ANTIOCH UNIVERSITY SEATTLE
School of Education

Purpose of the School of Education: The School of Education promotes constructivist pedagogy, critical reflection and a commitment to social justice through transformative education and realized by positive impact on the learner's growth, in school and beyond.

Credits:	3
Day & Time:	Mondays, 6:15 – 9:45 PM
Quarter/Year:	Fall 2016
Location:	Antioch Campus
Instructor:	Carolyn Colley
Contact information:	ccolley@antioch.edu
Office Hours:	Email to set up appointment

Course Description
Teacher candidates experience practice-based framework for science teaching and learning. Learning experiences integrate the use of technology, highlight multicultural and sustainability issues present in science education, and apply current assessment practices. Students develop practice-based, multicultural lessons that are based on Next Generation Science and Washington State Environmental and Sustainability Standards, with emphasis placed on student learning, assessing student understanding, culturally responsive teaching, and reflective teaching practices.

Course Essential Questions
This course is guided by the following essential questions:

- How do students learn science? Why is it important to reach all learners in the science classroom and know them as individuals? How can I do this?
- What teaching practices help students make sense of science? How can I facilitate the learning process in my classroom?
- How can I help students make sense of science ideas through using school, local, and global community resources and lived experiences? How will this help me reach all students?

Course Learning Objectives

- Teacher candidates (TC) will learn how to effectively plan for, instruct, and assess K-8 standards-based science instructional plans that meet the needs of diverse learners.
- TCs will design lessons that elicit student understandings of a scientific big idea, provide sensemaking opportunities for students, and allow students to apply their understandings.
- Evidence of student learning gathered from multiple sources of assessment and used to modify instruction in-the-moment and for subsequent lessons.
- TCs will design, reflect upon, and modify science instruction that uses students' everyday lives as the basis of learning. Student, classroom, school and community context and students' assets will form and shape science instruction. Families and community connections will be an intricate part of lesson design and reflection. .
- TCs will design reflect upon, and modify K-8 science lessons that are differentiated for the needs of the classroom learners.

- TCs will practice and reflect upon discourse strategies that help foster productive learning in science classrooms.

Course Requirements

1. *Attendance*: Students are expected to attend all scheduled classes. Credits may be denied for failure to attend classes. (Antioch University Seattle Catalog)
2. *Incomplete policy*. The University expects students to complete all coursework by the end of the quarter. In exceptional circumstances, students may request an exception and negotiate with the instructor for an Incomplete (Inc).
3. *Participation* in class exercises and discussions.
4. *Course Evaluations*: The final course evaluation (Week 7) is required for all students in all courses.

Required Course Texts

- Rosebery, A. S. & Warren B. (2008). *Teaching Science to English Language Learners: Building on Students' Strengths*. NSTA Press: Arlington, Virginia.
- Michaels, S., Shouse, A. W., & Schweingruber, H. A. (2008). *Ready, Set, Science! Putting Research to Work in K-8 Science Classrooms*. Washington, DC: The National Academies Press. http://www.nap.edu/openbook.php?record_id=11882

Recommended Texts (not required, but useful!)

- Cartier, J.L., Smith, M.S., Stein, M.K., & Ross, D. K. (2013). *5 Practices for Orchestrating Productive Task-Based Discussions in Science*. The National Council of Teachers of Mathematics, Inc. Reston. VA: NSTA Press.
- Zembaul-Saul, C.L., McNeill, K.L., Hershberger, K. (2012) *What's Your Evidence? Engaging K-5 Children in Constructing Explanations in Science.* Pearson Professional Development. (Print copy includes CD-ROM with teaching examples)

Standards (bookmark and/or download to your computer)

- Next Generation Science Standards (NGSS): http://www.nextgenscience.org/
- Common Core Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects: http://www.corestandards.org/assets/CCSSI_ELA%20Standards.pdf
- Common Core for Mathematics: http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf
- English Language Proficiency (ELPs): http://www.k12.wa.us/MigrantBilingual/ELD.aspx
- Environmental & Sustainability Education (ESE) Learning Standards: http://www.k12.wa.us/EnvironmentSustainability/default.aspx

Recommended Resources

- AAAS, *Benchmarks for Science Literacy*, 1993. http://www.project2061.org/publications/bsl/online/index.php
- AAAS, *Science for All Americans* (Project 2061), 1990. http://www.project2061.org/publications/sfaa/online/sfaatoc.htm

- Science and Children and Science Scope: These are NSTA practitioner journals aimed for elementary and middle school science teachers. See http://www.nsta.org/publications/journals.aspx for information.

