another.	Candidate fully explains all of the following aspects of NOS BUT DOES NOT connect them to the investigations: 1. science cannot answer all questions 2. science produces, demands, and relies on empirical evidence 3. science and technology are not the same but impact one another.	Candidate explains the following aspects of the nature of science in a partial or superficial way: 1. science cannot answer all questions 2. science produces, demands, and relies on empirical evidence 3. science and technology are not the same but impact one another.	Candidate cannot explain the following aspects of the nature of science: 1. science cannot answer all questions 2. science produces, demands, and relies on empirical evidence 3. science and technology are not the same but impact one another.
Understand the processes, tenets, and assumptions of multiple methods of inquiry leading	Candidate fully explains the following aspects of the nature of science AND	Candidate fully explains the following aspects of NOS BUT DOES NOT connect them	Candidate explains the following aspects of the nature of science in a partial or	Candidate cannot explain the following aspects of the nature of science:

Standard	Accomplished	Target	Acceptable	Unsatisfactory
to scientific knowledge (3a)	connects them to the investigations: 1. Science employs multiple methods and types of reasoning that share many common factors, habits of mind, and norms 2. scientific knowledge is tentative, durable, and self-correcting	to the investigations: 1. Science employs multiple methods and types of reasoning that share many common factors, habits of mind, and norms 2. scientific knowledge is tentative, durable, and self-correcting	superficial way: 1. Science employs multiple methods and types of reasoning that share many common factors, habits of mind, and norms 2. scientific knowledge is tentative, durable, and self-correcting	1. Science employs multiple methods and types of reasoning that share many common factors, habits of mind, and norms 2. scientific knowledge is tentative, durable, and self-correcting
Understand socially important issues related to science and technology in their field of licensure, as well as processes used to analyze and make decisions on such issues (4a)	Candidate fully explains the following aspects of the nature of science AND connects them to the investigations: 1. science is a creative endeavor 2. social, historical, and cultural factors play a role in the construction of scientific knowledge 3. science has a subjective element	Candidate fully explains the following aspects of NOS BUT DOES NOT connect them to the investigations: 1. science is a creative endeavor 2. social, historical, and cultural factors play a role in the construction of scientific knowledge 3. science has a subjective element	Candidate explains the following aspects of the nature of science in a partial or superficial way: 1. science is a creative endeavor 2. social, historical, and cultural factors play a role in the construction of scientific knowledge 3. science has a subjective element	Candidate cannot explain the following aspects of the nature of science: 1. science is a creative endeavor 2. social, historical, and cultural factors play a role in the construction of scientific knowledge 3. science has a subjective element

Safety Assignment (PBA)

Standard	Accomplished	Target	Acceptable	Unsatisfactory
Understand the legal and ethical responsibilities of science teachers for the welfare of their students, the proper treatment of animals, and the maintenance and disposal of materials (9a)	Within self-developed lessons and unit, candidate consistently identifies the legal responsibilities of the teacher AND is able to describe how to address these responsibilities	Given a hypothetical lab activity, the candidate is able to identify the legal responsibilities of the teacher AND describe how to address these responsibilities	Candidate is able to list the legal responsibilities of a teacher AND describe how to hypothetically address these responsibilities	Candidate is not able to list the legal responsibilities of a teacher AND is not able to describe how to address those responsibilities
Know and practice safe techniques for the preparation, storage, dispensing, supervision, and disposal of all materials used in science instruction	Within self-developed lessons and unit, candidate can safely prepare, store, dispense, and dispose of materials used during science instruction AND provide appropriate emergency procedures to share with students for activities	Given a hypothetical activity, candidate is able to list safe practices associated with materials including preparation, storage, disposal, and supervision AND is able to outline appropriate emergency procedures for the lab	Candidate is able to list safe practices associated with materials including preparation, storage, disposal, and supervision	Candidate is not able to list safe practices associated with materials in the science classroom
Know and follow emergency procedures, maintain safety equipment, and ensure safety procedures appropriate for the activities and abilities of students (9c)	Within self-developed lessons, candidate is able to articulate safety concerns and appropriate emergency procedures, as well as what safety equipment should be available and how to use it	Given a hypothetical activity, candidate is able to list safety concerns and appropriate emergency procedures, as well as what safety equipment should be available and how to use it	Candidate is able to list emergency procedures, explain the maintenance of primary safety equipment, and determine how to address safety concerns within a particular activity	Candidate is not able to describe emergency procedures, explain the maintenance of any safety equipment, or determine how to address safety concerns for a particular activity
Treat all living organisms used in the classroom and found in the field in a safe, humane, and ethical manner and respect legal restrictions on their collection, keeping, and use (9d)	Within self-developed lessons, candidate is able to articulate safe, humane, and ethical practices associated with the use and disposal living organisms	Given a hypothetical activity, candidate is able to list safe, humane, and ethical practices associated with the use and disposal of living organisms	Candidate is able to list safe, humane, and ethical practices associated with the use and disposal of living organisms	Candidate is not able to list safe, humane, and ethical practices associated with the use and disposal of living organisms

