

EDMS 545
Elementary Science Education
California State University San Marcos

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Office hours: 5:00-6:00 Tuesdays and Thursdays before class

Required Textbooks: Teaching Children Science. An Inquiry Approach
By Alfred E. Friedl. NY: McGraw-Hill.
“The Having of Wonderful Ideas” and Other Essays on Teaching and Learning by Eleanor Duckworth , NY: Teachers College Press
EDMS 545: Course Handout by Dr. Kathy I. Norman (if available)
“Creating Density” a monograph by Eleanor Duckworth, available online
California Science Framework, available online
California Standards for the Teaching Profession, available online

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 group 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 in to the course.

Course Objectives

By the end of this course, students should be able to

1. Demonstrate proficiency with the 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 student learning of science concepts and processes.
9. Design a 3-lesson elementary science teaching unit .

10. Practice strategies to include all students in science (linguistically and culturally diverse, students with disabilities and other students with special needs).

****You must go to ACD 202 to activate your CSUSM e-mail account, or provide another email address.**

College of Education 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 ongoing service. Our practices demonstrate a commitment to student-centered education, diversity, collaboration, professionalism, and shared governance.

Statement of CLAD Infusion

In 1992, the College of Education voted to infuse Cross-cultural, Language and Academic Development (CLAD) competencies across the curriculum. The CLAD competencies are attached to the syllabus and the competencies covered in this course are highlighted.

Course Requirements

COE Attendance Policy: “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.”

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. If you miss 1 class session or are late (or leave early) for more than four sessions, your highest possible grade is a B. If you miss 2 class sessions, your highest possible grade is a C. If you miss more than 20% of the class (3 class sessions), you may not receive a passing grade for the course. Absences do not change assignment due dates. Late assignments will receive a 10% reduction in points for each day late. After one week, late assignments will receive no credit. With prior notification of planned absences makeup sessions can be arranged with the instructor.

Topics Outline

The Learning Cycle Model of Teaching, Scientific Inquiry, and Constructivism
Learning Cycle Science Lesson demonstrations
Writing Objectives and Explanations of Science Concepts
CA Science Content Standards Grades K-8
CA Standards for the Teaching Profession
SDAIE Strategies 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 (Differentiated Instruction)
Cooperative Learning Structures

**Teaching Performance Expectations
Standards of Quality and Effectiveness for Professional Teacher Preparation Programs
California Commission on Teacher Credentialing September 6, 2001**

A. MAKING SUBJECT MATTER COMPREHENSIBLE TO STUDENTS

TPE 1A: Subject-Specific Pedagogical Skills for Multiple Subject Teaching Assignments

Teaching Reading-Language Arts 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 English-Language Arts (K-8). They understand how to deliver a comprehensive program of systematic instruction in word analysis, fluency, and systematic vocabulary development; reading comprehension; literary response and analysis; writing strategies and applications; written and oral English Language conventions; and listening and speaking strategies and applications. They know how to strategically plan and schedule instruction to ensure that students meet or exceed the standards. Candidates create a classroom environment where students learn to read and write, comprehend and compose, appreciate and analyze, and perform and enjoy the language arts. They understand how to make language (e.g., vocabulary, forms, uses) comprehensible to students and the need for students to master foundational skills as a gateway to using all forms of language as tools for thinking, learning, and communicating. They understand how to use instructional materials that include a range of textual, functional and recreational texts and how to teach high quality literature and expository text. They understand that the advanced skills of comprehending narrative and informational texts and literary response and analysis, and the creation of eloquent prose, all depend on a foundation of solid vocabulary, decoding, and word-recognition skills. Candidates teach students how to use visual structures such as graphic organizers or outlines to comprehend or produce text, how to comprehend or produce narrative, expository, persuasive and descriptive texts, how to comprehend or produce the complexity of writing forms, purposes, and organizational patterns, and how to have a command of written and oral English-language conventions.

