CALIFORNIA STATE UNIVERSITY SAN MARCOS
COLLEGE OF EDUCATION
EDMS 545 Science Education MSBC 61 Cohort 21824
Spring 2005 UH460 Fridays 8:00-2:15 (lunch - 11:45-12:45)

Instructor: Dr. Kathy I. Norman, 311 Univ.Hall **email: knorman@csusm.edu**
Phone: 760-750-4314 **Office Hours: after each class and by apt.**

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)

INFUSED COMPETENCIES

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. You will be required to formally address the following TPEs in this course: TPE 1A and TPE5. To successfully meet these TPEs, you must respond on TaskStream using the Science Exploratorium Lesson and Reflection as your focus. Your grade will not be submitted until you have submitted your responses, attached your evidence, and requested feedback from me on TaskStream.

A. MAKING SUBJECT MATTER COMPREHENSIBLE TO STUDENTS
TPE 1A: Subject-Specific Pedagogical Skills for Multiple Subject Teaching Assignments - Teaching Science in a Multiple Subject Assignment
Candidates for a Multiple Subject Teaching Credential demonstrate the ability to teach the state-adopted academic content standards for students in science (K-8). They balance the focus of instruction between science information, concepts, and investigations. Their explanations, demonstrations, and class activities serve to illustrate science concepts and principles, scientific investigation, and experimentation. Candidates emphasize the importance of accuracy, precision, and estimation.

C. ENGAGING AND SUPPORTING STUDENTS IN LEARNING
TPE 5: Student Engagement
Candidates for Teaching Credentials clearly communicate instructional objectives to students. They ensure the active and equitable participation of all students. They ensure that students understand what they are to do during instruction and monitor student progress toward academic goals. If students are struggling and off-task, candidates examine why and use strategies to re-engage them. Candidates encourage students to share and examine points of view during lessons. They use community resources, student experiences, and applied learning activities to make instruction relevant. They extend the intellectual quality of student thinking by asking stimulating questions and challenging student ideas. Candidates teach students to respond to and frame meaningful questions.

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.

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

Visual and Performing Arts
This course infuses 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.

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.

COURSE PREREQUISITES

Course prerequisites include admission to the program, successful completion of the Semester 1 courses, and successful completion of the Beginning Student Teaching experience.

REQUIRED TEXTS

Friedl, A.E. & Koontz, T.Y. (2005) *Teaching Science to Children, An Inquiry Approach.* NY: McGraw-Hill.
Science Framework for California Public Schools. (2003) Sacramento: California Dept. of Education.
Choate, J. S. (2003). *Successful Inclusive Teaching (4rd ed.)* Needham, MA: Allyn & Bacon.
Chancer, J. & Rester-Zodrow, G. (1997). *Moon Journals; Writing, Art and Inquiry through Focused Nature Study*. Portsmouth, NH: Heinemann. (2 copies of this book will be on reserve in the library for your use)

COURSE REQUIREMENTS

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. All writeen 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.

Professionalism/Dispositions

Because this course is part of an accredited program that leads to professional certification, students are expected to demonstrate behavior consistent with a professional career. Lack of professionalism in any of the following areas will alter the final grade.

1. Attend all class meetings. 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 1 day, your highest possible grade is a B. If you are absent more than 1 day, your highest possible grade is a C, which means that you will not pass the course. Late arrivals and early departures will affect your final grade. Absences do not change assignment due dates. Late assignments will receive a reduction in points for each day late.

2. Interact professionally and collaborate responsibly with your colleagues and professor. Teacher education is a professional preparation program and students will be expected to adhere to standards of dependability, and academic honesty. Prepare carefully for class, be ready to discuss readings and assignments thoughtfully.

3. Each written 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.

4. Complete all assignments on time. Late assignments will receive a 20% reduction in points for each day late. Occasionally a student may be asked to revise an assignment.

All University Writing Requirement

In keeping with the All-University Writing Requirement, all courses must have a writing component of at least 2,500 words (approximately 10 pages) which can be administered in a variety of ways.

Person-First Language

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

Multidisciplinary Magic

Students who wish to "go the extra mile" and integrate assignments within their methods courses this semester are encouraged to do so. For example, in social studies you are creating a unit. If an assignment in science or math can be completed meeting objectives for both disciplines, and be effective for your unit, it will be received with a welcome acceptance! Please note that you would be wise to consult with instructors with your idea to ensure that the integration of subjects is complete and meets the criteria for both assignments.

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.

IMPORTANT NOTE: This is NOT a typical college course in which the instructor lectures and you follow along learning the material; the instructor will NOT lecture. We will spend the majority of time doing elementary science laboratory investigations which will be lead by students, in order to help you gain confidence and competence in doing hands-on science. In addition, you will gain additional experience and knowledge in science teaching by observing and teaching elementary science at local schools. The instructor will NOT teach in the traditional sense, but will be a facilitator in helping students to achieve course objectives. If you are not comfortable with this, this is not a course you should take.

