

**CALIFORNIA STATE UNIVERSITY SAN MARCOS  
COLLEGE OF EDUCATION  
EDMS 545 Science Education CRN42545 Concurrent Program MSSP 8  
Fall 2005 UH439 Wednesdays 8:00-2:15**

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**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, attach your evidence, and request 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.

## **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 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.

### **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, professionalism, and academic honesty. Prepare carefully for class, and 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”).

### **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

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 APA Manual, 5<sup>th</sup> 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**

## 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.
- Rosenberg, M.B. (2004). *Teaching Children Compassionately : How Students and Teachers Can Succeed with Mutual Understanding (Nonviolent Communication Guides)*. Puddledancer Press.

## 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

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).

## COURSE TOPICS

Constructivism & The Learning Cycle Model of Teaching  
Concept Mapping  
Objectives for Student Learning & Science Concept Definitions  
Developing Essential Questions  
California Science Content Standards  
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

## ASSESSMENT OF COURSE OBJECTIVES

### In-Class Work

- Self-Assessments, Action Plan, Action Plan Implementation (individual) 5%
- Science Kits/Explanations/Activity (group) 5%
- Leadership of Hands-on Science Activities (group) 10%
- Learning Cycle Lesson Drawings and Explanations (individual) 10%
- Science Curriculum Group & Individual Work (group and individual) 15%
- Science Exploratorium Lesson Plan/Presentation (pairs) 10%
- Essential Questions Quiz (individual) 5%
- Mock Interview (group and individual) 5%

### Out-of-Class Assignments

- Drawings of School and Class with Explanation (individual) 5%
- Reading Accountabilities (individual) 15%
- Videotape and Reflection (individual) 15%

## Descriptions of Assessments

### *In-Class Work*

#### **Self-Assessments, Action Plan, Action Plan Implementation (individual) 5%**

Studies regarding characteristics of great teachers reveal that effective teachers are outstanding in three areas:

- Content Knowledge
  - Pedagogy
  - Affective traits or “Teacher Disposition”
1. Content knowledge can be measured through assessments, such as exams or performance assessments. You will complete a practice test to determine your level of content knowledge, as related to what 4<sup>th</sup> graders are expected to know.
  2. Pedagogy (or instructional skills and strategies) can be determined by observing your teaching. You can observe it by videotaping yourself and reviewing the video. You can also have others watch you teach or watch the video of you teaching.
  3. The affective component of teaching is harder to determine or watch. However, it is easily sensed, as it is the “attitude” one has. This is also called “disposition to teach” and it includes such important skills as listening, collaborating with others, and being respectful.

### **Where are you?**

### **Where do you want to go?**

In this class, you will do a self-evaluation of your current status with regard to **the characteristics of great teachers: content knowledge, pedagogy, and teacher disposition**. You will be assigned a partner with whom to discuss your self-evaluation and possibly revise your evaluation. In addition, you will develop an Action Plan for each of the 3 areas, review and revise it with your partner, and implement your action plan. Mid-semester you will again do a self-assessment, discuss it with your partner, and revise your action plan. This will be repeated at the end of the semester. By working with a partner, you and your partner can observe each other during the 8 week class and help each other improve in content knowledge, pedagogy, and teacher disposition.

Since attitude and teacher disposition can be difficult to define, a list of behaviors that indicate attitude disposition are below:

- General classroom attendance, promptness, and participation: is on time, respects time boundaries (breaks, etc.), regularly attends class, and actively participates.
- Attention to classroom discussion protocols: respects time limitations, recognizes and respects the perspectives of fellow classmates, gives wait time, listens actively, uses non-interruptive skills, mediates disagreements by working to understand others' perspectives and finding common ground, genuinely encourages all to participate.
- Social and cooperative skills (as illustrated in cooperative projects): assumes responsibility of one's roles, is open to consensus and mediation, effectively communicates ideas, attends group meetings, is dependable, respects others' ideas, expects quality work from self and colleagues, manages time effectively, uses organizational skills and leadership skills, is assertive but not aggressive, uses reflection as a means of evaluation, motivates and offers positive reinforcement to others.
- Attention to assignments: meets time deadlines, produces quality products, responds cooperatively to constructive criticism, uses rubrics or other stipulated criteria to shape an assignment, prioritizes tasks and performs/supervises several tasks at once.
- General classroom demeanor: is professional, creative, kind, sensitive, respectful, has a sense of humor, is supportive of fellow classmates and instructors; recognizes others' perspectives as valid and works to include all "voices" in the classroom; is aware of and responsive to issues and behaviors that might marginalize colleagues in the classroom.
- Flexibility: is responsive when reasonable adjustments to the syllabus, curriculum, schedule, and school site assignments become necessary (common to the educational arena); can work through frustrations by problem-solving with others and not letting emotional responses dominate or impair thinking; "bounces" back easily; can work calmly under stress.
- Openness to and enthusiasm for learning: can engage with a variety of educational ideas with an open mind and a sense of exploration; demonstrates passion for and metacognition of learning across the curriculum and within discipline areas; takes advantage of learning opportunities and seeks out additional opportunities for learning.