Websites for lesson plans and instructional resources:

- http://AmbitiousScienceTeaching.org/
- http://www.nsta.org/ (National Science Teachers Association)
- http://cse.edc.org/ (Center for Science Education)
- http://www.project2061.org/default_flash.htm (AAAS)
- http://www.lhs.berkeley.edu/ (Lawrence Hall of Science)
- http://school.discovery.com/ (Discovery Channel)

Assignments:

1. **Attendance and active participation and reading reflections**:
   - **Reading:** Weekly reading assignments are noted on the class schedule. Reflective discussions will take place during class and may also utilize online discussion groups through Sakai. TCs should be active readers by making notes and writing down questions, thoughts, and reflections to prepare to actively participate in reading discussions.
   - **Active participation**: Active participation means *being prepared for class, having completed assignments, and engaging in class discussions.* Participating means creating safe spaces, monitoring airtime, listening to and valuing others' ideas and perspectives, voicing concerns respectfully, being sensitive to who gets to speak, assuming "best intentions" and being mindful of impact, and being able to challenge each other.
2. **3 Teaching Enactments (TE) - Occur during weeks 3, 5, and 7:** Each TC will teach three 20-minute abbreviated lessons. Teaching enactment details will be provided in class. Teaching enactment details and reflection paper details will be provided in class.

Class Schedule and Summary of Assignment Due Dates

The schedule, assignments, and course content are subject to change at the discretion of faculty member. Bring a laptop, tablet, or smart phone to class as some of the assignments we will start working on in-class together. If this presents a challenge, please contact me and we can problem solve together.

WEEK 1 – OCT 3 COURSE OVERVIEW & SCIENCE UNIT PLANNING

Assignments Due	Week 1 Topics
1. **COMPLETE** and **BRING** *Science & You* survey. *You do not need to upload your responses to Sakai as some may be personal. Be prepared to discuss questions 5 and 6.*	• Intro to course • Overview of Ambitious Science Teaching (AST) and setting a vision for science education
2. **READ** ***Ready, Set, Science!*** **(*RSS*) Ch. 1 "New Vision in Science Education"** (16 pp) **http://bit.ly/1pZ8ys9** *What vision is presented in this chapter? What could that look like or sound like in a classroom? Other questions/notes that arise for you.*	• AST Practice #1: Planning for engagement with important science ideas • Intro to Next Generation Science Standards (NGSS)

WEEK 2 – OCT 10 UNIT PLANNING & ELICITING STUDENTS IDEAS

Assignments Due

NOTE: Complete assignments 1-3 prior to continuing on task 4 because they will support you as references in doing planning.

1. **READ "Planning for Engagement with Important Science ideas"** (12 pp) **http://bit.ly/1WEAT1B**

2. **READ Read Ready, Set, Science! (RSS) Ch.4** "Organizing science education around core concepts" (27pp) http://www.nap.edu/read/11882/chapter/5

3. **WATCH "Planning for Engagement with Important Science Ideas" (from 0:00 to 9:20) http://bit.ly/1MflhzK**

4. **UPLOAD COMPLETED DRAFT of 6 Steps on unit planner template.** *Template is available in Sakai. Upload to Sakai and bring copy (hard or electronic) to class. If typing into pdf is problematic, create Word doc with 5 steps and responses.*

5. **SKIM *Teaching Science to English Language Learners (TSELL)* Part I: Teaching from Students' Strengths** (pp 1-56). *What are science talks? How could science talks be considered an equity practice? How could you see science talks and building from students' everyday experiences as supporting students' science learning?*

Week 2 Topics

- Peer feedback on collaborative planning tool to support AST Practice #1: Planning for engagement with important science ideas
- Introduce AST Practice #2: "Eliciting Students' Ideas" with an example lesson walkthrough
- Discuss TSELL Part I readings.
- Planning time (as time permits)

