

**CALIFORNIA STATE UNIVERSITY SAN MARCOS
COLLEGE OF EDUCATION
EDMS 545B Science Education in Elementary Schools
Fall 2009 Monday 1:00-3:45 UH460**

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Office Hours: after each class and by apt.
Please call or email to set up a convenient time to meet.
E-mail: WebCT course mail

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, professionalism and shared governance. (adopted by COE Governance Community, October 1997)

Mandatory Furlough and Budget Crisis

Due to the devastating effects of current budget crisis in California, I have been furloughed nine days each semester of this academic year, representing a 9.23% reduction in both workload and compensation. A furlough is an unpaid day off on a faculty member's regularly-scheduled workday. In order to satisfy legal and ethical requirements of the California Labor Code, I am required to submit formal certification that I will not work on my furlough days. I am prohibited from teaching, conducting scholarly research, consulting with students, responding to email or voicemail, providing assignment feedback, or participating in any CSU work-related activities on my furlough days. Furlough dates vary by professor; my Fall Semester furlough dates are Sept. 18 and 25, Oct. 2 and 16, Nov. 20, 23, 24, 25, and Dec. 11. Furlough plans may be altered after the beginning of the semester as a result of administrative actions or other emergencies, thus subsequent revisions to this syllabus may occur.

The CSU faculty agreed to take furlough days in order to preserve jobs for as many CSU employees as possible, and to serve as many students as possible, in the current budget crisis. The agreement that governs faculty furloughs acknowledges that "cuts of this magnitude will naturally have consequences for the quality of education that we can provide." Within the furlough context, I will make every effort to support your educational experience at CSUSM. Visit CSUSM Budget Central [<http://www.csusm.edu/budgetcentral/>] to learn about the state budget crisis and how it impacts your educational opportunities. To avoid the continued loss of higher education availability in California, exercise your right to voice an opinion. Contact information for state legislators and the governor are provided at Budget Central.

If you are having problems related to your education and the budget, complete the Student Complaint Form <http://www2.csusm.edu/cfa/Furlough/FurloughResources.htm> (email form to cfa@csusm.edu)

Information on contacting elected officials is at <http://capwiz.com/calpac/state/main/?state=CA>

COURSE PREREQUISITES

Prerequisites and Semesters 1-2 of Integrated Bachelor of Arts and Multiple Subject Credential Program and consent of Program Coordinator.

REQUIRED TEXTS

- Friedl, A.E. & Koontz, T.Y. (2005). *Teaching Science to Children, An Inquiry Approach, 6th Ed.* NY: McGraw-Hill.
- *Science Framework for California Public Schools.* (2003) Sacramento: California Dept. of Education.
- Lamb, R. *Communication Basics: Overview of Nonviolent Communication.* Center for Nonviolent Communication.
- 2 Large Blue Books; 1 Laboratory Composition Book; \$1.50 cash for visit to Jack's Pond Nature Center

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 elementary school children. A series of team 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 into the course.

COURSE OBJECTIVES

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 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 of the Learning Cycle model of instruction to teach science in a contemporary manner.
6. Use of technology in elementary science teaching.
7. Demonstrate confidence in leading and performing investigations designed to teach science concepts, science process skills, and scientific attitudes.
8. Use of authentic methods of assessment to evaluate learning of science concepts and processes.
9. Design of an elementary science teaching mini-unit.
10. Practice strategies to include all students in science (linguistically and culturally diverse, students with disabilities and other students with special needs).

COURSE TOPICS

Constructivism & The Learning Cycle Model of Teaching
Concept Mapping
Learning Objectives & Science Concept Definitions
California Science Content Standards and the California Science Framework
Teaching English Language Learners in Science
Infusing Writing Activities in Science Lessons
Science Curriculum Kits and State Approved Texts
Science Process Skills and Scientific Attitudes
Current Issues in Science Education
Infusing Technology into Science Teaching
Authentic Assessments in Science
Science Projects, Student Research, Science Fairs
Safety in the Science Class
Inclusion and Teaching Science to Students with Special Needs
Benchmarks and the National Science Education Standards

STUDENT LEARNING OUTCOMES

Teacher Performance Expectation (TPE) Competencies

Standards of Quality and Effectiveness for Professional Teacher Preparation Programs California Commission on Teacher Credentialing

The course objectives, assignments, and assessments have been aligned with the CTC standards for the Multiple Subject Credential. This course is designed to help those seeking a California teaching credential to develop the skills, knowledge and attitudes necessary to assist schools and districts in implementing effective programs for all students. The successful candidate will be able to merge theory and practice in order to realize a comprehensive and extensive educational program for all students.

California Teacher Performance Assessment (CalTPA)

Beginning July 1, 2008 all California credential candidates must successfully complete a state-approved system of teacher performance assessment (TPA), to be embedded in the credential program of preparation. At CSUSM this assessment system is called the CalTPA or the TPA for short.

To assist your successful completion of the TPA a series of informational seminars are offered over the course of the program. TPA related questions and logistical concerns are to be addressed during the seminars. Your attendance to TPA seminars will greatly contribute to your success on the assessment.

Additionally, COE classes use common pedagogical language, lesson plans (lesson designs), and unit plans (unit designs) in order to support and ensure your success on the TPA and more importantly in your credential program.

The CalTPA Candidate Handbook, TPA seminar schedule, and other TPA support materials can be found on the COE website provided at the website provided:

<http://www.csusm.edu/liberalstudiesadvising/teaching/icpoption/tpa.html>

INFUSED COMPETENCES

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. (approved by CCTC in SB 2042 Program Standards, August 02))

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.

Visual and Performing Arts

This course encourages the infusion of the visual and performing arts in order to prepare our candidates with the skills to integrate the arts in their teaching. The Visual and Performing Arts Content Standards for California Public Schools (<http://www.cde.ca.gov/cdepress/standards-pdfs/visual-performing-arts.pdf>) describe what every student should know and be able to do in the visual and performing arts, pre-kindergarten through grade 12 in five strands: artistic perception; creative expression; historical and cultural context; aesthetic valuing; and connections, relationships and applications.

Technology

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

COURSE POLICIES

Attendance Policy

Due to the dynamic and interactive nature of courses in the College of Education, all students are expected to attend all classes and participate actively. Absences and late arrivals/early departures will affect the final grade. 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. Individual instructors may adopt more stringent attendance requirements. Should the student have extenuating circumstances, s/he should contact the instructor as soon as possible.

For this class, **if you are absent 2 days, your highest possible grade is a B. If you are absent more than 2 days, your highest possible grade is a C**, which means that you will not pass the course. **Late arrivals and early departures** will lower your course grade. For every two times that you are late or leave early, your course grade will be lowered by one letter grade. If you have an emergency or extenuating circumstances, please see the instructor to make arrangements accordingly. Absences do not change assignment due dates. With few exceptions, late assignments will not be accepted.

Technology

Students are expected to demonstrate competency in the use of various forms of technology (i.e. word processing, electronic mail, WebCT6, use of the Internet, and/or multimedia presentations). Specific requirements for course assignments with regard to technology are at the discretion of the instructor. Keep a digital copy of all assignments for use in your teaching portfolio. You must use your WebCT email account for this class. The best way to contact me is by WebCT email.