You may also use the PCP rubric to help evaluate your own and your partner's behaviors that indicate the "affective" components of teaching.

**PCP Rubric: Participation, Collaboration and Professionalism**

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

	<b>Excellent</b>	<b>Acceptable</b>	<b>Unacceptable</b>	<b>Comments</b>
<p><b><u>Attitude</u></b></p> <p>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><b><u>Participation</u></b></p> <p>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 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.	
<p><b><u>Professionalism</u></b></p> <p>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, regardless of task/topic.	Seldom behaves, talks, and works in a professional manner, regardless of task/topic.	
<p><b><u>Collaboration</u></b></p> <p>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><b><u>Contributions</u></b></p> <p>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><b><u>Disposition toward teaching</u></b></p> <p>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 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.	
<p><b><u>Leadership</u></b></p> <p>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.	

### **Science Kits/Explanations/Activity (group)**

**5%**

During one class session, you will work in groups to study the lessons and materials in a science kit. Each group will present their findings and demonstrate one hands-on lesson to the class.

### **Leadership of Hands-on Science Activities (group)**

**10%**

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 teams 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 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.

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** Strategies for English language learners and adaptations for students with disabilities.

Prepare a Powerpoint 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
  - references at the bottom.

You will videotape your lesson. After teaching it in the class, you should each watch the video and each write a one page reflection. The reflection should include strengths, weaknesses, and recommendations for improvement. Turn in the reflection at the next class session.

**IMPORTANT NOTE:** At least two days PRIOR to your team's presentation, email your complete lesson plan and your PowerPoint Presentation to the instructor for review. Include the date you will present to the class. After I have approved these, you should 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? 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? What leads to the big idea?

**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.)
- b. Concept Invention
- c. Concept Application

### Accommodations/Adaptations/Applications:

- Strategies for English language learners 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

## RUBRIC FOR HANDS-ON SCIENCE LESSONS

Title of Lesson: \_\_\_\_\_

Names: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Activity	Criteria/ Quality of Work	Score
<u>Materials</u> <u>5pts</u>	Materials were provided so that all students could easily participate - 5 pts. Materials were provided so that some students could easily participate - 3 pts. Materials were provided so that a few students could easily participate - 1 pts. Materials were not provided so that students could easily participate - 0 pt. <b>(5 points maximum)</b>	
<u>Essential Questions</u> <u>5pts</u>	You included 2 essential questions in the lesson, asking about the “big idea.” These were not simple knowledge or application questions, but questions relating the lesson to the big idea <b>(5 points maximum)</b>	
<u>Assessment &amp; Criteria</u> <u>5pts</u>	You included an explanation of a performance assessment during which students showed evidence that they achieved the objectives. You also included the criteria to be used for grading the assessment. <b>(5 points maximum)</b>	
<u>Concept Exploration</u> <u>10pts</u>	1) All students participated in a developmentally appropriate hands-on science activity, made observations, and collected data. Predictions were made at beginning 2) Are children provided with hands-on activities (sometimes problem solving) prior to being introduced to the new ideas? 3) Do the exploration activities elicit children ideas relative to those activities? 4) Are the exploration activities clear lead-in's to the introduction of the idea? That is, do the exploration activities provide the experiences children need to meaningfully grasp the new idea when that new idea is presented? 5) Is there a likelihood that the children will come up with the key idea as a consequence of the exploration activities? <b>(2 points for each of the above)</b>	
<u>Concept Invention</u> <u>10pts</u>	1) Students shared their observations, data and explanations. Teacher provided further explanations and terminology, and tied it all together. 2) When the new idea or skill is introduced, does the teacher directly relate the presentation to what children have experienced in the exploration activity? 3) Does the teacher attempt to elicit the key idea from the children before presenting that idea? 4) Is there an attempt by the teacher to check on children's understanding of the newly presented concept or skill? 5) Is there an attempt by the teacher to give children an example of what the concept is not? <b>(2 points for each of the above)</b>	

