



**EDMS 545 Section 1
Elementary Science Education
CRN #20827
Wednesdays
8:15 am – 2:45 pm
Farr Elementary School
Spring 2015**

Conceptual Framework Theme: Engaging diverse communities through leading and learning for social justice.

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School of Education Mission & Vision Statement
(Adopted by SOE Governance Community, January 2013)

Vision

To serve the educational needs of local, regional, and global communities, the School of Education advances innovative practice and leadership by generating, embracing, and promoting equitable and creative solutions.

Mission

The mission of the School of Education community is to collaboratively transform education. We:

- Create community through partnerships
 - Promote and foster social justice and educational equity
 - Advance innovative, student-centered practices
 - Inspire reflective teaching and learning
 - Conduct purposeful research
 - Serve the School, College, University, and Community
-

Basic Tenets of our Conceptual Framework

- Student centered education
 - Research and theory specific to the program field inform practice
 - Connections and links between coursework and application
 - Strong engagement between faculty and candidates
 - Co-teaching clinical practice
 - Culturally responsive pedagogy and socially just outcomes
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Table of Contents

| | |
|--|----|
| COURSE DESCRIPTION | 2 |
| Course Prerequisites | 2 |
| Purpose and Goals | 2 |
| Required Texts/Links | 3 |
| Optional Texts: | 3 |
| Course Objectives | 3 |
| INFUSED COMPETENCIES..... | 4 |
| Special Education | 4 |
| Authorization to Teach English Learners | 4 |
| Use of Technology..... | 4 |
| Teacher Performance Expectation (TPE) Competencies | 4 |
| California Teacher Performance Assessment (CalTPA)..... | 5 |
| GENERAL CONSIDERATIONS | 5 |
| School of Education Attendance Policy..... | 5 |
| Personal Comments about Attendance | 5 |
| Cell Phones | 5 |
| Person-First Language | 5 |
| Students with Disabilities Requiring Reasonable Accommodations | 5 |
| All University Writing Requirement..... | 6 |
| CSUSM Academic Honesty Policy | 6 |
| Plagiarism | 6 |
| COURSE REQUIREMENTS..... | 6 |
| Grading Standards | 6 |
| Grading Policy..... | 6 |
| COURSE TIMELINE | 7 |
| DESCRIPTION OF SCIENCE METHODS ASSIGNMENTS | 9 |
| ADDENDUM A GRADE SHEET | 15 |
| ADDENDUM B EVALUATION OF DISCREPANT EVENT PRESENTATION | 16 |

COURSE DESCRIPTION

Focuses on developing an understanding of theory, methodology, and assessment of second language acquisition in integrated and inclusive elementary classrooms. Requires participation in the public schools.

Course Prerequisites

Admission to the Multiple Subject Program

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 content 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 the option of integrating the ideas of science methods into the other disciplines.

Required Texts/Links

Teaching Science to Children An Inquiry Approach by Friedl, A. and Koontz, T. (6th Edition McGraw Hill, 2004)

Use of Discrepant Events for K-12 Science Teachers (Aztec Press /University Bookstore), (Keating Customized text) May be shared if needed.

Science Framework for California Public Schools K-12. (2004). Sacramento: California Dept. of Education. <http://www.cde.ca.gov/ci/cr/cf/documents/scienceframework.pdf>

Health Education Content Standards for California Public Schools K-12. (2008). Sacramento: California Dept. of Education. <http://www.cde.ca.gov/be/st/ss/documents/healthstandmar08.pdf>

Next Generation Science Standards (NGSS) 2012 Summary P-1-4
http://www.nap.edu/openbook.php?record_id=13165&page=1

Optional Texts:

Moon Journals: Writing Art and Inquiry Through Focused Nature Study (Heinemann, 1997). Available in class

Chemical Magic from the Grocery Store Sae, A. Available in class

Course Objectives

1. On completion of this course, students will be able to demonstrate the following: Knowledge of using strategies to integrate the California Framework and **standards** and the Next Generation Science Standards (NGSS) into the science curriculum;
2. Understanding strategies that **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 **interdisciplinary, integrated unit** that is appropriate to the grade-level course content;
5. The ability to design curricula, which utilize a **variety of instructional strategies including assessments** that develop children's higher-level thinking skills;
6. An understanding and appreciation for the dynamic nature, excitement and the **processes of science**
7. Applying the **Learning Cycle and Scientific Method** to the learning of Science
8. Strong general understanding of **science and health content knowledge**
9. Demonstrate the **use of technology** to enhance elementary science teaching and learning.
10. **Strategies inclusive to all students** in science (linguistically and culturally diverse, students with disabilities and other special needs)
11. Understanding **science safety procedures** related to the classroom and students.