WEEK 3 – OCT17 ELICITING STUDENTS IDEAS: Teaching Enactment

Assignments Due

1. **READ "Elicit Students Ideas & Adapt Instruction" Primer http://bit.ly/21ElhLs** *This should support and inform your lesson planning decisions for TEI.*

2. **COMPLETE AND UPLOAD "Eliciting students' ideas" plan.**Use AUS template and AST steps for the eliciting students' ideas found here: **http://bit.ly/1SeCV75**

3. **PREPARE for "Eliciting Students' Ideas" lesson:** Rehearse to practice. Bring copies of model scaffolds and materials needed.

Session Topic

Teaching Enactments: *Candidates teach and "eliciting students ideas" lesson to a small group of peers who will serve as students The focus of this lesson is on AST Practice #2 (Eliciting Students' Ideas) to elicit students' ideas, experiences, and language about an anchoring phenomenon.*

WEEK 4 – OCT 24 SUPPORTING ON-GOING CHANGES IN THINKING

Assignments Due

1. **UPLOAD COMPLETED reflection about "eliciting students' ideas" focused lesson**
   See reflection assignment details in the teaching enactment handout from week 1 include photos of student work and an analysis of students' initial thinking.

2. **WATCH "Supporting ongoing sensemaking"** (21m 09s) **https://vimeo.com/104463484**
   What are the goals of this practice? What kinds of activities are best? How does talk support students?

3. **READ *RSS* Ch 6** "Learning from Science Investigations" **http://bit.ly/1Rfpi7H** and ***RSS* Ch 7** "Making Thinking Visible: Models & Representations" **http://bit.ly/1RcyY3T** *How do these chapters connect with the above video "Supporting ongoing sensemaking" video?*

4. **READ *TSELL*** Ch 7, 8, 9 "Part II: Teaching Academic Language" *What connections do you see between these chapters and the teaching practice of supporting students' ongoing sensemaking?*

5. **SKIM *Literacy for Science*** Ch 4 "The language of science text and talk" **http://bit.ly/22GnWeK**

Session Topic

- Discussion of video and readings
- Introduction to AST Practice #3 "Supporting on-going changes in student thinking" as a focus for science teaching with an example lesson walkthrough
- Discussion of Academic Language: What is it? How do we support it?
- Summary Tables: Public records of learning

WEEK 5 – OCT 31 SUPPORT ON-GOING CHANGES IN STUDENT THINKING
Teaching Enactment

Assignments Due

Note: Task 1 will support your understanding the steps to the lesson guide in Task 2.

1. **READ "Supporting on-going changes in thinking"** primer article **http://bit.ly/1LCXxH3**

2. **COMPLETE AND UPLOAD "Sensemaking" lesson plan** using AUS template & AST steps for *supporting ongoing changes in student thinking* **http://bit.ly/1LCXxH3**

3. **PREPARE for TEII enactment**: Support ongoing changes in student thinking lesson. Rehearse to practice. Bring any materials or copies needed for your lesson.

Session Topic

Teaching Enactments: *Candidates teach to a small group. The focus of this lesson is to support students in building and changing their ideas through a sensemaking experience with opportunities for student talk and reasoning about the activity.*

WEEK 6 – NOV 7 PRESSING FOR EVIDENCE-BASED EXPLANATIONS

Assignments Due	Session Topic
1. UPLOAD COMPLETED reflection paper from "supporting on-going changes in student thinking" focused lesson. **2. WATCH "Pressing students for evidence-based explanations"**(19m 04s) https://vimeo.com/104469356 **3. READ** "Pressing for Evidence-based Explanation" Primer **http://bit.ly/1Rh9Llw** **4. READ** one of the following articles about evidence-based explanations (in Sakai under resources): ● Allen & Rogers (2015) Putting Ideas on Paper CER ● McNeill et al (2006) Constructing Explanations and Fading Scaffolds ● McNeill & Martin (2011) Claim, Evidence, Reasoning	• Discuss readings • Introduction to Practice #4: "Pressing for evidence-based explanations" with example lesson walkthrough • Planning time (as time permits)