Computer Use During Class

You are welcome to use a laptop computer in class when working on class assignments, for example. However, you will need to save checking email or other personal computer use for time outside of class. Most students find it disruptive when they are focusing on class activities or listening to presentations and can hear keyboarding in the classroom. Your kind consideration is greatly appreciated by all!

Electronic Communication Protocol:

Electronic correspondence is a part of your professional interactions. If you need to contact the instructor, e-mail is often the easiest way to do so. It is my intention to respond to all received e-mails in a timely manner. Please be reminded that e-mail and on-line discussions are a very specific form of communication, with their own nuances and etiquette. For instance, electronic messages sent in all upper case (or lower case) letters, major typos, or slang, often communicate more than the sender originally intended. With that said, please be mindful of all e-mail and on-line discussion messages you send to your colleagues, to faculty members in the College of Education, or to persons within the greater educational community. All electronic messages should be crafted with professionalism and care.

Things to consider:

- Would I say in person what this electronic message specifically says?
- How could this message be misconstrued?
- Does this message represent my highest self?
- Am I sending this electronic message to avoid a face-to-face conversation?

In addition, if there is ever a concern with an electronic message sent to you, please talk with the author in person in order to correct any confusion.

CSUSM Academic Honesty Policy

Students will be expected to adhere to standards of academic honesty and integrity, as outlined in the Student Academic Honesty Policy in the CSUSM University Catalog. All written work and oral assignments must be original work. All ideas/materials that are borrowed from other sources must have appropriate references to the original sources. Any quoted material should give credit to the source and be punctuated with quotation marks.

Students are responsible for honest completion of their work including examinations. There will be no tolerance for infractions. If you believe there has been an infraction by someone in the class, please bring it to the instructor's attention. The instructor reserves the right to discipline any student for academic dishonesty in accordance with the general rules and regulations of the university. Disciplinary action may

include the lowering of grades and/or the assignment of a failing grade for an exam, assignment, or the class as a whole. Incidents of Academic Dishonesty will be reported to the Dean of Students. Sanctions at the University level may include suspension or expulsion from the University.

Plagiarism

As an educator, it is expected that each student will do his/her own work, and contribute equally to group projects and processes. Plagiarism or cheating is unacceptable under any circumstances. If you are in doubt about whether your work is paraphrased or plagiarized, see the Plagiarism Prevention for Students website <http://library.csusm.edu/plagiarism/index.html>. If there are questions about academic honesty, please consult the University catalog.

All University Writing Requirement

In keeping with the All-University Writing Requirement, all 3-unit courses must have a writing component of at least 2,500 words (approximately 10 pages), which can be administered in a variety of ways. Writing requirements for this course will be met as described in the assignments.

Person-First Language

Use “person-first” language in all written and oral assignments and discussions (e.g., “student with autism” rather than “autistic student”).

Students With Disabilities Requiring Reasonable Accommodations

Students must be approved for services by providing appropriate and recent documentation to the Office of Disabled Student Services (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.

GRADING STANDARDS

A = 93-100
A- = 90-92
B+ = 87-89

B = 83-86
B- = 80-82
C+ = 77-79

C = 73-76
C- = 70-72
F = 0-69

- A 90-100%: Outstanding work on assignment, excellent syntheses of information and experiences, great insight and application, and excellent writing.
- B 80-89%: Completion of assignment in good form with good syntheses and application of information and experiences; writing is good.
- C 70-79%: Completion of assignment, adequate effort, adequate synthesis of information, and application of information and experiences, writing is adequate.
- D 60-69%: Incomplete assignment, inadequate effort and synthesis of information, writing is less than adequate.

It is expected that students will proofread and edit all their assignments prior to submission. Students will ensure that the text is error-free (grammar, spelling), and ideas are logically and concisely presented. The assignment's grade will be negatively affected as a result of this oversight. Each assignment will be graded approximately 80% on content and context (detail, logic, synthesis of information, depth of analysis, etc.), and 20% on mechanics. All reference/resource citations should use appropriate citation form. Please consult with the American Psychological Association (APA) format in the APA Manual, 5th edition for citation guidance.

You must maintain a B average (3.0 GPA) in your teacher education courses to receive a teaching credential from the State of California. Courses are not accepted if final course grades are below a C+.

Keep digital copies of all assignments. You will not be assigned a course grade unless all the assignments are turned in.

COMPASSIONATE COMMUNICATION

We will be including a study of Rachel Lamb's booklet Communication Basics: An Overview of Nonviolent Communication. This booklet is published by the Center for Nonviolent Communication. In Nonviolent Communication (also called Compassionate Communication), Marshall Rosenberg presents his approach to communication that centers on compassionate connection. Marshall encourages all individuals, and especially educators, to motivate "by a reverence for life." Rosenberg's Compassionate Communication process offers educators the tools to create exceptional learning environments.

Compassionate Communication (also called Nonviolent Communication) will help you:

- Maximize the individual potential of all students
- Improve trust and connection in your classroom community
- Strengthen student interest, retention and connection to their work
- Find cooperation without using demands
- Improve classroom teamwork, efficiency and results

Marshall B. Rosenberg, Ph.D. is the internationally acclaimed author of *Nonviolent Communication: A Language of Life*, and *Speak Peace in a World of Conflict*. He is the founder and educational director of the Center for Nonviolent Communication (CNVC). He travels throughout the world promoting peace by teaching these remarkably effective communication and conflict resolution skills. See www.cnvc.org resources for additional books and resources on how to use compassionate communication in teaching.

COOPERATIVE LEARNING ROLES FOR SCIENCE GROUP MEMBERS

Materials Manager Reporter
Lead Investigator Recorder (can be combined with Reporter duties)
Timekeeper/Taskmaster (if have 5th person)
Heterogeneous groups are best. Teacher assigns group members and the roles; roles are rotated.

ASSIGNMENTS

Each assignment is expected to have a clear organizational presentation and be free of grammar, punctuation and spelling errors. There will be a reduction in points for the above mentioned errors. Late assignments are not accepted. Prepare carefully for class, and be ready to discuss readings and assignments thoughtfully.

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| 1. Active Participation and Collaboration (all or nothing credit given) | 5% |
| 2. Reading Journal (Concept Maps and Big Ideas Papers) | 15% |
| 3. California Science Framework and Standards Activity | 10% |
| 4. Leadership of Hands-on Science Lesson Activities | 20% |
| 5. Learning Cycle Lesson Drawings | 5% |
| 6. Learning Cycle Lesson Explanations | 5% |
| 7. Science Exploratorium Lesson Plan/Presentation | 10% |
| 8. Science Unit and Presentation | 20% |
| 9. Course Reflection | 5% |
| 10. Curriculum Presentation | 5% |

DESCRIPTIONS OF ASSIGNMENTS

1. **Active Participation and Collaboration (all or nothing credit) - 5%**

Teacher education is a professional preparation program and students will be expected to adhere to standards of dependability, professionalism, and academic honesty (refer to rubric on next page). Grading will include a component of "professional demeanor." Students will conduct themselves in ways that are expected of those who are entering the education profession, including the following:

- On-time arrival to all class sessions and attendance for the entire class period
- Advance preparation of readings and timely submission of assignments
- A positive attitude at all times
- Active participation in all class discussions and activities
- Respectful interactions with the instructor and other students in all settings
- Carefully considered, culturally aware approaches to solution-finding

PCP Rubric: Participation, Collaboration and Professionalism

Students are expected to actively participate, collaborate, and demonstrate professionalism at all times.

