

Course Syllabus: Science Curriculum & Instruction

COURSE INFORMATION

267 (A) Summer C & I
Location CERAS #300
July 5- July 7; July 10-14
Monday- Thursday 3:00 – 6:00
Course Website: <https://Canvas.stanford.edu>

INSTRUCTOR INFORMATION

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Only a small part of teaching is visible to a student or an observer. Teaching is a more complex process than it appears, and most people underestimate the amount of knowledge that good teaching requires. Being a good student does not always translate to being a good teacher because much of what the teacher was doing to help us learn is fundamentally invisible to the student; even in retrospect. For most people, teaching is thought to be about knowing the science and telling it in such an engaging way that the students will actually listen. If the students listen well, it is supposed, they will learn and understand. In contrast, over the course of this academic year you will develop understandings and skills for teaching in a number of fields. You will develop a theoretical framework for effective science teaching, and you will learn how to translate that framework into effective instructional decisions for the students with whom you are working. We will work back and forth between theory and practice as well as between two aspects of instruction: (1) individual aspects of teaching and (2) whole class aspects.

In ED 267-A the emphasis will be on learning to plan for students. This does not mean learning to lesson plan. Rather, this short course focuses on helping the teacher understand the content and its relationship to the students who are learning that content. Together we will develop the teaching decisions and a plan for a 'Science Learning Segment'. To make these planning decisions, you will use what you already know about science teaching, what you know about student learning, and what you know about science. We will continue to assess what you know and reflect upon new ideas as you rethink ideas about instruction and about students as learners. One of the primary learning goals for the summer course is for you construct a basic understanding of the how the science is best learned in school.

The ED 267-B (*Fall*) and ED 267-C (*Winter*) courses provide further education regarding the knowledge bases and work of successful teaching. These courses will intertwine the fundamental concepts established in this introductory course. In this way the sequence of courses differs from traditional science courses where you "finish" a topic and move on. Teaching students science will be our focus throughout, but you will assume more and more responsibility for the teaching and be held to more complex and higher standards.ZA

You will become a member of several professional communities, for example, your ED 267 community and the school where you will be placed to do field work. As a member of these communities you assume responsibility to your instructors and peers and to your mentor teacher and students. This professional responsibility is more substantial than the responsibility that you have had for your own learning as a student.

Learning Goals

The Science C&I program instructors have outlined several overarching goals for STEP graduates. Below we list these goals and explain ED-267 A's role in helping you attain them. We expect that you will, over the year, apply

with increasing insight and effectiveness what you have learned in ED 267 to your teaching decisions and that this new knowledge will be evident in your teaching practice, from planning, executing, and assessing to reflecting.

Working with and learning about students

Through your field experiences, you will have opportunities to work with many students, many of whom will be different from the student that you were. You will use techniques to find out who your students are, and how to plan specifically for their learning. Broadly speaking, we will work on understanding what makes individual students tick and identify routines and policies that support student engagement in learning, not just participation, in a well-managed classroom. Management and motivation will be issues that are addressed in several courses in STEP as well as the many aspects of teaching that affect management and the quality of a classroom learning community.

You will learn how to diagnose what your students seem to understand (i.e. “where they are at”) relative to the learning goals planned for them. You will assess what they are understanding vis-à-vis what is intended for them to learn, every time you teach and/or talk with students, in this way you will know better what they should do next to build the intended understandings and skills. In this way you will be using assessment **FOR** learning much more often than assessment **OF** learning.

Working with and learning more about the subject matter...the science

Knowing the content of science is not enough; effective teachers must understand science at a depth that allows them to make effective decisions regarding the best way to introduce students to scientific ideas and to help them construct a deep understanding of those ideas. We will consider what students are to learn and why they are to learn it. We will unpack the science to discover what is likely to be difficult for our students to understand and why. In this way, we will discover the most useful ways to scaffold their building of new understandings. In this unpacking we will examine the science conceptions, the language of science and the nature of the subject. We will be interested in not only WHAT science says, but also in why we are persuaded that it is useful and reliable knowledge. In doing this you may well find yourselves reorganizing your own understanding both of some science conceptions and of what science is, so that it is more useful for you as a teacher.