INFUSED COMPETENCIES

Special Education

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

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 2002)

Use of Technology

This course infuses technology competencies to prepare candidates to use technologies, emphasizing their use in both teaching practice and student learning. Students are expected to demonstrate competency in the use of various forms of technology (i.e. word processing, electronic mail, Moodle, use of the Internet, and/or multimedia presentations). Specific requirements for course assignments with regard to technology are at the discretion of the instructor. Most assignments will be submitted in hard copy to the instructor, and some specific assignments will also be submitted/posted electronically on Moodle. Keep a digital copy of all assignments for use in your teaching portfolio. You must use your Moodle e-mail account for this class. The best way to contact me is by Moodle e-mail.

Teacher Performance Expectation (TPE) Competencies

The course objectives, assignments, and assessments have been aligned with the CTC standards for the Multiple Subject Credential. This course is designed to help teachers 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 Primary Emphases in EDMS 545:

TPE 1a-Subject Specific Pedagogical Skills for MS Teaching Assignments (Science)
TPE 5-Student Engagement

TPE Secondary Emphases in EDMS 545:

TPE 4-Making Content Accessible
TPE 7-Teaching English Learners
TPE 9-Instructional Planning
TPE 14-Educational Technology in Teaching and Learning

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>

GENERAL CONSIDERATIONS

School of Education Attendance Policy

Due to the dynamic and interactive nature of courses in the School of Education, all candidates are expected to attend all classes and participate actively. At a minimum, candidates 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 candidate have extenuating circumstances, s/he should contact the instructor as soon as possible. *(Adopted by the COE Governance Community, December, 1997).*

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.

Cell Phones

Please turn off your cell phone before the start of each class. In addition, there will be no texting during class. It is unprofessional for teachers to use their cell phone during meetings with peers or during professional development activities (our class is considered professional development!). Your consideration will be appreciated by peers.

Person-First Language

Use "person-first" language in all written and oral assignments and discussions (e.g., "student with autism" rather than "autistic student"). Disabilities are not persons and they do not define persons, so do not replace person- nouns with disability-nouns. Further, emphasize the person, not the disability, by putting the person-noun first.

Students with Disabilities Requiring Reasonable Accommodations

Students with disabilities who require reasonable accommodations must be approved for services by providing appropriate and recent documentation to the Office of Disable 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.

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. 9-14

Grading Standards

See grade sheet and point values of all assignments pp 15-16

Grading Policy

Final grades for EDMS 545 will be computed as a % of the total points earned:

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)

COURSE TIMELINE

Class #1 January 21 (Wednesday)

1/21 (Prior to first class please obtain the texts, downloads and complete the following:

- In Teaching Science to Children: Read Science Safety, Ch. 1, 2, 3. Outline, comments and questions.
- In the California Frameworks Read Introductions, Ch. 1 and 2. Outline, comments and questions.
- Read syllabus prior to attending class (what questions do you have??).
- Define Science? How were you taught Science? (Discussion)
- Introduction to Syllabus (Questions)
- Assign directors (see attached addendum)
- Intro to Science Frameworks/ Standards/Overview of Next Generation Science Standards (NGSS)
- Moon Journals,
- Science Content Topics in Text (Assign Groups)
- Field Trip/Community Resources
- Signups for various projects (DE/Moon Journals/Chapter Readings)

1/21

- Introduction to Discrepant Events: What are the critical pedagogical elements of inquiry as used in the Discrepant Event model? (Happy/Unhappy Balls)
- The Nature of Science and the Scientific Method/Learning Cycle (Loonie Goonies Simulation Game)

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, c and d). See syllabus Descriptions of Assignment # 1 a, b, c and d. Be prepared to share this your grade level group and prepare a presentation (time given in class) per description in #1d (note addition of Health Standards 1c)
- 3) Read TSC Introduction on Science Safety and Ch. 1, 2, 3 (notes and any questions), and choose one Chapter from Ch. 4-6 (Physical Science) to read and produce one graphic organizer and (or) teaching outline to share with reading team/ colleagues (see Assignment #9) . Assign Reading groups.

