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Summer 2019

### EECE 351 Teaching Science in the Elementary School

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**Queens College/CUNY  
EECE/Education Unit**

EECE 351 Teaching Science in the Elementary School (3.0 credit)  
Fall 2019 – Thursdays 9:10 to Noon, Room PH013

**Instructor Information**

Prof. Line A. Saint-Hilaire

PowderMaker Hall 054U

Office Phone: (718) 997-5348

E-mail: [Line.Augustin@qc.cuny.edu](mailto:Line.Augustin@qc.cuny.edu), when emailing please write EECE 351 first in the subject line, then the object of your message (For example: EECE 351 - questions about the moon observation or EECE 351-group members names)

Office Hours on face-to-face meeting days: Thursdays: 12:00 – 1:00 PM (except 9/26, 10/10, 10/24 and 11/14)

Wednesdays by appointment only

When you have questions, contact me, when you are confused or need extra help, stop by my office or send me an email. I will do whatever I can to assist you throughout the semester. So, make an effort to come by my office at least once to get help, to say “hello”, to ask about your grades, or just to have a cup of coffee or tea.

**A. COURSE DESCRIPTION**

In this course students learn important scientific content as well as methods for teaching elementary school science. You will learn teaching strategies and technologies for supporting students learning as defined by state and national standards for science education. An inquiry-based model of learning and assessment is emphasized. 3hr. 3cr. Prereq.: EECE 201, 310, and 340; coreq: EECE 350, 352 and 360. Open only to students in the NYS Initial Certificate Program in Childhood Education 1-6.

This course includes both face-to-face and online activities, to provide an hybrid experience. Contact time will be divided by about 65% face-to-face and 35% online. Online activities will be a blend of: a) Various online educational resources and the Annenberg learner media ([www.learner.org](http://www.learner.org)), the Annenberg site provides both content and pedagogical tools for teaching science to children, and b) Blackboard (BB). Blackboard (BB) is the course management environment that contains the primary tools you need throughout this course. With it, you will find the course documents, assignments, interact in the discussion board and be able to blog.

Face-to-face sessions will be held in PowderMaker Hall, room PH013 on Thursdays except for our field trip at Alley Pond Environmental Center (APEC).

**CONCEPTUAL FRAMEWORK: QUEENS COLLEGE PRINCIPLES FOR EDUCATOR PREPARATION (QC-7)**

This course is being offered as part of the Undergraduate program that prepares students for the New York State Initial Certificate in Childhood Education and grades 1-6 by the EECE department, which is part of the Education unit at Queens College. The Education unit seeks to promote **equity**, **excellence** and **ethics** in urban education and is committed to developing competencies in all teacher preparation and other education professional candidates that will enable them to:

- Hold high expectations for all learners,
- Work as change agents to promote equity and social justice,
- Foster nurturing and challenging democratic learning communities, and
- Respect and honor diversity.

This course is aligned with the Education Unit’s commitment to preparing educational professionals to work in diverse urban and suburban communities. Specifically, the knowledge, skills, and dispositions that candidates will development/demonstrate at the successful completion of this course are directly linked to the Education Unit’s seven principles: 1) discipline specific competencies, 2) learning and development, 3) families and urban communities, 4) diversity, inclusion, democracy and social justice, 5) language and literacy, 6) curriculum, instruction, and assessment, and 7) technology.

**CHALK AND WIRE**

The Education Unit uses Chalk and Wire as an electronic portfolio and assessment system. When candidates are

admitted to one of the undergraduate or graduate programs in the Education Unit, they will be required to register for a Chalk and Wire ePortfolio subscription to submit their assignments as directed until graduation. Faculty will assess all key program assignments submitted by candidates in Chalk and Wire. Designated course work will be assessed for professional knowledge and skills through key program courses. The electronic portfolio system is not used to assess for grading purposes. Chalk & Wire is also the integrated edTPA platform provider system used at Queens College.