Working with and knowing more about the process of learning

One of the most important ideas to fuel the decisions teachers make is the notion of how people learn and remember. As a simple example, if someone believes that people learn best by listening, that person will probably construct plans for teaching that involve the teacher giving information and student paying attention and listening, and will focus on how to help students become better listeners. We will examine various aspects of learning theory from the field of cognitive science on how people learn and the evidence that has been built over the last thirty years plus in support of this theory. We will examine the implications for teachers and teaching, which have particular relevancy to science learning. This topic will surface in other courses in STEP; so, again, C&I is not your only opportunity to encounter and understand these ideas.

Working with, knowing more about, and gaining skills in the work that teachers do

Often conversations about teaching revolve around one’s “teaching style” as if effective teaching practice is an individual matter, and a new teacher’s job is to seek his/her own “teaching style”. While empathetic to this view, and persuaded that our individuality counts in teaching, we want you to learn that deep foundations of successful teaching practice are broad, grounded and recognized. You will become familiar with the New Generation Science Standards and learn to use them both to assess, and to push, your own progress as a teacher over the year. We will use the basic course texts “*Understanding by Design*” by Wiggins and McTighe to understand who to plan for, how to plan, how to enact, how and why to gather data about what the students are understanding in class, how to reflect and modify plans and ideas, and how to build a classroom community. Again, C&I is not the only course where you will encounter these ideas.

The In-School Experience:

Your in-school experiences in Stanford University’s Teacher Education Program (S.T.E.P.) are always directly linked to your Practicum course as opposed to the Curriculum and Instruction class. The summer experience with the middle school children is no exception. In this first experience, however, you are not “student teaching” in the

traditional sense. With several of you in the same room, with the same students, the idea is for you to learn how to work alongside students so they are able to tell you what they seem to understand. We want you to find out what they know about the topic at hand, so you can make sound decisions about what you can do to help them build upon their current understanding. We want you to use every opportunity to speak with individual students to discover what prior understanding, experiences, interests, dreams and fears, and social issues they are bringing with them to science class. You will be encouraged to seek their strengths, as well as what they need to gain from science class. In short, we want you to discover who they are as individuals.

Two assignments link our C&I course with this summer school experience by asking you to explore the learners. You should speak with the science teachers and **ask for 2 15 minute** learning segments to gather data about your students on Thursday July 3, 2016. Overall, this C & I course seeks to provide you an introduction to the intellectual practice of teaching.

SUMMER C & I

The summer session of curriculum and instruction (ED 267A) will provide an opportunity for participants to develop a fundamental understanding of the basics of instructional planning. This brief course will provide an overview of ideas that we will revisit over the course of the academic year. We will work towards knowing how to plan and implement a component of teaching. This means:

- (a) Knowing what to teach, and knowing what goals are worthwhile and appropriate for students;
- (b) Creating mechanisms so students in the end can demonstrate they have learned what you have planned for them to learn;
- (c) Gathering data about your students' strengths, backgrounds, and interests to support their learning.
- (d) Creating instructional tasks to engage students in learning.

This quarter you will take what you already know about how to teach and consider it in the context of the students you are coming to know. In addition you will develop tools that will help you adapt to any teaching situation you may find yourselves in. These tools include:

1. The development of an understanding of current models for planning, assessing teaching and instructional strategy.
2. The development of an understanding of how to use continuous assessment to stay in touch with your students.
3. The development of an understanding of how to come to know your students.

The models for planning will help you organize larger pieces of instruction in effective ways. Taking the time to know your students is a necessary element in your development as a teacher.