WEEK 7 – NOV 14 PRESSING FOR EVIDENCE-BASED EXPLANATIONS Teaching Enactment

Assignments Due	Session Topic
1. TURN IN "evidence-based explanation" lesson plan using AUS template & AST steps for pressing for evidence-based explanations **http://bit.ly/1RwF1Mw** **2. PREPARE for teaching enactment**: Rehearse to practice. Bring any model scaffolds, summary charts, materials needed.	Teaching Enactments: *Candidates teach to a small group. The focus of this lesson is to have students revise or construct explanations based on evidence from prior experiences.* **End-of-course survey**

By Monday, November 21st at 10:00PM **upload your final teaching enactment reflection paper for your "pressing for evidence-based explanation" lesson to Sakai.**

Rubrics for assignments

Assignment	Expectations not met	Expectations Met	Expectations Met High
Attendance and completion of reading	More than 2 absences, or make-up assignments for absences were not completed, or did not meet expectations; Not prepared for class	One-two absence(s) during quarter, and make-up assignment met expectations; prepared for class	No absences during quarter; Prepared for and engaged in class
Teaching Enactment I: Eliciting student ideas with reflection paper	TE I LP not completed according to AUS standards.	TE I LP completed according to AUS and course standards. Lesson elicited student understanding of scientific big idea. Candidate linked assessment to learning objective.Student learning guided lesson.Active participant in peer's lessons and reflection.Lesson reflection complete. Level 1 or 2 on EdTPA rubric distributed in class.	Met requirements. Candidate preplanned back pocket questions and used student responses to inform instruction and direction of lesson. Lesson plan reflection reflected deep knowledge of positive impact on student learning and student voice. Level 3, 4 or 5 on EdTPA rubric distributed in class.
Teaching Enactment II: Sense making opportunities with reflection paper	TE II LP not completed according to AUS standards.	TE II LP completed according to AUS and course standards. Lesson based on elicitation of student understanding obtained in TE I. Lesson provided students with sense making opportunities of the scientific big idea. Candidate linked assessment to learning objective.Student learning guided lesson.Active participant in peer's lessons and reflection.Lesson reflection complete. Level 1 or 2 on EdTPA rubric distributed in class.	Met requirements. Candidate preplanned back pocket questions and used student responses to inform instruction and direction of lesson.Candidate's lesson allowed for student understanding to be exposed through classroom dialogue. Opportunities for students to reflect upon learning objective and self-assessment were provided. Lesson plan reflection reflected deep knowledge of positive impact on student learning and student voice. Level 3, 4 or 5 on EdTPA rubric distributed in class.
Teaching Enactment III: Application of learning with reflection paper	TE III LP not completed according to AUS standards.	TE III LP completed according to AUS and course standards. Students provided with opportunities to apply scientific big idea to a new situation. Candidate linked assessment to learning objective. Active participant in peer's lessons and reflection. Student learning guided lesson. Lesson reflection complete. Growth over three lesson sequence. Level 1 or 2 on EdTPA rubric distributed in class.	Met requirements. Candidate preplanned back pocket questions and used student responses to inform instruction and direction of lesson. Significant growth over three-microteaching lessons--attention to specific instructional practices that pushed candidate to focus on student learning. Lesson plan reflection reflected deep knowledge of positive impact on student learning and student voice. Level 3, 4 or 5 on EdTPA rubric distributed in class.
Overall course outcome	One or more of class assignments or expectations were not met.	All class assignments or expectations were met.	All class assignments or expectations met at a high level.

Antioch University Policies

Antioch University is committed to building a vibrant and inclusive educational environment that promotes learning and the free exchange of ideas. Our academic and learning communities are based upon the expectation that their members uphold the shared goal of academic excellence through honesty, integrity, and pride in one's own academic efforts and respectful treatment of the academic efforts of others.

All students are expected to comply with Antioch University policies, including the Title IX Sexual Harassment and Sexual Violence Policy and the Student Conduct Policy. To access academic, student, and other university policies are available online: http://aura.antioch.edu/au_policies/.