Class #2 January 28 (Wednesday)

1/28

- Must have syllabus (General Questions)/ Gradesheet printed for personal folder
- General Discussion of California Science Framework (Science Safety, Ch. 1 and Ch. 2)
- 30 minutes of team working time for Team Standards Framework presentations (#1a,b, c, d)
- Team presentation of Science Frameworks assignment (see example under description of assignments)

1/28

- Annenberg Video on using Inquiry Learning in K-6
- General Discussion of Friedl Text Introduction, Ch. 1-2 and Share graphic organizer/outline: (Ch. 4-6 Physical Science) (Assignment #7)
- Student discrepant events X 3 (pairs) (Assignment #2A/B)

Next Time

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

Class #3 February 4 (Wednesday)

2/4 Student discrepant events x3 (Assignment #2A/B)
Share Graphic Organizers Ch. 7-10 (Physical Science)

2/4 Introductions to Inquiry Based Problem Solving Model (Assignment # 6 A and #4 C)
"Superlinks" (OM program) (Individual Problem Solving) #4 A (in-class)
"Invention Convention" (Applied Science) Introduction/Overview #4 C

Next Time:

- 1) Choose one from TSC Ch. 11—13 Physical Science and Earth Science (Graphic Organizer)
- 2) Discrepant Events (per schedule)
- 3) Teams work on Invention Convention Presentations for February 25 (Class # 6)

Class #4 February 11 (Wednesday)

2/11 Student discrepant events X 3 (Assignment #2A/B)
Share Graphic Organizer Ch. 11-13 (Physical Science and Earth Science)

2/11 Open-ended vs. Closed -Ended Scientific. Experiments (in class hands-on activity Assignment #4).
"Verbal/Non-Verbal" (Team building/Cooperative Learning/problem solving) #6 B (in-class)

Next Time:

- 1) Choose one from TSC Ch. 14-17 Earth Science (Graphic Organizer)
- 2) Discrepant Events (per schedule)
- 3) Moon Journal Presentations (1/2 class)

Class #5 February 18 (Wednesday)

2/18 Share Graphic Organizers Ch. 14-17 Earth Science
Discrepant Events X 3 per schedule

2/18 Moon Journal Presentations (1/2 class)

Next time:

- 1) Share Invention Convention presentations: In teams develop an invention with associated activities (per handout) before class (part of Assignment #6 D)
- 2) Choose one from TSC Ch. 18-21 Life Science (Graphic Organizer)
- 3) Discrepant Events per schedule

Class #6 February 25 (Wednesday)

2/25
Share Graphic Organizers from TSC Ch. 18-21 Life Science
Discrepant Events (per schedule) (Assignment #2A/B)

2/25 Invention Convention Presentations in Teams (Assignment #6 D)

Next Time:

- 1) Wild Animal Park Field Trip/Safari Park (#5). Details to be emailed.
- 2) How to organize and conduct an effective inquiry based field trip (pre/during/post lessons for Animal Observation Study Level 2 inquiry) and open ended inquiry (Level 3)

Class #7 March 4 (Wednesday)

3/4_ Meet at WAP/Safari Park at 8:45-3:00
Debrief of Animal Observation Study (Team lesson due Class #8)/Debrief of Open ended inquiry lesson

Next Time:

- 1) Discrepant Event Quiz (Assignment #2 C)
- 2) Instructor evaluations
- 3) Moon Journal Presentations (1/2 class)
- 4) Final team lessons due for Animal Observation Study @ Safari Park

Class #8 March 11 (Wednesday)

- 1) Moon Journal Presentations (Assignment # 3 A/B)
- 2) Graphic Organizer Overview of the course
- 3) Discrepant Event Quiz (Assignment #2 C)
- 4) Instructor Evaluations

DESCRIPTION OF SCIENCE METHODS ASSIGNMENTS

The following are assignment prompts that represent the Spirit of the Assignment. Additional information and clarification will be given in class. Handouts and other resources will be provided on EDMODO. 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 of this syllabus.

