

## EDU 154/254

### Opportunity Task #1. Standards-Based Science Lesson Plan

**This assignment provides feedback on the following TPEs**

**TPE 1.3** Connect subject matter to real-life contexts and provide active learning experiences to engage student interest, support student motivation, and allow students to extend their learning.

**TPE 1.5** Promote students' critical and creative thinking and analysis through activities that provide opportunities for inquiry, problem solving, responding to and framing meaningful questions, and reflection

**TPE 1.6** Provide a supportive learning environment for students' first and/or second language acquisition by using research-based instructional approaches, including focused English Language Development, Specially Designed Academic Instruction in English (SDAIE), scaffolding across content areas, and structured English immersion, and demonstrate an understanding of the difference among students whose only instructional need is to acquire Standard English proficiency, students who may have an identified disability affecting their ability to acquire Standard English proficiency, and students who may have both a need to acquire Standard English proficiency and an identified disability.

**TPE 3.1** Demonstrate knowledge of subject matter, including the adopted California State Standards and curriculum frameworks

**TPE 3.2** Use knowledge about students and learning goals to organize the curriculum to facilitate student understanding of subject matter, and make accommodations and/or modifications as needed to promote student access to the curriculum.

**TPE 3.3** Plan, design, implement, and monitor instruction consistent with current subject-specific pedagogy in the content area(s) of instruction, and design and implement disciplinary and cross-disciplinary learning sequences, including integrating the visual and performing arts as applicable to the discipline. (See Subject- Specific Pedagogical Skills in Section 2 for reference)

**TPE 3.5** Adapt subject matter curriculum, organization, and planning to support the acquisition and use of academic language within learning activities to promote the subject matter knowledge of all students, including the full range of English learners, Standard English learners, students with disabilities, and students with other learning needs in the least restrictive environment.

**TPE 4.3** Design and implement instruction and assessment that reflects the interconnectedness of academic content areas and related student skills development in literacy, mathematics, science, and other disciplines across the curriculum, as applicable to the subject area of instruction.

**TPE 5.1** Apply knowledge of the purposes, characteristics, and appropriate uses of different types of assessments (e.g., diagnostic, informal, formal, progress-monitoring, formative, summative, and performance) to design and administer classroom assessments, including use of scoring rubrics

**TPE 5.8** Use assessment data, including information from students' IEP, IFSP, ITP, and 504 plans, to establish learning goals and to plan, differentiate, make accommodations and/or modify instruction.

**DUE DATE: April 21, 2021 (Full Draft); May 5, 2021 (Final)**

#### Purpose

The goal of this assignment is for you to create a 5E lesson plan using the Next Generation Science Standards and K-12 Science Framework. In your lesson plan, you will need to connect science content knowledge to real world phenomena and to provide Constructivist learning opportunities for students to engage their learning interest while promoting their critical thinking skills. You will be provided with an opportunity to teach a science lesson to your peers and receive feedback from them.

### **Preparation**

1. Participation in and discussion of science lessons taught by the instructor that model a balanced focus of instruction between science information, concepts and investigation. These lessons address different grade levels, different science strands, (life, earth and physical) and are aligned to state content standards. The role of estimation vs. precision in scientific investigations will be modeled and discussed. The instructor will incorporate and make explicit various strategies that are known to produce greater success in student learning, including those designed for English language learners. The instructor will model strategies to encourage all students to pursue their interests in science, especially those from traditionally underrepresented groups. Science lessons will be sensitive to the different cultural and ethnic backgrounds of the students.
2. Reading and discussing texts and articles about the manner in which learning occurs, with special emphasis on constructivist learning theory as it relates to the acquisition of scientific concepts.
3. Reading, discussing articles, and viewing videos on effective teaching strategies.