Antioch University Seattle Procedures

In addition to the above Course Requirements, students are responsible for abiding by the description of professional behavior as well as the following guidelines. Refer to the current Antioch University Seattle Catalog and the current Antioch University Student Handbook for full descriptions and procedures.

1. Attendance: Students are expected to attend all scheduled classes. Credits may be denied for failure to attend classes. Refer to the current Antioch University Seattle Catalog for full description.
2. Plagiarism: Plagiarism is defined as the presentation of an idea or a product as one's own, when that idea or product is derived from another source and presented without credit to the original source. "Idea or product" includes not only written work but also artworks, images, performances or ideas expressed orally of via any electronic, or other medium. Refer to the current Antioch University Seattle Catalog for full description and procedures.
3. Student Suspension, Dismissal, or Exclusion from Class Procedures. Refer to the current Antioch University Seattle Student Handbook for full description and procedures.
4. Communication Protocol: All students must have access to computer technology. AUS maintains a computer laboratory as well as computer access in the AUS Library.
   E-mail accounts and addresses are assigned for all Antioch Seattle students. Students are required to check their e-mail accounts at least weekly and are responsible for being aware of information posted as official announcements and through their programs.
   To comply with students' record confidentiality and security requirements, official e-mail communication with Antioch Seattle, including e-mail between students and instructors, should originate from and be conducted within the Antioch University Seattle e-mail system. Refer to the current Antioch University Seattle Catalog for full description and procedures.
5. Incomplete Policy and In Progress. The University expects students to complete all coursework by the end of the quarter. In exceptional circumstances, students may request an exception and negotiate with the instructor for an Incomplete (Inc). An Incomplete may be granted solely at the discretion of the instructor. Classroom courses may be allowed up to one additional quarter. Other courses may be allowed up to two additional quarters to complete the Inc. If the work is not completed by the final deadline set by the instructor and an assessment has not been submitted, a No Credit (NC) will be assigned, not subject to change. To earn credit for a course deemed No Credit or permanently incomplete, the student must reenroll in and repay for the course. Incomplete contracts are not available to non-matriculated/visiting students. Upon withdrawal from Antioch, outstanding courses incomplete are converted to NC (No Credit). An NC is permanent and not subject to change. Students must complete all course and degree requirements prior to or on the last day of classes of a term to be eligible to graduate that term. Refer to the current Antioch University Seattle Catalog for full description and procedures.

Reasonable Accommodation of Students with Disabilities

Antioch University is committed to providing reasonable accommodations to qualified students with disabilities in accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 2008. Students with disabilities may contact the Disability Support Services office to initiate the process and request accommodations that will enable them to have an equal opportunity to benefit from and participate in the institution's programs and services. Students are encouraged to do this as early in the term as possible, since

reasonable accommodations are not retroactive. The Disability Support Services office is available to address questions regarding reasonable accommodations at any point in the term.

Students in need of accommodation should contact the Disability Support Services (DSS) Office 206-268-4151 or TTY: 206-728-5745 or dss@antioch.edu to request reasonable accommodations.

Students are responsible for giving their faculty members a Letter of Accommodation from the DSS office as soon as possible in the quarter. In cases that the disability accommodation of extended time on assignments is granted, each assignment must be discussed and specific due dates agreed upon in advance between student and faculty.

All assignments align with AUS GTP Program Outcomes and AUS School of Education's conceptual framework

Program outcomes:

1. Multicultural Competency and Sensitivity, and a Commitment to Social Justice
2. Reflective Practice
3. Personal Qualities as a Leader
4. Knowledge of the Learner
5. Content Area Expertise
6. Student-centered Curriculum and Instruction
7. Personal Qualities as a Teacher
8. Sensitivity to the Community Context of Teaching and Learning
9. Responsibility to Washington State Standards

Conceptual Framework

1) Promotion of constructivist pedagogy
2) Promotion of critical reflection
3) Promotion of deep commitment to social justice through transformative education
4) Promotion of dedication to the learner's growth, in school and beyond

