Center for Professional Development
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Independent Study Course Syllabus

Course Number: SCI 900

Course Title: Physical Science Activities for the Primary Grades

☐ Online X Distance Learning

Instructor: Mary Bennett, MA **Phone number:** 800-967-9365/559-322-7067 **Email:** maryebennett@sbcglobal.net *Email is the preferred form of contact as it is checked regularly throughout the day and your instructor will respond within 24 hours.* **Other Contact Information**: Curriculum Services Associates 5876 E. Powers, Clovis, CA 93619 **Office Hours:** M-F 8:00 am – 5:00 pm by phone	**Units: 3** **Grade Level: 1-3**

Course Description

The experiments in *Physical Science Activities for the Primary Grades* engage students in the exploration of concepts covering water, air, energy, gravity, electricity, and magnetism. The lessons presented encourage students to take a constructivist approach to learning as they develop inquiry skills. Throughout this course, teachers will create an environment in which they work together with their students as active learners. In addition, students will increase their understanding of physical science through the presentation of investigations that allow them to manipulate common objects and materials found in their environment. The course content will allow students to not only be involved in learning experiences that answer simple questions but also communicate the results of those experiences to others. Teachers will be provided with background information for each experiment so that they may encourage alternative explanations and develop critical and logical thinking in their students.

Students in the preschool and lower primary grades can be involved at the awareness level with demonstrations that are designed to arouse their natural curiosity at the pre-conceptual level. The

emphasis at this level is on the development of sensory-motor, observation, and communication skills. After students have developed readiness for a particular concept through awareness level activities, the concept can be presented by introducing it in a formal classroom lesson. The emphasis at this level is to involve students in using comparison and organizational skills. As students gain an understanding about basic science concepts, they become ready for experiences that help them to develop mastery. At this level, they can be involved in experiments that include the application of appropriate mathematical concepts and skills in interpreting data and solving problems. Although most of the students using these course activities will be involved at the awareness and formal introduction levels, each of the teacher's pages provides suggestions for challenging the higher achieving students through use of extension investigations.

Course Dates

Self-paced; students may enroll at any time and take up to one year to complete assignments.

You have up to one year from the date of registration, and no less than three weeks (one week per credit), to complete the course.

Course Materials

In addition to the course manual, *Physical Science Activities for the Primary Grades*, contained within the Welcome email, the instructor will send the following materials via US mail:

- Science Materials: Straw, Dowel, 3 Balloons, Suction Cup, Candle, Walnut, Cow Magnet, Eyedropper, Flat Magnet, Battery Holder, Hand Lens, Clown, Bulb and Socket, 3 Wires

NOTE: The course manual is in a PDF format. Users will need the free Acrobat reader to open and view the files (http://get.adobe.com/reader/)

Online Resources

Relevant online resources that support course content and encourage further investigation.

Technology Requirements:

- In order to successfully complete the course requirements, course participants will need Internet access, be able to send and receive email, know how to manage simple files in a word processing program, and have a basic understanding of the Internet.

Course Requirements

The course is divided into six units of study. In each unit, participants will explore the teaching of science through:

- Standards Based Instruction
- Learning Activities
- Collaboration/Webquest Evaluation

- Article Review
- Reflective Essay
- Activity Development

Every assignment has a rubric. Most participants are successful on their assignments because they align their work to the rubric, and assignments can be corrected and resubmitted.

Student Learning Outcomes

Student will be able to:

- Create an environment in which teachers and students work as active learners and students are encouraged to communicate knowledge.
- Implement experiments based on the natural curiosity of primary grade students that allow them to explore by observation and manipulation of common objects and materials found in their environment.
- Engage students in experiments that will provide the foundation for basic science concepts and require the application of the science processes: observing, communicating, comparing, organizing, relating, inferring, and applying.
- Conduct investigations designed to teach primary grade students how to interpret data while developing problem-solving skills.
- Align science standards and objectives with course content.
- Integrate science lessons into other areas of the curriculum.
- Encourage parent participation by using activities for homework assignments.
- Promote staff interaction through observation and sharing.
- Review and analyze current trends in science education.

