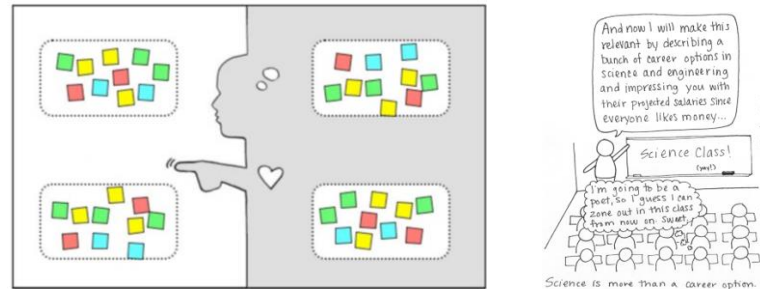


**Lasell University: School of Humanities, Education, Justice, and Social Sciences**  
**ED 342\_344, "Teaching Science Concepts: PK-2"\_"Science Concepts & Curriculum: 1-6", Spring 2020**  
 Fridays, 1:00-3:30 PM, STC 301



**Instructors:** Prof. Yihong Cheng and Prof. Dave Jackson

**Unofficial Mentors:** Mike Barnett, Elida Laski, Megan McKinley, Kate McNeill, Amie Patchen, Claudia Rinaldi, Beth Warren, ...

**"Office":** Zoom, SMS, and *likely-Winslow-G36* (when facing the door for the Campus Police, enter the door to the left)

**e-mail and phone:** [ycheng@lasell.edu](mailto:ycheng@lasell.edu) (+1 612-819-6808) and [djackson@lasell.edu](mailto:djackson@lasell.edu) (+1 617-460-1295)

**Office Hours:** Tuesdays 12:30-1:45 and Thursdays 12:30-1:45 [TENTATIVELY], or by appointment

**Canvas site:** <https://courses.lasell.edu/courses/6959>

Lasell University's mission statement: We immerse students in experiential and collaborative learning that fosters lifelong intellectual exploration and social responsibility.

Connected Learning Statement: *Connected learning* is the Lasell College educational philosophy describing the process of integrating ideas, concepts, and direct experience through action, combining projects, simulations, and real-world situations with direct, critical reflection. At Lasell, we include these components in every course so that students further develop and apply the knowledge and skills learned in the classroom.

Main course goals:

- **Feel confident and enthusiastic** that you can teach science...
- **Have relevant resources** that you can use for activities
- **Think with interpretive power** (make sense of students' sense-making)
- **Learn through practices** (vs. memorization of facts)

**Course "chunks":** (1) Intro: Science as Cultural Practice; (2) Next Generation Science Standards, and beyond [NGSS+]; (3) Assessment --> Curriculum --> Instruction; (4) Science & Literacy; (5) Engineering; (6) Computational Thinking; (7) Outro: Expanding Possibilities

Dave’s & Yihong’s philosophical stances:

- **Critical dialectical pluralism** (in brief!): Societies and communities shape and are shaped by power (im)balances, as related to positionalities from intersectional identities (~“critical”). Power (im)balances are best addressed by acknowledging and valuing all worldviews (“pluralism”), then engaging those worldviews – and proponents thereof – in dialogues that reimagine more just societies and communities to negotiate structural and institutional change (“dialectical”). [See Onwuegbuzie & Frels, 2013]
- **Heterogeneity as fundamental to learning**: Youths’ diverse lived experiences and ways of talking, acting, thinking, feeling, knowing, and valuing are fundamental resources to learning. [See Rosebery, Ogonowski, DiSchino, & Warren, 2010]
- **Expansive pedagogy around sense-making**: We adopt an open or expansive approach to support youth in negotiating meaning-making about scientific phenomena. Underlying this approach is the assumption that youth are making sense in different ways, regardless of whether the adult understands them. [See Bang, Brown, Calabrese Barton, Rosebery, & Warren, 2017]

**Course Description**

*ED342 - Teaching Science Concepts: PK – 2 \_ ED344 - Science Concepts & Curriculum: 1-6*

This course engages students in integrating early childhood and/or elementary science content with state and national curriculum standards and resources, including instructional technology, to develop effective science lessons. The course includes practice in integrating science concepts with early childhood and/or elementary curriculum and requires a 25-hour pre-practicum in local classrooms.