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,

B. ASSESSING STUDENT LEARNING

TPE 2: Monitoring Student Learning During Instruction

Candidates for a Teaching Credential use progress monitoring at key points during instruction to determine whether students are progressing adequately toward achieving the state-adopted academic content standards for students. They pace instruction and re-teach content based on evidence gathered

using assessment strategies such as questioning students and examining student work and products. Candidates anticipate, check for, and address common student misconceptions and misunderstandings.

TPE 3: Interpretation and Use of Assessments

Candidates for a Teaching Credential understand and use a variety of informal and formal, as well as formative and summative assessments, to determine students' progress and plan instruction. They know about and can appropriately implement the state-adopted student assessment program. Candidates understand the purposes and uses of different types of diagnostic instruments, including entry level, progress-monitoring and summative assessments. They use multiple measures, including information from families, to assess student knowledge, skills, and behaviors. They know when and how to use specialized assessments based on students' needs. Candidates know about and can appropriately use informal classroom assessments and analyze student work. They teach students how to use self-assessment strategies. Candidates provide guidance and time for students to practice these strategies.

Candidates understand how to familiarize students with the format of standardized tests. They know how to appropriately administer standardized tests, including when to make accommodations for students with special needs. They know how to accurately interpret assessment results of individuals and groups in order to develop and modify instruction. Candidates interpret assessment data to identify the level of proficiency of English language learners in English as well as in the students' primary language. They give students specific, timely feedback on their learning, and maintain accurate records summarizing student achievement. They are able to explain, to students and to their families, student academic and behavioral strengths, areas for academic growth, promotion and retention policies, and how a grade or progress report is derived. Candidates can clearly explain to families how to help students achieve the curriculum Standards of Quality and Effectiveness for Professional Teacher Preparation Programs

C. ENGAGING AND SUPPORTING STUDENTS IN LEARNING

TPE 4: Making Content Accessible

Candidates for Teaching Credentials incorporate specific strategies, teaching/instructional activities, procedures and experiences that address state-adopted academic content standards for students in order to provide a balanced and comprehensive curriculum. They use instructional materials to reinforce state-adopted academic content standards for students and they prioritize and sequence essential skills and strategies in a logical, coherent manner relative to students' current level of achievement. They vary instructional strategies according to purpose and lesson content. To meet student academic learning needs, candidates explain content clearly and reinforce content in multiple ways, such as the use of written and oral presentation, manipulative, physical models, visual and performing arts, diagrams, non-verbal communication, and computer technology. They provide opportunities and adequate time for students to practice and apply what they have learned. They distinguish between conversational and academic language, and develop student skills in using and understanding academic language. They teach students strategies to read and comprehend a variety of texts and a variety of information sources, in the subject(s) taught. They model active listening in the classroom. Candidates encourage student creativity and imagination. They motivate students and encourage student effort. When students do not understand content, they take additional steps to foster access and comprehension for all learners. Candidates balance instruction by adjusting lesson designs relative to students' current level of achievement.

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.

TPE 6: Developmentally Appropriate Teaching Practices

Background information for TPE 6: TPEs describe knowledge, skills, and abilities for all credential candidates, and they underscore the importance of generically-effective strategies for teaching a broad range of students. The purpose of TPE 6 is to establish additional expectations that are of greatest importance in teaching students at distinct stages of child and adolescent development. It is not the intent of TPE 6 to describe practices that are appropriate or effective only at one developmental level. •Standards of Quality and Effectiveness for Professional Teacher Preparation Programs. This TPE describes professional practices that are most commonly used and needed for students in each major phase of schooling, grades K-3, 4-8, and 9-12. 2

TPE 6A: Developmentally Appropriate Practices in Grades K-3

During teaching assignments in Grades K-3, candidates for a Multiple Subject Teaching Credential understand how to create a structured day with opportunities for movement. They design academic activities that suit the attention span of young learners. Their instructional activities connect with the children's immediate world; draw on key content from more than one subject area; and include hands-on experiences and manipulatives that help students learn. Candidates teach and model norms of social interactions (e.g., consideration, cooperation, responsibility, empathy). They understand that some children hold naïve understandings of the world around them. Candidates provide educational experiences that help students develop more realistic expectations and understandings of their environment. They know how to make special plans for students who require extra help in exercising self-control among their peers or who have exceptional needs or abilities.

