

**California State University San Marcos  
College of Education  
EDMS 545  
Science Education in Elementary Schools**

Spring, 2010 Three credits, Multiple-subject Cohort  
Wednesdays (for 8 weeks) at Early Childhood Center from 7:30 – 2:20

**Instructor: Joseph Keating, PhD Professor of Science Education**

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

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

**Required Texts:**

California State Science Framework and Standards California State Dept of Ed website  
Teaching Science to Children An Inquiry Approach by Friedl, A. and Koontz, T. (6<sup>th</sup> Edition McGraw Hill)

**Optional Texts:**

Moon Journals by Chancer, et. al  
Chemical Magic from the Grocery Store Sae, A.  
Use of Discrepant Events for Teaching Science by Keating, J. (Aztec Press)

**Purpose and Goals:**

The main purpose of this course is to help you become a better teacher of science while increasing your enthusiasm, interest and confidence in effective teaching methods. You will model and practice ways in which science and science processes can be naturally integrated into all the other disciplines. There will be a special emphasis on a student centered, problem solving and interdisciplinary approach to learning. Techniques for infusing multicultural aspects of science and adapting lessons to meet individual needs will also be addressed. As a result of this experience, we hope that as an elementary teacher you will feel comfortable teaching science, teaming with teachers who are specialists in this field, and utilizing integrating the ideas of science methods in your other disciplines.

**Objectives:**

On completion of this course, students will be able to demonstrate the following:

1. Knowledge of how to integrate the California Framework and Standards into science;
2. Understanding of how to integrate inquiry based science into all areas of the curriculum;
3. Awareness of the multitude of community resources available to teachers and the ways in which these resources can be used to strengthen the science program;
4. The ability to write science lesson plans and implement them into an integrated unit that has an appropriate grade-level course of content;
5. The ability to design curricula, which reflect a variety of instructional strategies and develop children's higher-level thinking skills;

6. An understanding and appreciation for the dynamic nature of the processes of science
7. Inclusion of all children in science instruction
8. Strong general understanding of science content knowledge

### **Grading Policy:**

Final grades for EDMS 545 will be computed on a scale of 170 points

A = 94-

A- = 90-93 %

B = 84-89 %

B- = 80-83

C+ = 77-79

(Anything less than a C+ does not count toward a California Teaching Credential)

### **COE 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. 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.

**Personal Comments about Attendance:** Prompt and consistent attendance is vital to success in this class. Attendance will be taken and class will start on time. Both attendance and punctuality are essential to completing all work satisfactorily. Only 50% of the potential value for an assignment can be credited as makeup for an assignment that is due and reviewed in a class that was not attended by the student. Two absences (in this case one full day of class =two class equivalents) in one semester can result in a minimum of one grade lower; three absences can result in a non-passing grade (unless there are extenuating circumstances). Late arrivals will be penalized at the discretion of the instructor.

### **California Teacher Performance Assessment (CalTPA)**

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

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

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

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

<http://lynx.csusm.edu/coe/CalTPA/CalTPAdocuments.asp>

### **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)  
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**All University Writing Requirement:** A minimum of 2500 words of writing assignments per semester is required. This will be fulfilled through a variety of ways in this course such as: reading logs, action research reports, field trip curriculum plans, discrepant event curriculum plans and independent study reports.

### **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 presentation assignments must be original work. All ideas/materials that are borrowed from other sources must have appropriate references to the original sources. Any quoted material should give credit to the source and be punctuated with quotation marks.

Students are responsible for honest completion of their work including examinations. There will be no tolerance for infractions. If you believe there has been an infraction by someone in the class, please bring it to the instructor’s attention. The instructor reserves the right to discipline any student for academic dishonesty in accordance with the general rules and regulations of the university. Disciplinary action may include the lowering of grades and/or the assignment of a failing grade for an exam, assignment, or the class as a whole.”

Incidents of Academic Dishonesty will be reported to the Dean of Students. Sanctions at the University level may include suspension or expulsion from the University.