National and Common Core Standards

In an effort to enhance the learning experiences, as well as demonstrate knowledge, skills, abilities, and commitment, teachers will infuse the five core propositions set forth by The National Board for Professional Teaching Standards in their teaching practices. This will be accomplished as teachers successfully implement appropriate activities in their classroom and

reflect upon the experience. In addition, teachers will be networking with their colleagues as part of a learning community.

National Board for Professional Teaching Standards(http://www.nbpts.org/)

1. Teachers are committed to students and their learning.
2. Teachers know the subjects they teach and how to teach those subjects to students.
3. Teachers are responsible for managing and monitoring student learning.
4. Teachers think systematically about their practice and learn from experience.
5. Teachers are members of learning communities.

National Standards

As students progress through this course they will be responsible for identifying and aligning course content to state or national science standards. In addition, they will reflect upon how the standards affect and guide teaching practices.

Common Core Standards

The **Common Core State Standards Initiative** is a state-led effort coordinated by the National Governors Association Center for Best Practices (NGA Center) and the Council of Chief State School Officers (CCSSO). The goal of this initiative is to develop a common core of state standards in English-language arts and math in grades K-12. The point of this effort is simple: *improving teaching and learning to ensure that high school graduates in every part of the nation have the knowledge and skills they need for college or a career*. The Common Core Standards are both research and evidence-based as well as internationally benchmarked. These standards define the knowledge and skills students should have within their K-12 education careers so that they will graduate high school fully prepared for college and careers.

Though the program is optional, states that adopt it are more likely to receive Race to the Top federal dollars.

Common Core State Standards Initiative
(http://www.corestandards.org/the-standards)

The standards are:

- Aligned with college and work expectations.
- Clear, understandable and consistent.

- Include rigorous content and application of knowledge through high-order skills.
- Build upon the strengths and lessons of current state standards.
- Informed by other top performing countries so that all students are prepared to succeed in our global economy and society.
- Evidence and researched based.

As you create lessons for your students you will be exploring National, State, District, or the Common Core Standards and identify how the lessons and activities you implement and develop align with those standards.

Schedule of Topics and Assignments

Assignments are available for use with or without student participation.

Schedule of Topics		**Assignments**
Unit 1	**Standards-Based Instruction**(SLO 1,9)	• Locate and explore relevant science standards • Reflect upon how standards guide teaching practices
Unit 2	**Learning Activities**(SLO 1,2,3,4,7)	• Identify 15 activities in the course content appropriate for the level of the students in your classroom • Align each of the activities to national, state, or district standards • Implement the activities and complete a reflection for each one assessing the results • Assign at least one activity as a homework assignment
Unit 3	**Teacher Collaboration** (SLO 6)	• Promote staff interaction and collaboration through the sharing of ideas and relevant teaching practices OR Explore and evaluate 2 science WebQuests

Unit 4	**Article Review** (SLO 8,9)	• Review and analyze current trends in the teaching of science specifically related to your teaching situation
Unit 5	**Reflective Essay** (SLO 9)	• Reflect upon the course content and analyze the implications for teaching
Unit 6	**Create an Activity** (SLO 1,4,5)	• Develop an extension activity that links another subject for two of the experiments

Evidence of Learning

- Course instructor observed evidence of understanding of course objectives as demonstrated through students' presentation of their knowledge of course concepts guided by focus questions.
- Course instructor observed evidence of understanding of course objectives as demonstrated through students' reflective writing assignments.
- Course instructor observed evidence of understanding of course objectives as demonstrated through students' correlation of the activities to state, national, or district standards.
- Student demonstrated their understanding of appropriate methods of teaching language arts through the design of lessons for classroom implementation.
- Student demonstrated their understanding of integrating other subject areas into the teaching of language arts through the suggestions described in each lesson.
- Student demonstrated reflective teaching practices through connections to course assignments and primary learning outcomes as described in a reflective essay.