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 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 science teaching.
7. Demonstrate confidence in leading and performing investigations designed to teach science concepts, science process skills, and scientific attitudes.
8. Use authentic methods of assessment to evaluate learning of science concepts and processes.
9. Design 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).

GRADING STANDARDS

A = 93-100	B = 83–86	C = 73-76
A– = 90-92	B- = 80-82	C- = 70-72
B+ = 87-89	C+ = 77-79	F = 0-69

In order to receive a passing grade for the class, you must respond to TPEs 1A and 5 on TaskStream, attach your evidence of successfully meeting the TPEs, and invite feedback from me on TaskStream.

It is expected that students will proofread and edit 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 citations, where appropriate, will use American Psychological Association (APA) format. Consult American Psychological Association (APA) Manual, 5th edition for citation guidance.

Grading will also include a component of "professional demeanor." Students will conduct themselves in ways that are generally expected of those who are entering the education profession. This includes but is not limited to:

- On-time arrival to all class sessions;
- Advance preparation of readings and timely submission of assignments;
- Respectful participation in all settings (e.g., whole group, small group, in/outside of class);
- Carefully considered, culturally aware approaches to solution-finding.

Exemplary "A" Students

1. Demonstrate serious commitment to their learning, making full use of the learning opportunities available and searching out the implications of their learning for future use.
2. Complete all assignments thoroughly and thoughtfully toward the goal of developing an in-depth unit.
3. Make insightful connections between all assignments and their developing overall understanding of concepts; continually question and examine assumptions in a genuine spirit of inquiry.
4. Students show a high level of achievement of course goals.

"B" Students

1. Simply comply with the course requirements and expectations.
2. Complete all assignments, usually thoroughly and thoughtfully.
3. Usually connect assignments to their developing overall understanding of concepts; may be satisfied with accepting their learning as it is received without deeply examining assumptions or seeking a higher level of understanding of the implications.
4. Students show reasonable achievement of course goals.

"C" Students

1. Demonstrate an inconsistent level of compliance to course requirements and expectations.
2. Complete all assignments with limited thoroughness and thoughtfulness.
3. Make limited connections between assignments and their developing overall understanding of concepts; may not be open to examining assumptions or implications and may actually dismiss the importance of the understanding of concepts.
4. Attempt, but show limited progress in achieving course goals.

ASSESSMENT OF COURSE OBJECTIVES

IN-CLASS ACTIVITIES

1.	Participation, Collaboration, and Professionalism (individual)	5%
2.	Moon Journals Assignment (individual)	5 %
3.	Science Curriculum Committee Mid-Term Prompts (team and individual)	10 %
4.	Mock Interview (team and individual)	10 %

ASSESSMENTS INITIATED IN CLASS, PREPARED OUTSIDE OF CLASS

5.	Reading Accountability (individual)	15 %
6.	Leadership of Hands-on Science Lesson (teams, presented during class time)	5 %
7.	Science Exploratorium Lesson Plan/Presentation (pairs, presented during class time)	10 %
8.	Videotape and Reflection (individual)	15 %
9.	Final Assignment (individual)	5 %
10.	Science Teaching Unit and Presentation (pairs)	20 %

PARTICIPATION, COLLABORATION AND PROFESSIONALISM

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

ASSESSMENT 1

Rubric for PCP: Participation, Collaboration and Professionalism

	Excellent	Acceptable	Unacceptable	Comments
Attitude Do you show a positive attitude toward class, "the work" and learning?	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.	
Participation Do you participate in class discussions productively, sharing your knowledge and understandings?	Attends every class, always on time and well prepared, and never leaves early. Gives closest attention to class activities and 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.	
Professionalism Do you exhibit professional behavior at all times?	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, regardless of task/topic.	Seldom behaves, talks, and works in a professional manner, regardless of task/topic.	
Collaboration Can you monitor and adjust your participation to allow for others' ideas to be heard? Are you supportive of others' ideas and work?	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.	
Contributions Do you contribute to whole class and group work? Do you "do your share"?	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.	
Disposition toward teaching Do you exhibit a positive disposition towards teaching all students?	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 Content 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.	
Leadership Do you interact productively with your peers and show leadership initiative?	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.	

At mid-semester, you will meet with me individually to review your progress.

At the end of the semester, you will do a self assessment using this rubric, and write a 1-2 page rationale.

ASSESSMENT 2

MOON JOURNALS ACTIVITY

Do an observation of some natural event using all of your senses and take notes. (An example might be walking on the beach and observing the ocean waves coming upon the beach. Another example might be going outside at night and observing the night sky, watching the starts and identifying the constellations.) In your notes, you will need at least five specific details for each sense. If there is one sense that can't be used for your observation, give the reason why. On the day we work with these observations, bring your notes. Even if it's something you've done many times before – do it again for this assignment. You are to use immediate experience, not memory.