	Excellent	Acceptable	Unacceptable	Comments
<p>Attitude Do you show a positive attitude toward class, “the work” and learning?</p>	Always displays a positive attitude. May offer constructive criticism and include alternatives that show initiative.	Sometimes displays a positive attitude. May offer constructive criticism and include alternatives that show initiative.	Seldom has a positive attitude. Often is critical. Does not offer alternative solutions to criticism.	
<p>Participation Do you participate in class discussions productively, sharing your knowledge and understandings?</p>	Attends every class, always on time and well prepared, and never leaves early. Gives closest attention to class activities & speakers.	Attends every class, on time and prepared, and never leaves early. Gives most attention to class activities and speakers.	Is not always ready when class time begins. Doesn't give full attention in class; sometimes talks when others are speaking.	
<p>Professionalism Do you exhibit professional behavior at all times?</p>	Consistently behaves, talks and works in a professional manner, regardless of task/topic.	Most of the time, behaves, talks and works in a professional manner.	Seldom behaves, talks, and works in a professional manner, regardless of task/topic.	
<p>Collaboration Can you monitor and adjust your participation to allow for others' ideas to be heard? Are you supportive of others' ideas and work?</p>	Consistently listens to, shares with, and supports the efforts of others. Tries to keep people working well together.	Most of the time listens to, shares with, and supports the efforts of others, but sometimes is not a good team member.	Rarely listens to, shares with, and supports the efforts of others. Is not always a good team player.	
<p>Contributions Do you contribute to whole class and group work? Do you “do your share”?</p>	Consistently provides useful ideas; always stays focused on the task. Exhibits a lot of effort and valuable contributions.	Most of the time provides useful ideas and stays focused. A satisfactory group member who does what is required.	Rarely provides useful ideas; not always focused. Reluctant to participate. Lets others take charge.	
<p>Disposition toward teaching Do you exhibit a positive disposition towards teaching all students?</p>	Consistently demonstrates concern in learning to teach all children. Always demonstrates strong commitment toward developing (a) an understanding of children, (b) teaching strategies, and (c) knowledge of the CA Standards for the Teaching Profession (CSTP), Teacher Performance Expectations (TPE), and CA Standards.	Most of the time demonstrates concern in learning to teach all children. Often demonstrates commitment toward developing (a) an understanding of children, (b) teaching strategies, and (c) knowledge of the CSTP's, TPE's, and CA Content Standards.	Rarely shows concern in learning to teach all children. Rarely demonstrates commitment toward developing (a) an understanding of children, (b) teaching strategies, and (c) knowledge of the CSTP's, TPE's, and CA Content Standards.	
<p>Leadership Do you interact productively with your peers and show leadership initiative?</p>	Shows strength through leadership in class activities; other students respect you as a leader.	Effectively participates and contributes, but rarely shows leadership qualities.	Does not show leadership in any area of class.	

2. Reading Journal (individual) - 15%

The purpose of the journal entries is to help you carry the science content from short term into long term memory and understanding so that you can more easily teach science when you become a classroom teacher. The assigned readings provide an important foundation for your increasing understanding of how to effectively teach science. You will need two large Blue Books. Reading journals (blue books) will be collected each class session and will only receive full points if completed by the date indicated in the schedule. You must use Blue Books, although you may type and staple in your entry. Spiral paper stuck in Blue Books will not be accepted.

Each class session you will be required to complete journal entries for one chapter (your choice of which chapter from the assigned readings). The first journal entry, which will consist of a Big Ideas Paper for one of the chapter readings assigned for Class Session 2, is due by the start of class time. The Big Ideas Paper consists of explaining (a) the key science concepts and (b) 2 teaching applications for one of the chapters assigned for that week (from whichever chapter you choose). Then for the next week (Session 3), you will create a Concept Map (following procedures taught in class) for one of the assigned chapter readings for that week (your choice of which chapter from the assigned readings). For Class Session 4, you will repeat the process for a Big Ideas paper, and the following week you will repeat the process for the Concept Map. This cycle/schedule will continue for the rest of the semester. Every week you will turn in the Blue Book. You will alternate making entries between your Large Blue Books so that while I am grading one, you are writing in the other.

- The Concept Map should include the **15-25 major concepts** discussed in **one** chapter. Do not include information from the investigations, only the science content. The Concept Map must follow the Concept Mapping procedures taught in class.
Each concept map has a possible total of 9 points.
 - a. Most general, inclusive Concept at top.....worth 1 point
 - b. Map must show structured hierarchy.....worth 2 points
 - c. 15-25 concepts included.....worth 2 points
 - d. 1-2 words (nouns) for Concepts.....worth 2 points
 - e. Verbs or prepositions for Linking Words between Concept.....worth 2 points
 - f. NOT mind-mapping or mind-webbing

- The Big Ideas paper should **explain 15-25 key science concepts** (not the investigations) from **one** chapter reading. Be sure to write in complete sentences, not outlines, though the sentences may be bulleted. Your Big Ideas paper is **not** a reflection of your thoughts; it is a summary of the science content.
Each Big Ideas paper is worth a total of 9 points.
 - a. Complete sentences.....worth 3 points
 - b. 15-25 Major science concepts included.....worth 3 points
 - c. Two teaching applications –examples of how you would teach concepts....worth 3 points

For both Big Ideas Papers and Concept Maps, **(a) indicate on each page of your Large Blue Book the title of the Chapter you are outlining, (b) write your name and date at the top of each page and (c) number each page.**

3. California Science Framework and Standards Activity - 10%

Purpose of the assignment: To read a portion of the California Science Framework and the Standards for a particular grade. You will write your individual response to the readings. Then you will work with your partner to prepare and do a presentation to the class. It is essential that you do the reading and the write-ups BEFORE you meet with your partner.

3a. Framework summary response: (Individual assignment to do after class) – 3%

- Read the first part of the California Science Framework, up to page 22. This includes Board Policy, the Introduction and Chapters One and Two.
- Think about the reading holistically.
- Type about a page, in your own words, that answers these questions: What were the most important ideas addressed in the reading? How does science teaching differ from instruction in other subjects? What are the most important elements of a strong science instructional program?
Come to class prepared to discuss the questions and turn in your answers.

3b. Grade level Science standard response: (with 2 others, in-class assignment) – 3%

- Using the standard for your chosen grade, each one of you will pick a line item from physical science, life science, or earth science (All 3 will be represented within each group of 3 students). For each one, come up with a brief description of an activity that children in that grade can do that also addresses one of the Investigation and Experimentation standards for the grade.
- You should end up with three sections, each of which includes a content line (physical, life, or earth science), an Investigation and Experimentation line, and a one or two sentence description of an activity that combines the two. The whole thing should be about a page. Write your name on yours and turn in with your partners'.
- See example next page.

