California State University San Marcos
College of Education
EDMI 545 – Middle School Science Education

General Information:

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Office Hours:	After class

Other times are also available by appointment so please feel free to call or e-mail me to set up a convenient time to meet.

Required Textbooks:
Abruscato, J. (2000) Teaching Children Science. A discovery approach. New York, Pearson Allyn & Bacon.

Koballa, R. T., & Tippins, J. D. (2000). Cases in middle and secondary science education: The promise and dilemmas, (2nd Ed.) Upper Saddle River, NJ: Pearson Merrill Prentice Hall.

Successful Inclusive Teaching, By Joyce S. Choate

Other handouts will be given in class or through WebCT (WebCT: http://courses.csusm.edu/)

Other Good Books:
Science Matters: Achieving Scientific Literacy, By Robert M. Hazen

Great Explorations in Math & Science (G.E.M.S.) Booklets over 36 to choose from
Any Selection will match a CA Science Standard http://www.lhs.berkeley.edu/GEMS/

A Year of Hands-on Science. (1996). By Lynne Kepler. New York: Scholastic.

200 Gooey, Slippery, Slimy, Weird & Fun Experiments. (1993). By Janice VanCleave.
New York: John Wiley

These are in the bookstore, but there are many excellent hands-on science books. Look in bookstores, museums, teacher stores, even grocery stores!

COE MISSION STATEMENT

The mission of the College of Education Community is to collaboratively transform public education by preparing thoughtful educators and advancing professional practices. We are committed to diversity, educational equity, and social justice, exemplified through reflective teaching, life-long learning, innovative research, and on-going service. Our practices demonstrate a commitment to student-centered education, diversity, collaboration, and professionalism and shared governance.

COURSE DESCRIPTION

This course is designed to provide a comprehensive overview of the objectives, skills, concepts, experiments, materials, and methods necessary to teach science to middle school children. A series of group activities will provide you with first-hand experiences in these areas. This course focuses on instructional methods, techniques, materials, lesson planning, curriculum development, organization and assessment in science. The integration of curricular areas is addressed. Methods of cross-cultural language and academic development will be integrated in to the course.

COURSE OBJECTIVES

By the end of this course, students should be able to

1. Demonstrate proficiency with inquiry skills of observing, measuring, inferring, classifying, predicting, verifying predictions, hypothesizing, isolating variables, interpreting data, and experimenting.
2. Identify exemplary materials (curriculum kits, science programs, textbooks, equipment, technology, ancillary materials) appropriate for elementary and middle school children.
3. Demonstrate knowledge and understanding of the California Science Framework, the California Science Content Standards, and the National Science Education Standards.
4. Demonstrate an understanding of the physical, earth and life science concepts included in the K-8 California Science Content Standards, and how to design lessons to teach the concepts.
5. Use the Learning Cycle model of instruction to teach science in a contemporary manner.
6 Use technology in elementary and middle school science teaching.
7. Demonstrate confidence in leading and performing investigations designed to teach science concepts, science process skills, and scientific attitudes. .
8. Use alternative methods of assessment to evaluate student learning of science concepts and processes.
9. Practice strategies to include all students in science (linguistically and culturally diverse, students with disabilities and other students with special needs).

INFUSED COMPETENCIES

Special Education

Consistent with the intent to offer a seamless teaching credential in the College of Education, this course will demonstrate the collaborative infusion of special education competencies that reflect inclusive educational practices.

Technology

This course infuses technology competencies to prepare our candidates to use technologies, emphasizing their use in both teaching practice and student learning.

Authorization to Teach English Learners

This credential program has been specifically designed to prepare teachers for the diversity of languages often encountered in California public school classrooms. The authorization to teach English learners is met through the infusion of content and experiences within the credential program, as well as additional coursework. Students successfully completing this program receive a credential with authorization to teach English learners.