<b>Credit Hours</b>	4; “generally means that students should devote about [8] hours of work to the class per week (in addition to in-class requirements)” --> assumed because 3 credits means 6 hours of preparation
<b>Prerequisites</b>	“Pass all required MTEL.” (with exceptions)
<b>Required Course Materials</b>	<ul style="list-style-type: none"> <li>• Geisen, M., &amp; Pearce, C. (2016). <i>Everything you need to ace science in one big fat notebook: The complete middle school study guide</i>. New York, NY: Workman Publishing.</li> <li>• Additional course readings as posted on the course’s Canvas site.</li> </ul>

**ASSIGNMENTS**

Below is a brief description of the assignments for this class, due at 11:59 PM unless otherwise noted. We will provide more detailed descriptions before the assignments are due. The due dates for the assignments are also listed on the schedule with the readings.

**Class Participation**

We feel+think that experiences during class are essential for your own personal growth and for creating a productive ED342\_344 community. We expect that you will attend all classes, arrive and depart on time, and actively participate in classroom activities and discussions. Email the instructors **before** an absence, except in medical emergencies.

**Science Autobiography**

10%

Reflecting on your past experiences with science teaching and learning can help you better understand their influence on your present and future work [purpose #1]. Also, this assignment will help the class (your "audience") get to know you as a science teacher and learner [purpose #2]. For this assignment, you will use your Empathy Map as a basis for developing a narrative ("genre") of your relationship with science, in all learning environments. Make sure to attend to affective/emotional elements, as well as the cognitive, behavioral, and social factors that have influenced your journey with science. Include your philosophy of what "counts" as science, in conversation with early course readings and activities (i.e. which ideas/beliefs do or do not resonate with you, and why). Your artifact may adopt any modality/ies (e.g., collage, video, slideshow, poem, essay, song, or something else), so long as it can be concisely presented (~3-4 minutes). This assignment is due **Wednesday, January 29**.

**Interpretive Power Reflection**

10%

The purpose of this exercise is to cultivate your attention to the diverse ways in which young people make sense of the world by analyzing discourse (including aspects of language use, body, action, emotion, participation, co-narration, perspective-taking, etc.) as it unfolds in social interaction in specific activity settings (e.g., classroom discussion). Throughout this process, we ask you take an interpretive stance, as compared with an evaluative or diagnostic stance. This means that you will a) interpret the students' talk assuming they are making sense of the subject matter and task, and b) use your audio-recording and/or notes as a source of evidence for your interpretations (i.e., referring to specific moments in the interaction and what they are evidence for), and staying close to the participants' words, gestures, tone, and so on.

Keeping these guidelines above in mind, you will choose a 5-10 minute classroom episode to reflect on in 2-4 pages, double-spaced. Note where you are feeling uncertain or exploring something new or going out on a limb or contradicting an earlier point, etc. The interpretive power reflection is due **Wednesday, February 12**.

**Curriculum Evaluation**

10%

Curriculum materials are also a critical resource. There are numerous curriculum materials, which represent a wide range of quality. It is important to critique those materials in order to help you choose and adapt curriculum materials for your classroom. You will select and critique materials from one curriculum project using a modified version of the American Association for the Advancement of Science (AAAS) evaluation criteria. You can choose to work with a partner to complete the curriculum evaluation, but you will need to each hand in a curriculum evaluation and complete the reflection independently. The curriculum evaluation is due **Wednesday, March 11**.

**Instructing Youth / Informing Adults, plus Reflection**

**Instructing Youth:** An important aspect of the teacher cycle is using available resources to design instruction. You and a partner will develop a thirty-minute lesson to teach a science topic of your choice by engaging students in science and/or engineering practices for a grade level of your choice. This lesson may become part of your final unit, or it may be on a separate topic. You can borrow materials from us, the Boston Museum of Science, or from Lasell's Brennan Library. You will then teach that lesson to ED342\_344 and we will act as your students. A lesson plan is due at the beginning of your lesson. One week after you teach your lesson you will hand in a reflection on your teaching. You may hand in one lesson plan, but each student will write an independent reflection. The due date for this assignment will depend on when you teach the class. People will teach the class ranging from **March 13 - April 24** and will hand in their lesson plans and reflections ranging from **March 20 - May 1**.