Grading Policies and Rubrics

100 total points possible
100 – 90 =A
89 – 70 = B or Credit Grade
Below 70 points = no credit

- The discernment between an A or a B is at the discretion of the instructor based on the quality of work submitted.
- Coursework falling short of a quality equaling a B or a Credit Grade will be returned with further instructions.

- All assignments must be completed in order to receive a grade. In addition, all assignments are expected to reflect the quality that teacher-training institutions require of professional educators. If completed assignments do not meet this standard, students will be notified with further instructions from the instructor.

Major Assignments

1. Standards Correlation 20 points
2. Learning Activities 40 points
3. Teacher Collaboration/WebQuest 10 points
4. Article Review 10 points
5. Final Reflection 10 points
6. Create an Activity 10 points

Rubric for Evaluating Assignments

Assignments	Sub-Standard	Standard	Superior
Standards Correlation 20 points Superior=20-17 Standard=16-14 Sub-standard=13-11	State or national standards were minimally explored and connected to the activities in the course content, presentation lacks organization and comprehension, writing contains noticeable mistakes in grammar and spelling.	State or national standards for the appropriate grade level were explored, connections were presented and sufficiently connected to course content, presentation is adequate, writing is acceptable with very few mistakes in grammar and spelling.	State or national standards for the appropriate grade level were thoroughly explored, connections were presented and connected to course content, presentation is comprehensive, very well organized, writing is clear, succinct, and reflects graduate level expectations.
Learning Activities 40 points Superior=30-27 Standard=26-24 Sub-standard=23-21	Not all required activities were implemented, standards were correlated to less than half of the activities, objectives were missing or vague, reflections contained a minimal description of the grouping, procedures, and few or no observations, suggestions,	All required activities were implemented, standards were correlated to most of the activities, the objectives were adequately stated but not always specific, reflections were generally clear but did not always comprehensively describe the groupings, and procedures, very few suggestions,	All or more of the required activities were implemented, standards were correlated to all activities, objectives were specific and stated in terms of observable learner outcomes, reflections were comprehensive and included observations of what went well or problems encountered, there was a clear and

	modification, or student reactions were explained, writing contains noticeable mistakes in grammar and spelling.	modifications, observations, or student reactions were included, at least one lesson was sent as homework, writing is acceptable with very few mistakes in grammar and spelling.	concise description of the groupings, the procedure, and suggestions, modifications, and student reactions were explained when appropriate, one or more lesson was sent as homework, writing is clear, succinct, and reflects graduate level expectations.
Teacher Collaboration OR WebQuest Evaluation 10 points Superior=10-9 Standard=8 Sub-standard=7	Two activities were shared, summary is vague and lacks a detailed description of the experience, few or no comments or suggestions from the teachers were included, it is not clear as to whether or not the teachers found the activities valuable, writing contains noticeable mistakes in grammar and spelling. Less than two WebQuests were minimally explored, the name of the WebQuest and URL was incomplete or missing, summary is vague and disjointed, it is not clear as to whether or not the WebQuest is appropriate or integrates other subject	Two activities were shared, there is an adequate description of the experience, comments from the teachers as well as suggestions for adaptations or modifications in the activities were minimally presented, it is vague as to whether or not the teachers found the activities valuable, writing is acceptable with very few mistakes in grammar and spelling. Two WebQuests were sufficiently explored, the name of the WebQuest and URL was present, summary is adequately described, it is somewhat evident as to whether or not the WebQuest is appropriate or integrates other subject areas, writing is acceptable	Two or more activities were shared, summary is comprehensive, concise and a detailed description of the experience is clearly presented, comments from the teachers were included as well as suggestions for adaptations or modifications in the activities, it is clear as to whether or not the teachers found the activities valuable, writing is clear, succinct and reflects graduate level expectations. Two or more WebQuests were thoroughly explored, the name of the WebQuest and complete URL was present, summary is comprehensive, concise and a detailed description of the