**SUMMER C & I:
 ASSIGNMENTS, DUE Dates, GRADING, AND EXPECTATIONS**

The summer session of curriculum and instruction (ED 267A) will provide an opportunity for participants to begin to develop an understanding of the basics of instructional planning. The models for planning will help you organize larger pieces of instruction in effective ways. Taking the time both to know your students, and to restructure your own science knowledge, are necessary elements in your development as a teacher.

Course Readings:

1. Lee (1996). Literacy Skills in Science Learning Among Linguistically Diverse Students. *Science Education*, Vol. 80, No. 6, pp. 651-671.
2. Lemke, J. (1991): *Talking Science: Chapter 2: A Lot of Heat and Not Much Light* (pp. 28-43)
3. Wellington, J. & Osborne, J. (2001) *Language and Literacy in Science Education*. London, UK: Open University Press
4. Bransford, J. (2000) *How People Learn* (Chp 2.) L Washington, DC: National Academies Press
5. Brown, J.; Collins, A.; & Duguid, P. (1989) *Situated Cognition and the culture of learning*. *Educational Researchers*, 18, 32-41.
6. Glynn & Muth (1994) *Reading to Learn Strategies*. *Journal of Research in Science Education*, 31, 1057-1073. (*this is available in the session 4 pack below*)
7. Wiggan & McTighe (2005) [**Chp. 1, 2, 4, 5& 7**] *Understanding by Design*. Saddle River, NY: Pearson Press.
8. DeBoer, G. (1990) *The History of Ideas in Science Education* [Chp. 1-3].

ASSIGNMENT DUE DATES

#	ASSIGNMENTS	DUE DATE	ASSESSMENT	% OF GRADE
1	Response to Course Materials	TH. 7/6/17 2:15 PM	CREDIT/NO CREDIT	10 %
2	20-Second Story	F. 7/7/17 2:15 PM	CREDIT/NO CREDIT	10 %
3	Pre-Assessment: Design, Deliver & Analyze Data	T. 7/11/17 2:15 PM	CREDIT/NO CREDIT	10%
4	Instruct & Analyze:	T. TBD <i>24 hours after your assigned teaching</i>	CREDIT/NO CREDIT	5 %
5	Practicum Tasks: Reading Comprehension & Graphic Analysis	W. 7/12/17 2:15 PM	CREDIT/NO CREDIT	5 %
6	Personal Science Text	TH. 7/13/17 2:15 PM	CREDIT/NO CREDIT	15%
7	Letter Writing Task	FR. 7/14/17 2:15 PM	CREDIT/NO CREDIT	10%
8	Final Product Planning	SAT 7/15/16 10:00AM	RUBRIC	35%

*** all assignments will be delivered by uploading them to Canvas prior to the start of class.

DESCRIPTION OF INDIVIDUAL ASSIGNMENTS

ASSIGNMENT # 1: A WRITTEN RESPONSE TO THE ED 267A SYLLABUS

After the first class, you are asked to write a two-page (double-spaced) paper that provides a response to the course materials. In this response, you might provide your general reflections on the course design and themes. Please include any questions that may emerge regarding the course assignments. You may consider asking questions about what you may want further information about or are not crystal clear about regarding the expectations of the course. This might include your comments regarding what feels satisfying or disconcerting, or the extent to which it works. Additionally, you may note where your expectations of what you anticipated learning in C & I will be met or not. This assignment should be uploaded to Canvas (Canvas.stanford.edu) by 2:15 Tuesday July 1, 2016. If you have any trouble, please submit it via e-mail to both Bryan and Catherine at: brbrown@stanford.edu & Stephanie Rafanelli Mstephraf@stanford.edu.

Email both instructors a copy of your assignment submissions should Canvas fail to operate appropriately.

