

EDCI 671: Teaching Science in Elementary Schools

Fall Semester 2007
Thursdays 9:30-12:15pm
Shady Grove Campus

Janet Coffey
jecoffey@umd.edu
Office Hours: by Appointment

Course Description

This course is designed to provide you with an opportunity to explore key issues related to teaching and learning science, particularly with elementary school students.

Assignments, readings, and in-class learning experiences for this course have been designed to support you in developing the knowledge, skills, and dispositions that will be helpful in teaching science in your elementary school classrooms. Specifically, I hope you will become better able to do the following:

- Provide a rationale for the teaching of science to elementary school students
- Listen and attend to student ideas in science
- Build powerful learning experiences around student ideas
- Promote classroom discourse that reflects the nature of science and supports students' science learning
- Integrate assessment meaningfully into everyday teaching to support student learning
- Make science and literacy connections
- Support science learning for all students
- Learn a little science!

Course Requirements and Assignments

1. Class Participation. (25%)

Students are expected to meaningfully participate in weekly discussions of readings and other class activities. How we participate in class discussions and how we support and challenge each other's understanding will be fundamental to what and how we learn throughout the course. All students are expected to come to class prepared to participate actively. *This includes thoughtful interaction with the assignments and reading for the class ahead of time, participation in class discussions and careful attention to the contributions of classmates.* If you must miss class for any reason, please notify me via email and arrange with a classmate to catch up on what you have missed.

2. Positioning paper. (15%)

What type of science learning environment would you like to create in your classrooms? And, what does this mean for the type of science teacher you will aspire to be? Reflect on your ideas of prior science learning experiences and your ideas about teaching science in elementary school classrooms. Write a short paper (~3-5 pages) to position yourself as a professional within a powerful learning environment. You may include your prior experiences -- inside and outside the classroom -- and consider how these experiences may affect your development as a teacher of science. *I encourage you to start this reflection thinking of the important characteristics of science learning in your ideal*

classroom and examine the reasons for the choices of these characteristics.
You'll revisit this at the end of the semester so don't lose it! DUE: September 13

3. Doing Science -- Exploring the Sun and Moon (20%)

Almost each week in class, we'll be doing a little science. One thing we'll be looking at and discussing over the semester is the moon. Throughout the first part of the course, you'll be asked to make observations of the moon.

I. **Every day:** Look at the sky and if you see the moon, record what you see. Look at the same time each day/night. *(INCLUDE AS MUCH DETAIL AS YOU CAN! What is the shape? Where is the moon positioned in the sky? What time are you looking?)*

II. **Every class:** Bring your sun and moon observations. While we won't be using them each week, bring them with you for times we do.

III. Turn in summary of observations, predictions, explanations OCT. 4

IV. Make group presentations in class (details to follow) OCT. 25

V. Final reflection on moon (details to follow) NO LATER THAN NOV. 8**

4. Reflections on Learning (15%)

We'll be watching a lot of videotape of elementary science teaching and learning together in class. You'll also be asked to read cases outside of class. Twice this semester you'll be asked to consider a "case study" or article and respond to the following questions:

- What has this case or article prompted you to wonder?
- What have you learned from this case or article?
- What new questions do you have?

Due: September 27th, November 1st

5. Case Study of Student Learning (25%)

A major focus for our class will be learning to listen to the substance of students' ideas. One way to access student thinking is to get them to talk or to closely examine their work. You'll be asked to conduct either a science talk **with a small group of students (~5 would suffice)** from your placement classroom OR teach a short science lesson that provides allows you some access (conversation or written work) into their thinking. We'll discuss this assignment in more depth in class. You will be asked to video or audio tape your experience with the students. This will provide a record for analysis and on which to reflect. Here are related project due dates, to give you a sense of the timeline:

Oct 11	Science topic (send by email) Conduct interviews this week
Oct 18	Planning for a Science Conversation OR Activity: Bring notes or transcript from interview, with beginning analysis of students ideas and reasoning
Oct 25	Develop a design for engaging students in discussion or activity
Nov 5 – Nov 16	Conduct a science talk or activity with kids (AUDIO OR VIDEOTAPE!!!)
Nov 29	Bring portion of transcript to class, with beginning analysis
Dec. 6	Report on analysis of student thinking in class
Dec 13	Submit written case study of student thinking

Accommodations

If you have a documented disability or other learning needs and you would like accommodations, please contact me as soon as possible to make the appropriate arrangements.

Honor Code

Of course, you are expected to abide by the University of Maryland's code of academic integrity. (For specifics see www.inform.umd.edu/campus/info/departments/jpo/code/acinteg.html).

Readings and Texts

Readings will be posted on the course website, which is housed on the University's ELMS system. To access the site, go to www.elms.umd.edu. Log on using your university ID and password. You should see our course listed as an option in the upper left hand corner.

Additional Resources

Montgomery County Public Schools website for science:

<http://www.mcps.k12.md.us/curriculum/science/>

Howard County Public Schools website for science:

http://www.hcpss.org/academics/science_elem.shtml

National Science Education Standards (National Research Council, 1996):

<http://www.nap.edu/catalog/4962.html>

Inquiry and the National Science Education Standards. (National Research Council, 2000) http://books.nap.edu/html/inquiry_addendum/index.html

Benchmarks for Science Literacy (American Association for the Advancement of Science, 1993)

<http://www.project2061.org/tools/benchol/bolframe.htm>

National Science Teachers Association website:

<http://www.nsta.org>

This is a working plan. The schedule and readings WILL be altered as the semester unfolds.

Date	Topic	Reading and Assignment
9/6	Introduction Reflect on positive learning experiences The Moon	
9/13	Creating a culture of learning: What are the essential characteristics we want to support? What does a positive learning environment look like? Attention to Student Thinking Science talks INTRODUCTION Role of discourse in science talks Doing Science	Due: positioning paper
9/20	What science? Inquiry, inquiry, inquiry...what is it?	Gallas, Chapter 1 Hammer & van Zee, Ch 2
9/27	More Student Thinking & More Inquiry, inquiry, inquiry...what does scientific reasoning and practices look like? How do we support it? Features of inquiry	Gallas, Chapter 2 & 3. Due: 1st reflection on reading/case
10/4	What do we know about how students learn science? And how does that connect to how we teach science? Interpreting students scientific thinking	NRC How people learn Gallas, 5, 6, 7 Due: Moon observations & predictions
10/11	NO CLASS – **Conduct student interview about science topic this week	Gallas 8 & 9 Due: Send science topic via email
10/18	Assessment as teaching...and learning	Atkin and Coffey, <i>Everyday Assessment</i> . Due: Notes and/or transcript from interview with beginning analysis
10/25	Integrating science across curriculum	Winokur & Worth (2006) Class presentations on moon-sun-earth model Due: Plan for science teaching activity
11/1	Prep for teaching experience	TBA Due: 2nd reflection on reading/case
11/8	IN SCHOOLS	Due: Final reflection on moon
11/15	IN SCHOOLS	
11/22	Thanksgiving – NO CLASS	
11/29	Analysis of teaching activities	Due: Bring portion of transcript from teaching activity and beginning analysis of student thinking
12/6	Share case studies of student learning	
12/13	Share case studies of student learning	Due: Final written case study of student thinking