TPE 6B: Developmentally Appropriate Practices in Grades 4-8

During teaching assignments in Grades 4-8, candidates for a teaching credential build on students' command of basic skills and understandings while providing intensive support for students who lack basic skills as defined in state-adopted academic content standards for students. They teach from grade-level texts. Candidates design learning activities to extend students' concrete thinking and foster abstract reasoning and problem-solving skills. They help students develop learning strategies to cope with increasingly challenging academic curriculum. They assist students, as needed, in developing and practicing strategies for managing time and completing assignments. Candidates develop students' skills for working in groups to maximize learning. They build on peer relationships and support students in trying new roles and responsibilities in the classroom. They support students' taking of intellectual risks such as sharing ideas that may include errors. Candidates distinguish between misbehavior and over-enthusiasm, and they respond appropriately to students who are testing limits and students who alternatively assume and reject responsibility.

TPE 7: Teaching English Learners

Candidates for a Teaching Credential know and can apply pedagogical theories, principles, and instructional practices for comprehensive instruction of English learners. They know and can apply theories, principles, and instructional practices for English Language Development leading to comprehensive literacy in English. They are familiar with the philosophy, design, goals, and characteristics of programs for English language development, including structured English immersion. They implement an instructional program that facilitates English language development, including reading, writing, listening and speaking skills, that logically progresses to the grade level reading/language arts program for English speakers. They draw upon information about students' backgrounds and prior learning, including students' assessed levels of literacy in English and their first languages, as well as their proficiency in English, to provide instruction differentiated to students' language abilities. They understand how and when to collaborate with specialists and para-educators to support English language development. Based on appropriate assessment information, candidates select instructional materials and strategies, including activities in the area of visual and performing arts, to develop students' abilities to comprehend and produce English. They use English that extends students' current level of development yet is still comprehensible. They know how to analyze student errors in oral and written language in order to understand how to plan differentiated instruction.

Candidates for a Teaching Credential know and apply pedagogical theories, principles and practices for the development of academic language, comprehension, and knowledge in the subjects of the core curriculum. They use systematic instructional strategies, including contextualizing key concepts, to make grade-appropriate or advanced curriculum content comprehensible to English learners. They allow students to express meaning in a variety of ways, including in their first language, and, if available, manage first language support such as para-educators, peers, and books.³ They use questioning strategies that model or represent familiar English grammatical constructions. They make learning strategies explicit.

Candidates understand how cognitive, pedagogical, and individual factors affect students' language acquisition. They take these factors into account in planning lessons for English language development and for academic content.

Teachers are not expected to speak the students' primary language, unless they hold an appropriate credential and teach in a bilingual classroom. The expectation is that they understand how to use available resources in the primary language, including students' primary language skills, to support their learning of English and curriculum content. •Standards of Quality and Effectiveness for Professional Teacher Preparation Programs

D. PLANNING INSTRUCTION AND DESIGNING LEARNING EXPERIENCES FOR STUDENTS

TPE 8: Learning about Students

Candidates for a Teaching Credential draw upon an understanding of patterns of child and adolescent development to understand their students. Using formal and informal methods, they assess students' prior mastery of academic language abilities, content knowledge, and skills, and maximize learning opportunities for all students. Through interpersonal interactions, they learn about students' abilities, ideas, interests and aspirations. They encourage parents to become involved and support their efforts to improve student learning. They understand how multiple factors, including gender and health, can influence students' behavior, and understand the connections between students' health and their ability to learn. Based on assessment data, classroom observation, reflection and consultation, they identify students needing specialized instruction, including students whose physical disabilities, learning disabilities, or health status require instructional adaptations, and students who are gifted.