DUE DATE: This assignment is due on Canvas by 2:15 on **Thursday July 6, 2017**
GRADE: C/NC -- 10%

ASSIGNMENT # 2: A 20-SECOND STORY + A PODCAST VERSION OF IT

You will write a 20-second story for your learning segment. You will create a videotape of you narrating this 20-Second story that will be hosted on any public video share site (e.g. YouTube or Vimeo). You can submit this video by copying a link to your video onto a word document. We would also like the copy of your text version of your 20-Second story, so please upload it to the Canvas system as well. Simply upload that document onto the Canvas assignments folder. Any publically available streaming service will work including sites like you Tube, Vimeo. We prefer links to the video on a website. If this proves to be too difficult, please bring the video with you on a memory stick. Additionally, you will have 10 people visit the site **and comment** on your 20-second story using comment sections on YouTube or Vimeo. For those of you who cannot upload the video, we will upload the videos after the class on Thursday. We will use these responses as a component of our class in the days after the assignment is submitted.

DUE DATE: The video is due on Canvas by 2:15 on **Friday July 7, 2017**.
GRADE: C/NC, 10%

ASSIGNMENT # 3 : PRE-ASSESSMENT - DESIGN, DELIVER, & ANALYZE DATA

DESIGN & DELIVER

You will develop a pre-assessment item designed to provide valuable information about 'who' your students at Columbia Middle School are. This pre-assessment will be designed to identify two types of things about your students:

Background Information: Who are your students as people outside school, what are their strengths, loves, hopes, dreams, fears, accomplishments, etc.?

Content Information: What do your students know about the subject that will help you improve your teaching.

Candidates should talk with their mentor (*on Day Two of summer school*) about **scheduling about 15** minutes of time to administer this pre-assessment.

ANALYZING THE RESULTS

After you have developed the pre-assessment, you will use it with your students during the first week of our course (*please negotiate the exact time & date with your cooperating teacher*). These instruments are designed to

provide valuable information about individual students in your Middle School. In order to make it useful, however, you will have to collect their responses both for analysis and for use. This assignment it to collect the following materials and analyze them:

- The pre-assessment “instrument” as amended and given at school,
- The set of student responses you collected (copies or originals are acceptable)
- An analysis of what you have learned from reviewing the students’ responses to the pre-assessment. The analysis will be completed using the course Analysis form. This form includes questions about:
 - i. An overview of the most common types of responses
 - ii. An indication of where these types of response might come from
 - iii. A description of how you can use the variety of responses provided by students as a resource to support their learning.
 - iv. A description of how you might be able to use the information you have gained to connect your students to the planned curriculum, and help them to succeed in the class.
 - v. What strengths do you note in your students’ responses that could be used as a resource for your teaching?

Upon completion please submit:

- a. The completed summary form (via Canvas).
- b. Copies of students’ responses (hand in during class),
- c. A copy of the assessment you designed.

DUE DATE: This assessment is due on Canvas by 2:15 on **Tuesday July 11, 2017.**

GRADE: C/NC -- 10%

ASSIGNMENT #4 A: INSTRUCT AND ANALYZE - INSTRUCT

Instruct

Although effective instruction involves more than standing in front of students and telling them what you would like them to know, direct instruction does have a place in educating young people. This assignment involves an opportunity for you to teach your C&I Peers. In groups (TBD), you will be assigned to teach the big ideas from a variety of literature. After reading your assigned chapters, you will work with your group to design a 10-minute learning segment to teach your C&I classmates about the key ideas from the chapters you read. We will want to know that you understood the key issues in the reading, and you will want to know the extent to which your peers understood those ideas. We will videotape this instructional episode for you to use for an analysis activity. Each member of your group should play an equal role in the design and execution of this activity.