### **Plagiarism:**

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

**Course Requirements:** *See Description of Assignments pp.6-16*

**Grading Standards:** *See grade sheet and point values of all assignments pp16-17*

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## **COURSE TIMELINE**

### **Class #1            January 20 (Wednesday)**

- 1/21    Read syllabus prior to attending class (what questions do you have??).  
How were you taught? /Intro to Syllabus, assign directors  
Intro to Science Frameworks/ Standards, Moon Journals, Topics in Text,  
Field Trip /Intro to Discrepant events/Teacher Dispositions (Pre-self assess) (Assignment #5)
- 1/21    What are the elements of inquiry as used in the Discrepant Event model? (Bouncing Balls)

The Nature of Science and the Scientific Method/Learning Cycle (Loonie Goonies)  
Open ended vs. Closed Ended Scientific. Experiments (in class hands-on activity Assignment #8).

**Next time:**

- 1) In the California Frameworks Read Ch. 1 and 2 and your assigned Section of the Standards by grade level
- 2) Write out standards exercise (1a, b). See syllabus Descriptions of Assignment # 1 a, b, c
- 3) Read TSC Introductory Ch 1 and 2 (notes and any questions) and Choose one Ch 4- 6 to read produce one graphic organizer and teaching outline to share with colleagues (see Assignment #9)

**Class #2 January 27 (Wednesday)**

- 1/28 Must have syllabus (General Questions)  
30 minutes of team working time for Team FW presentations (#1a,b, c)  
Signups for various projects (DE/Moon Journals/Chapter Readings)
- 1/28 Video on Inquiry Learning  
General Discussion of Ch 1-2 and Share graphic organizers (Ch 4-6) (Assignment #9)  
Student discrepant events X3 (Assignment #2A/B)

**Next Time:**

- 1) Choose one from TSC Ch 7-10 (Graphic Organizer and outline)
- 2) Discrepant Events x3 (per schedule)

**Class #3 February 3 (Wednesday)**

- 2/4 Student discrepant events x3 (Assignment #2A/B)  
Share Graphic Organizers Ch 7-10
- 2/4 Maps and Compass (Interdisciplinary/Visual Curriculum) (Assignment # 6)

**Next Time:**

- 1) Choose one from TSC Ch 11--13 (Graphic Organizer)
- 2) Discrepant Events (per schedule)

**Class #4 February 10 (Wednesday)**

- 2/11 Student discrepant events X 3 (Assignment #2A/B)  
Share Graphic Organizer Ch 11-13
- 2/11 Introductions to Inquiry Based Problem Solving Model (OM Program) (Assignment # 8)  
"Superlinks"  
"Verbal/Non-Verbal"  
"Invention Convention"

**Next Time:**

- 1) Share Invention Convention Inquiry Model: In teams develop an invention with associated activities (per handout) before class (part of Assignment #8)
- 2) Choose one from TSC Ch 14-17 (Graphic Organizer)
- 3) Discrepant Events (per schedule)

**Class #5 February 17 Wednesday**

- 2/18 Student discrepant events x3 (Assignment #2A/B)  
Share Graphic Organizers Ch 14-17
- 2/18 Invention Convention Presentations in Teams (Assignment #8)

**Next Time:**

- 1) Assign Inclusive Science Presentations (In teams)
- 2) Choose one from TSC Ch 18-21 (Graphic Organizer)
- 3) Discrepant Events (per schedule)
- 4) Moon Journal Gallery Walk /presentations (about ½)

### **Class #6 February 24 Wednesday**

- 2/25 1) Share Graphic Organizers from TSC Ch 18-21  
2) Discrepant Events (per schedule)(Assignment #2A/B)
- 2/25 Inclusion Science Presentations (Assignment # 4)  
Moon Journal Gallery Walk /presentations (about ½)

### **Next Time:**

- 1) Field Trip WAP (details)
- 2) Moon Journal Gallery Walk /presentations (about ½) (Class #8)