Students with Disabilities Requiring Reasonable Accommodations

Students are approved for services through the Disabled Student Services Office (DSS). This office is located in Craven Hall 5205, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909. Students authorized by DSS to receive reasonable accommodations should meet with their instructor during office hours or, in order to ensure confidentiality, in a more private setting.

RESOURCES

JOURNALS

Science	Science Scope	Physics Teacher
Science and Children	The Science Teacher	Journal of Chemical Education
Science Education	School Science and Math	Innovations in Science & Technology Education
Science News	American Biology Teacher	Journal of Research in Science Teaching

EISENHOWER NATIONAL CLEARINGHOUSE http://enc.org

The Eisenhower National Clearinghouse (ENC) has recently launched an all-new web site, ENC Online, at http://enc.org. ENC, which was established by the U.S. Department of Education, provides K-12 math and science educators with information about teaching materials, innovative ideas, and professional development.

The content on ENC Online has been organized into four major categories. They are Curriculum Resources, Web Links, Professional Resources, and Topics. Through Curriculum Resources, teachers can locate teaching or professional development materials using subject words, grade level, cost, and type of material to meet their specific needs.

Teachers have said that the Digital Dozen, a monthly selection of exemplary math and science web sites, is one of their favorite features on the site. It is now found in the Web Links area. (Teacher can now also choose to have Digital

Dozen delivered to their email boxes when registering with ENC.) Web Links also includes links to sites offering lesson plans, arranged by math or science topics.

The Professional Resources area is intended to become a part of a teacher's professional support system. A Timesavers section found within the Professional Resources area offers a collection of the most popular professional resources in one place for quick linking and use. Standards and state frameworks are also found under Professional Resources, as are federally funded resources, professional development strategies, and research articles.

ENC has always created projects and publications on relevant topics for teachers. The Topics area arranges hundreds of articles, teacher interviews, and selected curriculum resources and web sites thematically. Key education issues addressed in the Topics area include inquiry and problem solving, integrating educational technology, equity, and assessment. These areas include the materials developed for ENC Focus, our quarterly magazine for math and science educators.

COURSE REQUIREMENTS

COE Attendance Policy

Due to the dynamic and interactive nature of course in the COE, all students are expected to attend all classes and participate actively. At a minimum, students must attend more than 80% of class time, or s/he may not receive a passing grade for the course at the discretion of the instructor.

My Attendance Policy

If two class sessions are missed, or if the student is late (or leaves early) more than three sessions, s/he cannot receive a grade of "A". If three class sessions are missed, the highest possible grade that can be earned is a "C+". If extenuating circumstances occur, the student should contact the instructor as soon as possible to make appropriate arrangements.

Absences do not change assignment due dates. Late assignments will receive a 10% reduction in points for each day late. After one week, late assignments will receive no credit. If your printer breaks, use a CSUSM computer lab to print out your work.

ASSIGNMENT DESCRIPTIONS

1. Professionalism – 10%

Students will engage in active learning each class session, and will be expected to actively participate, collaborate, and demonstrate professionalism at all times. The following questions will be used as a rubric to measure your professional conduct.

- Do you participate in class discussions productively, sharing your knowledge and understandings?
- Do you interact productively with your peers, taking on a variety of roles (leader, follower, etc.)?
- Do you contribute appropriately to group work—do you "do your share"?
- Are you able to accept others' opinions?
- Are you supportive of others' ideas?
- Do you support your peers during their presentations?
- Can you monitor and adjust your participation to allow for others' ideas as well as your own to be heard?
- Do you show a positive attitude and disposition towards teaching all students?
- Do you exhibit professional behavior at all times?
- Do you attend each and every class, arrive on time and well prepared in all aspects, and do not ever leave early?
- Do you give close attention to each activity and speaker, and never whisper or do other things while there is a speaker?