George Mason University
College of Education and Human Development

Secondary Education (SEED) Lesson Planning Assessment
Completed in Methods I

Assessment Information
In the Secondary Education (SEED) program, the Lesson Planning Assessment is completed during Methods I and is assessed by Methods I instructor. The candidate must earn a score of 2 to be successful on this assignment. If a candidate does not earn a 3 on the assignment, he/she must meet with the course instructor or assessor prior to resubmitting. The data from this assessment are used to identify both best practices and gaps in developing and assessing a specific lesson plan and the impact on student learning.

Standards Addressed in This Assessment
- Interstate Teacher Assessment and Support Consortium (InTASC) Standards: 1, 2, 3, 4, 5, 6, 7, 8, 9
- Virginia Department of Education (VDOE) Standards: 1, 2, 3, 4, 5, 7
- Council for the Accreditation of Educator Preparation (CAEP) Standards: 1.1 (InTASC Standards), 1.2 (Use of Research), 1.3 (Content and Pedagogical Knowledge), 1.4 (College and Career Readiness), 1.5 (Technology)
- CAEP Cross-Cutting Themes (CCT): Technology, Diversity

Assessment Objective
The candidate will develop a research-supported lesson plan that effectively meets the needs of a specific population of learners.

Rationale
It is important that teacher candidates demonstrate their ability to design an effective lesson plan with specific, performance-based learning objectives that meet the learning needs of their learners. Lesson planning can be guided by four basic questions (adapted from Spencer, 2003):

1. *Who are my learners?* (Consider the number of learners, their academic readiness levels and cultural backgrounds, their prior knowledge, etc.)
2. *What do I want my learners to learn?* (Consider the content or subject (and interdisciplinary connections), the type of learning (knowledge, skills, behaviors), how to integrate college- and career-ready standards, etc.)
3. *How will I know what the learners understand?* (Consider informal and formal assessments, formative and summative assessments, higher order questioning techniques, feedback from learners, etc.)
4. *How will my learners learn best?* (Consider the teaching models, learning strategies, length of time available, materials, technology resources, differentiation, modifications, etc.)

You might also want to ask:
- What knowledge, skills, and understandings do my learners already have?
- What knowledge or prerequisite skills do I need to access, activate, or build in this lesson? How will I access those prerequisite skills or activate that prior knowledge?
- Where have learners come from and what are they going on to next?
- How can I build in sufficient flexibility to respond to emergent needs indicated by ongoing observation and formative assessment?

During field experiences and the internship, a lesson plan must be developed for each teaching session. As a novice teacher, lesson plans are developed for each instructional episode (lesson, one-to-one instruction, and small group activity). When teaching new content or grade levels, your lesson plans will be more detailed. As you gain pedagogical content knowledge and are proficient, your lesson planning becomes less detailed. Part of the planning process includes considering the following tasks:

- List content and key concepts (research more if needed).
- Define your aims and identify specific learning objectives/goals/outcomes aligned to appropriate curriculum standards, Virginia Standards of Learning (SOL) and Aligned Standards of Learning (ASOL), and College- and Career-Ready standards.
- Create assessments that are aligned to your specific learning objectives/goals/outcomes.
- Think about the structure of the lesson, pacing, transitions, and use of technology.
- Identify the strengths and needs of all learners.
- Identify adaptations/modifications/extensions needed to meet learner needs.
- Determine "best practices" and learning strategies aligned to the learning objectives/goals/outcomes.
- Identify learning resources and support materials, including technology.

Directions for Completing this Assessment Task

Develop and teach a lesson plan using the template attached. Review the rubric to guide the development of your lesson plan.

Submission Directions

You will submit a detailed lesson plan (using the Lesson Plan Template) that addresses each of the sections described below.