Note: I = Individual and T = Team

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: Read a portion of the California Science Framework and the Standard(s) 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? What questions do you have?

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. The fourth line describes a simple formative or summative assessment for that activity. The whole thing should be about a page

- See example next page.

1c. Grade level Health Education standards response

Grade level Health Education Content Standards Response (I) – 5 points

[The Health Education Content Standards for California Public Schools](#) are categorized into 8 Health Content Standards: Essential Health Concepts; Analyzing Health Influences; Assessing Valid Health Info; Interpersonal Communication; Decision Making; Goal Setting; Practicing Health Enhancing Behaviors; and Health Promotion. These 8 content standards are included in 6 Health Content Areas: Nutrition and Physical Activity; Growth, Development & Sexual Health; Injury Prevention and Safety; Alcohol, Tobacco, and Other Drugs; Mental, Emotional, and Social Health; and Personal and Community Health.

For the same grade level assigned to you for Task I B, you will select one Health Content Standard under one of the Health Content Areas and write an activity that students in that grade level can do.

1d. 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, a brief description of the activity and any modifications for challenged students). 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. and 1c.

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)

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.

Health Content Area: Nutrition and Physical Activity

Health Content Standard 1.8.N - Identify ways to increase and monitor physical activity.

Activity

In pairs, students will take turns in a jump rope activity. Starting with 5 jumps and increasing the jumps by 5, they will observe and record the maximum number of jumps that their partner can comfortably complete.

Assessment (Formative) Each student will first predict the maximum number of jumps that s/he can comfortably complete and then, in their science journals, identify factors that may influence their performance on the task.

Assignment 2 A/B/C – Discrepant Event

Spirit of the Assignment: 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. **For extra credit you can present your DE in your CT classroom (10 pts)**

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

- Working in a team or two, 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.
- Practice doing the event.
- 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 2b i.e. Discrepant Event journal.)
- Include two questions that can be included in the DE quiz at the end of the course
- 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 (with about 5-10 minutes for discussion/evaluation).**
- After presenting your event, give or email each member of the class a copy of the lesson plan.
- Turn in your lesson plan, the questions (to the DE coordinator), and your individual journal.

2b. Discrepant event journal

I 10 points

- After you have done your discrepant event with a child or children or **with the class you are assigned**, 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. The quiz is based mostly on the questions submitted by each partner pair. *This quiz will be open notebook. That means you should take careful notes during each discrepant event presentation.*

Assignment # 3 A/B– Observation/art/writing (Integrating Multiple Disciplines with Science Inquiry)

The spirit of this assignment: observe something using all your senses, then use what you have observed to do a 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 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

- A. 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.
- B. Observation is a critical part of science and teaching science to children. To that end observe a natural event and take notes. Try to identify as many specific details by using multiple senses. 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 with the art and writing pieces.

3b. Art and Writing Integrated into Science

I 15 points

- A. Follow the directions in the Moon Journals book for the writing and art activities for your assigned day. Apply the specifics of your observations 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.
- B. Look in the Timeline for the Moon Journal presentations. On that day, bring your Science Observations and Art and Writing Invitations to class for a brief presentation.
- C. 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 – Using experiments that are open-ended, inquiry based and inductive “The Paper Towel Experiment”

Spirit of the Assignment: Teachers will apply their knowledge of the Scientific Method and 5E Inquiry model to design an experiment that will address a problem, control variables, collect and analyze data then present (and rebut) findings to the class. This activity will reinforce knowledge of how science works as well as applying communication, debating and explanation skills (all part of the Science Standards). The value of this inductive approach vs. the typically used deductive approach will be discussed in class as well as various ways to implement this Level 2-3 Inquiry Model with K-5 students. **10 Pts.** (Done in class)

Assignment #5 The logistics of how to organize and create inquiry based Field Trips in Science (Safari Park 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 that apply an inquiry based model (in this case an animal observation study. 4) Independent/student choice field trip experience. Details of the field trip overview and requirements will be presented in class. (15 pts.)*

Assignment #6 (A – C): Inquiry-Based Problem Solving/Teaching Model

Spirit of the Assignment: Three different examples of applying inquiry in an Elementary Classroom. Reinforces the Discrepant Event Model (30 Pts)

- A. Odyssey of the Mind: “Superlinks” (Individual Problem Solving/Competitive-Non-Competitive Model) - 5 pts
- B. “Verbal Non-Verbal” (Group Problem Solving) - 5 pts
- C. “Invention Convention” (Applied Inquiry) - 20 pts

Assignment #7 Applying Readings to the Understanding of Science Topics/ Content for K-6 Teachers (Book Report Groups)

Spirit of the Assignment: Gain a basic understanding of the major scientific concepts taught in K-6 from Earth Science, Biology, Chemistry and Physics. 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.