3c. Team preparation and presentation – (with 2 others, In-class assignment) – 4%

Get together with your partners. Look at the activities that you each wrote up for Assignment 2b. Choose one activity.

- With your partner, write up a lesson plan for the activity (with objectives, assessment, and a brief description of the activity}. Put it on chart paper or PowerPoint so it can be easily presented to the class. Make sure you quote the line from the standard on which your lesson plan is based.
- With your partners, come up with a brief overview of the Science Standards for your grade. Don't try to give us every single line of the standard. Summarize it in such a way that we see an overview of what students are supposed to learn in physical, earth, and life science and in investigation and experimentation in that grade.
- Your group will have 5 minutes to present your lesson plan and standards choices. Be prepared to explain why your lesson plan represents really good science for kids.
- Your grade for this assignment will be based on the content and quality of your presentation, and on the level of collaboration with your partners.

Sample Response to Assignment 3b.

Grade Four

Physical Science

1b. Students know how to build a simple compass and use it to detect magnetic effects, including the Earth's magnetic field

Investigation and Experimentation

6f. Follow a set of written instructions for a scientific investigation.

Activity

Following directions from the Internet, the students will work in partner pairs to build compasses, using paper cups, thread, a needle and a magnet. They will observe and record the action of the compass indoors and outdoors, and in proximity to various objects.

Life Science

2c. Students know decomposers; including many fungi, insects, and microorganisms, recycle matter from dead plants and animals.

Investigation and Experimentation

6c. Formulate and justify predictions based on cause-and-effect relationships.

Activity

The students will predict the growth of mold on bread that has no preservatives. They will observe and record the progress of the mold in various circumstances (if the bread is left in the open air, if the bread is in a closed sandwich bag, etc.)

Earth Science

5c. Students know moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition).

Investigation and Experimentation

6b. Measure and estimate the weight, length, or volume of objects.

Activity

In groups of four, students will create landforms (using common dirt) on cookie sheets. They will add measured amounts of water to their landforms, and will collect and measure the dirt that runs off.

4. **Leadership of Hands-on Science Lesson Activities** (teams of 3) - 20%

NOTE: These are also called Learning Cycle Lessons.

Students will lead hands-on science lessons during class. The lessons should model inquiry instruction, good questioning skills, and be content-understandable and non-judgmental. The lessons should be based on the CA Science Content Standards. Strategies for English language learners, technology integration, and methods for teaching students with disabilities should be included.

You will work in groups of 3 to lead science lessons based on the Learning Cycle Model of Instruction. You will teach these to your classmates. Each lesson will be allocated 40 minutes of class time to teach. Your classmates will not role-play elementary students, but will learn the science content and how to teach it. Treat your classmates as teachers, not elementary students.

The lessons should include hands-on lessons, and should emphasize particular science concepts. The Exploration and Application phases of the Learning Cycle require different hands-on science activities using manipulatives. **ALWAYS begin Exploration with students making PREDICTIONS.** 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. **You need to know and demonstrate the stages of the Learning Cycle, or you will not be given credit for your lesson.**

Be sure you understand the concepts you are emphasizing, and that you can explain them. The lessons should be developmentally appropriate for K-6, and should follow the NSTA Safety Guidelines. **Begin the lesson by writing essential questions about the lesson on the board, for students to consider during the lesson.** These questions should be **higher level questions** (analysis, synthesis or evaluation level) according to Bloom’s Taxonomy. Make sure that you include the **3 stages of the Learning Cycle.** **Begin the lesson with students writing their predictions about the outcomes of the activity.** Make sure that science content background and applications to everyday life are addressed. You need to **EXPLAIN** Strategies for English language learners and adaptations for students with disabilities.

Prepare a PowerPoint Presentation to use in your lesson that is a strong overview of all of your lesson plan components. Include standards (content and experimentation/investigation), objectives, definitions of important science concepts in the lesson, assessment/criteria, learning cycle phases, a detailed explanation of the science content, and applications to everyday life. Additionally, include a list of at least 3 web sites (with short descriptions) that address the science topic and concepts through simulations, graphics and movies. You should have links to these web sites and show at least 3 examples of web sites during the lesson. **Bring at least 3 children’s literature books reflecting science concepts to class to showcase.**

Science Lesson Plan Handout

- Prepare a handout which includes the information under Lesson Design, making sure you include: Your names at the top and references at the end of the lesson plan.

IMPORTANT NOTE: At least four full days PRIOR to your presentation, email your complete lesson plan and your PowerPoint Presentation to the instructor for review. (Failure to email the completed lesson and PowerPoint to the instructor at least 4 days prior to your presentation will **count 10 points off your grade for this assignment.**) Include your cohort name and # and the date you will present to the class in the email. After I email you back regarding needed changes and you make revisions, email the revised ones to me and I will approve them.

Bring copies of the data sheets for students in the class, and post the lesson plan and data sheets to the WebCT DISCUSSION thread for **Leadership of Hands-on Science Lesson Activities**

Please email final lesson plan and PowerPoint to knorman@csusm.edu 4 days prior to presenting. On the day of your lesson presentation, please begin the lesson by turning in 1 copy of the rubric completed as a self-evaluation along with 1 paper copy of your lesson plan to the instructor. Failure to do so will result in 10 points off your grade for this assignment.

Use the Learning Cycle model of instruction for the instructional strategies and student activities:

- a. **Exploration** (Begin with students making predictions; then have a hands-on SCIENCE activity.)
- b. **Concept Invention** (Make sure students share and discuss data and ideas in the first part of this stage; then teacher introduces new terms and provides further explanations.)
- c. **Concept Application** (Should be a 2nd hands-on SCIENCE activity.)

LESSON DESIGN

Elements of the Learning Experience

Grade Level: What is the grade level?

Lesson Title: What is the title of your lesson?

Student Groupings: How will you group students for instruction?

Content Area: Science

Subject Matter: Life, Science Physical Science or Earth Science?

Time Period for the Learning Experience: *Example: two 30 minute sessions science*

Learning Goals/Learning Objectives:

State Science Standards: What standards are addressed? Include at least 1 science area (life science, physical science, or earth science) standard and 1 investigation standard.

Learning Goals based on the Content Standards.? What do you want students to be able to do?

Write in complete sentences. Use an action verb and explain how students will demonstrate their new knowledge and understanding. "The students will _____."

Science Concept(s): What are you trying to teach? Do not say "The students will ____." (That is an objective, not a concept.)

Essential Questions (higher level; see Bloom's taxonomy): What are your essential questions for this concept? What leads to the big idea? (be sure these are not lower level fact or info. questions)

Class Description

Type of class (self contained, subject specific) time of year, general background of students learning in relationship to new learning (challenges and prior learning)

English Learner: Beginning, intermediate, and advanced (use the ELD standards to determine the needs of each of these students.