TPE 9: Instructional Planning

Candidates for a Teaching Credential plan instruction that is comprehensive in relation to the subject matter to be taught and in accordance with state-adopted academic content standards for students. They establish clear long-term and short-term goals for student learning, based on state and local standards for student achievement as well as on students' current levels of achievement. They use explicit teaching methods such as direct instruction and inquiry to help students meet or exceed grade level expectations. They plan how to explain content clearly and make abstract concepts concrete and meaningful. They understand the purposes, strengths and limitations of a variety of instructional strategies, including examining student work, and they improve their successive uses of the strategies based on experience and reflection. They sequence instruction so the content to be taught connects to preceding and subsequent content. In planning lessons, they select or adapt instructional strategies, grouping strategies, and instructional material to meet student learning goals and needs. Candidates connect the content to be learned with students' linguistic and cultural backgrounds, experiences, interests, and developmental learning needs to ensure that instruction is comprehensible and meaningful. To accommodate varied student needs, they plan differentiated instruction. When support personnel, such as aides and volunteers are available, they plan how to use them to help students reach instructional goals. •Standards of Quality and Effectiveness for Professional Teacher Preparation Programs

E. CREATING AND MAINTAINING EFFECTIVE ENVIRONMENTS FOR STUDENT LEARNING

TPE 10: Instructional Time

Candidates for a Teaching Credential allocate instructional time to maximize student achievement in relation to state-adopted academic content standards for students, instructional goals and scheduled academic tasks. They establish procedures for routine tasks and manage transitions to maximize instructional time. Based on reflection and consultation, they adjust the use of instructional time to optimize the learning opportunities and outcomes for all students.

TPE 11: Social Environment

Candidates for a Teaching Credential develop and maintain clear expectations for academic and social behavior. The candidates promote student effort and engagement and create a positive climate for learning. They know how to write and implement a student discipline plan. They know how to establish rapport with all students and their families for supporting academic and personal success through caring, respect, and fairness. Candidates respond appropriately to sensitive issues and classroom discussions. They help students learn to work responsibly with others and independently. Based on observations of students and consultation with other teachers, the candidate recognizes how well the social environment maximizes academic achievement for all students and makes necessary changes. •

F. DEVELOPING AS A PROFESSIONAL EDUCATOR

TPE 12: Professional, Legal, and Ethical Obligations

Candidates for a Teaching Credential take responsibility for student academic learning outcomes. They are aware of their own personal values and biases and recognize ways in which these values and biases affect the teaching and learning of students. They resist racism and acts of intolerance. Candidates appropriately manage their professional time spent in teaching responsibilities to ensure that academic goals are met.

Candidates for a Teaching Credential understand and honor legal and professional obligations to protect the privacy, health, and safety of students, families, and other school professionals. They are aware of and act in accordance with ethical considerations and they model ethical behaviors for students. Candidates understand and honor all laws relating to professional misconduct and moral fitness.

TPE 13: Professional Growth

Candidates for a Teaching Credential evaluate their own teaching practices and subject matter knowledge in light of information about the state-adopted academic content standards for students and student learning. They improve their teaching practices by soliciting feedback and engaging in cycles of planning, teaching, reflecting, discerning problems, and applying new strategies. Candidates use reflection and feedback to formulate and prioritize goals for increasing their subject matter knowledge and teaching effectiveness.

COURSE ASSIGNMENTS

1. Reading Responses for “The Having of Wonderful Ideas” and “Inventing Density”
(due for each assigned essay)
2. Construct Graphic Organizer for Life, Earth, and Physical Sciences
3. Individual Science Activities Portfolio
4. Science Instruction Observation and Personal Reflection (tentative)
5. Report on a Science Website
6. Science Teaching Unit with Learning Cycle Lessons

ASSIGNMENT DESCRIPTIONS

1. READING RESPONSES (ONE PER ESSAY)

Students should be exposed to readings in science education and do appropriate applications.