Group	Assigned Readings to Teach
1	Wiggin & McTighe (2005) [Chp. 1]Understanding by Design. Saddle River, NY: Pearson Press. Lee. O. (1996). Lee (1996). Literacy Skills in Science Learning Among Linguistically Diverse Students. Science Education, Vol. 80, No. 6, pp. 651-671.
2	Wiggin & McTighe (2005) [Chp. 2]Understanding by Design. Saddle River Lemke, J. (1991): Talking Science: Chapter 2: A Lot of Heat and Not Much Light (pp. 28-43)
3	Wiggin & McTighe (2005) [Chp. 4]Understanding by Design. Saddle River Wellington, J. & Osborne, J. (2001) <i>Language and Literacy in Science Education</i> . London, UK: Open University Press
	Wiggin & McTighe (2005) [Chp. 5]Understanding by Design. Saddle River

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4	Brown, J.; Collins, A.; & Duguid, P. (1989) Situated Cognition and the culture of learning. <i>Educational Researchers</i> , 18, 32-41.
5	Wiggin & McTighe (2005) [Chp. 6] Understanding by Design. Saddle River
6	Wiggin & McTighe (2005) [Chp. 7] Understanding by Design. Saddle River
7	DeBoer, G. (1990) This History of Ideas in Science Education [Chp. 1-3]

You will use the analysis form on our course website to analyze the results of your teaching experience.

Group	Assigned Readings to Teach	Teaching Date	Assignment #4 Submit Date
1	<ul style="list-style-type: none"> Wiggin & McTighe (2005) [Chp. 1] Understanding by Design. Saddle River, NY: Pearson Press. Lee, O. (1996). Lee (1996). Literacy Skills in Science Learning Among Linguistically Diverse Students. <i>Science Education</i>, Vol. 80, No. 6, pp. 651-671. 	Monday July 10, 2017	Tuesday July 11, 2017
2	<ul style="list-style-type: none"> Wiggin & McTighe (2005) [Chp. 2] Understanding by Design. Saddle River Lemke, J. (1991): Talking Science: Chapter 2: A Lot of Heat and Not Much Light (pp. 28-43) 	Tuesday July 1, 2017	Wednesday July 12, 2017
3	<ul style="list-style-type: none"> Wiggin & McTighe (2005) [Chp. 4] Understanding by Design. Saddle River Wellington, J. & Osborne, J. (2001) <i>Language and Literacy in Science Education</i>. London, UK: Open University Press 		
4	<ul style="list-style-type: none"> Wiggin & McTighe (2005) [Chp. 5] Understanding by Design. Saddle River Brown, J.; Collins, A.; & Duguid, P. (1989) Situated Cognition and the culture of learning. <i>Educational Researchers</i>, 18, 32-41. 	Wednesday July 12, 2017	Thursday July 13, 2017
5	<ul style="list-style-type: none"> Wiggin & McTighe (2005) [Chp. 6] Understanding by Design. Saddle River 		
6	<ul style="list-style-type: none"> Wiggin & McTighe (2005) [Chp. 7] Understanding by Design. Saddle River 	Thursday July 13, 2017	Friday July 13, 2017

DUE DATES: Each of the groups will teach their lesson, in chronological order, **on the day after you teach your section by 3pm.**

GRADE: C/NC. 10% Points will be assigned for completion of both tasks.

ASSIGNMENT #5: PRACTICUM TASKS: READING COMPREHENSION & GRAPHIC ANALYSIS

1. Reading Comprehension

Another critical component of students' learning involves their ability to read and comprehend science text. This is a critical skill that all of your students will need to master. In order to help them learn this skill, you will engage them in a **5 to 15 minute** activity that is designed to help students improve their reading comprehension. You will create handouts that give students an opportunity to complete 1 of the following two tasks:

- a. *Reading Comprehension Task A: “What they are Really Saying is...”*
In this activity to will assign a short textbook reading passage for your students to read. After they read the text, you will have them translate the science text into short paragraphs written in their own language. To write their 1 paragraph interpretation of the text, students will use the sentence starter “What they are ‘really’ saying....”
- b. *Reading Comprehension Task B: Change the Audience*
In this activity you will assign a short textbook reading passage for your students to read. After they read the text, you will have them create a short written description of what they read. However they will re-write their paragraph in a variety of alternative literate forms. Student can choose to re-write the text in the following forms:
 - i. A Song
 - ii. A Poem
 - iii. A News Article
 - iv. A Magazine Article

You group will administer 1 activity per class, but each individual will complete their own analysis.