### **Class #7 March 3 Wednesday**

- 3/4 Using Field Trips in Science (WAP Field Trip) (Assignment # 7)

### **Next Time:**

- 1) Moon Journal Presentation and Gallery Walk (about ½)
- 2) Discrepant Event Quiz (Assignment #2 C)
- 3) Student Dispositions final self-evaluation
- 4) Instructor evaluations

### **Class #8 March 10 Wednesday**

- 1) Moon Journal Presentations (Assignment # 3 A/B)
- 2) Student Dispositions final self-evaluation (Assignment #5)
- 3) Discrepant Event Quiz (Assignment #2 C)
- 4) Instructor Evaluations

### **Description of Science Methods Assignments**

The following are assignment prompts that represents the Spirit of the Assignment (addition information and clarification will be given in class). Each prompt will be scored using a rubric that uses a likert scale: no response (0) to exceptional (maximum possible points for that assignment). Due dates are on the timeline.

The criteria for grading are:

- Fully addressing the prompt.
- Clear, coherent professional writing. You must demonstrate good understanding and appropriate interpretation of the topic.
- Correct spelling and grammar on final drafts.

### **Assignment 1 – California Science Framework and Standards**

Spirit of the assignment: to read a portion of the California Science Framework and the Standard for a particular grade. You will write your individual response to the readings. Then you will work with your grade level team to prepare and do a presentation to the class. It's important that you do the reading and the write-ups BEFORE you meet with your team.

#### **1a. Framework summary response I 10 points**

- Read the first part of the California Science Framework, up to page 20. This includes Board Policy, the Introduction and Chapters One and Two.
- Think about the reading holistically.
- Write about a page, in your own words, that answers these questions: What do you think are the most important ideas addressed in the reading? Were there any ideas in the reading which were very new to you, or which disagreed with something you thought?

#### **1b. Grade level Science standard response I 10 points**

- Read through all the standards for your assigned grade level. Using the standards for your chosen grade (K-6), pick a line item from physical science, or life science, or earth science (jigsaw so that each science content area (biology, chemistry/physics and earth science) is covered within the team). Come up with a brief description of an activity that children in that grade can do that also addresses one of the Investigation and Experimentation standards for the grade. One of many great reputable new resources that you might use is the following web site which includes award winning lessons that apply the standards in this way and also use technology:  
<http://www.nsta.org/publications/interactive/laptop/grade.htm>
- You should end up with four sections, each of which includes a content line (physical, life, or earth science), an Investigation and Experimentation line, and a one or two sentence description of an activity that combines the two describe a simple formative or summative assessment for that activity. The whole thing should be about a page
- See example next page.

**1c. Team preparation and presentation T 5 points**

**You will be given 30-40 minutes of class time to work with your team.**

- Get together with your team (arranged by grade level K-6). Look at the activities that everyone wrote up for Assignment 2b. Choose one.
- As a team, write up a lesson plan for the activity (with objectives, assessment, and a brief description of the activity}. Put it on chart paper or an overhead transparency so it can be easily presented to the class. Make sure you quote the line from the standard on which your lesson plan is based.
- As a team, come up with a brief overview of the Science Standards for your grade. Don't try to give us every single line of the standard. Summarize it in such a way that we see generally what students are supposed to learn in physical, earth, and life science and in investigation and experimentation in that grade.
- In 8 minutes or less, present your lesson plan and standards choices. Be prepared to explain why your lesson plan represents really good science for students.
- Your grade for this assignment will be based on the content and quality of your presentation, and on the level of collaboration of the group.

**Sample responses to Assignment 1b.**

Grade Four

Physical Science

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

Investigation and Experimentation

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

Activity

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

Assessment (summative): The student will be able to draw and explain how s/he built the compass and how it used and applied (a rubric will be used to assess the level of understanding).