ASSIGNMENT EXAMPLE

Students will be assigned readings and should present their responses to each assigned essay discussing the big ideas and key concepts presented.

The responses should be 1-2 pages. They may be typed or handwritten, but must be legible. They will be checked off for completion each due date, noted in the course outline. Representative samples will be examined for closer reading.

PRIMARY TEACHING PERFORMANCE EXPECTATIONS

TPE 1A: Subject-Specific Pedagogical Skills for Multiple Subject Teaching Assignments

TPE 4: Making Content Accessible

TPE 5: Student Engagement

TPE 6: Developmentally Appropriate Teaching Practices

TPE 6A: Developmentally Appropriate Practices in Grades K-3

TPE 6B: Developmentally Appropriate Practices in Grades 4-8

2. GRAPHIC ORGANIZER

Students will construct graphic organizers for each of the basic scientific content areas of life, earth, and physical science. Additionally, students will construct a composite graphic organizer for health, and nutrition and fitness.

The graphic organizers will show the relationship and sequencing of the major science concepts and sub-concepts for each of the major content areas taught in grades k-5 as outlined in the California Science Content Standards. Examples of graphic organizers will be provided.

PRIMARY TEACHING PERFORMANCE EXPECTATIONS

TPE 1A: Subject-Specific Pedagogical Skills for Multiple Subject Teaching Assignments

TPE 2: Monitoring Student Learning during Instruction

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TPE 6: Developmentally Appropriate Teaching Practices

TPE 6A: Developmentally Appropriate Practices in Grades K-3

TPE 6B: Developmentally Appropriate Practices in Grades 4-8

TPE 8: Learning about Students

TPE 9: Instructional Planning

3. SCIENCE ACTIVITY PORTFOLIO

Students will develop an annotated portfolio of the science activities performed in class.

The portfolio will include photographs, drawings, charts, and a short analysis of the science concepts involved in the activity. The student teacher will consider the role of the student learner as well as the roll of the teacher in the learning cycle, identification of the science process skills, scientific attitudes, and learner characteristics involved for a particular student developmental or age group. Additionally, the value of the science activity to provide opportunity for students to learn should be noted. The pre-service teacher should also consider questioning strategies and how the activity will engage the young learner. Include in the documentation anticipated learning goals, objectives, and desired skills. Literature and writing connections and opportunity should also be explored and annotated for each activity. Assessment of student learning should also be considered and documented.

Classroom discussion will provide additional information as how to accomplish the intent of the portfolio.

PRIMARY TEACHING PERFORMANCE EXPECTATIONS

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Teaching Science in a Multiple Subject Assignment

TPE 2: Monitoring Student Learning During Instruction

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TPE 5: Student Engagement

TPE 6: Developmentally Appropriate Teaching Practices

TPE 6A: Developmentally Appropriate Practices in Grades K-3

TPE 6B: Developmentally Appropriate Practices in Grades 4-8

TPE 10: Instructional Time

4. SCIENCE INSTRUCTION OBSERVATION (tentative)

This assignment will be considered and discussed in class if school age children are available to participate.

5. SCIENCE AND THE INTERNET

Student will report on at least one internet website that focuses on a science topic(s) and instruction for elementary school children.

The report will consist of an oral and written report. The student will be expected to use the technology to access the website and present it to the class. The written report will be 1-2 pages in length and either typed or handwritten. The report will a thorough description of the website, its appropriateness for use, and ease of use for a student or teacher in designing a science lesson or of direct use by a student learner.