**Informing Adults:** Many non-profit organizations / district curriculum developers have been designing, implementing, and evaluating intervention programs that aim at better engaging students in science and/or engineering practices. For this assignment, you and a partner will present to the board of directors / district leadership team of one of such organizations, namely your fellow classmates, about an intervention program designed by you. You will need to explain in 30 minutes details about the student population the program serves, the setting in which the program takes place, the learning activities to be included and how they are scheduled, expected outcomes of your program, and any information that will persuade the board members that the program is worth trying. One week after you present your program you will hand in a reflection on your presentation. You may hand in one PowerPoint/handout/visual aid, but each student will write an independent reflection. The due date for this assignment will depend on when you present the program. People will present to the class ranging from **March 13 - April 24** and will hand in their program designs and reflections ranging from **March 20 - May 1**.

**Field Trip & Reflection****10%**

Observing science teaching is a great way of making your own science teaching/science curriculum better. One of our Friday classes around Spring Break, therefore, will be cancelled so that you will have some time for a "field trip" to take a close look at how science can be taught in different settings, then write a (double spaced) 2-4 page reflection on what you see and how you can integrate what you observe into how you teach or design science classes. The field trip should last for two and a half hours, the length of our typical class. You may choose one of the following options as your field trip site.

1. The National Science Teaching Association (NSTA) is holding its National Conference on Science Education from Thursday, April 2 to Sunday, April 5 at Boston Convention & Exhibition Center. Do not miss it if you are in for mind capturing workshops and connecting with science educators across the country! You will need to complete an online registration at <https://www.nsta.org/conferences/registration/> and pay a registration fee. The rate is \$90 per day for full-time students from Thursday to Saturday, and \$60 for Sunday. We are exploring whether scholarships are available (and you can, too!).
2. Museum of Science, Boston, is also a great place to consider. Open from 9 to 5 from Saturday to Thursday and 9 to 9 on

Sunday, the museum holds a variety of exhibits, live presentations, and theatrical experiences. Register for the museum's Teacher Partner Program (TPP) at <https://www.mos.org/teacher-partners> for free access to the exhibits and its Education Resource Center (ERC), where you can find tons of books and professional development opportunities. You can still access the ERC even if you don't get a TPP card (just ask at the turnstiles).

3. We can try to schedule an observation of a science class at MacArthur Elementary School, Kennedy Middle School, or McDevitt Middle School of Waltham Public Schools. We're also exploring opportunities at Willams Elementary School of Newton Public Schools (right next to Lasell!).
4. We can try to schedule an observation of an after-school STEM program session at Kennedy Middle School or McDevitt Middle School of Waltham Public Schools.
5. If none of the above options interest you or if you have a preferred space on which to reflect, please check with us (Dave & Yihong / Prof. Jackson & Prof. Cheng).

The 2-4 page reflection is due **Wednesday, April 8.**

### **Curriculum Unit Design**

**40%**

As teachers or curriculum developers, you develop lessons and entire units to help support your students in learning science. For the final project of this class, you are going to design a curricular unit that would last 6 class days. These could be consecutive class days, or it could be a unit that you imagine spread out over a longer period of time (e.g. twice a week for 3 weeks). You can work with one partner to design the curriculum unit or you can create the unit independently. If you do choose to work with a partner, you need to do three aspects independently: (1) Design One Lesson; (2) Reflection for final curriculum unit; and (3) Three extensions for the unit (people working by themselves do not need to design the three extensions).