Life Science

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

#### Investigation and Experimentation

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

#### Activity

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

Assessment (Summative): The student can construct a simple data table to illustrate the progress of growth and offer explanations for their findings comparing the different variables of growth (or inhibition)

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#### Earth Science

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

#### Investigation and Experimentation

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

#### Activity

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

Assessment (Formative): The students will form hypothesis to predict the effect of differing amounts of water on their specific landforms.

### **Assignment 2 – Discrepant Event**

Spirit of the Assignment: to develop and teach a particular kind of a science inquiry lesson that teaches both science thought processes and science content. You will practice your discrepant event on at least one school-age child and reflect on the child's responses and what they indicate about how much he/she understood. Working by yourself or with a partner you will actually present your discrepant event to the class and give a copy of the lesson plan to each class member. After all the discrepant events have been presented, you will take a quiz to demonstrate that you personally learned the important science concepts that were presented.

#### **2a. Discrepant Event Lesson Plan and Presentation T 15 points**

- Working in a team or two or three, find a discrepant event associated with one of the reading topics you will do in the textbook (Friedl). You can get one from the Text (Friedl) or Discrepant Events, by Keating, or go to a bookstore or the children's section of the library and look for books on Science Tricks, or Science Magic.
- Get together the materials needed for the discrepant event. (If you can't get certain things, look for another event to do.)
- Practice doing the event. (If you can't get it to work, you may need to find another event to do.)
- Make sure you understand the science behind the event. If you got it from an Internet website, there may be background info on the site. Another good place to look: the children's section of the public library. Find children's books on the topic in addition to or even preferably to books for adults. The children's books will explain things simply and will use the appropriate vocabulary for you to use with your students. Remember, you don't have to have a college-level understanding of the topic, just have good, accurate information at your students' level.

- Do your discrepant event with at least one school-age child or a classroom group and take careful notes on the child's responses. (This ties in with Assignment 3b.)
- Fill in the discrepant event cover sheet, including the two questions.
- On your assigned day, bring in your materials and equipment and do your discrepant event for/with the class. **You are limited to 15 minutes presentation time.**
- After presenting your event, give each member of the class a copy of the lesson plan.
- Turn in your lesson plan, the cover sheet and your individual journal.

**2b. Discrepant event journal I 15 points**

- After you have done your discrepant event with a child or children, look at your notes and think about how it went. (You may realize that your event needs to be modified before you do it with the class.)
- Write a description of what happened, with special attention to what the child said and did. Analyze the child's response: what portions of the event, and to what extent, did the child understand what was happening? Why or why not?

**2c. Discrepant event quiz I 20 points**

After all discrepant events have been presented in class; a quiz will be given on the content of the events. Dr. Joe Keating will design the quiz based on the questions submitted by each partner pair on their Discrepant Event Cover Sheet. *This quiz will be open notebook, but not open handout. That means you should take careful notes during each discrepant event presentation.*

**Assignment 3 – Observation/art/writing**

The spirit of this assignment is for you to observe something using all your senses, then use what you have observed to do writing and an art activity from the book Moon Journals. You can use any kind of an experience for this: a walk on the beach, playing basketball, bathing a baby. Immediate experience is very important, so even if it's something you've done many times before, do it again for this assignment. **DON'T DO IT FROM MEMORY.**

**3a. Observation I 5 points**

- Sign up for a particular day, from 1 to 28 in the Moon Journals book. Look at the Art Invitation and the Writing Invitation for your particular day. If you didn't buy the book, borrow it from the Moon Journals director or use one of the copies and copy the relevant pages.
- Observation is a critical part of science and teaching science to children. To that end observe a natural event and take notes. You will need at least three specific details for each sense. Your notes can be in any format, and can be handwritten, as long as they are legible. If there is one sense that can't be used for your observation, give the reason why.) You will turn in your notes.