PRIMARY TEACHING PERFORMANCE EXPECTATIONS

TPE 4: Making Content Accessible

TPE 5: Student Engagement

TPE 5: Student Engagement

TPE 6: Developmentally Appropriate Teaching Practices

TPE 6A: Developmentally Appropriate Practices in Grades K-3

TPE 6B: Developmentally Appropriate Practices in Grades 4-8

TPE 13: Professional Growth

6. SCIENCE TEACHING UNIT

You will create a unit on a specific science topic. You must bring a stamped, self-addressed manila envelope in order to receive a final grade. The grade will be determined by the unit plan, lessons and your final presentation.

1. Unit Plan (1 page-include title, grade level, goals for unit, Calif. Science Content Standards addresses, and one-two line descriptions of each learning cycle lesson)
2. 3 Learning Cycle Lesson Plans *Adapt from Commercial Lessons!*
For each lesson, include the following: *Do not re-invent activities.*
 - a. Topic
 - b. Science Concept --Write out the science concept(s) you are teaching in a complete sentence. Do not say “The students will ____.” (That is an objective, not a science concept.)
 - c. Objectives (1-2) (use behavioral objectives with action verbs—i.e., The students will ____)
 - d. Exploration Activity- explain what students will do and what teacher will do
 - e. Concept Invention Activity --explain what students will do and what teacher will do
 - f. Concept Application Activity- explain what students will do and what teacher will do
3. SDAIE Strategies –explanation of SDAIE strategies included and how they are used
4. Strategies for Teaching Students with Disabilities—explanation and how they are used
5. Integration of Technology into Lessons
6. Science Process Skills – explanation of science process skills used and how they’re used
7. Description of an Activity Center to go with Unit

8. Description of 3 Authentic Assessments for the Unit
9. Description of Final Project for Unit
10. Science Content Background (2-4 pages)
11. References

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.

PRIMARY TEACHING PERFORMANCE EXPECTATIONS

TPE 1A: Subject-Specific Pedagogical Skills for Multiple Subject Teaching Assignments

Teaching Reading-Language Arts in a Multiple Subject Assignment

Teaching Science in a Multiple Subject Assignment

TPE 4: Making Content Accessible

TPE 5: Student Engagement

TPE 6: Developmentally Appropriate Teaching Practices

TPE 6A: Developmentally Appropriate Practices in Grades K-3

TPE 6B: Developmentally Appropriate Practices in Grades 4-8

TPE 9: Instructional Planning

TPE 10: Instructional Time

TPE 13: Professional Growth

Criteria for Grading Assignments

A	Outstanding work on assignment, excellent syntheses of information and experiences, great insight and application, and excellent writing.	90-100%
B	Completion of assignment in good form with good syntheses and application of information and experiences; writing is good.	80-89%
C	Completion of assignment, adequate effort, adequate synthesis of information and application of information and experiences, writing is adequate.	70-79%
D	Incomplete assignment, inadequate effort and synthesis of information, writing is less than adequate.	60-69%

Late assignments will be penalized by a 10-point reduction each day they are late.

Course Grades

An “A” student is one who:

- completes all assignments on time and demonstrates the ability to summarize, analyze, and/or reflect at high levels.
- varies sources of information for assignments, demonstrating high degree of effort in pursuing varied perspectives around important educational issues.
- completes all the reading assignments and develops thoughtful and thorough responses.
- produces work that reveals a strong commitment to self-discovery and learning.

- produces work at a high professional level in terms of both writing and content.
- develops a high quality presentation, demonstrating significant learning around a contemporary issue.
- presents confidently and intelligently, demonstrating effective teaching skills.
- completes assignments in/out of class with a focus on learning and exploration, pushing him/herself to better understand the profession through quality work.
- attends almost every class meeting and is fully engaged during class.
- pushes him/herself to new understandings by participating in discussions, sharing his/her opinions, and valuing others' perspectives.
- contributes to the positive environment of the class by respecting all members.