#### **Unit Framework (5%)**

- Before developing the entire curriculum unit, we would like you to develop an outline that provides that target learning goals and a description of the instructional sequence. This will allow us to provide you with feedback as you start to think through your complete curriculum unit. The outline is due **Wednesday, February 26.**

#### **Design One Lesson (5%)**

- Before designing the complete unit, we would first like you to hand in one individual lesson, different than your example lesson. This must be completed independently even if you are working on the unit with a partner. The one lesson is due **Wednesday, March 25.**

#### **Design One Student Assessment (5%)**

- You will develop one assessment including both the student version of the assessment as well as a rubric or key that you would use to evaluate students' understanding. The student assessment can take a variety of forms such as a quiz, presentation, lab report, performance assessment or other written assignment. The assessment is due **Wednesday, April 1.**

**Final Curriculum Unit (25%)**

- You will design a curricular unit that would last 6 class days (approximately ~45-55 minutes a day) that targets a specific science topic. You will develop detailed lesson plans for the 6 days including any handouts, slideshows, pictures, etc. that you would use with the students. Ideally, one of the six detailed lessons should already be developed from the lesson you taught in class. Your unit must include a hands-on science experiment or activity, as well as an introduction & purpose, science standards, science background, anticipated prior knowledge, strategies for leveraging cultural and linguistic diversity, relevance to students’ lived experiences, extra supports and enrichment, literacy connections, and one student assessment (the one you already developed). You will also hand in a reflection that discusses how you developed your unit and a rationale for your particular instructional sequence.
- **If you choose to design your curriculum unit with a partner**, you will need to independently write your reflection. You will also need to develop three extensions to the unit discussing possible next steps (each about ½ page long). The extensions could be descriptions of three additional lessons that you are summarizing instead of writing in depth. Or they could be a little less traditional, like a description of a field trip (e.g. visit to Darwin exhibit at Museum of Science, with related pre and post discussion, project, and/or activity) or a more long-term project (e.g. testing water quality in the Charles River) that you can imagine doing as next steps.
- Your final curriculum unit is due **Thursday, May 7**.

**Course Policies**

<p><b>Communication Policies</b></p>	<p>We expect that you will check your email each weekday (Mon.-Fri.), and the Canvas site as needed for readings, assignments, and email notifications.</p> <ul style="list-style-type: none"> <li>• We will provide feedback on assignments within a week of submission</li> <li>• Email both instructors, and at least one of us will answer your email within 24 hours on weekdays and within 48 hours on weekends.</li> <li>• For information on canvas notification recommendations, visit this site: <a href="https://community.canvaslms.com/docs/DOC-10624-4212710344">https://community.canvaslms.com/docs/DOC-10624-4212710344</a></li> </ul>
<p><b>Netiquette Expectations</b></p>	<p>When posting online, remember the following recommendations:</p> <ul style="list-style-type: none"> <li>• Stay on topic and within the scope of the course material. Be as brief as possible while still making a substantive contribution.</li> <li>• Be attentive to existing arguments; in discussion forums, read all messages in a thread before replying.</li> <li>• Always give proper credit when referencing or quoting another source.</li> <li>• If you agree with someone else, make sure to build on their statement by adding something of your own.</li> <li>• Always be respectful of others’ opinions even when they differ from your own. When you disagree</li> </ul>

	with someone, express your differing opinion respectfully and non-judgmentally. Be open-minded. (Derived from the <a href="#">University of Florida Netiquette Guide for Online Courses.</a> )												
<b>Attendance</b>	See "Class Participation", above, for attendance policy.												
<b>Late Work</b>	Assignments lose 8% of the overall grade for every day or part thereof they are late.												
<b>Academic Integrity</b>	<p>Lasell College expects students to hold themselves to high ethical standards. You should be familiar with the College's policy for academic integrity as it appears in the catalog, including the examples of academic dishonesty listed. Consequences for violating this policy, including reporting and grade/course penalties, are outlined in the current college catalog.</p> <p>All work you submit toward your degree must be your own and must include proper credit for any resources you use. If you use copyrighted work, you must obtain proper permission. Lasell's Brennan Library has published these <a href="#">LibGuides on plagiarism and copyright</a>; for more information follow the link to "Defining and Avoiding Plagiarism" on the Purdue Online Writing Lab (OWL) web page on plagiarism.</p>												
<b>Teaching through disruption</b>	In the event of campus closing due to snow or other event, the class activity will be facilitated online via the Canvas conference tool. Students will receive an invitation to join the conference and should log in at beginning of the usual course time.												
<b>Grading Policy</b>	<p>Your grades are reflective of expectations that you have exceeded, met, or not met at a given time. <b>Focus on your progress/growth toward and beyond these expectations</b>, rather than the letter grade or percent. Your grade for each assignment as well as your final grade will be determined by the following scale (all numerals are percentages):</p> <table border="0"> <tr> <td>A 93-100</td> <td>A- 90-92</td> <td>B+ 87-89</td> <td>B 83-86</td> <td>B- 80-82</td> <td>C+ 77-79</td> </tr> <tr> <td>C 73-76</td> <td>C- 70-72</td> <td>D+ 67-69</td> <td>D 63-66</td> <td>D- 60-62</td> <td>F below 60</td> </tr> </table>	A 93-100	A- 90-92	B+ 87-89	B 83-86	B- 80-82	C+ 77-79	C 73-76	C- 70-72	D+ 67-69	D 63-66	D- 60-62	F below 60
A 93-100	A- 90-92	B+ 87-89	B 83-86	B- 80-82	C+ 77-79								
C 73-76	C- 70-72	D+ 67-69	D 63-66	D- 60-62	F below 60								