	areas, writing contains noticeable mistakes in grammar and spelling.	with very few mistakes in grammar and spelling.	experience is clearly presented, it is highly evident as to whether or not the WebQuest is appropriate or integrates other subject areas, writing is clear, succinct and reflects graduate level expectations.
Article Review 10 points Superior=9-10 Standard=8 Sub-standard=7	The topic of the article is marginally appropriate to the content of the course and the teaching situation, critique is vague and disjointed, few or no examples are provided for classroom application, writing contains noticeable mistakes in grammar and spelling.	The topic of the article adequately applies to the content of the course and the teaching situation, critique is generally well organized, few examples are provided for classroom application, writing is acceptable with very few mistakes in grammar and spelling.	The topic of the article is highly appropriate to the content of the course and the teaching situation, critique is comprehensive and very well organized, specific examples are provided for classroom application, writing is clear and succinct and reflects graduate level expectations.
Reflective Essay 10 points Superior=9-10 Standard=8 Sub-standard=7	Reflection is vague in relation to the strategies presented in the course, lacks a description of the classroom environment, with little or no indication of student participation or plans for future implementation, and writing contains noticeable mistakes in grammar and spelling.	Reflection is specific to strategies presented in the course, there is adequate description of the classroom environment, student reaction, as well as plans for future implementation, and writing is acceptable with very few mistakes in grammar and spelling.	Reflection displays critical thinking that is clear, concise, and specific to the strategies presented in the course, a comprehensive description of the classroom environment, the reaction of the students, and plans for future implementation are included, and writing is clear and succinct and reflects graduate level expectations.
Activity Development 10 points	Vague description of the activity is defined, activity is somewhat	Clear, and detailed description of the activity is defined,	Comprehensive, clear, and detailed description of the activity is

Superior=10-9 Standard=8 Sub-standard=7	linked to a skill, and objective, subject infusion is unclear, target audience, learning materials and a description of the processes, procedures and an analysis of the activity unclear, writing contains noticeable mistakes in grammar and spelling.	activity is linked to a skill, objective and infuses another subject area, target audience, learning materials and a description of the processes, procedures and an analysis of the activity is presented, writing is acceptable with very few mistakes in grammar and spelling.	defined, activity is clearly linked to a specific skill, objective and infuses another subject area, target audience, learning materials and a description of the processes, procedures and an analysis of the activity is thoroughly presented, writing is clear, succinct and reflects graduate level expectations.

Writing Requirements

Superior: Writing is clear, succinct, and reflects graduate level expectations.
Standard: Writing is acceptable with very few mistakes in grammar and spelling.
Sub-standard: Writing contains noticeable mistakes in grammar and spelling.

Grading Options

Course assignments are graded with the use of a Scoring Rubric. Course participants have the option of requesting a letter grade or a credit/no credit.

Instructor/Student Contact

Built into the course requirements are several contacts between the course instructor and the students via phone, fax, or email. Questions are addressed and assistance is offered through these contacts, however, students are encouraged to contact the instructor at anytime throughout the course to discuss the materials, assignments, or any questions that they may have.

How to send Email:

The subject line of all Email must contain the following information:
course number your last name, first initial.
example: SCI 900 Bennett, M.
Email sent without this subject line will not be opened.

If you have to leave a message, please leave your name, the course number, and any questions you may have along with a phone number so that we may return your call.

The required contacts are as follows:

- Carefully examine the course materials and the assignments. Contact the course instructor via phone or email after you have gone through the course material and when you are ready to begin the assignments. Indicate the grade level that you teach, how you are going to implement the activities, and ask any questions that you may have regarding the course. In addition, you are encouraged to contact the instructor at any time to discuss the assignments or ask for clarification.