Special education: one student with learning disabilities and one with another special education identified Disability

GATE student: identify the students' needs

Regular education: remaining students

Developmental needs of the students at this age

Give examples based on the different learning needs for K-3 and 4-6

Developmental age appropriate skills and needs of the students

Example: engaging activities (hands on, etc)

Assessment Plan

Type of assessment: Prior knowledge (pre assessment), Formative (progress monitoring), Summative (final product)

Description of assessment

Feedback strategies: how students will be informed of specific successes and challenges and future activities to fill the individual students gaps.

Reflection of the assessment: Strengths and weaknesses in relationship to the learning goal.
Describe your alternative assessment based on the potential gaps in the students learning.

Assessment Criteria

What criteria will you use to grade the assessment? How will you know if a student has successfully completed the assessment and accomplished the learning goals? What will they do to show you they have succeeded?

Resources

What will the teacher need? What will the students need?
Review teacher’s manuals, pacing guides, and appropriate supplemental materials to determine the materials you will need to present this lesson. Materials should include lists of supplies to present this lesson.

Instructional Strategies: Lesson Procedures

Explain the procedures for each phase of the Learning cycle. Include what the teacher will do and what the students will do. Include suggested number of minutes for each component of the lesson.

The Learning Cycle	INSTRUCTIONAL STRATEGIES <i>What the teacher does.</i>	STUDENT ACTIVITIES <i>What the students do.</i>
<u>Engagement</u>	How will you focus/motivate students? ___ mins	What will students be doing during the anticipatory set? ___ mins
<u>Exploration</u>	Explain what and how you will provide an exploration science activity (must be hands-on). ___ mins	Explain what students will be doing during the exploration activity. ___ mins
<u>Concept Invention</u> a. Students share what they did and learned during Exploration b. Teacher introduces students to new information.	How will you have students share their ideas, knowledge and questions from the exploration phase? Explain how <u>you</u> will introduce students to relevant information, terminology and concepts to reinforce what they learned during exploration. ___ mins	Explain how students will share their ideas, knowledge and questions from exploration phase. Explain what students will be doing while you are introducing relevant information, terminology and concepts to reinforce what they learned during exploration. ___ mins
<u>Concept Application</u>	Concept Application- Explain what and how you will provide a second hands-on science activity that extends students’ thinking and learning from the two previous two phases? ___ mins	Explain what students will be doing during the concept application activity. ___ mins

Reflection

Explain why the instructional strategies, student activities and resources are appropriate for this lesson.

- Why are the instructional strategies and student activities appropriate for this class based on content and student development?
- How do they address the developmental needs of these students?
- How do they help the students make progress toward achieving the state adopted academic content standards for students in this content area?
- Understand connections between lesson content and the outside world.

Differentiated Instruction based on the Learning Goals and instructional Strategies:

1. English Learner

TASKS	Beginning EL	Intermediate EL	Advanced EL
Identify 2 specific learning needs based on the student description			
Identify one instructional strategy or student activity that could challenge the student			
Explain why the strategy or activity you chose could challenge the student based on the learning needs of the student			
Describe how you would adapt the strategy or activity to meet the learning needs of the student considering subject matter pedagogy in your description			
Explain how your adaptation would be effective for the student in making progress towards the goals of your lesson			
Explain how your adaptation would be effective for the student in making progress toward English language development			
What progress monitoring assessment would you choose to obtain evidence of the student's progress towards a learning goal?			
Give rationale for your choice of assessment. Use your knowledge of academic content in this lesson and this student's learning needs in your rationale.			

2. Special Education

TASKS	LEARNING DISABILITY	GROUP SELECTED DISABILITY
Identify 1 instructional strategy or student activity from the plans that could be challenging for the student considering the description of your student		
Explain why this strategy or activity could be challenging for the student based on your description		
Describe how you would adapt the strategy or activity to meet the needs of the student		
Explain how your adaption would be effective for the student making progress toward achieving the learning goal		
Identify one additional instructional strategy or student activity that could be challenging for the student considering their learning needs		
Explain why the strategy or activity you chose could be challenging for the student based on specific aspects of the student description		
Describe how you would adapt the strategy or activity you identified to meet the needs of the student		
What progress monitoring assessment would you choose to obtain evidence of the student's progress towards a learning goal?		
Give rationale for your choice of assessment. Use your knowledge of academic content in this lesson and this student's learning needs in your rationale.		

3. GATE

TASKS	Describe GATE students' needs:
Identify 1 instructional strategy or student activity from the plans that will be challenging for the student considering the description of your student	
Explain why this strategy or activity will be beyond the students current ability and will challenge the student based on your description	
Describe how you would adapt the strategy or activity to meet the needs of the student	
Explain how your adaption would be effective for helping the student make progress going beyond the learning goal	
Identify one additional instructional strategy or student activity that will be challenging for the student considering their learning needs	
Explain why the strategy or activity you chose will be challenging for the student based on specific aspects of the student description	
Describe how you would adapt the strategy or activity you identified to meet the needs of the student	
Explain how your adaptation would be effective for helping the student make progress toward going beyond achieving the learning goal	
What progress monitoring assessment would you choose to obtain evidence of the student's progress towards learning goal?	
Give rationale for your choice of assessment. Use your knowledge of academic content in this lesson and this student's learning needs in your rationale.	

Also include in Lesson Design:

Applications to Everyday Life and Explanations (at least 3):

Science Content Background: (1-2 pages minimum) summary of the content background

Web Sites: at least 3 interactive relevant web sites with descriptions

Children's Literature Books: Title, author, publisher, year of 3 children's books on the topic.
BRING 3 BOOKS TO CLASS.

Arts Standards Integration: Explain how you will integrate learning in the Arts. List Arts Standard.

References: Title, author, publisher, year

5. Learning Cycle Lesson Drawings (individual) - 5%

In your Lab Book—Reserve the first page in your Lab Book for a **Title Page**, and reserve the next page for your **Table of Contents**. After each Learning Cycle presentation, you will make a drawing illustrating what you learned during the lesson. Number each drawing (Drawing #1, #2, #3, etc.). **At the top of each page, write the date, title and number of the drawing. Label the drawing with the title of the lesson.**

Be sure to pay attention during the lesson so that you have something to draw and a given drawing illustrates your understanding of the lesson. You must **legibly label** parts of drawings. **Drawings should illustrate the major science concepts** that students were supposed to learn. Drawings will be assessed based on the following criteria:

- **Does the Drawing illustrate the major science concepts taught in the lesson?**
- **Does the Drawing include legible labels?**
- **Does the Drawing make “sense”? Can one look at it and understand what was taught?**

You must do at least 10 of these total. (We will have more than 10 learning cycle lessons; you can pick the 10 you want to do). Each will count 10 points for your L.C. Lesson Drawings grade.

6. Learning Cycle Lesson Explanations (individual) - 5%

In your Lab Book--On the page immediately following each Drawing for a given Learning Cycle presentation, you will write an explanation of the science concepts taught—about ½-1 page in length. Number each Explanation (Explanation #1, #2, #3, etc.). **At the top of each page, write the date, title and number of the Explanation. Label the Explanation with the title of the lesson.** Be sure to pay

attention during the lesson so that you have something to explain! Each explanation should be a complete description of the major science concepts that students were to learn during the lesson.