<u>Science Content Background</u> 10 pts	Your team provided a thorough explanation of the science content background in the PP presentation - 10 pts. Your team provided a short explanation of the science content background - 6 pts. Your team provided an incomplete explanation of the science content background - 2 pts. Your team provided a poor explanation of the science content background - 0 pts.  <b>(10 points maximum)</b>	
<u>Relevant Web Sites</u> 10 pts	Your PP presentation and lesson plan included 5 web sites with descriptions and links to the sites. <b>(2 points for each)</b>	
<u>Concept Application</u> 10 pts	1) Are hands-on activities used in the application/elaboration stage? 2) Are there explicit attempts to offer children corrective and confirmatory feedback? 3) Will any new element (refinement) be added to broaden and deepen children's understanding or skill? 4) Can the application/elaboration activities serve as exploration activities for a new idea? <b>(2.5 points for each)</b>	
<u>Strategies for English language learners</u> 5 pts	Numerous (5) Strategies for English language learners are explained  <b>(1 pts for each )</b>	
<u>Applications to real life</u> 5 points	5-6 applications to everyday life are described  <b>(1 points for each)</b>	
<u>Adaptations for Students with Disabilities</u> 5 points	5 adaptations to meet the needs of students with disabilities are included  <b>(1 points for each)</b>	
<u>Arts</u> 5pts	You integrated one or more arts standards in a meaningful way – 5 pts. Arts included, but did not include standards – 3 pts. Little relation to the arts – 1 pts.	
<u>Handout</u> 10 pts	Handout included everything listed for lesson plan  <b>(1 points OFF for each missing item)</b>	
<u>Presentation</u> 5 pts	Your team was ready to present at the beginning of class, had all materials ready and all handouts copied, and stayed within the time allocated. You kept students on-task and did not waste time - 5 pts. Your team accomplished some of the items listed - 3 pts. Your team accomplished few of the items listed - 1 pts. Your team did not accomplish any of the items listed - 0 pts.  <b>(5 points maximum)</b>	
	<b>TOTAL POINTS/100</b>	

**Learning Cycle Lesson Drawings and Explanations (individual)** **10%**

During the 15 minutes following each Team presentation, you will make a drawing illustrating what you learned during the lesson. You will attach an explanation to the drawing, usually about 1 page. Be sure to pay attention during the lesson so that you have something to draw!

**Science Curriculum Group & Individual Work (group and individual)** **15%**

Instructions will be given in class

**Science Exploratorium Lesson Plan/Presentation (pairs)** **10%**

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

Develop an inquiry activity to teach to elementary students. You may work in pairs on this assignment (pairs, not three, four or five).

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, post it to Taskstream with an explanation of how it meets TPE1A and with a copy of your Reflection and your self-assessment Rubric (explanation plus 3 attachments). 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)

- 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?

After the Exploratorium, you will do a self-assessment by completing the RUBRIC for this assignment. You will post the Lesson, Reflection, and Self-Assessment to Taskstream as attachments to TPE 1A, along with a description of how this work meets TPE 1A.

**RUBRIC FOR ACTIVITY, POSTER AND PRESENTATION-Science Exploratorium**

Score	Criteria	Quality of Work		
		Excellent	Acceptable	Unacceptable
_____	<u>Visual Display</u> 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.
_____	<u>Timing</u> 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.
_____	<u>Student Data Sheet</u> 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.
_____	<u>Materials</u> 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.
_____	<u>Your Understanding</u> 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.
_____	<u>Your lesson</u> 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.
_____	<u>Reflection</u> 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** \_\_\_\_\_

**Essential Questions Quiz (individual) 5%**

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The goal of this assignment is to ensure that students pay attention to the relevant grade level content of the lessons presented in class. The quiz will be based on the essential questions stated in your hands-on lesson assignments. These quizzes will be open notes, but not open handout. That means you should take careful notes during each lesson presentation and may not use your lesson handout or book.

**Mock Interview (group and individual) 5%**

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This will occur on the last day of class, and will involve an individual writing prompt and a group interview.

**Out-of-Class Assignments**

**Drawings of School and Class with Explanation (individual) 5%**

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You will make 2 drawings: one of your school and one of your classroom where you are doing your advanced student teaching. Include different aspects in your sketches, but be sure to emphasize anything to do with science or our study of the natural world. Type an explanation of your drawings, usually about 2 pages.

**Reading Accountabilities (individual) 15%**

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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:

1. Draw a concept map (15-25 concepts with linking words), using correct concept mapping procedures taught in class or
2. Type Big Ideas "paper" (1 page) explaining the key science concepts (**sentence form, not outlines**)

**Videotape and Reflection (individual) 15%**

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

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.

### **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: POST TO TASKSTREAM TPE 5**

Post an explanation of how this meets TPE 5, along with the following as attachments:

- A video of the science lesson
- A complete lesson plan
- Your reflective self critique (written responses to the four questions above)
- Two peer critiques of the lesson or the video (may be handwritten) with clear signatures of reviewers (may be cooperating teacher, other teachers, supervisor, classmates). Reviewers may watch you teach or watch your video and should focus on items in 3a and 3b above.