2. DISCUSSION QUESTIONS: (Based on Readings from Cases in Middle & Secondary Science Education) - 10%

Each student will be required to submit a discussion question for the class based on the readings of the assigned chapters from the book: *Cases in Middle and Secondary Science Education.*. The questions should be submitted to the instructor via email by 8.00 the night before the class for which the readings are assigned. The discussion question should be an open-ended question that provides opportunity for discussion and calls for diverse responses. In addition it should reflect that you read the assigned readings. The dates when the questions are due are reflected in the course schedule. Examples of such questions will be available on WebCT.

3. READING RESPONSES (15%)

Students will be assigned a minimum of 3 chapters of science content readings and should present their responses to chapters in one of the following forms:
a. A Big Ideas paper explaining the key science concepts.
b. A visual or symbolic representation of the key science concepts
c. A graphic organizer that demonstrates the key science concepts and their relationships to one another (samples will be provided in class)
The responses should be 1-2 pages. They will be checked off for completion each due date, noted in the course outline. The reading responses will be sequentially due at the three different times shown in the syllabus.

4. MIDDLE LEVEL SCIENCE INSTRUCTION CASE STUDY - 25%

In this assignment you will develop a case study of science instruction. It will consist of four parts:

I. Your observations of the classroom.
II. Teacher Interview.
III. Student Interviews.
IV. An analysis of your interviews and observations.

When writing up the case study, **do not include the teachers, or a student names**, but do identify the grade level of the students. Report all answers to questions in the following format; write out the question then the response, either your observations or answers to questions of the six students and teacher.

Ask a science teacher if you can observe 2-3 science lessons in his or her class. Then answer the following:

I. Classroom Observation Questions

1) How would you define science instruction in this classroom?
2) What are the characteristics of science instruction?
3) What do the students do during science instruction?
4) What materials are used?
5) How often do the students engage in hands-on activities?
6) How is the classroom organized for science instruction?
7) What science materials are in the classroom?
8) Do you see writing infused within the science lessons? If so, what are some examples?
9) Are there students in the class who are learning English? What differences and similarities exist for students who are learning English?

Feel free to add more descriptive information in regard to science instruction.

II. Teacher Interview Questions

After you have observed the class interview the teacher in person (do not give them the questions to answer), a personal interview allows you to ask follow up questions to clarify answers.

1) How do students learn science?
2) How do you organize instruction so that students learn concepts related to the California science standards?
3) What are the different activities that you do during science instruction?
4) How do you group the students during science activities?
5) How often do the students participate in hands-on science activities?
6) Do you integrate writing activities into science lessons? What are some examples?
7) What is the easiest thing about teaching science?
8) What is the most difficult thing about teaching science?
9) If you could design the ideal science program, what would be the characteristics of the program?
10) How do you organize instruction for science in two languages or in a language other than English? What challenges does this present for you?

11) How do you adapt instruction for students with special needs? Are their particular techniques or issues related to science teaching and students with special needs?

Feel free to include other questions during the interview. If possible, take a portable tape recorder to record the responses for later transcription, as it is easy to miss some things when you are taking notes. Be sure to ask the teacher if she or he minds if you use the tape recorder, and do not use it if the teacher is hesitant.

III. Student Survey

Ask the teacher if you can hand out the Science Survey to **six** students in the class. Do **not** have the students put their names on the surveys. Feel free to include other questions on the survey, but do not make it too long for the student to answer. To report out the data, write the question then **six students responses** to the question.

Student Survey Questions

Please answer the following questions.

Grade level: _____ Are you a Boy ❒ Girl ❒ ?

What language(s) do you speak? English ❒ Spanish ❒ Other ❒

1) What happens during science in your class? How does your teacher teach you science?
2) How often do you do hands-on science activities in class?
3) What sorts of science activities do you do in class?
4) Do you work in-groups to do science activities? If so, what do you do in the groups? Does each person have a job to do?
5) Do you have science materials to use during science activities? What sorts of materials do you use?
6) What are some of the science topics you have studied this year in science class?
7) Do you like science time? What do you like best about it?
8) Are you a good student in science? What helps you learn best?