- 1) They will formulate a graphic organizer/outline, demos, visuals, manipulates to assist in explaining the major concepts, critical vocabulary and examples of DE/Demonstrations that apply.
- 2) They will meet with their group to jigsaw each of the assigned chapters.
- 3) In a general class discussion they will pose any additional questions or issues related to the topics discussed.
- 4) The Discrepant Events for that class period will attempt to be coordinated with the topics of that day so they are representative (10 pts each X 5 = **50 pts**)

Assignment #8 Participation in all aspects of class work

Spirit of the Assignment: Participation in each class through discussions, questioning and group involvement (10 pts).

EXTRA CREDIT

All students can gain extra credit for certain in-class and out-of-class activities. *There is a cap of 15 points total that can be applied to your grade. Five examples are provided below.*

- Apply your Discrepant Event with the class you are tutoring/teaching (10 pts.)
- **Read a scientific article(s)** concerning science or science education and write a one-page reaction paper on each article. Articles must be a relatively current 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
- **Attend a Science conference or workshop (5pts)**

List of Potential Classroom Directors (may include 1-2 people)

- Director of Directors – Assigns Directorships – keeps list
- Classroom note-taker: organizes succinct summary of major ideas of each class and distributes electronically
- Discrepant Event Coordinator
- Moon Journal Coordinator,
- California Frameworks Coordinator
- Technology coordinator—assists with use of smart classroom to facilitate student presentations
- Timer ...Keeps student/instructor presentations 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/phone numbers
- 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 send to and or present to class
- Field Trip Coordinator—Helps with arrangements to the Safari Park
- Science Methods Text (Friedl) Topic Area Assignments
- 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

Name _____

Attendance: (10 pts per class= 80 pts in all)

| | | | |
|----|----|----|----|
| #1 | #2 | #3 | #4 |
| #5 | #6 | #7 | #8 |

Assignments:

| | | |
|---|--|----------|
| 1a. | Framework Write-up | _____/10 |
| 1b. | Science Standard Write-up | _____/10 |
| 1c. | Framework/Standards Team Presentation | _____/5 |
| 1d. | Health Standard Write-up | _____/5 |
| 2a. | Discrepant Event Lesson Plan and Presentation | _____/15 |
| 2b. | Journal—Doing your discrepant event with a child | _____/10 |
| 2c. | Discrepant Event Quiz – Open notebooks | _____/20 |
| 3a. | Observation of natural event | _____/10 |
| 3b. | Art/Writing (Moon Journals) | _____/20 |
| 4. | Open-ended experiments (inductive/inquiry based) | _____/10 |
| 5. | Using Field Trips/community in Science (Safari Pk.) | _____/15 |
| 6. | Problem Solving (OM/Verbal_NV/ Inv.Conv) | _____/30 |
| 7. | Assigned Reading Topic from Friedl TSC (5 X) | _____/50 |
| Chapters 1,2,3 ____+____+____+____+____+____= | | |
| 8. | Participation Credit (Discussion/presentations/etc.) | _____/10 |

| | |
|-------|----------------------------|
| (max) | Extra/Additions ____/15 pt |
| | Total _____/300 |

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 (in both the delivery and handout) does the teacher appear to have a good grasp of the underlying scientific principles and content knowledge? _____/3

3. Does the discussion/demonstration with the class utilize _____/3

- good inquiry methods (probing questions, non-judgmental responses, student-centered, closure)
- generate enthusiasm among all students (inclusive)
- take a constructivist approach (allow students to formulate

4. Is the discrepant event appropriate for linguistically diverse students? (Explain, be specific) _____/3

5. What is the overall effectiveness of the DE presentation? _____/3
What areas are recommended for improvement?

Total _____/15