California State University San Marcos
College of Education
EDMI 545
Science Education in the Middle School

Spring, 2001, 3 credits, Middle School Cohort

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The Mission of the College of Education Community is to transform public education by preparing thoughtful educators and advancing professional practice. We are committed to the democratic principles of educational equity and social justice for all learners, exemplified through reflective teaching, learning and service. We value diversity, collaboration, professionalism and shared governance.

Required Texts:

Chancer, et. al. Moon Journals
Keating. Science Methods
Keating. Use of Discrepant Events for Teaching Science

Optional Texts:
Science Framework for California Public Schools
Keating. Invention Convention for K-6 Teachers
Sae. Chemical Magic from the Grocery Store

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 can be naturally integrated into all the other disciplines. There will be a special emphasis on a student centered, problem solving and divergent 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 a teacher at the elementary or middle school level you will feel comfortable teaching science, teaming with teachers who are specialists in this field, and utilizing science methods in your other disciplines.

Objectives:

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

1. knowledge of the California Framework in science;

2. understanding of how to integrate science into other curriculum areas;
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 lesson plans and implement them into an integrated unit based and 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 processes of science
7. sheltering instruction for second language learners (SDAIE).

Grading Policy:

Final grades for EDMI 545 will be computed on a scale of 200 points

A = 184 points or more
A- = 180 - 183.5 points
B = 164 - 179.5 points
B- = 160 - 163.5 points
C+ = 155 - 159.5 points
C = 144 – 154.5 points
C- = 140 – 143.5 points
(Anything less than a C+ does not count toward a California Teaching Credential)

Prompt and consistent attendance is vital to success in this class. Attendance will be taken and class will start on time. For each absence, five points will be deducted. For each tardy, one or two points will be deducted, depending on how late you are. You'll also lose one or two points if you leave early. If a serious problem arises, which is beyond your control, please talk to one of us. In addition, the College of Education attendance policy is in effect:

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 then 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.

A separate timeline, with dates and times of class meetings, topics, and assignment due dates, is attached.

Due Dates:

When you come to class, we expect you to have the readings already done for that class. Assignments must be turned in at the start of class, otherwise they will be considered tardy. Late assignments will lose ten percent of their points for each day they are late. After one week, they will receive no credit. If you are absent the day an assignment is due, put the assignment in the mail the next day.

Please Also Note: Any evidence of cheating (including plagiarism--presenting the words or ideas of others as you own) will result in a failing grade for that assignment and possibly a failing grade for the course. Some assignments will include comments and suggestions on appropriate referencing. If you have modified an already existing lesson plan or unit, please include a copy of the original lesson plan. See one of us if you have any questions about what exactly constitutes plagiarism.

EDMI 545 Science Education in the Middle School
Instructors: Joe and Josephine Keating
Assignments – Spring, 2001

Points in this class are given for journal entries, lesson plans, and a quiz. Not only does journal writing reinforce language arts skills, but it is also a great mechanism of authentic assessment for instructors and self assessment for students. It might be a part of an overall portfolio or a separate assignment in itself. Obvious adaptations would be necessary with any students whose writing skill levels are low. It is important that the teacher designs a specific rubric and that the student understand the manner in which it has been applied. Students and their parents are accustomed to standardized tests, math chapter tests and so on. In order to get them to accept authentic assessments, you must be specific about your expectations. Students must know exactly what they are accountable for.

The following are assignment prompts. Each prompt will be scored using a likert scale: no response (0) to exceptional (maximum possible points for that assignment, to total a possible 200 points. Your responses should be around one page double spaced, unless otherwise noted. Due dates are on the timeline.

1. Cooking lesson plan - rough draft.
- This must be based on a recipe, not on an already existing lesson plan, and should include the recipe.
- The children must be able to handle the ingredients themselves, at least at some point in the preparation process. (In other words, the whole thing should not be a demonstration.)
- It should follow the Survival Tips for Hands-On Instruction that you will be given.
- It must state a specific grade that it is geared for, and identify concepts and/or skills the children should have acquired before doing this lesson.
- It must include at least one cognitive objective and at least one behavioral objective, and assessment for all objectives given.
- Tell what your behavioral expectations are for the children.