Explanations will be assessed based on the following criteria:

- **Does the Explanation describe the major science concepts taught in the lesson?**
- **Does the Explanation make “sense”? Can one read it and understand what was taught?**
- **Is each Explanation on a separate page from the drawings and the other explanations?**

You must do at least 10 of these total. (We will have more than 10 learning cycle lessons; you can pick the 10 you want to do). Each will count 10 points for your L.C. Lesson Explanations grade.

7. Science Exploratorium Lesson Plan/Presentation (pairs) 10%

Develop an inquiry activity to teach to elementary students. You may work in pairs on this assignment (not groups of 3). You will prepare a hands-on science lesson and poster reflecting a science concept. You will present the lesson at our Elementary School Science Exploratorium. Prior to teaching the lesson, turn it in to your instructor for review.

Be sure you understand the concept(s) you are emphasizing, and that you can explain them. Please ensure that your activities should follow the NSTA Safety Guidelines. The lessons should include hands-on tasks, 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.)

Type Lesson Design with your names at the top and REFERENCES at the end of the lesson plan.

Prior to the Exploratorium, turn in the completed Self-Evaluation Rubric.

Lesson Design

Grade Level: What is the grade level?

Lesson Title: What is the title of your lesson?

Student Groupings: How will you group students for instruction?

Content Area: Science

Subject Matter: Life, Science Physical Science or Earth Science?

Time Period for the Learning Experience: *Example: two 30 minute sessions science*

Learning Goals/Learning Objectives:

State Science Standards: What standards are addressed? Include at least 1 science area (life science, physical science, or earth science) standard and 1 investigation standard.

Learning Goals based on the Content Standards.? What do you want students to be able to do? Write in complete sentences. Use an action verb and explain how students will demonstrate their new knowledge and understanding. “The students will _____.”

Science Concept(s): What are you trying to teach? Do not say “The students will ____.” (That is an objective, not a concept.)

Essential Questions (higher level; see Bloom’s taxonomy): What are your essential questions for this concept? What leads to the big idea? (be sure these are not lower level fact or info. questions)

Resources: What will the teacher need? What will the students need?

Instructional Strategies: Lesson Procedures

BRIEFLY Explain the procedures for each phase of the Learning cycle. Include what the teacher will do and what the students will do. Include suggested number of minutes for each component of the lesson.

The Learning Cycle	INSTRUCTIONAL STRATEGIES <i>What the teacher does.</i>	STUDENT ACTIVITIES <i>What the students do.</i>
<u>Engagement</u>	How will you focus/motivate students? ___ mins	What will students be doing during the anticipatory set? ___ mins
<u>Exploration</u>	Explain what and how you will provide an exploration science activity (must be hands-on). ___ mins	Explain what students will be doing during the exploration activity. ___ mins
<u>Concept Invention</u> c. Students share what they did and learned during Exploration d. Teacher introduces students to new information.	How will you have students share their ideas, knowledge and questions from the exploration phase? Explain how <u>you</u> will introduce students to relevant information, terminology and concepts to reinforce what they learned during exploration. ____ mins	Explain how students will share their ideas, knowledge and questions from exploration phase. Explain what students will be doing while you are introducing relevant information, terminology and concepts to reinforce what they learned during exploration. ____ mins
<u>Concept Application</u>	Concept Application- Explain what and how you will provide a second hands-on science activity that extends students' thinking and learning from the two previous two phases? ____ mins	Explain what students will be doing during the concept application activity. ____ mins

Reflection

Explain why the instructional strategies, student activities and resources are appropriate for this lesson.

- Why are the instructional strategies and student activities appropriate for this class based on content and student development?
- How do they address the developmental needs of these students?
- How do they help the students make progress toward achieving the state adopted academic content standards for students in this content area?
- Understand connections between lesson content and the outside world.

References: Title, author, publisher, year of resources

****NOTE:** We will share Exploratorium plans so that all students leave with plans for all lessons, which you may use during student teaching.

Exploratorium Reflection (individual)

*Turn in at class session after the Exploratorium.

*Respond to the following

- How did the children respond? (What did they say and do?)
- How do the children's actions and responses demonstrate their level of understanding?
- How did you (or can you) improve upon your lesson to facilitate understanding?

8. Science Curriculum/Presentation (teams of four; each writes one unit) **20%**

The goal of this assignment is for you to develop year-long plans for instruction in science based on the California Science Content Standards, as well as develop skills for teaching in the elementary grades. For this assignment, you will plan a year of science instruction for one grade level, based on the California Science Content Standards. You will divide the Science Content Standards for one grade level into four units. For each unit, you will use the science standards (and their descriptions in the Science Framework) to design enduring understandings, desired outcomes, end-of-unit assessments, and rubrics to use in grading the assessments. For the final part of this assignment you will develop ideas for three learning cycle lessons for each unit, based on the Science Standards, Enduring Understandings, Desired Outcomes and Final Assessments in the units. You will work in a group of four-- the same group for your project in your science course. You will relate the science course project topic to this Science Curriculum Plan.

When you complete this assignment, you will have a curriculum plan for teaching the science standards, units and lessons for teaching science for a full year for one grade level. We will share these, so that everyone leaves with curriculum plans, units and lessons for a full year of teaching science at all grade levels. You may share these with your cooperating teachers and use them in your student teaching.

Year-Long Science Curriculum for Grade ____

Overview of Year-Long Curriculum (Page 1 of Unit):

Units

Brief description of each unit.

Authors

Unit 1:

Description:

Unit 2:

Description:

Unit 3:

Description:

Unit 4:

Description:

Each Unit (begin on Page 2 of Year-Long Curriculum):

Unit ____ (1, 2, 3 or 4) Plan

1. Grade: _____

2. Unit Title: _____

3. Content Area: _____

4. Subject Matter: _____

5. Time Period: _____

6. Standards

Content (Physical, Life, Earth Science)Standards
Investigation and Experimentation Standards

7. Enduring Understandings (info and processes you hope students remember and understand next year)

8. Desired Outcomes (reads like an objective; tell what students can DO after instruction)

9. Teacher's Dilemma

Based on a previous unit of study, write a brief scenario of possible challenges the learners may have had when presented with this unit based on the formative and summative assessments.

Scenario of Possible Challenges of Learners

10. Assessment Plan

Days can be flexible due to where it is placed in the unit plan. Indicate the day in the second row.

ASSESSMENT	1	2	3	4 Final Cumulative Assessment
Which day of the unit?	DAY :	DAY :	DAY:	DAY :
Goals Assessed: Based on the content standards and learning goals				
Type & Description What type of assessment will be given? <u>Prior knowledge</u> (pre assessment), <u>Formative</u> (progress monitoring), <u>Summative</u> (final assessment). Write out a description of the assessment.				
Purpose Reason for the assessment				
Implementation and Criteria How will the assessment be conducted and corrected? What criteria will you use? (What will you look at when grading?)				
Feedback strategies How students will be informed of successes and challenges				
Informing instruction Determine what material will need review for identified students, the students who are near mastery and students who have learned the material and need extension.				