IV. An analysis of your interviews and observations.

Examine the three sets of data (your responses, those of the teacher and students) for matches and mismatches. It is your duty that to ensure that your analysis demonstrates your understanding of the concepts discussed in class and how they come into play (or fail to) in classroom situations. You might want to make a grid to organize the data:

Data Analysis Chart

	Me	Teacher	Students
How is science taught?			
How does the teacher teach science?			
How often do the students participate in hands-on science activities?			
What Adaptations and Accommodations are present			

Use whatever categories or questions that seems relevant in the left-hand column in order that you may compare and contrast the three points of view regarding science instruction

Analysis of Information—The paper you will write

Using the data you have collected and the match/mismatch chart and type a 2-3-page case study of the science instruction. Compare your observations, the teacher interview and student responses and report out the matches or mismatches between groups. Turn in your case study along with six surveys, teacher interview and your classroom observations. Include a kudos or recommendation section. Describe good science teaching practices you observed and make recommendations that you think could help the teacher improve his or her science instruction.

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5. LEADERSHIP OF HANDS-ON LEARNING CYCLE SCIENCE LESSON

You will work in pairs to lead science lessons based on the Learning Cycle Model of Instruction. You will teach these to your classmates. Each person will be allocated a maximum of thirty minutes of class time to teach his or her lesson. Use activities from the textbook, Internet sites or other science resources. The class will not role-play middle level students, but will learn the science content and how to teach the lesson. Treat your classmates as teachers, not middle level students.

Each group will be assigned a different chapter from the textbook. This will determine the grade level and California Science Standard your lessons will cover. The group will work together reviewing each other's lessons, sharing resources, and making sure each member presents a different lesson. Collaboration between group members is essential to divide up the work, and support each other.

Your Hands-On Learning Cycle Science Lesson will have two parts.
Part I. Lesson presentation
Each person will present a Learning Cycle Lesson, which includes a PowerPoint presentation during the Concept Invention phase.
Part II The group will share, web sites and/or other resources teachers would find helpful in presenting the standard.

Part I. Each person will present one lesson that follows the Learning Cycle lesson format and will emphasize a science concept related to the California Science Standards. The lesson will have at least one hands-on activity, it is NOT reading or completing worksheets (though they may require students to read something or complete lab observation sheets). You should take the activities "off of paper" and require students to use science process skills with science manipulatives. Each hands-on activity is required to have predictions made and recorded before beginning the activity. And a data sheet where students can record observations or data collected from the activity. Try to have students make quantitative measurements (length-meters, weight-grams, time), remember to use metric units of measurement.

The Learning Cycle lesson format

I. Grade Level and California Science Standard the lesson is addressing
II. Objectives (3-4) (use behavioral objectives with action verbs—i.e., The students will ___)
III. Background Information, what information would a teacher need to teach the lesson, if they didn't have any science background on the particular concept.
IV. Materials needed for the lesson
V. Exploration Phase, describe the procedure in detail for conducting the exploration phase of the lesson. What will the teacher and students do, what are possible questions the students will have? (see rubric for details)
VI. Concept Invention Phase Describe in detail how to teach the concept. (see rubric for details) Include the use of your PowerPoint here.
VII. Concept Application Phase how will you specifically address this section. If at all possible include another hands on activity. (see rubric for details)

Resources from the Internet are a required part of Concept Invention Phase. Images, movies, simulations, sounds, and other exciting resource are available free over the Internet. Students are responsible for emailing the instructor a PowerPoint presentation for the Concept Invention Phase part of your lesson. The PowerPoint can only be emailed or brought in on a CD. **The instructor's computer does not have a zip or 3.5 inch disk drives**. Keep the PowerPoint relatively simple; don't add bells and whistles that take away from the content.