A “B” student is one who:

- completes all or almost all assignments, all or most on time, and demonstrates the ability to summarize, analyze, and/or reflect at fairly high levels, showing consistent improvement over time.
- varies sources of information for assignments, demonstrating high degree of effort in pursuing varied perspectives around important educational issues.
- completes all or most of the reading assignments and develops thoughtful and fairly thorough responses.
- produces work that reveals a commitment to self-discovery and learning.
- produces work that is close to professional level in terms of both content and writing, working to develop a strong command of writing, speaking, planning and presenting.
- develops presentations, demonstrating significant learning
- presents confidently and intelligently, demonstrating effective teaching skills.
- completes assignments in/out of class with a focus on learning and exploration, pushing him/herself to better understand the profession through quality work.
- attends almost every class meeting and is regularly engaged during class.
- pushes him/herself to new understandings by participating in discussions, sharing his/her opinions, and valuing others' perspectives.
- contributes to the positive environment of the class by respecting all members.

A “C” student is one who:

- completes or attempts most of the assignments, mostly on time, and demonstrates the ability to do some quality summarizing, analysis, and reflection, showing improvement over time.
- varies sources of information for assignments, demonstrating effort in pursuing varied perspectives around important educational issues.
- completes most of the reading assignments and develops thoughtful and sometimes thorough responses.
- produces work that reveals a commitment to some self-discovery and learning.
- produces work that is not yet at a professional level in terms of both writing and content.
- develops a quality presentation, demonstrating learning around a contemporary issue.
- presents confidently and intelligently, demonstrating some effective teaching skills.
- completes assignments in/out of class with a focus on learning and exploration, pushing him/herself a little to better understand the profession.
- attends most class meetings and is often engaged during class.
- pushes him/herself to some new understandings by participating to a moderate degree in discussions, sharing his/her opinions, and valuing others' perspectives.
- contributes to the positive environment of the class by respecting all members.

A “D” student is one who doesn’t meet all of the minimal standards of a “C” student; “F” is earned by someone who hasn’t completed significant portions of the required work and fails to meet the “C” student standards.

Journals for Additional Reading

Science	School Science and Math
Science and Children	Innovations in Science and Technology Education
Science Education	Journal of Research in Science Teaching
Science News	American Biology Teacher
Science Scope	Physics Teacher
The Science Teacher	Journal of Chemical Education

Visit <http://enc.org> to see the new web site of Eisenhower National Clearinghouse

The Eisenhower National Clearinghouse (ENC) has recently launched an all-new web site, ENC Online, at <http://enc.org>. ENC, which was established by the U.S. Department of Education, provides K-12 math and science educators with information about teaching materials, innovative ideas, and professional development.

The content on ENC Online has been organized into four major categories. They are Curriculum Resources, Web Links, Professional Resources, and Topics. Through Curriculum Resources, teachers can locate teaching or professional development materials using subject words, grade level, cost, and type of material to meet their specific needs.

Teachers have said that the Digital Dozen, a monthly selection of exemplary math and science web sites, is one of their favorite features on the site. It is now found in the Web Links area. (Teacher can now also choose to have Digital Dozen delivered to their email boxes when registering with ENC.) Web Links also includes links to sites offering lesson plans, arranged by math or science topics.

The Professional Resources area is intended to become a part of a teacher's professional support system. A Timesavers section found within the Professional Resources area offers a collection of the most popular professional resources in one place for quick linking and use. Standards and state frameworks are also found under Professional Resources, as are federally funded resources, professional development strategies, and research articles.

ENC has always created projects and publications on relevant topics for teachers. The Topics area arranges hundreds of articles, teacher interviews, and selected curriculum resources and web sites thematically. Key education issues addressed in the Topics area include inquiry and problem solving, integrating educational technology, equity, and assessment. These areas include the materials developed for ENC Focus, our quarterly magazine for math and science educators.

Lastly, visitors will find news and timely information about workshops, student contests, awards and grants, and other developments in math and science education.