



Professional Development Institute

Flex Course Syllabus

Active and Hands-On Science Instruction (K-6)

PDI Course Number: 98T02

UCSD Course Number: EDUC41446

If you would like information about receiving post-baccalaureate (graduate) credit for completing this course, [please click here](#).

Course Timeline

Participants have one year to complete the course. Participants must spend a minimum of three weeks in this course.

Course Description

With the advent of the new science standards, are you finding it increasingly difficult to make science more interesting and “hands-on?” In order to create student interest and fascination in science, teachers need to design curriculum where students do not simply learn about science, but also “do” science. This online course is designed for K-6 teachers who are interested in learning a variety of ways to enhance their science instruction through active, hands-on experiences, while at the same time being able to “hit” the various standards. Teachers will gain a variety of ideas for conducting hands-on experiments and investigations, establishing science learning stations, integrating science with other content areas, and using technology to enhance science instruction. Time will also be spent on introducing ways to integrate science into other content areas including language arts and math. Teachers will also learn specific strategies for making science motivating so that even their hardest-to-reach student populations (which include English language learners and students with special needs) will be able to make sense of the new science standards in an engaging and fun way. By the end of this course, teachers will feel entirely confident to implement hands-on science practices in the classroom.

Educational Outcomes

1. Teachers will understand the importance of using science standards to drive instruction.
2. Teachers will learn a variety of ways to teach science beyond simply using the textbook.
3. Teachers will gain a variety of ideas for creating hands-on science stations in the classroom.
4. Teachers will be introduced to hands-on science experiments that can be done easily in the classroom.
5. Teachers will learn classroom management techniques for active science classrooms.
6. Teachers will learn a wide variety of strategies to integrate science and language arts.
7. Teachers will learn a variety of strategies to integrate science and math.
8. Teachers will learn a variety of ways to use technology in an effort to increase students' understanding of science concepts.
9. Teachers will learn how to create a science WebQuest.
10. Teachers will learn how to find and use interactive science websites, including virtual science field trips.
11. Teachers will learn strategies for promoting the teaching and understanding of science vocabulary in the classroom.
12. Teachers will learn about the different ways to assess science skills.
13. Teachers will learn about the importance of student engagement and the role that motivation plays in the learning of science.
14. Teachers will learn a variety of strategies for motivating and engaging their students in the process of science.
15. Teachers will learn strategies for teaching science content to English Language Learners.
16. Teachers will learn strategies for teaching science content to students with special needs.
17. Teachers will learn how to use science trade books to enhance the science curriculum.
18. Teachers will be introduced to a variety of science websites to augment their science curriculum.
19. Teachers will learn how to get parents involved in their child's science education.

Instructional Media

- Online Discussions
- Online Engagement
- Online Collaboration
- Instructor Feedback
- Instructor Interaction
- Online Resources and Websites
- Supplemental Instructional Materials

- Printable Classroom Resources

Evaluation

- Test #1 (5% of final grade)
- Test #2 (5% of final grade)
- Test #3 (5% of final grade)
- Test #4 (5% of final grade)
- Test #5 (5% of final grade)
- Autobiography and Goals for the Course (10% of final grade)
- Article/Video Reflection (15% of final grade)
- Course Collaboration/Share Ideas with the Class (10% of final grade)
- Cumulative Assignment/Project: Integrating Other Content into Hands-On Science (20% of final grade)
- Culminating Practicum (20% of final grade)

Topical Outline

Unit One

- Introduction to Science Education
- Science Standards
- Beyond the Textbook
- **Assignment #1**
Write an autobiography including information about yourself, your grade level and what you specifically hope to learn about creating a hands-on science curriculum. Your autobiography should be a minimum of three paragraphs.
- **Test #1**

Unit Two

- Science Stations
- Cool and Easy Science Experiments
- Science Classroom Management
- **Assignment #2**
As an educator, it is important to be aware of the research, studies, and professional work done in the field. In the course, you will find an article and/or video that are relevant to the specific course content. Read the article or watch the video and then write an essay with your thoughts.
- **Test #2**

Unit Three

- Integrating Science and Language Arts
- Integrating Science and Math
- Integrating Science and Technology
- Create a Science WebQuest
- **Assignment #3**

Online Discussion Board Participation/Engagement: Please post a tip, strategy, or idea that specifically relates to hands-on science activities and will make a difference to other teachers in their own classrooms. Your assignment should be a minimum of three paragraphs and detailed enough for another teacher to easily follow. This is a great opportunity to share and collaborate with other teachers at your grade level around the country. Take time to review and respond to other postings that are relevant to your classroom population in order to gain effective ideas to use immediately in your classroom.

- **Test #3**

Unit Four

- Beyond the Science Classroom
- Science Vocabulary
- Science Assessment
- **Test #4**

Unit Five

- Engaging Students in the Process of Science
- Strategies for Working with English Language Learners
- Strategies for Working with Students with Special Needs
- **Test #5**

Unit Six

- Science Trade Books
- Science Websites
- Getting Parents Involved
- **Assignment #4**
- *Choose three hands-on science lessons in which you can appropriately integrate language arts, mathematics, and technology. Each lesson should be written in a minimum of two paragraphs, with the first paragraph detailing the lesson and the second paragraph outlining specific details of how each content area will be integrated into the hands-on science lesson. Each paragraph should be no less than five sentences. When you are finished, you will have written a total of six detailed paragraphs, with each paragraph consisting of no less than five sentences. Be sure to list all of the standards to which each hands-on science lesson applies (including science standards and other content standards), as well*

as the grade level to which each lesson best applies. Keep in mind that this assignment is a cumulative project and therefore, you are expected to demonstrate the knowledge you gained from the course and your ability to apply what you have learned in a practical setting.

- **Assignment #5**

The culminating practicum is a three-step process. (1) In the first assignment, you were asked what goals you had and what you hoped to learn from the course. Think back to your original goals for this course. Write a minimum two-paragraph reflection specifically describing how what you learned can be used to help you reach those goal(s). (2) Next, write a minimum three-paragraph plan that specifically describes the ways in which you intend to implement a particular strategy you learned in this course into your own teaching situation. (3) Last, write a minimum two-paragraph reflection describing a student you have or have had in the past. Then, discuss how the strategies you learned in this course will specifically benefit that student as you put your plan into action.

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