2. Graphic Analysis

In this activity you will prepare a task that is designed to help students develop an improved understanding of graphic representations. This activity will be used as a model for your future instruction regarding students’ graphic analysis skills. This activity will include your production of two instructional materials:

- (a) *Create a Graphic Analysis Toolbox:* This is a 1 page list of analysis skills your students will use analyze and critique data representations. This toolbox is a document that students can refer to during analysis (e.g. reminding students to read the key of a diagram).
- (b) *Create an Activity:* You will create a 5 to 10 minute activity that will provide students with an opportunity to analyze a chart or diagram of some type. This activity does not need to use all of the skills of the toolbox, but the skills described on the toolbox should provide sufficient knowledge for students to successfully complete the analysis task.

DUE DATES: Each of the groups will teach their lesson, in chronological order, on **Wednesday July 12, 2017**.

GRADE: C/NC. 10% Points will be assigned for completion of both tasks.

***** Each of you is responsible to complete one of the above activities. You will analyze the data collectively and submit individual analyses. Each individual will submit an analysis of the results using the analysis form provided on Canvas. Discuss this assignment with your teacher to establish a time to conduct the task.

ASSIGNMENT #6: PERSONAL SCIENCE TEXT

Although textbooks provide the primary source of science text-based content for students, teachers often rely on a variety of resources to gain a richer understanding of the science content being taught. Teachers transform their content knowledge for teaching, extending it to incorporate pedagogical content knowledge. As an exercise to transform your science content understanding in this way, you will write a “Personal Science Text.” This text is a written description of all of the science concepts and ideas that are associated with the concept you are teaching. Ideally, this text could serve as the primary source of academic content for the teacher. It will include all of the science ideas in a coherent and detailed fashion that will ultimately serve as a resource for the teacher as they plan to teach the content.

DUE DATES: This is due on Canvas by 2:15pm on **Thursday July 13, 2017**.

GRADE: C/NC. 15% Points will be assigned for completion.

ASSIGNMENT # 7: LETTER WRITING TASK

We will read 3 additional articles along with the reading we will do for the Instruct and Analysis task. Those readings include:

1. Atkin, M. (1990). Teach Sciences for Science's Sake; For Global Competitiveness, Try Technology.
2. Olson, S. (1998, Sept. 30). Science Friction. Education Weekly.
3. Manzo, K. (1997) Scientists Protest Exclusion From Standards Writing. Education Weekly. November 26, 1997.

Since we recently moved towards a new model for content standards The New Generation Science Standards, you will use the content of these articles to help you write a short, crisp letter to State Superintendent of School Tom Torlakson. In that letter you will make specific recommendations about the following: (a) Who should decide what science gets taught in schools? (b) What concepts and key ideas should be taught in high schools, using one high school science course, as an example? (c) Why every California citizen-to-be should learn science?, and (d) How your suggestions will help the students and the State of California. This letter should be between 2-4 pages double-spaced and should be directly written to the State Superintendent.

DUE DATES: This is due on Canvas by 2:15pm on **Friday July 14, 2017**.

GRADE: C/NC. 10% Points will be assigned for completion of both tasks.

ASSIGNMENT #8 FINAL PRODUCT OF THE COURSE:

We will together construct the first two parts of a plan for a learning segment. This year, we will split the class into two groups. Both groups will be preparing for what would be learning segments that would span several lessons. One group will focus on teaching for some typical ninth graders about "Osmosis". The other group will be teaching the concept of "Mitosis." We chose 'Osmosis' as a phenomenon that is connected to all three science disciplines, biology, chemistry and physics. "Mitosis" is fundamentally biological, but will provide a breadth and wealth of planning opportunities. We will be using the principles of "Backward Planning" as described in *Understanding by Design*, the course text. The initial parts of a plan for a learning segment will be the start of a template for how you will develop lesson plans and unit plans in the future. You will use these methods as you plan for your students from here on.