Course assignment alignment with State and University Standards

Standard V (WAC 181-78A-270(1))	**edTPA Washington rubric (language from Elem. Math TPA)**	**Course assignments**
a. Effective teaching		
(i)Using multiple instructional strategies, including the principles of second language acquisition, to address student academic language ability levels and cultural and linguistic backgrounds	EM10: How does the candidate use knowledge of students' language development to identify a key language demand central to content learning? EM11: How does the candidate support academic language development associated with content learning? EM12: How does the candidate reveal students' understanding and use of academic language associated with content learning?	Teaching Enactment
(ii) Applying principles of differentiated instruction, including theories of language acquisition, stages of language, and academic language development, in the integration of subject matter across the content areas of reading, mathematical, scientific, and aesthetic reasoning	EM10: How does the candidate use knowledge of students' language development to identify a key language demand central to content learning? EM11: How does the candidate support academic language development associated with content learning? EM12: How does the candidate reveal students' understanding and use of academic language associated with content learning?	Teaching Enactment Readings Class discussion
(iii) Using standards-based assessment that is systematically analyzed using	EM3: How are the informal and formal assessments selected or designed to provide	Teaching Enactment

multiple formative, summative, and self-assessment strategies to monitor and improve instruction	evidence of student progress toward the standards/learning targets? EM6: How does the candidate demonstrate an understanding of student performance with respect to standards/learning targets? EM8: How does the candidate use conclusions about what students know and are able to do to plan next steps in instruction? EM7: How does the candidate provide students feedback to guide their further learning? EM9: How does the candidate use evidence to evaluate and change teaching practice to meet the varied learning needs?	
(iv) Implementing classroom/school centered instruction, including sheltered instruction that is connected to communities within the classroom and the school, and includes knowledge and skills for working with others	EM4: How does the candidate actively engage students in developing understandings of mathematical concepts?	Teaching Enactment Readings Class discussion
(v) Planning and/or adapting standards-based curricula that are personalized to the diverse needs of each student	EM2: How does the candidate use knowledge of his/her students to target support for students' development of conceptual understanding, computational/procedural fluency, and mathematical reasoning/problem solving skills?	Teaching Enactment Readings Class discussion
(vi) Aligning instruction to the learning standards and outcomes so all students know the learning targets and their progress toward meeting them	EM13: How does the candidate focus student attention on the learning targets? EM14: How does the candidate support students to access resources for learning and to monitor their own learning progress? EM15: How does the candidate use student-voice evidence to identify instructional improvements?	Teaching Enactment
(vii) Planning and/or adapting curricula that are standards driven so students develop understanding and problem-solving expertise in the content area(s) using reading, written and oral communication, and technology	EM1: How do the candidate's plans build conceptual understanding, computational/procedural fluency, and mathematical reasoning/problem solving skills? EM4: How does the candidate actively engage students in developing understandings of mathematical concepts? EM5: How does the candidate elicit and monitor students' responses to deepen their understanding of mathematical concepts?	Teaching Enactment
(viii) Preparing students to be responsible citizens for an environmentally sustainable, globally interconnected, and diverse society		Teaching Enactment
(ix) Using technology that is effectively integrated to create technologically proficient learners		Teaching Enactment Discussion Forum
(x) Informing, involving, and collaborating with families/neighborhoods, and communities in each student's educational process, including using information about student cultural	EM2: How does the candidate use knowledge of his/her students to target support for students' development of conceptual understanding, computational/procedural fluency, and mathematical reasoning/problem solving skills?	Teaching Enactment

identity, achievement and performance		
b. Professional development		
Developing reflective, collaborative, professional growth-centered practices through regularly evaluating the effects of his/her teaching through feedback and reflection	EM8: How does the candidate use conclusions about what students know and are able to do to plan next steps in instruction EM9: How does the candidate use evidence to evaluate and change teaching practice to meet the varied learning needs?	Teaching Enactment
c. Teaching as a profession		
(i)Participating collaboratively and professionally in school activities and using appropriate and respectful verbal and written communication	NA	Pre-internships Class discussion
(ii)Demonstrating knowledge of professional, legal, and ethical responsibilities and policies	NA	Pre-internships

Course Acknowledgements
I would like to acknowledge the work of Dr. Sara Hagenah for her support and feedback on this syllabus and assignments based on her previous experiences designing and facilitating this course over the past several years.