Section 1: Classroom Context

Classroom decisions are made based upon your learners' strengths and needs. Your plan may vary based upon when, in a unit of instruction, the lesson takes place, and even the time of the lesson. In this section, you will provide basic information about your learners and the classroom—including academic and cultural backgrounds and prior knowledge, and any assessments that will guide your planning. Make certain to address how your knowledge of your learners will affect your planning. (½–1 page)

Section 2: Planning for Instruction

Before you teach a lesson, you must decide the learning objectives/goals/outcomes and connection to Virginia Standards of Learning (SOL) and Aligned Standards of Learning (ASOL), and/or College- and Career-Ready standards you will use and why you have selected these objectives and specific strategies to teach the lesson to your specific group of learners. You make these decisions based upon learner needs, current research, prior knowledge or pre-assessments of learning, aligned to appropriate curriculum standards. While planning your lesson, using your knowledge of your learners, you will make decisions as to the modification/differentiation and/or accommodations you will need to meet the needs of all learners in your classroom. Then, with an informed understanding of your audience and your content, identify the learning materials needed to teach the lesson and any technology you and/or your learners will use in this lesson. In this section, be sure to detail all of these planning elements, including how you will assess learner mastery of lesson content— using both formative and summative assessments throughout the lesson. Virginia Standards of Learning (SOL) and Aligned Standards of Learning (ASOL), and/or College- and Career-ready skills, and any content specific objectives should be included in lesson plans. (1–2 pages)

Section 3: Instruction and Assessment

After you have identified *what* your class will learn, you will begin to chart out specifically *how* you will teach the lesson. When completing this section of the lesson plan, you will identify the procedures that you will use from the opening of the lesson through the lesson closure. Script this section of the plan, noting what you will say and do and what you are asking learners to do. Be certain to include formative assessments and guided practice activities and any independent practice and summative assessments you will have learners complete. (2–3 pages)

Section 4: Reflection: Impact on Learning

John Dewey noted that without reflection, there is no learning. In this section, reflect upon the lesson and consider whether your learners were able to meet the learning objectives/goals/outcomes for the lesson (Dewey, 1933). How do you know learners were able to successfully meet the lesson objectives/goals/outcomes? (Be specific here

and use formative/summative assessment results to guide your response.) What was your impact on learning? (That is, how did your instructional decisions seem to affect learning? Again, be specific.) What strategies or activities were the most successful? What could have made the lesson stronger? What did you learn about teaching, learners, and learning that will affect your next instructional experience? (1 page)

NOTE: *Lesson plans will be evaluated based on adherence to the provided lesson plan format; consistency with instructional methods taught in the program; appropriate rationale provided; specification of objectives, as related to state and national standards; whether there was an appropriate match between the assessment of learning and learning objectives; coherence of writing, and mechanics. Additionally, plans should include the Virginia Standards of Learning (SOL), Aligned Standards of Learning (ASOL), College- and Career-Ready skills, and other content specific objectives.*

References

Dewey, J. (1933). *How we think. A restatement of the relation of reflective thinking to the educative process* (Revised ed.). Boston: D. C. Heath and Company.

Spencer, J. (2003). *Learning and teaching in the clinical environment*. London, England: BMJ Publishing Group.

Lesson Plan Template

Section 1. Classroom Context

Grade level: **Number of students:**
Content Area: **Name of Unit:**
Lesson planned for ____ minutes
Circle when this lesson occurs in the unit: _ beginning middle __end

Narrative including any additional contextual information that will impact planning:

Section 2. Planning for Instruction

Performance-based Objective(s)

National content standards and VA Standards of Learning (SOL)/Career- and College- Ready Standarc

Lesson Rationale: What research base did you use to make instructional decisions? Why have you selected these objectives and these specific strategies?

Differentiation and Accommodations

Materials/Technology

Section 3. Instruction and Assessment

Instruction Context: Describe purpose of the lesson.

Lesson Procedures: Detail the sequence of the lesson, including the Opening/Strategies/Assessments/Closure activities. Note: The reader should be able to teach the lesson from this plan.

LESSON PLAN MUST BE A 5E LESSON FOR SCIENCE EDUCATION

Engage:

Explore:

Explain:

Elaborate:

Evaluate:

Assessments: Include explanation of assessment choices (formal/informal and formative/summative assessments) and alignment of assessments to lesson objectives.

Section 4. Reflection: Impact on Student Learning

Narrative reflection on the lesson and the impact on student learning. Include any changes you would make to the lesson based upon your reflection.