You will be assigned a writing invitation and an art invitation in Moon Journals. On the day we do the activities in class, you are to bring the supplies you need to complete each invitation, plus your notes from your natural event observation. We will complete the invitations in class. Then we will show and explain our productions. Turn in a copy of your product.

ASSESSMENT 3

SCIENCE CURRICULUM COMMITTEE WORK (Mid-Term Oral and Writing Prompt)

This will be completed during class. Bring Science Framework, text, and other resources.

ASSESSMENT 4

MOCK INTERVIEW (End of Term Oral and Writing Prompt)

This will be completed in class.

ASSESSMENT 5

READING ACCOUNTABILITY

Grading: Maximum of 5 pts. for each chapter's concepts. 20 CHAPTERS X 5 PTS=100 PTS

For each of chapters 2-21, complete one of the following:

A. Draw a concept map, using correct concept mapping procedures taught in class or
B. Select one science concept that interests you and do follow the procedures below.
   For each concept:
   1. Provide evidence you understand the concept. Explain the concept and give an example.
   2. Explain how you will teach this concept in your classroom. Give an example of an activity that you will use to teach the concept. Explain what students will do in the activity to learn the concept.
   3. Develop a **higher level** thinking question about the concept, one designed for students. Make sure it is a higher level question, not a lower level question.

      Analysis: Understand how parts relate to the whole
      Compare ____to ____.
      How would you solve __?
      How does this part relate to _____?

      Evaluation: Development of opinions, judgments or decisions
      Do you agree____? Justify and explain.
      What do you think about_____?
      What is the most important_____? Prioritize_____according to_____.
      How would you decide about____? What criteria would you use to assess_____?

      Synthesis: Combination of new ideas to form a new whole
      What would you predict/infer from_____?
      What ideas can you add to_____?
      How would you create/design a new_____?
      What might happen if you combined_____with_____?
      What solutions would you suggest for_____?

ASSESSMENT 6

LEADERSHIP OF HANDS-ON SCIENCE LESSON (teams of 2 or 3)

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 content standards. SDAIE strategies, technology integration, and methods for teaching students with disabilities should be included and pointed out during the lesson.

You will work in teams of two-three to lead science lessons based on the Learning Cycle Model of Instruction. You will teach these to your classmates. Each lesson will be allocated a maximum of 45 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 must 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.

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. Make sure that you include the 3 stages of the Learning Cycle. Make sure that science content background and applications to everyday life are addressed. You need to explain SDAIE strategies and adaptations for students with disabilities.

Prepare a Powerpoint Computer Presentation to use in your lesson. The presentation should include a detailed explanation of the science content, as well as a list and definitions of science concepts important to the lesson. Additionally, include a list of at least 5 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 examples during the lesson.

Science Lesson Handout

- Prepare a handout which includes the information under Lesson Plan Format
- Bring copies of the activity for each person with
    - team members' names at the top
    - reference at the bottom.

*** Also do a self-assessment, using the rubric for this assignment. Turn in your completed rubric stapled on top of the assignment.

IMPORTANT NOTE: Two days PRIOR to your team's presentation, email your complete lesson plan and your PowerPoint Presentation to the instructor for review. After I have approved these, you may make copies of the lesson plan to distribute to students in class on your presentation day.

Lesson Plan Format

Lesson Title: What is the title of your lesson?

Grade Level: What is the grade level?

Student Groupings: How will you group students for instruction?

Materials/Resources/Technology: What does the teacher need? What do the students need?

California Science Content Standard(s): What standards are addressed? Include at least one science area (life science, physical science, or earth science) standard and one investigation standard.

Lesson Objective(s): 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? Which essential questions will be answered through the lesson? Do not say "The students will ____." (That is an objective, not a concept.)

Essential Question(s): What are your essential question(s) for this concept?

Assessment: How will your students demonstrate that they have met the objective? What evidence demonstrates that they have achieved the objective?

Criteria for Assessment: What criteria will you use to grade the assessment? How will you know if someone has successfully completed the assessment?

Lesson Procedures: Explain the procedures for each. Include what the teacher will do and what the students will do.

The Learning Cycle

a. Exploration (Begin with students making predictions.)
(minutes?)
b. Concept Invention
(minutes?)
c. Concept Application
(minutes?)