Be sure you understand the concepts you are teaching, and that you can explain them. The lesson should be developmentally appropriate for middle level and should follow the NSTA Safety Guidelines.
Make sure that you include the three stages of the Learning Cycle and science content background is addressed.

Part II. Share a description of website used in developing the lessons in your handout to the class. Share any other pertinent information a teacher would need to present the lessons.

Each group will prepare a handout that includes the lesson that each person presented, a description of websites used. Bring copies of the activity (for everyone) with (a) group members' names at the top

6. Science Lesson Reflection – 5%

Use your lesson from Leadership of Hands-on Science lesson. After presenting it to your classmates and/or children modify the lesson to reflect changes you made to improve it. Include a reflection on how the lesson went and why you think the changes are necessary. One page only.

7. Integrated Teaching Unit- 10%

You will be developing a science/social studies integrated unit. The unit will reflect a science concept and a number of lessons necessary to teach the unit following the learning cycle model. The lessons should include hands-on lessons, and should emphasize particular science concepts. The Exploration and Application phases of the Learning

Cycle must require different hands-on science activities using manipulatives. Hands-on activities are NOT reading or completing worksheets (though they may require students to read something or complete lab observation sheets). You should take the activities "off of paper" and require students to use the science process skills with science manipulatives. This is a dual assignment for science and social studies.

8. **SCIENCE TEACHING NOTEBOOK – 5%** (individual): An electronic Notebook will be accepted if you can get all the items at one place)
You will keep a class notebook, and will meet with the instructor during the last class period to review contents. Please use section dividers and labels for sections. For some assignments, you may need to make copies in order to include everything in your notebook.

I. California Science Content Standards for grades 6-8 (download from http://www.cde.ca.gov/board/pdf/science.pdf and print)

II. Reading Responses
III. Discussion Questions

IV. Learning Cycle Lessons presented in class
   a. Lesson Plan Handout
   b. Individual lesson reflections – (What would you modify in order to teach the lesson)

V. Science Instruction Case Study
   a. Case Study Paper
   b. Your Observations
   c. Teacher Interview
   d. Student Surveys

VI. Science Unit Plan

VII. Other Class Handouts

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Rubric for SCIENCE INSTRUCTION CASE STUDY

Score	Criteria	Quality of Work			
_____	Classroom Observations	All questions are followed by specific examples. Two or more observations are made and referred too for each question. 20 pts.	All questions are followed by answers. Two or more observations are made and referred too. 17 pts.	All questions are followed by answers. One observation is made and referred too. Observations are not very specific. 13 pts.	Not all questions are followed by answers. One observation is made. Observations are not very specific. 5 pt.
_____	Teacher Interview	Teacher was interviewed in person. Follow up questions were asked. All questions are followed by the teacher's responses. Teacher responses are specific and detailed. 20 pts.	Teacher was interviewed in person. All questions are followed by the teacher's responses. Some teacher responses are not specific. 17 pts.	It is not clear if the teacher was interviewed in person. All questions are followed by the teacher's responses. 13 pts.	It is not clear if the teacher was interviewed in person. Questions are not followed by the teacher's responses. Missing some teacher responses. 5 pt.
_____	Student Responses to Survey	Six student responses follow each question. 10 pts.	Student responses don't follow question. 8 pts.	Less than six responses are included. 5 pts.	No student responses. 0 pts.
_____	Analysis of Information	Analysis of information includes detailed description of matches and mismatches between data collected. The questions on Data Analysis Chart are addressed. Recommendations or kudos included. 3-2 pages. 50 pts.	Analysis of information includes description of matches and mismatches between data collected. The questions on Data Analysis Chart are addressed. Recommendations or kudos included. 2-1 pages. 44 pts.	Analysis of information includes description of matches and mismatches between data collected. Most questions on Data Analysis Chart are addressed. Recommendations or kudos included. 1 page. 39 pts.	Analysis of information includes nearly all descriptions of matches and mismatches between data collected. A few questions on Data Analysis Chart are addressed. Recommendations or kudos included. 1 page or less 25 pts.