You will work on drafts of the pieces of this assignment in class, using Catherine & I as resources, as well as at home. The pieces of the plan that you make will grow and develop to a final copy as you apply both feedback from us.

(note) We expect and intend you to come and talk to us about it, and we also expect that you will need to REVISE your work from feedback that you receive from us as the course goes along. We hold both these expectations if you are to push and promote your own progress in becoming a teacher. These expectations, then, are to support you in that progress.

PART 1: WHAT YOU WANT THE STUDENTS TO COME TO UNDERSTAND

To structure what you want the students to come to understand about osmosis and mitosis you will complete 4 pieces:

1. Some **results** from the use of the **pre-assessment probe**.
Even if the results are not about content, you can use information about their interests and background to plan a better lesson.
2. The **Rationales** for teaching this topic and why high school students might want to learn it.
3. A written "**20 second story**" about the concept of "Osmosis"

4. A written **Science Text for Teachers**
5. Your **Goals for Understanding** written in both scientific vocabulary and ordinary, everyday language. These goals will be a set of small paragraphs that represent an unfolding of understanding about “Osmosis”, in which the results of the pre-assessment are addressed, and that include some arguments from evidence that support why we trust the explanation of science for some real world phenomenon.

Details about each of these components of the plan are provided below.

PART 2: WHAT THE STUDENTS WILL DO TO DEMONSTRATE AND ARTICULATE THAT THEY DO HAVE THAT UNDERSTANDING IN THE END.

To decide what they will do to demonstrate and articulate that they have, in fact, built the understanding you intended in the end, you will create two pieces of work:

5. A summative assessment task that students would do, in class, to demonstrate and articulate their understandings of what you intended for them.
6. A rubric method of assessing the evidence of understanding provided by the completion of that summative assessment task.

DUE DATE: This completed assignment with all parts and versions is due on Canvas no later than Sat. July 15, 2017 at 10:00 am.

GRADE: This project earns 35% of the quarter’s grade. A 7-item rubric is provided, with the expectation and intention that you will reach levels 2 or 3 on each item. 35% means that your work reached that level of achievement. Any Level One rating will cause a 5.5% reduction.

Calendar

SUNDA Y	MONDA Y	TUESDA Y	WEDNESDA Y	THURSDA Y	FRIDA Y	SATURDA Y
2 No Class	3 No Class	4 No Class	5 Session 1	6 Session 2 Assignment #1: Response to Syllabus	7 Session 3 Assignment #2: 20 Second Story	8 No Class

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SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
9 No Class	10 Session 4	11 Day 6 Session 5 Assignment #3: Pre-Assessment Design, Deliver, & Analyze Assignment 4: Instruct & Analyze (Group 1)	12 Day 7 Session 6 Assignment #5: Practicum Task Assignment 4: Instruct & Analyze (Group 2 & 3)	13 Session 7 Assignment #6: Personal Science Text Assignment 4: Instruct & Analyze (Group 4 & 5)	14 Session 8 Assignment #7: Letter Writing Task Assignment 4: Instruct & Analyze (Group 6)	15 No Class Assignment #8: Final Planning Product

IMPORTANT REFERENCES

DESCRIPTION	WEB LINK
The Next Generation Science Education Standards	http://www.nextgenscience.org/next-generation-science-standards
The National Science Education Standards	http://www.nap.edu/readingroom/books/nse/
Inquiry and the National Science Education Standards: A Guide for Teaching and Learning.	http://www.nap.edu/books/0309064767/html/
Knowing What Students Know: The Science and Design of Educational Assessment	http://www.nap.edu/books/0309072727/html/
Virtual Labs & Simulations	http://www.hazelwood.k12.mo.us/~grichert/sciweb/applets.html
Lesson Plan Exchanges	http://www.teachers.net/cgi-bin/lessons/sort.cgi?searchterm=Science
How Students Learn: Science in the classroom	http://www.nap.edu/catalog/11102.html