### **Performance Demonstration**

1. Using various instructional materials, candidates will develop a science lesson plan. The lesson plan will include a performance task aligned to state standards and the knowledge and skills required to complete the task. This lesson plan will be an independently completed project that includes at least one hands-on activity. The use of the FOSS kits is highly recommended.
2. During science lesson presentation, each candidate will involve their classmates - who are serving as proxy students – and engage in a balanced focus of instruction between science information, concepts and investigation. Candidates will use developmentally appropriate scientific process language and skills, such as observing, communicating, comparing, organizing, relating, inferring and/or applying to engage students in inquiry around content specific to the lesson.
3. The lesson plan should address the full range of English learners, Standard English learners, students with disabilities, and students with other learning needs in the least restrictive environment.

### **Assessment (See Rubric below)**

Candidates' lessons will be assessed for science content, science process and instructional strategies for each of the following task elements:

- Formal written lesson plan using MSMU lesson plan template (see attached\*).
- You will incorporate the 5E's (Engage, Explore, Explain, Elaborate, Evaluate)
- 10-15 minute lesson (presented to the class)

**Total Points Possible = 25**

**Deductions for Incomplete Work: 0-5 points lost if not Professional Work Quality**

TPE	Criteria	<b>5 points Outstanding</b>	<b>4 points Proficient</b>	<b>3 points Partially Proficient</b>	<b>2 points Developing</b>	<b>1 point Inadequate</b>
<p><b>TPE 3.1</b> Demonstrate knowledge of subject matter, including the adopted California State Standards and curriculum frameworks.</p> <p><b>TPE 3.3</b> Plan, design, implement, and monitor instruction consistent with current subject-specific pedagogy in the content area(s) of instruction, and design and implement disciplinary and cross-disciplinary learning sequences, including integrating the visual and performing arts as applicable to the discipline. <i>(See Subject-Specific Pedagogical Skills in Section 2 for reference)</i></p>	<p>Science instruction incorporates NGSS lesson structure by including all 3 dimensions</p> <ul style="list-style-type: none"> <li>• Science and Engineering Practices</li> <li>• Disciplinary Core Ideas</li> <li>• Cross Cutting Concepts</li> </ul>	<p>All 3 NGSS dimensions are explicitly addressed in the 5-E lesson plan and are aligned with the NGSS standards and learning objectives. <b>Many</b> well developed questions at various levels of DOK are included throughout the lesson. Includes appropriate planning, designing, implementing, and monitoring plans. Opportunities to integrate with 2 other content areas are indicated.</p>	<p>All 3 NGSS dimensions are addressed in the 5-E lesson plan and are aligned with the NGSS standards but does not explicitly connect to learning objectives. <b>Many</b> well developed questions at various levels of DOK are included throughout the lesson. Includes appropriate planning, designing, implementing, and monitoring plans. Opportunities to integrate with 1 other content area is indicated.</p>	<p>All 3 NGSS dimensions are covered in the 5-E lesson plan but are not explicitly indicated or aligned with NGSS standards or learning objectives. Includes some appropriate planning, designing, implementing, and monitoring plans. <b>Several</b> questions are included.</p>	<p><b>Fewer than 3</b> NGSS dimensions are included in the 5-E lesson plan. Learning objectives are not clear. Includes a few appropriate planning, designing, implementing, and monitoring plans. <b>Few</b> questions are included.</p>	<p><b>Fewer than 2</b> NGSS dimensions are included in the 5-E lesson plan. Learning objectives are not clear. Does not include appropriate planning, designing, implementing, and monitoring plans. <b>No</b> questions are included.</p>
<p><b>TPE 3.2</b> Use knowledge about students and learning goals to organize the curriculum to facilitate student understanding of subject matter, and make accommodations and/or modifications as needed to promote student access to the curriculum.</p> <p><b>TPE 3.5</b> Adapt subject matter</p>	<p>Science instruction includes specific strategies to support the full range of English learners and Standard English learners.</p>	<p>Lesson Plan and presentation demonstrate specific considerations and appropriate support and accommodations/modifications to support EL students' access to science content, practices and concepts. Scaffolds are</p>	<p>Lesson Plan and presentation demonstrate specific consideration and appropriate support and accommodations/modifications to support EL students' access to science content, practices and concepts. Scaffolds are</p>	<p>Lesson Plan and presentation demonstrate specific consideration and appropriate support and accommodations/modifications to support EL students' access to science content, practices and</p>	<p>Lesson Plan and presentation demonstrate limited consideration and appropriate support and accommodations/modifications to support EL students' access to science content, Scaffolds are</p>	<p>Lesson Plan and presentation demonstrate NO consideration and appropriate support and accommodations/modifications to support EL students' access to science content, students' access to science content,</p>