Rubric for Leadership of Hands-On Science Lessons

Concept_____ Name_____

Score	Criteria	Quality of Work			
_____	Lesson Plan Format	Lesson contained all sections. Very specific and detailed and easy to follow 5 pts.	Lesson contained all sections. Some details and easy to follow 4 pts.	Lesson contained all sections. Few details 2 pts.	Lesson missing sections. Not specific or detailed 1 pt.
_____	Technology	Used numerous visuals in Power Point presentation. Description of Five or more web pages connected to concept in handout. 10 pts.	Used some visuals in Power Point presentation. Description of four web pages connected to concept in handout 7 pts.	Used few visuals in Power Point presentation. Description of Three web pages connected to concept in handout 4 pts.	No visuals in Power Point presentation. Description of two or fewer web pages connected to concept in handout 0 pt.
_____	Exploration Activity	All students participated in a developmentally appropriate hands-on science activity, made observations, and/or collected data. Predictions are made before beginning activity. 10 pts.	Some students participated in a developmentally appropriate hands-on science activity, made observations, and/or collected data. Predictions are made before beginning activity. 8 pts.	A minimal number of students participated in a hands-on science activity, made observations, and/or collected data. No Predictions are made. 6pts.	None of the students participated in a hands-on science activity, made observations, and/or collected data. No Predictions are made. 0 pt.
_____	Exploration Phase	1. Lesson contains an activity-based exploration related to the question or problem that allows students to collect data or search for patterns. Three of Three Present 10pts.	2. Do Student's make predictions or theories elicited and discussed without being corrected? Two of Three Present. 8 pts.	3. Do students discuss what they observe, clarifying their observations and data with each other and the teacher? One of Three Present 6 pts.	None of the parts of an exploration phase present 0 pt.
_____	Concept Invention Phase	1. The teacher takes an active role in presenting the concept. Students make their own meaning out of the observations Four of four present 15 pts.	2. The teacher includes formal instruction using textbooks, audiovisuals, or demonstrations. Three of four are present. 13 pts.	3. Student's are encouraged to formulate solutions or answers in writing, through discussion, and/or in small group work? Two of four are present 10 pts.	4. The students' efforts are guided by the teacher; students are encouraging to reflect on their evidence, reasons, and the consequences or implications of their solutions? One of four are present 7pt.

_____	Science Content Background	You provided a thorough explanation of the science concept, and demonstrated a correct and thorough understanding of it in lesson and handout. 10 pts.	You provided a very short explanation of the science concept, and demonstrated some understanding of it in lesson and handout. 8 pts.	You provided an incomplete explanation of the science concept, and did not demonstrate a correct and thorough understanding of it in lesson and handout. 6 pts.	You provided a poor explanation of the science concept, and demonstrated a poor understanding of the science concept you were teaching in lesson and handout. 2 pt.
_____	Concept Application Phase	Does the Concept Application Phase have many tasks or problems where students apply the concepts to real-world, situations, or extend the concepts to new situations? Do students generate new questions, or articulate unresolved problems. 20 pts.	Does the Concept Application Phase have some tasks or problems where students apply the concepts to real-world, situations, or extend the concepts to new situations? Do students generate new questions, or articulate unresolved problems. 17 pts.	Does the Concept Application Phase have a few tasks or problems where students apply the concepts to real-world, situations, or extend the concepts to new situations? Do students generate new questions, or articulate unresolved problems. 15 pts.	The Concept Application Phase is missing tasks or problems where students apply the concepts to real-world, situations, or extend the concepts to new situations? Students do not generate new questions, or articulate unresolved problems. O pt.
_____	Handout	Handout included Learning Cycle Lesson Plan, and description of web sites related to concept. 10 pts.	Handout included lesson, but not website descriptions. 8pts.	Handout included website descriptions, but not lesson. 4 pts.	No Handout 0 pt.
_____	Presentation	Your presentation was outstanding. Evidence of planning and practice 10 pts.	Your presentation was well done. Some evidence of planning and practice 8 pts.	There was little evidence of planning and practice 4pts.	You did a presentation. 0 pts.
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Middle Level Science EDMI 545 Course Outline