### **Academic Support**

<b>Educational Accommodations Statement</b>	<p>The <a href="#">Disability Services</a> office supports Lasell students with special needs. If you require accommodations, please let us know as soon as possible and no later than the end of the first week of the course.</p> <p>To request academic accommodations at Lasell College contact Dolores Radlo, Director of the Academic Achievement Center &amp; Learning Disabilities Services at <a href="mailto:dradlo@lasell.edu">dradlo@lasell.edu</a>, (617) 243-2474.</p>
<b>Assistance in Writing and Academic Tutoring</b>	<p>The Academic Achievement Center* (<a href="mailto:aac@lasell.edu">aac@lasell.edu</a>, 617-243-2474, <a href="https://www.lasell.edu/academics/academic-centers/academic-achievement-center.html">https://www.lasell.edu/academics/academic-centers/academic-achievement-center.html</a>), provides academic tutoring in specific subject areas, technology to assist you with reading and writing needs, and workshops on topics such as test taking and study skills. Online academic support service may also be available through <a href="#">Tutor.com</a> through your Canvas course menus.</p>

	<b>*Great for MTEL prep! :)</b>
<b>Research Assistance</b>	Reference librarians at the Brennan Library ( <a href="mailto:reference@lasell.edu">reference@lasell.edu</a> , 617-243-2244) can help you find and evaluate resources for your research projects. Contact a librarian for help with exploring the library website in order to gain a better understanding of the many uses of our academic databases and Laser Search. <i>Note: Library services may not be available to non-matriculated students.</i>
<b>Canvas Support</b>	Canvas learning management support for students is available at (833) 846-2535 and at <a href="https://cases.canvaslms.com/liveagentchat">cases.canvaslms.com/liveagentchat</a> . You can also find this information under Resources in your Canvas global navigation menu or visit our Student Canvas FAQ.
<b>Technical Support</b>	The IT Department Help Desk provides support for technology-related issues. Should you ever have problems accessing your Lasell account or using other course resources, submit your request to the Help Desk at <a href="mailto:helpdesk@lasell.edu">helpdesk@lasell.edu</a> . If you need immediate assistance, they are available 24/7 by phone at 617-243-2200.
<b>Title IX and Sexual Respect</b>	Lasell College is committed to maintaining a conducive learning environment for all students and a professional workplace for its employees. Lasell College prohibits all forms of discriminatory and harassing behaviors including sexual harassment, sexual violence, and any type of sexual misconduct. Incidents of other forms of harassment and/or discrimination should be brought to the attention of the Title IX Coordinator or a Title IX Deputy Coordinator. More information is available at <a href="https://www.lasell.edu/discover-lasell/title-ix-and-sexual-respect.html">https://www.lasell.edu/discover-lasell/title-ix-and-sexual-respect.html</a> .
<b>Diversity and Inclusion</b>	The Lasell community appreciates diverse, global perspectives and recognizes that students, faculty, and staff from a range of backgrounds make our campus greater. We are committed to providing our community with the academic resources and professional development needed to foster an inclusive environment. More information is available at <a href="https://www.lasell.edu/campus-life/diversity-and-inclusion.html">https://www.lasell.edu/campus-life/diversity-and-inclusion.html</a> .
<b>Counseling Center</b>	The college years are often a time of change and growth, challenge and achievement. When challenges present themselves it is often helpful to talk to a caring, professional counselor. The Counseling Center offers a free, confidential place to discuss personal concerns, problems, or feelings as students grow towards greater independence and satisfaction with life. For those students needing care beyond the scope of our services (e.g., weekly psychotherapy, psychiatric evaluation, or specialized substance abuse or intensive mental health treatment), we can assist with referrals to services in the local community. Appointments can be made by calling the main line at 617-243-2181 or the Director at 617-243-2145. The Counseling Center is located at 18 Maple Terrace and is open during the academic year Monday through Friday 8:30 a.m. to 4:30 p.m.
<b>Self-care during class time</b>	Some students may need or wish to leave the class to gather themselves, take a breather, or get water or food. This is acceptable in our class – an instructor will check in with you to ensure that you