Reflection of Assessment: Strengths and Weaknesses in relationship to the learning goal.

Identify one strength in the assessment plan and explain why it is a strength in relation to the learning goals.	
Identify one weakness in the assessment plan and explain why it is a weakness in relation to the learning goals in this unit.	

Additional Assessment: Describe your alternative assessment based on potential gaps in the students' learning. Project what additional assessments might be needed to determine mastery of the content standards and learning goals.

List of Additional Assessments

Another Additional Assessment: You might have found this assessment in supplementary resources or teacher made. Write the additional assessment you would use to check student understanding.

Describe Additional assessment

Write your reasons why you feel this supplemental assessment would benefit student learning and improve your assessment plan by answering these reflective questions. Example: Answer the reflective questions based on how you as the teacher might use these to improve the assessment plan.

When in the plan would you use this assessment? What days would you use this supplemental assessment to give you further information on the progress of your students?	
What goals would be assessed by this assessment? What additional information would you look for to ensure you have assessed the learning goals and content standards?	
What type of assessment would it be? Formal or informal. Where did the assessment come from?	
What would be the purpose of the assessment? Example: Example: reason for the assessment and what knowledge and skills are acquired.	
How would you implement the assessment? How the assessment will be conducted and corrected	
What feedback strategies would you use? How would you inform students of their successes and challenges?	
How would the results of the assessment inform instruction? Determine what material will need review for identified	

students, the students who are near mastery and students who have learned the material and need extension.	
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Explain how the additional assessment you described improves your assessment plan.

Address the teacher's dilemma and need for more information about what the students really know and understand. Determine what the possible misconceptions might be and the student progress toward achieving the learning goals.	
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11. Ideas for 3 Lessons for each Unit. Include the following:

Lesson Design

Grade Level: What is the grade level?

Lesson Title: What is the title of your lesson?

Student Groupings: How will you group students for instruction?

Content Area: Science

Subject Matter: Life, Science Physical Science or Earth Science?

Time Period for the Learning Experience: *Example: two 30 minute sessions science*

Learning Goals/Learning Objectives:

State Science Standards: What standards are addressed? Include at least 1 science area (life science, physical science, or earth science) standard and 1 investigation standard.

Learning Goals based on the Content Standards.? What do you want students to be able to do? Write in complete sentences. Use an action verb and explain how students will demonstrate their new knowledge and understanding. "The students will _____."

Science Concept(s): What are you trying to teach? Do not say "The students will ____." (That is an objective, not a concept.)

Essential Questions (higher level; see Bloom's taxonomy): What are your essential questions for this concept? What leads to the big idea? (be sure these are not lower level fact or info. questions)

Resources: What will the teacher need? What will the students need?

Instructional Strategies: Lesson Procedures

BRIEFLY Explain the procedures for each phase of the Learning cycle. Include what the teacher will do and what the students will do. Include suggested number of minutes for each component of the lesson.

The Learning Cycle	INSTRUCTIONAL STRATEGIES <i>What the teacher does.</i>	STUDENT ACTIVITIES <i>What the students do.</i>
<u>Engagement</u>	How will you focus/motivate students? ___ mins	What will students be doing during the anticipatory set? ___ mins
<u>Exploration</u>	Explain what and how you will provide an exploration science activity (must be hands-on). ___ mins	Explain what students will be doing during the exploration activity. ___ mins
<u>Concept Invention</u> e. Students share what they did and learned during Exploration f. Teacher introduces students to new information.	How will you have students share their ideas, knowledge and questions from the exploration phase? Explain how <u>you</u> will introduce students to relevant information, terminology and concepts to reinforce what they learned during exploration. ____ mins	Explain how students will share their ideas, knowledge and questions from exploration phase. Explain what students will be doing while you are introducing relevant information, terminology and concepts to reinforce what they learned during exploration. ____ mins
<u>Concept Application</u>	Concept Application- Explain what and how you will provide a second hands-on science activity that extends students' thinking and learning from the two previous two phases? ___ mins	Explain what students will be doing during the concept application activity. ___ mins

Last Assignment of Course:**9. Course Reflection (individual) 5%**

Instructions will be given in class. Typed course reflections will be due the last class.

Complete Assignment Checklist

Assignment	%	Individual or Team	Documents to Turn In	Due Date
Reading Journal	15	Individual	Blue Books - individual Ch 2-21	Each Class
Framework and Standards Activity	10	Individual Trios	Part A & B – individual Part C – Groups of 3	Sept.28 Oct. 5
Leadership of Hands-On Science Lesson Activities	20	Trios	Self-Eval Rubric - trios Lesson Plan - trios	Through -out
Learning Cycle Lesson Drawings	05	Individual	Drawings w Labels - Blue Book/Lab- individual	Nov. 30
Learning Cycle Lesson Explanations	05	Individual	Explanations - Blue Book/Lab- individual	Nov. 30
Science Exploratorium-Nov. 9	10	Pairs	Lesson Plan-Pairs Data sheet- Pairs Reflection - individual	Nov. 2 Nov. 2 Nov. 16
Science Curriculum Unit	20	Individual	Self-Eval Rubric - indiv Unit – indiv.	Nov. 30
Course Reflection	05	Individual	Typed Responses individual	Dec. 7
Curriculum Presentations	05	Team	Powerpoint printout (1 per team)	Dec. 7

Your Full Name _____ Cohort _____

SCIENCE EDUCATION GRADESHEET

This will be attached to your Class Folder. Keep your own copy in your Science Notebook.

Attendance

(Present, late or absent—sign your name and indicate if late. For previous classes, indicate if present for whole class or left early)

Class

1 _____ 8 _____
 2 _____ 9 _____
 3 _____ 10 _____
 4 _____ 11 _____
 5 _____ 12 _____
 6 _____ 13 _____
 7 _____

Reading Journal (9 points each)

Aug. 31 _____ points	Oct. 26 _____ points
Sept. 14 _____ points	Nov. 2 _____ points
Sept. 21 _____ points	Nov. 9 _____ points
Sept. 28 _____ points	Nov. 16 _____ points (No class Nov. 23 rd)
Oct. 5 _____ points	Nov. 30 _____ points
Oct. 12 _____ points	Dec. 7 _____ points
Oct. 19 _____ points	

Assessment of Course Objectives

Percent of Grade

Your Grade

Final Points

- | | |
|---|-----|
| 1. Participation and Collaboration | 5% |
| 2. Reading Journal | 15% |
| 3. Framework and Standards Activity | 10% |
| 4. Leadership of Hands-on Science Lesson Activities | 20% |
| 5. Learning Cycle Lesson Drawings | 5% |
| 6. Learning Cycle Lesson Explanations | 5% |
| 7. Science Exploratorium Lesson Plan/Presentation | 10% |
| 8. Science Curriculum | 20% |
| 9. Course Reflection | 5% |
| 10. Curriculum Presentations | 5% |