**3b. Art and Writing Incorporated into Science I 15 points**

- Follow the directions in the Moon Journals book for the writing and art activities for your assigned day. Apply and connect them to your observation for assignment 5a. As creatively as you can. If either the writing or the art won't work, see the instructor. As an alternative to this have a child apply an observation to the art and writing and present that as your artifact.
- Look in the Timeline for Art/Writing. On that day, bring your response to the Art and Writing Invitations to class for Show and Tell.
- **REMEMBER—YOU ARE NOT GOING TO DO YOUR WRITING AND ART ABOUT THE MOON. YOU ARE GOING TO USE WHAT YOU OBSERVED, WHETHER IT'S WALKING ON THE BEACH OR BATHING A BABY.**

**Assignment 4 – Inclusive Science**

The spirit of this assignment is for you to explore ways for you to make sure that every child you teach is welcomed and able to participate fully in all science activities. Through readings and Internet research you

will increase your awareness and gather information on issues/situations that can lead some children to be excluded. With your team, you will prepare and present a skit that illuminates one particular issue.

Join a group. Each group will address one of the following topics:

- Limited English
- Cultural Issues
- Gender issues
- Physical disability
- Cognitive disabilities and emotional disturbances
- Other

**4a. Internet research I 10 points**

- Find resources on the internet (articles, websites) that are relevant to your group's topic. Make this material available to the other members of your group.
- Choose one website to report on. Consider the following items:
  1. Your name
  2. Site name and site address
  3. Your group's topic – Make sure you clarify in your report how the website connects to the topic, such as physical disability.
  4. Brief description of the information that the site provided of the site

**4b. Team presentation (skit and discussion) T 5 points**

- Within your group, share material gathered on the internet
- Discuss the importance/main points/implications of your reading and research
- Use this as a context to develop a short skit (approximately five minutes followed by a two-three minute question and discussion period) that presents a scenario that:
  - a. Demonstrates a student in a science class having difficulty with the content and/or with a teacher strategy
  - b. Demonstrates a teacher alleviating the difficulty by modeling at least one effective practice or strategy. At least two others should be either shown or discussed.
  - c. At least three references to the readings/research (these references can be shown or discussed)
  - d. Concludes with a discussion facilitated by the group. This discussion should assess the audience's understanding of the issues presented. Your group should develop some questions or other assessment device that can be explained and discussed by the whole group.

Both peers and the instructor on the presentation and discussion, according to these criteria, will evaluate the team:

- Was the scenario interesting (simple props, costumes, charts, sound effects, etc.)?
- Was the dialogue lively?
- Was it humorous, or did it otherwise engage the emotions of the audience?
- Was it memorable? Did the class understand the important concepts, and will the class remember them?

REMEMBER—IT'S BETTER TO SHOW THAN TO DESCRIBE. IT'S BETTER TO DEMONSTRATE THAN TO EXPLAIN.

**Assignment #5 Appropriate Teacher Dispositions/Attributes (Pre and Post Evaluations) 10 pts.**

*The Maintenance and Development of Positive Teacher Behaviors  
in the College of Education Courses  
(Affective Objectives)*

Purpose/Rationale

A variety of practitioner and university research suggests the importance of linking affective objectives to all cognitive objectives in all subject areas (Roberts and Kellough, 2000) and the

correspondence of particular teacher personal attributes considered critical to establishing this linkage to excellent teaching and learning (Baldwin, Keating and Bachman, 2003). Krathwohl, Bloom and Masia (1964) developed a useful taxonomy for teachers to use in implementing affective objectives. These are hierarchical from least internalized to most internalized: 1) receiving; 2) responding; 3) valuing; 4) organizing; 5) internalizing. Teachers should be integrating these expectations into their teaching but must also be able to demonstrate the attributes associated with these in their own learning.

In light of this, it is critical for pre-service teachers to be given an overall dispositional model (a range of behavioral expectations) that can be used by them, as future teachers, and that illustrates the importance of and encourages the practice of these attributes. These attributes generally reflect the high expectations of quality teaching such as enthusiasm, positive attitudes, positive interactions and supportive interpersonal relationships within the teaching environment. There is a general consensus within the educational community that these attributes are considered highly desirable professional qualities for teachers (with an obvious range of individual manifestations) that will assist in promoting successful teaching and learning outcomes for both teachers and their K-12 students.