are safe and to lend support.

### Course Outline (subject to change)

<u>Class</u>	<u>Topic(s)* &amp; Activity/ies</u> [shaded by course "chunk"; see page 1] <i>*Most classes will start with reflecting on course readings</i>	<u>Readings (Due)</u>	<u>Assignments (Due)</u>
Class 1 Fri 1/24	<b>Course overview + science as a cultural practice</b> <ul style="list-style-type: none"> <li>• Introductions: Background sheet + Empathy map</li> <li>• What is "science"?</li> <li>• Syllabus overview: Goals, expectations, assignments, etc.</li> <li>• Jigsaw readings about science as a cultural practice</li> <li>• Set-up Bottle Ecosystem investigation</li> <li>• Generate a Driving Questions Board (DQB)</li> <li>• Assign science autobiography</li> </ul>	{ }	{ }
Class 2 Fri 1/31	<b>The Next Generation Science Standards (NGSS)</b> <ul style="list-style-type: none"> <li>• Reflect on science autobiography</li> <li>• Q&amp;A about syllabus</li> <li>• NGSS:               <ul style="list-style-type: none"> <li>• Practices, DCIs and cross-cutting concepts</li> <li>• How to read a standard</li> <li>• Unpacking a standard</li> </ul> </li> <li>• Reflect on Bottle Ecosystem investigation, via NGSS practices</li> <li>• Watch video(s) of Ss engaging in science practices and reflect</li> <li>• Video/transcript analysis - Do plants grow every day?</li> <li>• Sign-up for "Lesson" (instructing youth / informing adults)</li> <li>• Assign Interpretive Power exercise (read prompt by Wed.; due 2/12)</li> </ul>	<a href="#">Next Generation Science Standards: What's different, and do they matter?</a> (Bell et al., 2014)  <i>Seeing Students Learn Science (SSLS)</i> pp. 1-18 (start Ch. 1)  Rodriguez talk (10 min): <a href="#">Avoiding ... curriculum pitfalls</a>	Science Autobiography (Wed., 1/29) Bring Q&A about syllabus (start of class)
Class 3 Fri 2/7	<b>"NGSS+"</b> <ul style="list-style-type: none"> <li>• Jigsaw share-out on vignettes from reading (Bang et al 2017)</li> <li>• Re-reflect on Bottle Ecosystem investigation, via "Principles of Expanding Meaningful Opportunities to Learn" (Bang et al., 2017) and "Equity, Engagement, and Diversity Practices" (Rodriguez, 2015)</li> <li>• Measuring time: Jigsaw (<a href="http://exactlywhatistime.com">exactlywhatistime.com</a> - home page;</li> </ul>	"Using Diversity as a Strength in the Science Classroom" (bottom of 312-317)  <a href="#">Toward More Equitable Learning in</a>	Brief (1-page) summary of vignette and how it connects with each of the 3 principles (due at start of class)