<p>curriculum, organization, and planning to support the acquisition and use of academic language within learning activities to promote the subject matter knowledge of all students, including the full range of English learners, Standard English learners, students with disabilities, and students with other learning needs in the least restrictive environment.</p>		<p>included in <b>all parts</b> of the lesson plan with excellent rationales. Modes of communication and strategies for differing proficiencies are included.</p>	<p>included in <b>all parts</b> of the lesson plan with excellent rationales.</p>	<p>concept. Scaffolds are included in <b>most parts</b> of the lesson plan with adequate rationales.</p>	<p>included in <b>few parts</b> of the lesson plan and rationales are limited or absent</p>	<p>practices and concepts. Scaffolds and rationales are included in <b>no parts</b> of the lesson plan</p>
<p><b>TPE 4.3</b> Design and implement instruction and assessment that reflects the interconnectedness of academic content areas and related student skills development in literacy, mathematics, science, and other disciplines across the curriculum, as applicable to the subject area of instruction</p>	<p>Science instruction includes opportunities for students to apply related skills in Common Core literacy, speaking and listening, writing and mathematics.</p>	<p>Lesson plan includes <b>several</b> opportunities for students to apply Common Core Language Arts and Math skills through the use of scientific discourse, science notebooks and reading informational text. The Common Core ELA and Math standards are specifically identified.</p>	<p>Lesson plan includes <b>several</b> opportunities for students to apply Common Core Language Arts and Math skills through the use of scientific discourse, science notebooks and reading informational text.</p>	<p>Lesson plan includes <b>some</b> opportunities for students to apply Common Core Language Arts and Math skills through the use of scientific discourse, science notebooks and reading informational text.</p>	<p>Lesson plan includes <b>few</b> opportunities for students to apply Common Core Language Arts and Math skills through the use of scientific discourse, science notebooks and reading informational text.</p>	<p>Lesson plan includes <b>no</b> opportunities for students to apply Common Core Language Arts and Math skills through the use of scientific discourse, science notebooks and reading informational text.</p>
<p><b>TPE 1-3</b> Connect subject matter to real-life contexts and provide active learning experiences to engage student interest, support student motivation, and allow students to extend their learning</p> <p><b>TPE 1.5</b> Promote students' critical and creative thinking and analysis through activities that provide</p>	<p>Science instruction provides connections to students' real-life experiences and engages students in active developmentally appropriate learning experiences.</p>	<p>Lesson plan includes anchoring, relevant natural phenomenon(a) that is developmentally appropriate and stimulate(s) students' curiosity and drives inquiry. Lesson sequence <b>seamlessly</b> aligns critical thinking</p>	<p>Lesson plan includes anchoring, relevant natural phenomenon(a) that is developmentally appropriate and stimulate(s) students' curiosity and drives inquiry. Lesson sequence <b>seamlessly</b> aligns critical thinking</p>	<p>Lesson plan includes anchoring, relevant natural phenomenon(a) that is developmentally appropriate and stimulate(s) students' curiosity and drives inquiry. Lesson</p>	<p>Lesson plan includes anchoring, relevant natural phenomenon(a) that is developmentally appropriate and stimulate(s) students' curiosity and drives inquiry. Lesson sequence <b>inconsistently</b></p>	<p>Lesson plan does not include anchoring, relevant natural phenomenon(a) that stimulate(s) students' curiosity and drives inquiry and/or lesson sequence has <b>little to no</b> alignment of critical thinking</p>