- |     |                            |   |                                 |
|-----|----------------------------|---|---------------------------------|
| 5a. | Self pre-assessment        | I | 5 points                        |
| 5b. | Instructor post-assessment | I | 5 points (based on improvement) |

### Scoring Criteria

Each of these seven “attributes” will be scored on a 5-point rubric with justification by the student (based on completion) and by the instructor at the end of the course and adjusted to reflect a potential maximum score of 5/5. Demonstrated improvement for an individual in any area will be used as a strong consideration in the scoring of these attributes. Peer input and intermediate conferences may assist in formative assessments.

- 5 = Much above/Excellent qualities demonstrated for this attribute as noted with justification (no evidence of sub par examples)
- 4 = Above average qualities demonstrated for this attribute as noted with justification (few or no sub par examples)
- 3 = Average qualities demonstrated for this attribute as noted with justification (some Limitations or examples noted)
- 2 = Below average qualities demonstrated for this attribute (numerous limitations or examples noted)
- 1 = Well below average qualities demonstrated for this attribute (serious overall limitations noted in this area)

### Generally Accepted Attributes of Highly Effective Teachers (as seen in pre-service programs)

(Roberts and Kellough, 2000; Stone, 2002; McEwan, 2002; Baldwin, Keating and Bachman, 2003; Johnson and Johnson, 1994; COE Mission Statement, 1997)

The following will be used as a guideline to assess the level of attainment (and progress) in demonstrating these attributes. Score yourself for each attribute based on a 1-5 scale with appropriate justification and examples.

- 1) **General classroom attendance, promptness, and participation:** is on time, respects time boundaries (breaks, etc.), regularly attends class, and actively participates.
- 2) **Attention to classroom discussion protocols** (per Epstein’s Five Stage Rocket): 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.
- 3) **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.

- 4) **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.
- 5) **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.
- 6) **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.
- 7) **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.

**Assignment # 6 Model of Interdisciplinary Science Teaching that incorporates authentic assessment**  
(Map and Compass)

Spirit of the Assignment: Students will learn how to read topographic maps and use a compass to find directions. By doing this activity you will apply elements of geology, mathematics and geography. 10 Pts.  
(Done in class)

**Assignment #7 Using Field Trips in Science** (WAP Field Trip)

Spirit of the assignment: by attending this field trip students will understand: 1) general procedures for planning an implementing a field trip in science; 2) how to access and use resources provided by a site prior to going; 3) Pre, during and post lesson plans using a) prepared curricular materials at a field site; or teacher developed and implemented curricular plans

Details of the field trip overview and requirements will be presented in class. (15 pts.)

**Assignment #8 Inquiry Based Problem Solving/Teaching Model (Odyssey of the Mind (5 pts) and Invention Convention (10pts) and the use of Open Ended Science Experiments (Paper Towel Experiment) (5pts).** A model to solve problems and the scientific method (Learning Cycle) will be utilized in class to apply and overview these three different examples of inquiry based curricular (or extracurriculum) models in science. (20 pts)

**Assignment #9 Applying Readings in Science Topics/ Content for K-6 Teachers**

- 1) Each week students will read one of the three or four topic areas (Chapters) of science content and pedagogy assigned that week from Friedl/Koontz.
- 2) They will formulate a graphic organizer and outline (as a handout) to assist in explaining the major elements of that chapter to their small group.
- 3) They will meet with their group to jigsaw each of the assigned chapters.
- 4) In a general class discussion they will post any questions or issues related to the topics discussed.
- 5) The Discrepant Events for that class period will be coordinated so they represent at least some of these topic areas. (5 pts each X 6= 30 pts)

**EXTRA CREDIT**

All students can gain extra credit for certain in-class and out-of-class activities. *There is a cap of 10 points total that can be applied to your grade. Three are provided below.*

