

Final Project–Unit Plan

The purpose of this assignment is for you to integrate all of the knowledge of this science methods course into the construction of a small unit (4-5 days worth of lessons) for any grade 3-8. You may select your own topic and grade level, but this project must be your own work. Look at the example unit plan before you begin your own.

Expectations

1. Begin by using the Understanding by Design model.
 - a. Start by deciding what core concepts (“big ideas”/“enduring understandings”) the students will learn that are important and not trivial knowledge. Identify the standard(s) that will be addressed. Then develop one or more essential questions that will guide the students’ inquiry through the unit. These are due at end of week 1. You need to wait for feedback before progressing.
 - b. Next you will design the summative assessment you will give your students (can be a meaningful project or a more traditional quiz). This is due at the end of the second week. You will need to wait for feedback before progressing.
 - c. Finally, develop the actual lesson plans you will use to teach the unit. These are due by the end of the course.
2. Give an overview how this unit will use three-dimensional learning (from the Next Generation Science Standards/Framework for Science Education). Explain in your own words how this unit engages students in learning about at least one disciplinary core idea (DCI), at least one scientific and engineering practice (SEP), and at least one crosscutting concept (CC). These elements need to be shown as “interwoven” and not separate topics addressed in isolation.
3. State common and expected preconceptions/misconceptions/alternative conceptions held by students about this topic. Do some research, don’t just guess. Also, stating students will not likely know about something is NOT a misconception.
4. The lesson plans should clearly show three-dimensional learning. You may chose the other details of your format, but include the following items:
 - Instructional Model: Show one of the instructional models from Chapter 7 of the textbook *Teaching for Conceptual Understanding in Science* in practice: 5E/learning cycle, Posner’s or Stepan’s Conceptual Change Model, or ADI.
 - 1-2 Objectives per lesson written using precise verbs
 - List of equipment/safety concerns
 - Vocabulary: List all vocabulary terms. Identify them as either “important to know” or “worth being familiar with”.
 - Strategies: Show at least 3 of the strategies from Chapter 8 of the textbook *Teaching for Conceptual Understanding in Science* in practice.
 - Clear description of activities that show students using one or more SEPs as they learn about science content (DCIs and CCs). Give enough detail that a substitute teacher could follow your plan. There should be explicit quotes of directions you would given and beginning questions you would ask.
5. List all references you use, articles or textbooks. Use proper APA referencing.

Scoring Guide

	1 point for each bullet point unless otherwise noted
Understanding by Design Elements (3 points total)	<ul style="list-style-type: none"> ○ Concepts listed by: Enduring Understandings/Big Ideas, Worth Knowing, Worth Being Familiar With ○ Essential question(s) are given. They are truly essential and not trivial. They are not easily answered without deep reflection. ○ Summative assessment is clearly the culminating activity of the unit. The lessons work toward it and are not just activities meant to keep students busy.
3 Dimensional Learning Overview (2 points total)	<ul style="list-style-type: none"> ○ At least one relevant DCI, SEP, and CC related to the content of the unit are state (1 point). ○ Explanation given as to how the unit engages students in learning about the DCI, SEP, and CC in an integrated fashion. Students should USE a SEP and not just talk about it. Students should reflect on how the CC relates to the DCI being investigated.
Anticipated Misconceptions (2 points total)	<ul style="list-style-type: none"> ○ For the unit overall, give at least two anticipated common preconceptions/misconceptions/alternative conceptions that students may hold about the concept you are teaching.
Instructional Model (2 points)	<ul style="list-style-type: none"> ○ The unit clearly and meaningfully uses one of the following models for at least a portion of the unit: 5E/7E, Stepan's CCM, Posner's CCM, ADI.
Behavioral Learning Objectives (2 points total)	<ul style="list-style-type: none"> ○ For each lesson, include at least one specific objective using an observable action verb. ○ In the unit overall, there is at least one objective clearly related to the selected DCI, CC, and SEP.
Material Preparation and Safety Precautions (1 point)	<ul style="list-style-type: none"> ○ List all materials needed for the lesson. (1/2 point) ○ List all safety precautions you will take for your lesson. Include things you tell students and actions you will take. (1/2 point)
Vocabulary (1 point)	<ul style="list-style-type: none"> ○ List of key vocabulary from the lesson given.
Instructional Strategies (3 points)	<ul style="list-style-type: none"> ○ Use of 3 strategies from Chapter 7 of the textbook. ○ Usage is appropriate to the purposes explained in the textbook.
Quality/Details (3 points)	<ul style="list-style-type: none"> ○ Your lessons show quality in preparation. The lessons should include enough detail step-by-step that any qualified teacher could teach the lessons. ○ Give exact quotes of directions and core questions that would be asked. ○ The concepts are taught in a manner which helps students understand the concept at a deep level, not just memorize facts or a definition.
References (1 point)	<ul style="list-style-type: none"> ○ Give proper APA citations and references for all materials not created by yourself.

The final grade of this task will be constructed by adding the scores of each individual component. This task counts for 25% of the student's semester grade.