<p>opportunities for inquiry, problem solving, responding to and framing meaningful questions, and reflection</p>		<p>questioning, data collection and analysis, and evidence based explanations. Anticipation of student experiences to drive instruction is included.</p>	<p>questioning, data collection and analysis, and evidence based explanations.</p>	<p>sequence <b>adequately</b> aligns critical thinking questioning, data collection and analysis, and evidence based explanations.</p>	<p>aligns critical thinking questioning, data collection and analysis, and evidence/ based explanations.</p>	<p>questioning, data collection and analysis, and evidence based explanations.</p>
<p><b>TPE 5.1</b> Apply knowledge of the purposes, characteristics, and appropriate uses of different types of assessments (e.g., diagnostic, informal, formal, progress-monitoring, formative, summative, and performance) to design and administer classroom assessments, including use of scoring rubrics</p> <p><b>TPE 5.8</b> Use assessment data, including information from students' IEP, IFSP, ITP, and 504 plans, to establish learning goals and to plan, differentiate, make accommodations and/or modify instruction.</p>	<p>Science instruction includes various forms of assessment that supports both assessment <u>for</u> learning and assessment <u>of</u> learning.</p>	<p>Lesson plan indicates <b>several</b> opportunities for various assessments including but not limited to the following <b>4</b>: diagnostic, formative, self-reflective, and summative.</p> <p>Appropriately collect and analyze assessment data from multiple measures and include sources to plan and modify instruction accordingly, including differentiation, accommodations, and/or modifications as necessary.</p>	<p>Lesson plan indicates <b>several</b> opportunities for various assessments including but not limited to the following <b>4</b>: diagnostic, formative, self-reflective, and summative.</p> <p>Appropriately collect assessment data from multiple measures and include sources to plan and modify instruction accordingly, including differentiation, accommodations, and/or modifications as necessary. Does not include analyzing assessment data.</p>	<p>Lesson plan indicates <b>some</b> opportunities for various assessments including <b>3</b> of the following: diagnostic, formative, self-reflective, and summative.</p> <p>Assessment data includes a few measures and include sources to plan and modify instruction accordingly, including differentiation, accommodations, and/or modifications as necessary.</p>	<p>Lesson plan indicates <b>few</b> opportunities for various assessments including <b>2</b> of the following: diagnostic, formative, self-reflective, and summative.</p> <p>Assessment data includes a few measures and but does not include sources to plan and modify instruction accordingly, including differentiation, accommodations, and/or modifications as necessary.</p>	<p>Lesson plan indicates <b>no or only 1</b> opportunity for assessment and/or no purpose for assessments is provided.</p> <p>Does not include any plans or modifications. Does not include differentiation, accommodation, and/or modifications.</p>

**\*Lesson Plan Format for  
Specially Designed Academic Instruction in English (SDAIE)**

**with SIOP Elements**  
**MSMU Lesson Plan Format**

**Context and Goals**

Grade/Class/Subject: \_\_\_\_\_ Teacher: \_\_\_\_\_  
*(For what class is this lesson designed?) (Your name)*

Time/Duration of the lesson: *(i.e. 9:15-10:00 or 45 minutes)*

English Language Proficiency of Students: *(Before classroom instruction, teachers will understand their students' English language proficiency, and the language demands of the lesson's instructional materials.)*

California Content Standards:  
*(Which standards do you plan to teach? Paste these from the Current CA Content Standards)*

Enduring Understandings:  
*(What concepts/big ideas?)*

Essential Knowledge/Skills:  
*(What knowledge/skills? How does this lesson build upon prior lessons? How will this knowledge/skill enable students to understand future lessons?)*

Higher-Order Questions:  
*(What is/are the focusing question(s) for this lesson?)*