Final Course Grade _____
 Final Letter Grade _____

EDMS 545B COURSE SCHEDULE OF TOPICS AND ASSIGNMENTS: FALL 2009

DATE	COURSE TOPICS & ASSIGNMENTS	Read Chapters
8/31 Class 1	<p>Possible Outcomes: Your Goals and Course Goals</p> <ul style="list-style-type: none"> • Orientation to Class; index card IDs • Participation and Collaboration • The Learning Cycle Model of Instruction • Instructor Led Learning Cycle Lesson on Matter • Divide into groups of 3 for Leadership of Hands-on Learning Cycle Lessons • Text Overview • Bring Signed Syllabus Contract to next class (on website under Syllabus) • Bring Erosion Lesson Plan to next class (on website under Handouts) • Bring Text, Science Framework, and Lab Comp book to next class. • Download, print and bring California Science Content Standards, Grades K-6 to next class http://www.cde.ca.gov/be/st/ss/scmain.asp. (You must print these even though they are in the Frameworks; you will need them separate.) <p>For next session: Write Big Ideas Paper on Ch 1 or 2 in Blue Book. Bring Culture Bag.</p>	1 and 2
9/7	Labor Day Holiday	
9/14 Class 2	<p>Turn in Reading Journal</p> <ul style="list-style-type: none"> • Writing Learning Objectives, Science Concepts & Essential Questions • Concept Mapping Instructor Led Learning Cycle Lesson on Landforms: Erosion • Drawings and Explanations in Composition Book • Team time for Learning Cycle Lessons • Private Universe: What causes the seasons? Understanding science concepts. • Science Framework Discussion: Do Part A- Framework Summary Response. • <u>Each person should bring Science Framework & Content Standards to classes.</u> • Divide into groups of 4 for Year-Long Curriculum • Culture Bags <p>For next session: Draw Concept Map on Ch 3 or 4 in Blue Book.</p>	3 and 4 Framework 1-22
9/21 Class 3	<p>Turn in Reading Journal</p> <p><u>Meet at Jack's Pond Nature Center; We will begin at 1:15</u></p> <ul style="list-style-type: none"> • Turn in Reading Journal. • Nature Center Lesson Activities <p>For next session: Write Big Ideas Paper on Ch 5 or 6 in Blue Book.</p>	5 and 6
9/28 Class 4	<p>Turn in Reading Journal</p> <ul style="list-style-type: none"> • Science Process Skills and Scientific Attitudes • Science Content Standards Overview and Activity • Instructor Led Learning Cycle Lesson on Heat Transfer (in Ch. 5) • Team 1 Learning Cycle Lesson on topic from Ch. 6 • Team Time for Science Framework and Standards Activity, Parts B and C <p>For next session: Draw Concept Map on Ch 7 or 8 in Blue Book.</p>	7 and 8
10/5 Class 5	<p>Turn in Reading Journal</p> <ul style="list-style-type: none"> • Turn in Framework Summary Response and Grade Level Sci Standard Response • Science Framework and Standards Activity presentations • Teaching English Language Learners in Science • Instructor Led Learning Cycle Lesson on Electricity (in Ch. 7) • Team 2 Learning Cycle Lesson on topic from Ch. 8 • Team time for Learning Cycle Lessons <p>For next session: Write Big Ideas Paper on Ch 9 or 10 in Blue Book.</p>	9 and 10 Comp. Communic booklet
10/12 Class 6	<p>Turn in Reading Journal</p> <ul style="list-style-type: none"> • Work on Science Curriculum Unit: Grade Level Groups • <u>Performance Assessments</u> • <u>Developing Criteria for Assessing Learning and Using Rubrics to Show Criteria</u> • Instructor Led Learning Cycle Lesson on Light (in Ch. 9) 	11 and 12

	<ul style="list-style-type: none"> • Team 3 Learning Cycle Lesson on topic from Ch. 10 • Team time for Learning Cycle Lessons • Communication Basics: An Overview of Nonviolent Communication <p>For next session: Draw Concept Map on Ch 11 or 12 in Blue Book</p>	
10/19 Class 7	<p>Turn in Reading Journal</p> <ul style="list-style-type: none"> • NSTA Position Statements on Elementary Science and Assessments • Integrating Writing into Science Activities • Work on Science Curriculum Unit: Grade Level Groups • Instructor Led Learning Cycle Lesson on Flight (in Ch. 11) • Team 4 Learning Cycle Lesson on topic from Ch. 12 • Select Partners for Science Exploratorium (work in pairs) <p>For next session: Write Big Ideas Paper on Ch 13 or 14 in Blue Book.</p>	13 and 14
10/26 Class 8	<p>Turn in Reading Journal</p> <ul style="list-style-type: none"> • Work on Science Curriculum Unit: Grade Level Groups • Instructor Led Learning Cycle Lesson on Sun, Moon and Stars (Ch. 14) • Team 5 Learning Cycle Lesson on topic from Ch. 13 • Inclusion and Teaching Science to Students with Special Needs • Science Exploratorium Planning time <p>For next session: Draw Concept Map on Ch 15 or 16 in Blue Book.</p>	15 and 16
11/2 Class 9	<p>Turn in Reading Journal</p> <ul style="list-style-type: none"> • Turn in 1 page Lesson for Science Exploratorium and 1/2-1 page "Data Sheet" • Work on Science Curriculum Unit: Grade Level Groups • Instructor Led Learning Cycle Lesson on Geology: Topography (Ch. 15) • Team 6 Learning Cycle Lesson on topic from Ch. 16 • Inclusion and Teaching Science to Students with Special Needs= <p>For next session: Write Big Ideas Paper on Ch 17 or 18 in Blue Book.</p>	17 and 18
11/9 Class 10	<p><u>12:00 Meet at Live Oak Elementary School, Fallbrook- Exploratorium</u></p> <ul style="list-style-type: none"> • Bring copies of Data Sheets for the elementary children • Turn in Reading Journal • Upload Exploratorium Lesson Plan and Data Sheet to WebCT Discussion Thread <p>For next session: Draw Concept Map on Ch 19 or 20 in Blue Book.</p>	19 and 20
11/16 Class 11	<p>Turn in Reading Journal</p> <ul style="list-style-type: none"> • Turn in Exploratorium Reflection; Exploratorium Discussion • Required: bring 2 copies of Curriculum Unit/Grade in class. • Science Projects, Student Research, Science Fairs • Safety in the Science Class • Instructor Led Learning Cycle Lesson on Plants (Ch. 18) • Team 7 Learning Cycle Lesson on topic from Ch. 17 <p>For next session: Write Big Ideas Paper on Ch 21 in Blue Book; No class 11/23</p>	21
11/30 Class 12	<p>Turn in Reading Journal</p> <ul style="list-style-type: none"> • Turn in Final copy of Science Curriculum Units • Turn in Learning Cycle Lesson Drawings and Explanations • Upload Curriculum to WebC T Discussion Thread • Benchmarks • National Science Education Standards • Instructor Led Learning Cycle Lesson on Bones (Ch. 21) • Team 8 Learning Cycle Lesson on topic from Ch. 19 or 20 • Begin Course Reflection 	
12/7 Class 13	<p>Last Class</p> <ul style="list-style-type: none"> • Curriculum Presentations • Turn in Course Reflection; Course evaluation 	