	<p><a href="#">"Calendars"; "Time in Different Cultures"</a></p> <ul style="list-style-type: none"> <li>• Activity: Conceptions of "life" (card-sorting)</li> <li>• Choose your Field Experience site</li> <li>• Update the Bottle Ecosystem investigation</li> <li>• Answer questions about the Interpretive Power exercise</li> </ul>	<p><a href="#">Science</a> (Bang et al 2017): <b>All</b> read p. 33-39 &amp; 55-56;  <b>Jigsaw vignettes</b>: p. 40-46, 46-51, 51-55)</p> <p><a href="#">Rodriguez (2015) - Engagement, equity, and diversity practices</a> (table on p. 1043 = required, article = optional)</p>	
Class 4 Fri 2/14	<p><b>"3D" assessment in science: Evaluation and adaptation</b></p> <ul style="list-style-type: none"> <li>• Evaluate 1-2 assessment/s</li> <li>• Adapt 1-2 assessment/s</li> <li>• Mini-reflection – connecting interpretive power with assessment</li> <li>• Update the Bottle Ecosystem investigation</li> </ul>	<p>SSLS pp. 18-32 (complete Ch. 1)</p> <p>SSLS (Ch. 2)        *All: 33 &amp; 48-50        *Ex 1: 34-39        *Ex 2: 40-48</p>	Interpretive Power assignment (Wed., 2/12)
Class 5 Fri 2/21	<p><b>Science curriculum: Approaches and evaluation</b></p> <ul style="list-style-type: none"> <li>• All: Example from Massachusetts Model Curriculum Units (MCUs)</li> <li>• Pairs: Evaluate curriculum that you brought</li> <li>• Intro to Curriculum Evaluation assignment</li> <li>• Update the Bottle Ecosystem investigation</li> </ul>	<p>"Curriculum Integration..." (Venville et al., 2010)</p> <p>PB 4 (Bell &amp; Shouse)  <a href="#">"...instructional models that fit... NGSS..."</a> + addendum</p>	Bring curriculum at beginning of class on 2/21 (for practice with curriculum evaluation)
Class 6 Fri 2/28	<p><b>Science lessons: Unit and lesson structure</b></p> <ul style="list-style-type: none"> <li>• <u>Units</u>: Creating a storyline / instructional sequence</li> <li>• Pick an instructional model and start creating a framework for your final unit project</li> <li>• Peer feedback on your unit framework</li> </ul>	<p><i>Ready, Set, SCIENCE!</i>, Ch. 1:        "Rethinking Children's Capacity for Scientific</p>	Finish unit framework draft 1 for final unit project (Wed., 2/26)

	<ul style="list-style-type: none"> <li>• <u>Lessons</u>: Some structures popular in science education</li> <li>• Lesson Example by Dave &amp; Yihong (Prof. Jackson &amp; Prof. Cheng), followed by feedback from class</li> <li>• Update the Bottle Ecosystem investigation</li> <li>• Mid-semester feedback</li> <li>• Work-time for curriculum evaluations</li> </ul>	<p>Understanding" (pp. 6-8 only)</p> <p><a href="#">What We Call Misconceptions May Be Necessary Stepping-Stones</a></p>	
<p>Class 7 Fri 3/6</p>	<p><b>Science lessons: Practice designing a lesson</b></p> <ul style="list-style-type: none"> <li>• Discuss mid-semester feedback trends</li> <li>• Work time &amp; questions: Start designing one lesson in Final Unit</li> <li>• Wrap-up the Bottle Ecosystem investigation</li> <li>• If time: <a href="#">"Plants-In-Motion" videos</a></li> </ul>	{ }	<p>Curriculum Evaluation due (Wed., 3/4)</p>
<p>Class 8 <b>Fri 3/13 or Fri 3/27, to make-up for "field trip"</b></p>	<p><b>Science &amp; Literacy: Synergies</b></p> <ul style="list-style-type: none"> <li>• Lesson 1 + feedback</li> <li>• Lesson 2 + feedback</li> <li>• Why science &amp; literacy?</li> <li>• Writing opportunities, modes, and strategies (from "Writing to Learn") --&gt; pick one to use with your students by 5/1</li> <li>• Distinguishing between different types of scientific questions</li> </ul>	<p><i>Linking Science &amp; Literacy, Ch. 6: "Writing to Learn" (pp. 149-160)</i></p>	<p>First lesson taught / Work on your lesson plan (even if you're not presenting first!).</p>
<p>Class 9 Fri 4/3</p>	<p><b>Science &amp; Literacy: Sense-making via argumentation &amp; explanation</b></p> <ul style="list-style-type: none"> <li>• 9 Discussion Talk Moves (TERC)</li> <li>• Analysis of quote problematizing living/non-living binary</li> <li>• Re-visit Bottle Ecosystem investigation: provide worked examples (unconfounded and confounded experiments) then self-critique</li> <li>• Importance of exploring BEFORE direct instruction (greater learning gains--&gt; see Dr. Laski's slides)</li> </ul>	<p><i>Linking Science &amp; Literacy, Ch. 11: "Using Diversity as a Strength in the Science Classroom" (p. 305-312)</i></p> <p>"Engaging Students in the Scientific Practices of Explanation and</p>	<p>One lesson plan for final unit due Wed., 4/1</p>