**Observable Outcomes**  
**What do you want students to learn?**

Content Objectives:  
*(What specific objectives from the content standards above does this lesson address?)*

**Assessment/Checking for Understanding**  
**What evidence will you gather/look for?**

*(How will you know if students learned both the content and language objectives? What informal and/or formal methods will you use to gather evidence? What criteria will you use to assess learning? How might pre-assessment be used in your analysis of this evidence?)*

Content Objectives: <i>(What specific objectives from the content standards above does this lesson address?)</i>	<i>(How will you know if students learned both the content and language objectives? What informal and/or formal methods will you use to gather evidence? What criteria will you use to assess learning? How might pre-assessment be used in your analysis of this evidence?)</i>
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<p><b>Academic Language Objectives:</b>  <i>(What specific objectives from the ELD standards does this lesson address?)</i></p>	
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<p><b>Key Vocabulary:</b></p>	<p><b>Supplementary Materials:</b>  <i>(What resources, “realia”, visuals, documents, or manipulatives will you use?)</i></p>
<p><b>Technology in Support of Learning:</b>  <i>(What type of technology will you use in your instruction?)</i></p>	<p><b>Technology in Support of Learning:</b>  <i>(What type of technology will the <u>students</u> use to achieve and/or demonstrate the objectives?)</i></p>

**Anticipated Misunderstandings/Difficulties:**  
*(What areas of confusion or difficulty do you anticipate students might encounter with this material? How will you address them?)*

**Student Assets:**  
*(What interests, prior knowledge do students bring to help them with this material? Include for all focus students.)*

**Lesson Pre-assessment and Sequence:**

<p>Element  <i>Describe <b>what</b> will happen-what will teacher and/or students do</i></p>	<p>Rationale  <i>Describe <b>why</b> you chose to do it this way.</i></p>	<p>Differentiation: Modifications/Adaptations  <i>For each segment of the lesson sequence, describe any needed modifications for EL, special needs, or socio-emotional needs.</i></p>
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<p>Pre-Assessment of Students' Knowledge or Ability: (Before instruction begins, how will you assess what students know and/or are able to do related to the objective?)</p>		
<p>LESSON SEQUENCE</p>		
<p>Instruction to Support Learning: <i>(How will you design learning experiences to facilitate students' understandings, knowledge and skills? Things to comment on: teacher's role, student groupings, ways to ensure engagement (i.e., linking information to students' lives and previous learning), ways you are scaffolding.)</i></p> <p>Structured Student Learning Activities: <i>(What activities will help students grasp and practice concepts/skills? How will students be grouped and manage their learning?)</i></p>		<p><i>(EL focus student: describe this student's EL goals. Describe the assets and challenges related to this lesson for <b>this English learner</b>. What will you do specifically support <b>this student</b> for this lesson?)</i></p> <p><i>Special Needs focus student: describe this student's special need and relevant IEP goals, his/her assets and challenges related to this lesson. Describe what you will specifically do to support <b>this student</b> for this lesson.</i></p> <p><i>Focus student with social-emotional challenges: Describe the social-emotional assets and challenges for <b>this student</b>. Describe what you will specifically do to support <b>this student</b> for this lesson.</i></p> <p><i>Advanced students: What will you do for those students who already "get it" and need to be challenged in different ways?)</i></p>



Post-Assessment: <i>(How will you know if students learned both the content and the language objectives? What informal and/or formal methods will you use to gather evidence? What criteria will you use to assess learning? How might pre-assessment be used in your analysis of this evidence?)</i>		
Extension: <i>(How might this lesson be extended into future content areas or lessons?)</i>		

Theories that might be useful for rationales (Note: You may wish to refer to your “toolbox” for helpful resources further explaining below):

Universal Design for Learning: *Multiple means of representation; Multiple means of action & expression; Multiple means of engagement.(the what, how, and why of learning)*

Five E's: *Engage, Explore, Explain, Elaborate, Evaluate*