Accommodations/Adaptations/Applications:

- SDAIE strategies and explanations (5)
- Adaptations for students with disabilities and explanations (5)
- Applications to everyday life and explanations (5)

Science Content Background: 1-2 page summary of the content background

Web Sites: 5 interactive relevant web sites with descriptions

Children's Literature Books: Title, author, publisher, year of 5 children's books on the topic

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

References: Title, author, publisher, year of resources

RUBRIC FOR LEADERSHIP OF HANDS-ON SCIENCE LESSON

For Grading and Self-Assessment. Complete, staple on top of lesson plan and turn in to Dr. Norman

Score Criteria Quality of Work

		8-10 pts	4-7 pts	1-3 pts	0 pts
_____	Info. about lesson 10 point max	You included title (1 pt), grade level (1 pt), student groupings (1), materials/ resources/ tech (1 pt), content standards (1 pt), objectives (3 pts), references (2 pts).	4-7 components included.	1-3 components included.	These components not included.
_____	Science Concepts/ Essential Questions 10 point max	You included 1-2 statements of the science concept, as well as essential questions answered through the lesson.	Science concepts and essential questions are poorly described.	Science concepts and essential questions are brief and unclear.	Science concepts and/or essential questions not included.
_____	Assess-ment and Criteria 10 point max	You included a performance assessment during which students show evidence that they achieved the objective(s), and criteria for grading	Performance assessment poorly described; link with objective unclear. Criteria for grading not described.	Assessment included, but not a performance objective or the assessment does not match the objective. No or weak criteria.	Performance assessment not included. Did not include criteria for grading.
_____	Concept Exploration 10 point max	Predictions were made at beginning. All students participated in a developmentally appropriate hands-on science activity, made observations, and collected data.	Some students participated in a developmentally appropriate hands-on science activity, made observations, and collected data.	You provided a demonstration of a hands-on science activity.	None of the students participated in a hands-on science activity. No demonstration occurred.
_____	Concept Invention 10 point max	Students shared their observations, data and explanations. Teacher provided further explanations and terminology, and tied it all together.	A minimum of student sharing and explaining occurred. Teacher provided some explanation.	No student sharing occurred. Teacher provided all explanations.	No student sharing occurred. Little teacher sharing occurred.
_____	Concept Application 10 point max	All students participated in a developmentally appropriate hands-on science activity, made observations, and collected data.	Some students participated in a developmentally appropriate hands-on science activity, made observations, and collected data.	You provided a demonstration of a hands-on science activity.	None of the students participated in a hands-on science activity. No demonstration occurred.

Score Criteria Quality of Work

		5 pts	3-4 pts	1-2 pts	0 pts
_____	Science Content Background 5 point max	Your team provided a thorough explanation of the science content background.	Your team provided a short explanation of the science content background.	Your team provided an incomplete explanation of the science background.	Your team provided a poor explanation of the science background.
_____	SDAIE Strategies 5 point max	Five SDAIE strategies are explained.	3-4 SDAIE strategies are explained.	1-2 SDAIE strategies are explained.	No SDAIE strategies are explained.
_____	Adaptations for Students with Disabilities 5 point max	Five adaptations to meet the needs of students with disabilities are included.	3-4 adaptations to meet the needs of students with disabilities are included.	1-2 adaptations to meet the needs of students with disabilities are included.	No adaptations to meet the needs of students with disabilities are included.
_____	Applications to real life 5 point max	Five applications to everyday life are described.	3-4 applications to everyday life are described.	1-2 applications to everyday life are described.	No applications to everyday life are described.
_____	Interactive Relevant Web Sites 5 point max	You included 5 web sites with descriptions and links to the sites.	You included 3-4websites with descriptions and links to the sites.	You included 1-2websites with descriptions and links to the sites.	You included no web sites with descriptions and links to the sites.
_____	Literature Books 5 point max	You showed 5 children's books.	You showed 3-4 children's books.	You showed 1-2 children's books.	Children's books not included.
_____	Handout & Presenta-tion 5 point max	Included all parts of the Lesson Plan.	Included more than half of the parts.	Included less than half of the parts.	Handout not passed out to each student or didn't do presentation.
_____	Arts 5 point max	You integrated one or more arts standards, integrated in a meaningful way.	Arts included in some way, but did not integrate standards.	Little relation to arts included.	Arts not included.

Total Points _____

ASSESSMENT 7

SCIENCE EXPLORATORIUM LESSON PLAN AND PRESENTATION (PAIRS)

Critical Assessment Task (CATs) to be submitted and discussed on TaskStream for TPE 1A and 5.

Develop an inquiry activity to teach to elementary students. You may work in pairs on this assignment. You will prepare a hands-on science lesson and poster about a science concept. You will present the lesson at our Elementary School Science Exploratorium. Be sure you understand the concept(s) you are emphasizing, and that you can explain it. The activity should be developmentally appropriate, and should follow the NSTA Safety Guidelines. Prior to teaching the lesson, turn it in to your instructor for review. After teaching the lesson, turn it in again with a copy of your Reflection and your self-assessment Rubric. 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.)

Type a 1 page abbreviated Lesson Plan with your names at the top and REFERENCES at the bottom.

Lesson Plan Format

Lesson Title: What is the title of your lesson?

Lesson Objective(s): 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 science concept.)

Essential Question(s): What are your essential question(s) for this concept?

Materials/Resources/Technology: What does the teacher need? What do the students need?