George Mason University
College of Education and Human Development

Council for the Accreditation of Educator Preparation Common Assessment
Lesson Plan Rubric

The target score for all Candidates is "Proficient," Level 2. The Candidate must earn a score of 2 to be successful on this assignment. If a Candidate does not earn a 2 on the assignment, he/she must meet with the course instructor or assessor prior to resubmitting. The data from this assessment are used to identify both best practice and gaps in developing and assessing a specific lesson plan and its impact on student learning.

GENERAL SCORING GUIDELINES

3 = ***Highly Proficient:*** rich, sophisticated, exemplary in all aspects of quality (including both mechanics of writing and clarity/insightfulness of thinking), thoroughly accurate and developed, exceeds expectations for a Candidate at this stage of development, integrates thorough understanding of relevant professional literature/research**.**

2 = ***Proficient:*** well developed, good quality (may include very few errors in mechanics, and shows clarity of thinking), fully meets expectations for a Candidate at this stage of development, shows understanding of relevant professional literature/research. **This is the TARGET score.**

1 = ***Not Proficient:*** superficially developed, minimally acceptable quality (Written work/plans may include a few errors in mechanics and inconsistent clarity in thinking), lags behind expectations for most Candidates at this stage of development. May show beginning/weak understanding of the relevant professional literature/research**.**

Lesson Plan Rubric

Section 1: Classroom Context			
Criteria	**Not Proficient 1**	**Proficient 2**	**Highly Proficient 3**
The Candidate identifies individual and group prerequisites in order to design instruction to meet learners' needs in the cognitive, linguistic, social, emotional, and physical areas of development. ***InTASC 1***	◯ The evidence indicates that the Candidate demonstrated a partial understanding of learners' developmental levels, planning instruction that aligned to the	◯ The evidence indicates that the Candidate demonstrated an accurate understanding of learners' developmental levels by planning varied instruction appropriate to support learning	◯ The evidence indicates that the Candidate demonstrated an accurate understanding of learners' developmental levels and was able to plan and articulate specific, varied strategies for engaging learners in the learning and providing varied options for learners to demonstrate mastery aligned

VDOE 1 ***CAEP 1.1*** **CAEP CCT: Diversity**	developmental levels of some (but not all) of the learners.	goals, actively engaging learners in learning that aligned with overall subsets of learner's developmental levels.	to the developmental learning level of each learner and groups of learners in the classroom.
Section 2: Planning for Instruction			
Criteria	**Not Proficient** **1**	**Proficient** **2**	**Highly Proficient** **3**
The Candidate identifies performance-based objectives and/or appropriate curriculum goals/outcomes that are relevant to learners. ***InTASC 7*** ***VDOE 2*** ***CAEP 1.1*** ***CAEP 1.2*** ***CAEP CCT: Diversity***	◯ The evidence indicates that the Candidate planned activities that did not include learner-appropriate and measurable objectives aligned with standards and/or use of prior knowledge.	◯ The evidence indicates that the Candidate planned challenging activities using learner-appropriate and measurable objectives that used appropriate scaffolds and differentiation that address learner needs to build on prior knowledge.	◯ The evidence indicates that the Candidate planned challenging activities using learner appropriate and measurable objectives with appropriate scaffolds and differentiation that address individual learner strengths and needs to build on prior knowledge and used pedagogical content knowledge/teaching strategies that aligned with multiple standards, including College- and Career-Ready Skills, clearly connects to the range of previous and future learning.
The Candidate identifies national/state/local standards that align with objectives, are appropriate for curriculum goals, and are relevant to learners. ***InTASC 7*** ***VDOE 2*** ***CAEP 1.1*** ***CAEP 1.2*** **CAEP CCT: Diversity**	◯ The evidence indicates that the Candidate planned activities that did not include learner-appropriate and measurable objectives aligned with national/state/local standards that are aligned with appropriate for curriculum goals.	◯ The evidence indicates that the Candidate planned challenging activities using learner-appropriate and measurable objectives closely aligned with national/state/local standards address learner needs, build on prior knowledge and used instructional strategies, including College- and Career-Ready Skills, and connects to future learning.	◯ The evidence indicates that the Candidate planned challenging activities using learner appropriate and measurable objectives with appropriate scaffolds and differentiation that address individual learner strengths and needs to build on prior knowledge and used pedagogical content knowledge/teaching strategies that aligned with multiple standards, including College- and Career-Ready Skills, clearly connects to the range of future learning.
The Candidate creates learning experiences that make content accessible and meaningful for learners to ensure content mastery.	◯ The evidence indicates that the Candidate demonstrated knowledge of the content using explanations that were	◯ The evidence indicates that the Candidate displayed knowledge of the important content in the discipline by using content-related	◯ The evidence indicates that the Candidate displayed extensive knowledge of the important concepts in the discipline by using multiple representations, multiple formats, and appropriate