- **Read a scientific articles** concerning science or science education and write a one-page reaction paper on each article. Articles must be current – must have a 2002 or 2003 publication date. They can be from scholarly journals, or ERIC, from the internet, from the newspaper, or from general interest publications. Please make sure to include the Author, Title, Publication Name, and Date of Publication.  
2 points per article (maximum two articles)
- **Watch a television show or movie** that deals with science or science education and write a one-page reaction paper. (Maximum **two reports** (2 points per report))
- **Be a director**, according to the list below. 5 points  
List of Potential Classroom Directors

Director of Directors – Assigns Directorships – keeps list

Technology coordinator—assists with use of smart classroom to facilitate student presentations

Timer ...Keeps student presentation on time

Assignment Folder coordinator---collects and hands out grade folders and papers before and after class

Environmental coordinator---makes sure classroom environment is appropriate both before and after class

Name Tag Director – Make sure everybody has a name tag each class

Contact Information Director—Make class list with current contact info including emails

Framework/Standards Copies Manager/Director of Presentations – holds hard copies of the grade level standards and Chapters 1 and 2 of the Syllabus, for students to copy. Also directs formation of grade-level groups for presentations.

Assignment coordinator—sends out weekly reminders of assignments due and clarification with instructor if needed

Photographer – takes photos of students (for folders) and various class activities. Shows them to class.

Science Education researcher– Find science/science education websites and news articles that are relevant and present to class

Moon Journals assignments coordinator – keep copies of book, assign days, assist with gallery walk

Field Trip Coordinator—Helps with arrangements to the WAP

Science Method Text Topic Area Assignments

Early Childhood Center Coordinator –Assists in coordinating the DE that will be done at the Center as well

Other (you choose depending on your expertise and needs of the class)

**Addendum A Grade Sheet (Please copy and bring to class for folder)**

Gradesheet – EDMS 545, Spring 2010– Keating

			_____
			Name
<b>Attendance:</b>			
#1	#5	#9	#13
#2	#6	#10	#14
#3	#7	#11	#15
#4	#8	#12	#16
<b>Assignments:</b>			
1a.	Framework Write-up	I	____/10
1b.	Standards Write-up	I	____/10
1c.	Framework/Standards Team Presentation	T	____/5
2a.	Discrepant Event Lesson Plan and Presentation	T	____/15
2b.	Journal—Doing your discrepant event with a child	I	____/15
2c.	Discrepant Event Quiz – Open notebooks	I	____/20
3a	Observation of natural event (Connected to Moon Journals)	I	____/5
3b.	Art/Writing (Moon Journals)	I	____/20
4a.	Internet website write-up (Connected to Inclusive Science Presentation)	I	____/10
4b.	Inclusive Science Team Presentation	T	____/5
5a	Appropriate Disposition - Self pre-assessment	I	____/5
5b.	Dispositions - Instructor post-assessment	I	____/5
6	Map and Compass (Inter. Learning)	I	____/10
7	Using Field Trips in Science (WAP)	T	____/15
8	Problem Solving (OM and IC and Open ended)	I or T	____/20
9	Assigned Reading Topic from Friedl TSC	I/T	____/30
			Additions _____/10 pt
			Total _____/200

**Addendum B Evaluation of Discrepant Event Presentation (Copy and bring to class to use with each presentation)**

Name:

1. Is the handout clear and inclusive of all necessary information? \_\_\_\_\_/3  
Does it reference any other books or materials from which ideas were gathered?

2. In the presentation and explanation does the teacher appear to have a good grasp of the underlying scientific principles? \_\_\_\_\_/3

Is the major scientific concept clearly explained?

3. Does the discussion/demonstration with the class utilize \_\_\_\_\_/3

- good inquiry methods (questions)
- generate student enthusiasm
- take a constructivist approach

4. Is the discrepant event appropriate for linguistically diverse students? \_\_\_\_\_/3

5. What is the overall effectiveness of the presentation? \_\_\_\_\_/3

Total \_\_\_\_\_/15