Tentative Course Outline

Class #	Date	Topic
1	1/20 AM	Course Overview: What is Science? The Nature of Science and Inquiry Process in Science Review Syllabus Sign up for Leadership of Science Activities **Bring Syllabus to Class**
2	1/20 PM	Teaching Tips: Constructing Knowledge and Discovering Meaning through the Learning Cycle **Bring 6-8 California Science Content Standards to class** **Down Load Science content Standards at** http://www.cde.ca.gov/board/pdf/science.pdf
3	1/27 AM	Teaching Tips: Inquiry Processes in Science Writing Objectives Using CA Science Standards *Read Chapter 2 of Cases in Middle Science..* **Question Due**
4	1/29 PM	Teaching Tips: Planning and Managing Inquiry based Lessons Writing Objectives and Explanations of Science Concepts. *Read Chapter 4 of Cases in Middle Science..* **Question Due**
5	2/3 AM	Teaching Tips: Using Cooperative strategies & questioning and Wait as Learning tools *Read Chapter 3 of Cases in Middle Science* **Question Due** **Reading Response Due**
6	2/5 AM	Science classroom experiences *Read Chapters 10 of Cases in Middle Science*
7	2/5 PM	Teaching Tips: Assessment of Understanding and Inquiry *Read Chapter 7 of Learning from Cases* *Learning Cycle Lesson Presentations* **Question Due**
8	2/11 AM	Teaching Tip: Integrating Science with other subjects *Read Chapter 6 of Cases in Middle Science* **Reading Response Due** *Learning Cycle Lesson Presentations*
9	2/17 PM	Teaching Tips: Science WebQuests *Read Chapter 9 of Cases in Middle Science* **Question Due** *Learning Cycle Lesson Presentations*
10	2/20 PM	Teaching Tips: Adapting Science curriculum for children with Special Needs *Read Chapter 5 of Cases in Middle Science* **Question Due** **Science Exploratorium Lesson Due** *Learning Cycle Lesson Presentations*
11	2/25 AM	Science Instruction Case Study Observations and Workshop *Read Chapter 1 of Cases in Middle Science Ed.*

12	3/2 PM	Teaching Tips: Science Projects, Student Research, Science Fairs and Science Safety *Read Chapters 7 of Cases in Middle Science Ed.* *Learning Cycle Lesson Presentations* **Question Due** **Unit Plan Due**
13	3/ 4 AM	Teaching Tips: Teaching for Understanding & Professional Development for Elementary Science Teachers *Read Chapter 11 of Cases in Middle Science Ed.* *Learning Cycle Lesson Presentations* **Question Due** **Reading Response Due**
14	3/8 AM	Teaching Tips: State Approved Textbooks Contemporary Issues in Science Education *Read Chapter 8 of Cases in Middle Science Ed.* **Case Study Due** **Notebook Due**
15	3/8 PM	Case study Presentations

SCIENCE METHODS GRADESHEET

Assignments Grade	Percent of Grade	Your Grade		Points for Final
1. Professionalism	10%	_____	x 0.10 =	_____
2. Reading Responses	15%	_____	x 0.15 =	_____
3. Discussion Questions	10%	_____	x 0.10 =	_____
4. Science Instruction Case Study	25%	_____	x 0.25 =	_____
5. Leadership of Hands-on Science Lessons	20%	_____	x 0.20 =	_____
6. Science Lesson Reflection	5%	_____	x 0.05=	_____
7. Science Teaching Unit and Presentation	10%	_____	x 0.10 =	_____
8. Science Teaching Notebook	5%	_____	x 0.05 =	_____

FINAL GRADE = _____