InTASC 4 ***VDOE 1*** ***CAEP 1.1*** ***CAEP 1.3***	not always accurate and clear.	strategies that clearly identify how concepts related to one another, using developmentally appropriate terminology/ language to build an understanding of content for all learners.	content-related strategies and developmentally appropriate terminology/language, including varied levels of questioning, a wide variety of opportunities to build a higher-level of understanding of content for all learners.
Criteria	**Not Proficient** **1**	**Proficient** **2**	**Highly Proficient** **3**
The Candidate organizes and creates face-to-face and/or virtual environments that support individual and collaborative learning. ***InTASC 3*** ***VDOE 5*** ***CAEP 1.1*** ***CAEP 1.4*** ***CAEP 1.5*** ***CAEP CCT:*** **Technology**	◯ The evidence indicates that the Candidate transitions inefficiently between learning activities with some loss of instructional time, monitoring and responding to learner behavior (both positive and negative) in a way. that is inconsistent, inappropriate and/or ineffective for meeting classroom and individual learner needs, including in virtual environments.	◯ The evidence indicates that the Candidate transitions efficiently and smoothly between learning activities with minimal loss of instructional time, using varied learning situations that includes monitoring and responding to learner behavior (both positive and negative) in a way that is consistent, appropriate and effective for meeting classroom and individual learner needs; including in virtual environments.	◯ The evidence indicates that the Candidate demonstrates respect for and interest in individual learner's experiences, thoughts and opinions and uses transitions that are seamless, effectively maximizing instructional time, and combining independent, collaborative, and the individual needs of all learners, including in virtual environments.
The Candidate uses appropriate technology to engage learners and to assess and address learner needs. ***InTASC 6*** ***VDOE 4*** ***CAEP 1.1*** ***CAEP 1.5*** ***CAEP CCT:*** **Technology** ***CAEP CCT:*** **Diversity**	◯ The evidence indicates that the Candidate is inconsistent, inappropriate and/or ineffective in using appropriate technologies for meeting classroom and individual learner needs.	◯ The evidence indicates that the Candidate uses appropriate technology in a way that is consistent, appropriate and effective for meeting classroom and individual learner needs.	◯ The evidence indicates that the Candidate uses appropriate technology effectively, maximizing instructional time, and combining independent, collaborative, and the individual needs of all learners.
The Candidate facilitates learners' use of appropriate tools and resources to maximize content learning in varied contexts. ***InTASC 5*** ***VDOE 2***	◯ The evidence indicates that the Candidate implemented teacher-directed lessons with limited use of tools appropriate for the content being	◯ The evidence indicates that the Candidate used a variety of appropriate tools to explore content that includes learner-led learning activities including cross-curricular	◯ The evidence indicates that the Candidate used collaborative problem solving as a way to explore content with the majority of instruction being learner-led learning activities including real-world and cross-curricular learning

CAEP 1.1 ***CAEP 1.4*** ***CAEP 1.5*** ***CAEP CCT:* Technology**	learned.	learning opportunities, with clear connections between content and other disciplines.	opportunities, with clear connections between content and other disciplines that encouraged independent, creative and critical thinking.
Criteria	**Not Proficient** **1**	**Proficient** **2**	**Highly Proficient** **3**
The Candidate plans how to achieve learning goals, choosing accommodations to differentiate instruction for individuals and groups of learners. ***InTASC 2*** ***VDOE 2*** **CAEP 1.1** **CAEP CCT: Diversity**	◯ The evidence indicates that the Candidate planned activities that did not include learner-appropriate and measurable goals aligned to the developmental levels of some (but not all) of the learners; instruction was inappropriate and/or inaccessible for groups of learners.	◯ The evidence indicates that the Candidate planned challenging activities using learner-appropriate and measurable goals that used appropriate scaffolds and differentiation that aligned with overall subsets of learner's developmental levels making learning accessible and challenging for the classroom.	◯ The evidence indicates that the Candidate demonstrated an accurate understanding of learners' developmental levels and was able to plan and articulate specific, varied strategies for engaging learners in the learning and providing varied options for learners to demonstrate mastery aligned to the developmental learning level of each learner and groups of learners in the classroom.
The Candidate plans instruction based on pre-assessment data, prior knowledge, and skills. ***InTASC 7*** ***VDOE 2*** ***CAEP 1.1***	◯ The evidence indicates that the Candidate planned activities that did not include learner-appropriate and measurable objectives aligned with pre-assessment data and/or use of prior knowledge.	◯ The evidence indicates that the Candidate planned challenging activities using learner-appropriate and measurable objectives that address learner needs to build on prior knowledge aligned with pre-assessment data and/or use of prior knowledge.	◯ The evidence indicates that the Candidate planned challenging activities using learner-appropriate and measurable objectives with appropriate scaffolds and differentiation that address individual learner strengths and needs to build on prior knowledge and used pedagogical content knowledge/teaching strategies that aligned with pre-assessment data and/or use of prior knowledge.