- Upon completion of the first two activities selected from the course content, send the reflections to the course instructor via email or fax. The instructor will contact you for assessment and feedback. Do not fax or email anything other than the first two activities, the remaining coursework will be sent via regular mail upon completion of all the assignments.

- Upon receipt of your completed assignments the instructor will contact you via phone or email to confirm course completion and discuss the coursework.

References/ Resources

Delicious
(http://delicious.com/maryebennett)
This link is to my social bookmarking site. This site is constantly growing with relevant and valuable resources for teachers.

Bibliography of science resources: (https://delicious.com/maryebennett/science)

Final Course Grade and Transcripts

When all work for the course has been completed, students will need to logon to the Center for Professional Development website (http://ce.fresno.edu/cpd) to "Submit Grade Form". Once the instructor fills out the grade form online, students may log back in to request their Grade Report as well as order transcripts online. Please allow at least two weeks for the final grade to be posted. For more information see the Independent Studies Policies and Procedures that were sent to you when you received your course materials, or in your online course. They are available, also at http://ce.fresno.edu/cpd - under General Information > CPD Policies.

Plagiarism and Academic Honesty

All people participating in the educational process at Fresno Pacific University are expected to pursue honesty and integrity in all aspects of their academic work. Academic dishonesty, including plagiarism, will be handled according to the procedures set forth in the Fresno Pacific University Catalogue. URL http://www.fresno.edu.

CONTINUING EDUCATION PROGRAM STUDENT LEARNING OUTCOMES:

CE 1. Demonstrate proficient written communication by articulating a clear focus, synthesizing arguments, and utilizing standard formats in order to inform and persuade others, and present information applicable to targeted use.
CE 2. Demonstrate comprehension of content-specific knowledge and the ability to apply it in theoretical, personal, professional, or societal contexts.
CE 3. Reflect on their personal and professional growth and provide evidence of how such reflection is utilized to manage personal and professional improvement.
CE 4. Apply critical thinking competencies by generating probing questions, recognizing underlying assumptions, interpreting and evaluating relevant information, and applying their understandings to the professional setting.
CE 5. Reflect on values that inspire high standards of professional and ethical behavior as they pursue excellence in applying new learning to their chosen field.
CE 6. Identify information needed in order to fully understand a topic or task, organize that information, identify the best sources of information for a given enquiry, locate and critically evaluate sources, and accurately and effectively share that information.

FRESNO PACIFIC UNIVERSITY STUDENT LEARNING OUTCOMES

Student Learning Outcomes Oral Communication: Students will *exhibit* clear, engaging, and confident oral communication – in both individual and group settings – and will critically *evaluate* content and delivery components.
Written Communication: Students will *demonstrate* proficient written communication by *articulating* a clear focus, *synthesizing* arguments, and utilizing standard formats in order to *inform* and *persuade* others.
Content Knowledge: Students will *demonstrate* comprehension of content-specific knowledge and the ability to apply it in theoretical, personal, professional, or societal contexts.
Reflection: Students will *reflect* on their personal and professional growth and *provide evidence* of how such reflection is utilized to manage personal and vocational improvement.
Critical Thinking: Students will *apply* critical thinking competencies by *generating* probing questions, *recognizing* underlying assumptions, *interpreting* and *evaluating* relevant

information, and *applying* their understandings to new situations.
Moral Reasoning: Students will *identify* and *apply* moral reasoning and ethical decision-making skills, and *articulate* the norms and principles underlying a Christian world-view.
Service: Students will *demonstrate* service and reconciliation as a way of leadership.
Cultural and Global Perspective: Students will *identify* personal, cultural, and global perspectives and will employ these perspectives to *evaluate* complex systems.
Quantitative Reasoning: Students will accurately *compute* calculations and symbolic operations and *explain* their use in a field of study.
Information Literacy: Students will *identify* information needed in order to fully understand a topic or task, *explain* how that information is organized, *identify* the best sources of information for a given enquiry, *locate* and critically *evaluate* sources, and accurately and effectively *share* that information.