Assessment: How will your students demonstrate that they have met the objective? Is there a clear match between the standards, objectives and the assessment?

Assessment Criteria: What criteria will you use for grading the assessment? How will you know students have successfully completed the assessment?

Lesson Procedures: BRIEFLY explain the procedures for each. Include what the teacher will do and what the students will do.

- Exploration (Students should first make predictions.)
- Concept Invention
- Concept Application

References: Title, author, publisher, year of resources

The Reflection (to turn in after the Exploratorium; answer the following)

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

You will turn in your lesson plan prior to the Exploratorium.

After the Exploratorium, you will do a a self-assessment by completing the RUBRIC for this assignment. Staple it on top of your REFLECTION, with another copy of the Lesson Plan on bottom, and turn into the instructor. (Staple 3 items, Rubric on top, Reflection in middle, 1 page Lesson Plan on bottom)

RUBRIC FOR ACTIVITY, POSTER AND PRESENTATION-Science Exploratorium

Score	Criteria	Quality of Work		
		Excellent	**Acceptable**	**Unacceptable**
_____	Visual Display 10 pts. max	3 sided visual display shows great creativity and is thought-provoking. Graphically demonstrates concept.	3 sided visual display shows creativity and thoughtfulness; has graphics or pictures.	Visual display is present, but required little imagination or creativity.
_____	Timing 10 pts. max	You easily adjusted your teaching to the time allocated. You showed creativity and flexibility.	You adjusted somewhat to the time allotted .You showed some creativity and flexibility.	You did not easily adjust your teaching to the time allocated. You showed little creativity and/or flexibility.
_____	Student Data Sheet 10 pts. max	You had copies of a data sheet for all students.	You had data sheets, but not for all students.	You did not require students to keep data.
_____	Materials 10 pts. max	You have necessary materials for all students to participate in hands-on lesson.	You have necessary materials for some students to participate in hands-on lesson.	You had materials for demonstrations only.
_____	Your Understanding 20 pts. max	It was obvious that you had a complete and thorough understanding of the science content.	You did not have a complete understanding of the science content.	You had misconceptions about the science content.
_____	Your lesson 20 pts. max	Learning Cycle Lesson is (a)hands-on, (b)developmentally appropriate, & (c)feasible for all students.	Two of the 3 characteristics are present.	Teacher does a hands-on activity for students.
_____	Reflection 20 pts. max	You wrote a complete reflection about how children demonstrated understanding, and how you could or did improve.	You wrote some about how children responded, showed understanding, & how you could or did improve.	You wrote little about how children responded, showed understanding, & how you could or did improve.

Total points _____

ASSESSMENT 8

VIDEOTAPE AND REFLECTION

This assignment requires a 15-20 minute video taping of you teaching a science instructional experience in an elementary classroom setting.

The goals of this assignment are to:
1. Provide practice for preparing a formal lesson that you will teach.
2. Provide you with opportunities to infuse effective practice strategies in their planning and teaching.
3. Provide you with opportunities to reflect on your teaching choices. Students will self and peer review/critique the video taped lessons.

1. **PART 1: LESSON PLAN**
   Prepare your lesson plan and review it with your Cooperating Teacher.

2. **Part 2: VIDEOTAPE**
   Videotape yourself teaching a science lesson.

3. **PART 3: REFLECTING ON YOUR TEACHING LESSON (Your self critique)**
   a. First, review your teaching video to evaluate your performance with regard to the following general competencies. This is for your benefit!
      - Planning and subject area competence
      - Instructional skills
      - Accommodations to insure success of every student
      - Evaluation (learner achievement *and* own skills)
      - Classroom organization
      - Student behavior
      - Personal/professional behavior

   b. Then, write a self critique, reflecting on the experience in writing by answering the following questions:
      (1) What worked and why? [What elements of the lesson effectively contributed to student learning?]
      (2) What did not work and why? [What elements of the lesson did not contribute to student learning?]
      (3) If the lesson were taught again, in what specific ways could it be modified to increase its effectiveness?
      (4) Based on the feedback received, what specific plans can be made to increase teacher effectiveness?

      (Based on Hanna & Hansen, 1992)

4. **PART 4: TURN IN**
   a. A videotape of the science lesson
   b. A complete lesson plan
   c. Your reflective self critique (written responses to the four questions above, typed, double spaced)
   d. Two peer critiques (may be handwritten) with clear signatures of reviewers

SPECIAL NOTICE. This assignment *may* require some special arrangements and understandings because of its nature and the fact that a recording is being made.