Section 3: Instruction and Assessment			
Criteria	**Not Proficient 1**	**Proficient 2**	**Highly Proficient 3**
The Candidate develops appropriate sequencing and pacing of learning experiences and provides multiple ways to demonstrate knowledge and skill. ***InTASC 8*** ***VDOE 2*** ***CAEP 1.1***	◯ The evidence indicates that the Candidate used limited instructional strategies that did not allow for differentiated learning experiences and/or did not provide multiple ways to demonstrate learning.	◯ The evidence indicates that the Candidate used a variety of instructional strategies to engage and challenge learners in differentiated learning situations.	◯ The evidence indicates that the Candidate used a variety of instructional strategies to engage and challenge learners in differentiate learning situations allowing all learners to take ownership of their learning.
The Candidate uses a variety of instructional strategies to encourage learners to develop an understanding of the content and to apply knowledge in meaningful ways. ***InTASC 8*** ***VDOE 3*** ***CAEP 1.1***	◯ The evidence indicates that the Candidate used limited instructional strategies that did not allow for differentiated learning situations and/or did not engage and challenge learners.	◯ The evidence indicates that the Candidate used a variety of instructional strategies to engage and challenge learners in differentiated learning situations allowing learners to have ownership of their learning.	◯ The evidence indicates that the Candidate used a variety of instructional strategies, including appropriate, available technologies, to engage and challenge learners in differentiate learning situations allowing all learners to have ownership of their learning.
The Candidate engages learners in multiple ways of demonstrating knowledge and skill as part of the assessment process. ***InTASC 6*** ***VDOE 4*** ***CAEP 1.1***	◯ The evidence indicates that the Candidate provided limited opportunities for learners to demonstrate learning and did not have opportunities of feedback or analysis of learner data to inform future instruction.	◯ The evidence indicates that the Candidate provided effective feedback to learners on multiple instances of formative, summative, informal, and/or formal assessments and analyzed data to inform instruction.	◯ The evidence indicates that the Candidate provided multiple opportunities for learners to demonstrate learning by using formative, summative, informal, and/or formal assessments. Assessments were differentiated to match a full rating of learner needs and abilities.

Section 4: Reflection: Impact on Learning			
Criteria	**Not Proficient 1**	**Proficient 2**	**Highly Proficient 3**
The Candidate uses a variety of self-assessment and reflection strategies to analyze and reflect on his/her impact on student learning and to plan for future instruction/ adaptations. ***InTASC 9*** ***VDOE 7*** ***CAEP 1.1***	◯ The evidence indicates that the Candidate did not participate in professional development; participated in professional development not relevant to personal needs identified through ethical and responsible self-reflection to plan for future instruction/ adaptations, and personal learning goals.	◯ The evidence indicates that the Candidate used self-reflection to identify professional development opportunities relevant to learning needs and applied activities in their teaching in an ethical and responsible manner to plan for future instruction/ adaptations, and personal learning goals.	◯ The evidence indicates that the Candidate consistently used self-reflection to identify professional development opportunities relevant to improving teaching and learning for specific groups of learners and successfully made systematic application of activities in their teaching in an ethical and responsible manner to plan for future instruction/ adaptations, and personal learning goals.

FACULTY USE ONLY	
	Candidate was not evaluated due to extenuating circumstances that impeded the completion of this assessment.

Some content adapted from the STAR Evaluation developed by Emporia State.