### **5. PART 5: Discussion and Presentation**

Discuss your teaching and the lesson with your Team in our class. Your Team will make a 30-minute presentation to the whole class, describing the lessons in each of your elementary classrooms, and showing the video of one team members' teaching.

First, be sure to advise the regular classroom teacher and the principal of the videotaping 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.

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.

### **Cooperative Learning Roles for Science Group Members:**

- Materials Manager
- Reporter
- Recorder
- Timekeeper/Taskmaster
- Lead Investigator

The teacher assigns the roles, which are rotated.

### **Compassionate Communication**

We will be including a study of Marshall Rosenberg's *Teaching Children Compassionately : How Students and Teachers Can Succeed with Mutual Understanding*.

Marshall Rosenberg describes his progressive, radical approach to teaching that centers on compassionate connection. Marshall describes the counterproductive role that power and punishment play in our schools, and challenges educators to motivate students instead "by a reverence for life." This practical application of 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. He is based in Wasserfallenhof, Switzerland.



**SB 2042 - AUTHORIZATION TO TEACH ENGLISH LEARNERS COMPETENCIES**

<b>PART 1: LANGUAGE STRUCTURE AND FIRST- AND SECOND-LANGUAGE DEVELOPMENT</b>	<b>PART 2: METHODOLOGY OF BILINGUAL, ENGLISH LANGUAGE DEVELOPMENT, AND CONTENT INSTRUCTION</b>	<b>PART 3: CULTURE AND CULTURAL DIVERSITY</b>
<b>I. Language Structure and Use: Universals and Differences (including the structure of English)</b>	<b>I. Theories and Methods of Bilingual Education</b>	<b>I. The Nature of Culture</b>
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)	<b>II. Theories and Methods for Instruction In and Through English</b>	D. Physical geography and its effects on culture
E. Language in context	A. Teacher delivery for <u>both</u> English language development <u>and</u> content instruction	E. Cultural congruence
F. Written discourse	B. Approaches with a focus on English language development	<b>II. Manifestations of Culture: Learning About Students</b>
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)
<b>II. Theories and Factors in First- and Second-Language Development</b>	<b>III. Language and Content Area Assessment</b>	<b>III. Cultural Contact</b>
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	<b>IV. Cultural Diversity in U.S. and CA.</b>
		A. Historical perspectives
		B. Demography
		C. Migration and immigration

This form and information submitted is Confidential.

**Peer Evaluation Form**  
**To be used with All Group Assignments**

**Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_ **Assignment:** \_\_\_\_\_

**Instructions:** Copy front to back, and complete a copy for each group assignment. *Please evaluate the contributions of each member of your group for each group assignment in the course. Be sure to include your own self-assessment when completing this evaluation. Turn in to the instructor immediately after completing the related assignment. Be sure to list the assignment you are completing the evaluation for:*

**Scale: 1= Exceptional, 2= Above Avg., 3= Average, 4= Below Avg., 5= Poor**

1. How would you rate the performance of your group peers on the assignment checked above in terms of the contributions each member of your group has made to the assignment through the semester?

<u>Student Name</u>	<u>Rating</u>
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- You
- 
- 
- 
- 

Comments:

2. How would you rate the performance of each group member in playing the leadership role for his or her particular set of assigned project tasks?

<u>Student Name</u>	<u>Rating</u>
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- You
- 
- 
- 
- 

Comments:

This form and information submitted is Confidential.

3. How would you rate the performance of each member of your group in contributing to the overall success of the assigned project?

Student Name                      Rating

- You
- 
- 
- 
- 

Comments:

**Ranking:** Please rank each member of your group in terms of his or her overall contribution to the project/assignment.

**Scale: 1= Most significant contributor, 2= Next most significant contributor, etc.**

- 1.
- 2.
- 3.
- 4.
- 5.

**Comments:**

## 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)

8/31 \_\_\_\_\_  
 9/7 \_\_\_\_\_  
 9/14 \_\_\_\_\_  
 9/21 \_\_\_\_\_  
 9/28 \_\_\_\_\_  
 10/5 \_\_\_\_\_  
 10/12 \_\_\_\_\_  
 10/19 \_\_\_\_\_

FIX

### 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

#### In-Class

- Self-Assessments, Action Plan, Action Plan Implementation      5%
- Science Kits/Explanations/Activity      5%
- Leadership of Hands-on Science Activities      10%
- Learning Cycle Lesson Drawings and Explanations      10%
- Science Curriculum Group & Individual Unit      15%
- Science Exploratorium Lesson Plan/Presentation      10%
- Essential Questions Quiz      5%
- Mock Interview      5%

#### Out-of-Class

- Drawings of School and Class with Explanation      5%
- Reading Accountabilities      15%
- Videotape and Reflection      15%

Course Grade \_\_\_\_\_