		Argumentation" (Reiser et al., 2012)	
Class 10 Fri 4/10	<b>Engineering(/Design/Technology): Intro and Iteration 1</b> <ul style="list-style-type: none"> <li>• Lesson 3 + feedback</li> <li>• Lesson 4 + feedback</li> <li>• Engineering - why, where is it in the NGSS, connections to literacy, working with the community, resources (e.g., <i>Engineering is Elementary [EiE]</i> by Museum of Science, Boston).</li> <li>• Critique <i>Engineering is Elementary (EiE)</i> example videos</li> <li>• "...Designing Shelters", iteration 1</li> </ul>	<i>Raise the Roof: Designing Shelters</i> (Launcher book for EiE-K unit, "...Designing Shelters")  PB 7: "Learning STEM Through Design" (Escudé et al.)  "Scientific and Engineering Practices in K-12 Classrooms" (Bybee, 2011)	Field Trips Reflection due Wed., 4/8
Class 11 Fri 4/17	<b>Computational Thinking (CT) and Practices: Defining and designing</b> <ul style="list-style-type: none"> <li>• Definitions of CT/CP/CTP</li> <li>• LEGO™ activity</li> <li>• One or more of...               <ul style="list-style-type: none"> <li>○ Tynker</li> <li>○ Scratch Jr.</li> <li>○ Scratch</li> <li>○ Micro:bit (virtual)</li> </ul> </li> </ul>	"[CT]: A Competency Whose Time Has Come" (Grover & Pea, 2017)  "Remaining Trouble Spots with [CT]" (Denning, 2017)  MA DLCS standards (e.g., bottom of page 9 through page 12)	Assessment from Final Unit due Wed., 4/15
Class 12 Fri 4/24	<b>Engineering(/Design/Technology): Iteration 2 and reflection</b> <ul style="list-style-type: none"> <li>• Lesson 5 + feedback</li> <li>• Lesson 6 + feedback</li> <li>• "...Designing Shelters", iteration 2</li> </ul>	PB 53 (Shouse & Lakhani): "Failing Forward"	Driving Questions due for Final Unit (overall) and each lesson Wed.,

	<ul style="list-style-type: none"> <li>Reminder: Symposium on Wed. 4/29</li> </ul>	PB 40 (Bevan & Ryoo): "How can Making promote equity and excitement in STEM?"	4/22)
Ed. Sympo . Wed 4/29	<b>Education Symposium (4:30-7:00 PM; attendance expected for all education students) -- support (the presenting colleagues), learn (with colleagues), and prepare (for when you'll be presenting!).</b>	N/A	N/A
Class 13 Fri 5/1	<b>Expanding possibilities: Equity, testing, and 6 W's</b> <ul style="list-style-type: none"> <li>Pizza! (please share any dietary preferences you may have)</li> <li><i>If needed: Lessons 7+ and feedback</i></li> <li>Reflection on video and reading</li> <li>Diversity and equity case studies</li> <li>Card sort: Dave's sister's past experiences with science, engineering, and technology</li> <li>MTEL Practice</li> <li>Effective studying strategies</li> <li>Revisit empathy map</li> <li>Revisit 6 Ws chart</li> <li>Work time - final assignments</li> </ul>	<a href="#">The Power of Being Seen</a> (article & 3-min. video)  "Creating a 'We' Culture: Strategies to ensure all students connect with science" (Carlone et al., 2014)  Video: <a href="#">Who gets to be a "smart science student"?</a>	Nothing checked this week, but keep working on final unit! :)

Final assignment due: Thursday 5/7 at **11:59 pm...**

...and as always,