First, be sure to advise the regular classroom teacher and the school administrator of the assignment and its intent:

- This is to be a learning experience for you to see yourself in the role of the teacher as your students see you. "In the role of the teacher" requires you to introduce a lesson; deliver directions about how to do something; demonstrate a procedure; ask questions to check student understanding; work with individual, small group, or the entire class; transition between activities; monitor student progress and behavior. You do not have to deliver a lecture for this assignment.
- You will self critique your work in writing in light of the questions above. Other peers or teachers also will critique your work in writing using the same questions.
- While students *may* be filmed, the intent ***never*** is to focus on the children or their behavior. However, your management and interaction with the students may be part of the critique.
- Notify parents about this assignment in order to obtain permission for their child to participate. If parents object to the possibility that their child will be seen on videotape, simply make arrangements for the child to be elsewhere during the taped instruction time.

Arrange for a video camera and an operator, if possible. Many elementary schools now have video equipment on site. Classroom teachers or aides or other student teachers may be available to help with the actual filming.

Arrange for timely viewing/critique by two other individuals (classmates/other teacher trainees, the classroom teacher, another experienced teacher or administrator).

If you find that videotaping is not allowed in your school/classroom, then arrange for someone to take photographs of you teaching and turn the photos in with your lesson plan.

ASSESSMENT 9

FINAL ASSIGNMENT

Instructions will be given during class.

ASSESSMENT 10

SCIENCE TEACHING UNIT (completed outside of class, may work in pairs)

You will create a typed unit on a specific science topic. You may work in pairs on this assignment.

*** Also do a self-assessment, using the rubric for this assignment. Turn in your completed rubric stapled on top of the assignment on the regular class day. Just staple everything; **no folders** please.

You will present an overview of your unit on the last class day. Bring a handout, described at the end of the Unit description.

Unit Components:

1. **Unit Plan** (1 page; include title, grade level, goals for unit, and short descriptions of each learning cycle lesson)
2. **Unit Assessment (Summative, Performance Assessment for Entire Unit, not a portfolio)**
   a. Describe what the students will do to demonstrate learning for entire unit. What evidence will they present?
   b. Include criteria that you will use to judge assessment
   c. Include rubric, as a tool to grade assessment (see http://rubistar.4teachers.org/) Include criteria (b) in rubric.
3. **Accommodations/Adaptations/Applications:**
   a. SDAIE strategies and explanations (5)
   b. Adaptations for students with disabilities and explanations (5)
   c. Applications to everyday life and explanations (5)
4. **Science Content Background:** 1-2 page summary of the science content background
5. **Web Sites**: 5 interactive relevant web sites with descriptions
6. **Children's Literature Books:** Title, author, publisher, year of 5 children's books on the topic
7. **Arts Standards Integration**: Explain how you will integrate learning in the Arts.
8. **References:** Title, author, publisher, year of resources
9. **Five Learning Cycle Lesson Plans (details follow)** (three lesson plans if working alone)
   Adapt from Commercial Lessons in books and science curricula. Do not re-invent activities.

   Lesson Title: What is the title of your lesson?
   Grade Level: What is the grade level?
   Student Groupings: How will you group students for instruction?
   Materials/Resources/Technology: What does the teacher need? What do the students need?
   California Science Content Standard(s): What standards are addressed? Include at least one science area (life science, physical science, or earth science) standard and one investigation standard.
   Lesson Objective(s): 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? Which essential questions will be answered through the lesson? Do not say "The students will ____." (That is an objective, not a concept.)
   Essential Question(s): What are your essential question(s) for this concept?
   Assessment: How will your students demonstrate that they have met the objective? What evidence demonstrates that they have achieved the objective?

Lesson Procedures: Explain the procedures for each. Include what the teacher will do and what the students will do.

- Exploration (Students should first make predictions.) (minutes?)
- Concept Invention (minutes?)
- Concept Application (minutes?)

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.

On the last class day, you will present an overview of your unit. Bring a handout for everyone (one page-front and back) including the title, grade level, goals, unit assessment description with criteria, web addresses of web sites, list of literature books, arts integration, references, and brief descriptions of the 3 stages of each lesson. Do not exceed one page front and back.