10 points

2. Lesson plan - final draft.

20 points

3. Discrepant event lesson plan and journal. Directions attached.

Note: When you present your discrepant event in class, bring a copy of your lesson plan for each student in the cohort. At the same time, present to the instructor:

- Copy of your lesson plan.
- Journal entry describing a child's (or children's response to the discrepant event.
- Two questions (and suggested responses) based on the content or basic concept of your discrepant event and the application of that concept.

25 points

4. Community resource/field trip project (Pre/During/Post Activities). Directions to be given separately.

20 points

5. Problem solving (Superlinks solution and evaluation) 20 points

6. Do an observation of some natural event using all your senses and take notes. You will need at least five specific details for each sense (if there is one sense which can't be used for your observation, give the reason why). On the day we work with these observations, bring your notes. Even if it's something you've done many times before - do it again for this assignment.

10 points

7. Do the activities described in the particular writing and art invitations you were assigned from Moon Journals. At least one must connect to your observation for Assignment #6.

10Points

8. Attend the Hansen Conference. 10 points

9. Observe a science lesson and write it up according to the following Guidelines:

These guidelines call for you to interview the teacher before and after the lesson, as well as draw your own conclusions while observing.

Part 1. How did the teacher come to do this lesson? How did he/she pick the topic? Where did the materials come from? Before the teacher does the lesson get him/her to predict children's responses to the lesson as follows:

Name three children in the class who will like this lesson and do well on it.

Name three children who might have difficulty, either cognitive or behavioral and describe the problems they are likely to have.

Part 2. Is there a written or unwritten plan for this lesson? What are the objectives? How will the teacher know if the objectives were met at the end of the lesson? How does the teacher know as the lesson is going on whether the kids are getting it? Does the teacher make any adaptations to address the needs of the children who might have difficulty? Can you clearly follow the procedures the teacher is using and do they relate directly to the objectives?

Part 3. How did the lesson go? Did the teacher correctly predict the performance of specific children? Did the adaptations (if there were any) work? How about the class as a whole? Did the children get it? How does the teacher know whether they got it or not? Were there any logistical problems? If you taught this lesson, would you change it in any way?
15 points

10. Interdisciplinary Group Problem Solving Project "Invention Convention" (see customized text =(20 oral pres. + 20 written pres.) 40 points

11. After all discrepant events have been presented, an open-note QUIZ will be administered utilizing questions which have been submitted.
20 points

Course Agenda

February 7 (Wednesday)
AM (no class)
PM Introduction to Syllabus and Assignments
Overview of Frameworks and Assignment
Discrepant Event Presentation (Model)

February 9 (Friday)
AM Framework Assignment in Class
Discrepant Event Presentation and Discussion (Model)
Schedule Discrepant Event paired presentation

PM Scientific Method/Learning Cycle
Loonie Goonies
Paper Towel Experiment
Using instruments in science

Due: Framework Assignment in class
Reading Assignment on: 1) Discrepant Events 2) Science Research and experiments and 3) science safety 4) Benally "Navajo Ways of Knowing" 5) Controversial issues in science –Evolution and Human Sexuality (all in Keating)

February 21 (Wednesday)
AM Discrepant Event Presentations in class (4) **#3**
Moon Journal Presentations in class

PM Strategies for doing "Hands-on, Minds-on" science lesson plans "--Recipes
Overview of Field Trip Assignment (for February 23 PM)

Due: Moon Journal Presentation #6 and #7
Food for fruit salad

February 23 (Friday)

AM Map and Compass (an interdisciplinary, performance based curriculum)

PM Field Trip (Independently in Groups per assignment)

Due : Readings on Authentic Assessment in Science (in Keating)

February 28 (Wednesday)

AM Problem Solving "Super Links" in class **#5**
Invention Convention Assignment overview

PM Rough Draft of Hands-on science lesson plan (individual conference) **#1**
Groups work on Invention Convention in class

Due: Rough Draft of Lesson Plan
Field Trip Overview #4

March 2 (Friday)

AM Introduction/Discussion of Inclusive Science
Discrepant Event student presentations (2) **#3**

PM Discrepant Event student presentations (4) **#3**

Due: Readings on Inclusive Science Education (in Keating)

March 7 (Wednesday)

AM Final draft of Hands-on science lesson plan **#2**
Science Classroom Observation assignment due **#9**
Discrepant Event student presentations (4) **#3**

PM Invention Convention Group Presentations **#10**
Discrepant Event Quiz **#11**