SCIENCE TEACHING UNIT RUBRIC **Topic** _____ **Name** _____

Score	Criteria	Quality of Work			
_____	Unit Plan 5 pts. max	Unit plan was included, with title, grade level, goals, standards, lesson descriptions.	Unit plan included some, but not all, of the components.	Unit plan was very brief and did not include all components.	No unit plan was included.
_____	Summative Performance Unit Assessment 5 pts. max	Complete description of assessment for the unit was included.	Assessment description was not well thought out, was not summative, or wasnot performance.	Assessment was very brief and was not summative.	Did not include unit assessment.
_____	Rubric 5 pts. max	Excellent rubric showing assessment criteria.	Rubric did not show all assessment criteria.	Rubric had little relation to assessment.	Did not include rubric.
_____	SDAIE Strategies 5 pts. max	Five SDAIE strategies are explained.	3-4 SDAIE strategies are explained.	1-2 SDAIE strategies are explained.	No SDAIE strategies are explained.
_____	Adaptations for Students with Disabilities 5 pts. max	Five adaptations to meet t he needs of students with disabilities are included.	3-4 adaptations to meet the needs of students with disabilities are included.	1-2 adaptations to meet the needs of students with disabilities are included.	No adaptations to meet the needs of students with disabilities are included.
_____	Applications to real life 5 pts. max	Five applications to everyday life are described.	3-4 applications to everyday life are described.	1-2 applications to everyday life are described.	No applications to everyday life are described.
_____	Science Content Background 5 pts. max	A complete explanation of science content background was included.	Some science background was included.	A very brief explanation of the science content background was included.	No explanation of the science content background was included.
_____	Web Sites 5 pts. max	You included 5 web sites with descriptions and links to the sites.	Web sites were not described.	Web sites were incomplete.	You did not include web sites. .
_____	Children's Literature Books 5 pts. max	You included the bibliographic info for 5 children's books on the topic.	You left out some of the information (title, author, year, publisher)	Minimal information on children's books was included.	Children's books not included.
_____	Arts Standards Integration 5 pts. max	You integrated arts standard(s) in a meaningful way.	Arts were included, but no standards.	Little relation to the arts could be found.	No arts included.
_____	Five Learning Cycle Lessons 5 points each 25 points total	Lesson plans included all components, including 3 stages of the learning cycle..	Learning Cycle Lesson plans included most of the components.	Lesson plans included some of the components.	Lesson plans very brief and non-descriptive.
_____	References 5 pts. max	You included all bibliographic information on references.	You left out some of the information (title, author, year, publisher)	Minimal reference information was included.	References not included.
_____	Overview Presentation and Handout 20 pts. max	Your presentation showed that you had a deepunderstanding of the topic and how to teach it. Handout was exemplary.	Your presentation showed that you had an understanding of the topic and how to teach it. Handout was complete	Your presentation showed that you had little understanding of the topic and how to teach it. Handout missing components.	You did not do a presentation/have handout

Total Points _____

SB 2042 - AUTHORIZATION TO TEACH ENGLISH LEARNERS COMPETENCIES

PART 1: LANGUAGE STRUCTURE AND FIRST- AND SECOND-LANGUAGE DEVELOPMENT	PART 2: METHODOLOGY OF BILINGUAL, ENGLISH LANGUAGE DEVELOPMENT, AND CONTENT INSTRUCTION	PART 3: CULTURE AND CULTURAL DIVERSITY
I. Language Structure and Use: Universals and Differences (including the structure of English)	**I. Theories and Methods of Bilingual Education**	**I. The Nature of Culture**
A. The sound systems of language (phonology)	**A.** Foundations	**A.** Definitions of culture
B. Word formation (morphology)	**B.** Organizational models: What works for whom?	**B.** Perceptions of culture
C. Syntax	**C.** Instructional strategies	**C.** Intra-group differences (e.g., ethnicity, race, generations, and micro-cultures)
D. Word meaning (semantics)	**II. Theories and Methods for Instruction In and Through English**	**D.** Physical geography and its effects on culture
E. Language in context	**A.** Teacher delivery for both English language development and content instruction	**E.** Cultural congruence
F. Written discourse	**B.** Approaches with a focus on English language development	**II. Manifestations of Culture: Learning About Students**
G. Oral discourse	**C.** Approaches with a focus on content area instruction (specially designed academic instruction delivered in English)	**A.** What teachers should learn about their students
H. Nonverbal communication	**D.** Working with paraprofessionals	**B.** How teachers can learn about their students
I. Language Change		**C.** How teachers can use what they learn about their students (culturally responsive pedagogy)
II. Theories and Factors in First- and Second-Language Development	**III. Language and Content Area Assessment**	**III. Cultural Contact**
A. Historical and current theories and models of language analysis that have implications for second-language development and pedagogy	**A.** Purpose	**A.** Concepts of cultural contact
B. Psychological factors affecting first- and second-language development	**B.** Methods	**B.** Stages of individual cultural contact
C. Socio-cultural factors affecting first- and second-language development	**C.** State mandates	**C.** The dynamics of prejudice
D. Pedagogical factors affecting first- and second-language development	**D.** Limitations of assessment	**D.** Strategies for conflict resolution
E. Political factors affecting first- and second-language development	**E.** Technical concepts	**IV. Cultural Diversity in U.S. and CA.**
		A. Historical perspectives
		B. Demography
		C. Migration and immigration

EDMS 545 Science Education - Tentative Schedule Cohort 61
Fridays 8:00-2:15 (lunch - 11:45-12:45), UH460

Reading For Next Class

Wednesday Jan. 26 – Room 439 — Ch. 1-5

Orientation to Class; index card IDs
Private Universe: What causes the seasons? Understanding science concepts.
The Learning Cycle Model of Instruction
Writing Objectives for Student Learning
Learning Cycle Lesson 1: Matter
Concept Mapping
Text Overview

Writing Science Concept Definitions and Essential Questions
Video: Understanding by Design 1
Library Resources and Web Sites for Science Teaching
Team time for Learning Cycle Lessons
Bring Science Framework to next Class
Assignment: Talk to Cooperating Teacher – science unit topics; teach when student teaching

____

Friday Jan. 28 — Ch.6-7

Science Process Skills and Scientific Attitudes
Science Framework Overview
California Science Content Standards Activity
Learning Cycle Lesson 2: Heat
Video: Understanding by Design 2
Discuss Videotape and Reflection Assignment

Teaching English Language Learners in Science
Team time for Learning Cycle Lessons
Assignment: Talk to Cooperating Teacher – science unit topics; teach when student teaching

____

Friday Feb.4 — Ch.8-9

Turn in Reading Accountabilities Ch 2-7
Team 1 – Leadership of Hands-on Science Lesson – Magnetism
Performance Assessments
Video: Understanding by Design 3

Team 2 – Leadership of Hands-on Science Lesson – Static Electricity
Developing Criteria for Assessing Learning and Using Rubrics to Show Criteria
Begin collecting materials for units

____

Friday Feb.11 — Ch.10-12

Science Curriculum Kits and State Approved Texts
Curriculum Committee Work: Oral and Written Prompts

Team 3 – Leadership of Hands-on Science Lesson – Current Electricity
Integrating Writing into Science Activities
Discuss Science Exploratorium
Discuss Moon Journals Assignment
____ Bring books and other resources for units to next class

Friday Feb.18 Ch.13-15

Team 4 – Leadership of Hands-on Science Lesson – Sound Choate sci.ch.
Complete PCP Rubrics in class
Individual Meetings with Instructor
Discuss Units/Unit Planning time

Team 5 – Leadership of Hands-on Science Lesson – Light, Lenses and Color
Science Projects, Student Research, Science Fairs
For next class: Bring Resources for Moon Journals Writing and Art Activities
Science Exploratorium Planning time

____

Friday Feb.25 Ch.16-18

Turn in Reading Accountabilities Ch 8-15
Turn in **1 page** Lesson for Science Exploratorium and **1/2-1 page** "Data Sheet"
Team 6 – Leadership of Hands-on Science Lesson –Simple Machines
Bring Resources for Moon Journals Writing and Art Activities
Moon Journals Writing and Art Activities

Team 7 – Leadership of Hands-on Science Lesson – Air, Air Pressure and Flight
Inclusion and Teaching Science to Students with Special Needs

____

Friday March 4 Ch.19-21

Science Exploratorium at Elementary School

Discuss Exploratorium
Turn in Videotape, Lesson plan, Reflection and Critiques (in that order)
Team 8 – Leadership of Hands-on Science Lesson – Weather and Climate
Benchmarks for Science Teaching
National Science Education Standards

____

Friday March 11

(Team 9 – Leadership of Hands-on Science Lesson – Geology)
Safety in the Science Class
Complete PCP Rubrics with Rationales
Turn in Reading Accountabilities Ch. 16-21
Turn in Exploratorium Reflection
Turn in Final Assignment

9:00 - 11:00 Unit Presentations/Turn in Units
11:00 - 12:00 Lunch
12:00- 2:15 Mock Interview

Respond to TPE 1A and 5 on TaskStream, using your Science Exploratorium Lesson and Reflection as your evidence

SCIENCE EDUCATION GRADESHEET

KEEP YOUR OWN COPY OF THIS IN YOUR SCIENCE NOTEBOOK. ANOTHER COPY WILL BE IN YOUR CLASS FILE.

Attendance

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

1/26 _____

1/28 _____

2/4 _____

2/11 _____

2/18 _____

2/25 _____

3/4 _____

3/11 _____

Reading Accountabilities (5 points each)

Ch. 2 _____ point	Ch. 9 _____ point	Ch. 16 _____ point
Ch. 3 _____ point	Ch. 10 _____ point	Ch. 17 _____ point
Ch. 4 _____ point	Ch. 11 _____ point	Ch. 18 _____ point
Ch. 5 _____ point	Ch. 12 _____ point	Ch. 19 _____ point
Ch. 6 _____ point	Ch. 13 _____ point	Ch. 20 _____ point
Ch. 7 _____ point	Ch. 14 _____ point	Ch. 21 _____ point
Ch. 8 _____ point	Ch. 15 _____ point	

Assessment of Course Objectives	Percent of Grade	Your Grade
1. Participation, Collaboration, and Professionalism	5%	
2. Moon Journals Assignment	5 %	
3. Science Curriculum Committee Mid-Term Prompts	10 %	
4. Mock Interview	10 %	
5. Reading Accountability	15 %	
6. Leadership of Hands-on Science Lesson	5 %	
7. Science Exploratorium Lesson Plan/Presentation	5 %	
8. Videotape and Reflection	15 %	
9. Science Teaching Unit and Presentation	20 %	
10. Final Assignment	10%	

Course Grade _____