Your Chalk and Wire ePortfolio helps you collect, organize, and reflect on your academic work. It can contain files, images, and multimedia that document your academic progress, enriching your learning, sharpening your technological skills, and preparing you for certification. You can also share your professional ePortfolio with colleagues, and potential employers. A professional look and feel make the Chalk and Wire ePortfolio a great tool to use when searching for internships, employments and graduate schools. **Do NOT register for a Chalk and Wire subscription until you are specifically asked to do so.** The login and help site can be found at: [https://ep.chalkandwire.com/ep2\\_qccuny/SecureUrlPage.aspx?urlId=6587&u=guest&cus=343](https://ep.chalkandwire.com/ep2_qccuny/SecureUrlPage.aspx?urlId=6587&u=guest&cus=343)

## B. COURSE LEARNING GOALS & OBJECTIVES

Five years (and more) after this course is over, I hope students will still

1. Be familiar with essentials science education documents such as the New York State Standards, the New York City Scope and Sequence and the New Generation of Science Standards.
2. Relate science education to the cognitive and affective development of children. Develop teaching objectives and plan activities that are in harmony with the character of science, the standards, learning styles and the developmental level of the children for which they are intended.
3. Plan instruction to include both the process of teaching using inquiry method and the content of science.
4. Read articles from science teaching periodicals and OER available to the elementary school science teacher.

Upon completion of the course the students should

- a) Be able to write and teach science lesson demonstrating an understanding of the standards, age/grade-appropriateness, content knowledge and inquiry method of instruction.
- b) Be able to use available resources such as official documents (standards), websites from official organizations (NYC, nys) and others educational resources (NGSS, Teach Engineering, national geography, Annenberg), library, etc.
- c) Demonstrate respect and care for all students – not only meeting their needs as learners but as cultural beings.

## C. REQUIRED RESOURCES: OPEN EDUCATIONAL RESOURCES, notebook

### REQUIRED:

- One (1) composition notebook **not spiral**
- Access and use of Queens College email, Blackboard and the World Wide Web
- Annenberg website: [www.learner.org](http://www.learner.org)
- The Next Generation of Science Standards: [www.nextgenscience.org](http://www.nextgenscience.org)
- The wonders of science: <https://thewonderofscience.com>
- New York State Science Education Standards, Elementary and Intermediate NYS Science Core Curricula and the New York City Scope and Sequence (NGSS updated). PDF files are available on Blackboard and at <http://www.emsc.nysed.gov/ciai> and <http://www.nyced.gov>

Other required Online resources:

- <http://www.project2061.org/publications/sfaa/online>
- [www.nsta.org/about/positions/natureofscience.aspx](http://www.nsta.org/about/positions/natureofscience.aspx)
- <https://www.youtube.com/watch?v=TkvjDZseD4k>
- <https://www.youtube.com/watch?v=ACowHxGEAUg>
- <https://www.youtube.com/watch?v=855Now8h5Rs>
- <https://www.nextgenscience.org>
- <https://www.youtube.com/watch?v=GHTIhX527jQ>
- <http://www.nap.edu/download/11102.html>
- <https://www.bsos.org/bsos-5e-instructional-model/>
- <https://www.whatihavelearnedteaching.com/5e-model-science-instruction/>
- <https://lesley.edu/article/empowering-students-the-5e-model-explained>
- <https://rightquestion.org/education/facilitatestudentcuriosity>

- <https://artofteachingscience.org/mos/8.3c.html>
- [https://sites.nationalacademies.org/DBASSE/BOSE/STEM Integration in K-12 Education/](https://sites.nationalacademies.org/DBASSE/BOSE/STEM_Integration_in_K-12_Education/)
- <https://www.teachhub.com/integrate-science-across-curriculum>
- <https://www.youtube.com/watch?v=Z-hwIMnbDrw>
- <https://www.edutopia.org/blog/what-heck-inquiry-based-learning-heather-wolpert-gawron>,
- <https://www.oxfordlearning.com/engaging-young-learners-through-inquiry-based-learning/>
- <http://blog.nsta.org/2013/06/19/examples-of-science-assessments/>
- <http://enhancinged.wgbh.org/research/eeeeee.html>
- <https://www.edutopia.org/blog/what-heck-inquiry-based-learning-heather-wolpert-gawron>
- <https://www.oxfordlearning.com/engaging-young-learners-through-inquiry-based-learning/>
- <https://thescienceteacher.co.uk/assessment-design/>
- <http://blog.nsta.org/2013/06/19/examples-of-science-assessments/>
- <https://www.exemplars.com/assets/files/toolkit.pdf>

#### Useful online resources:

- [http://hartcourtschool.com/menus/science/nyc/video/video\\_menu.html#](http://hartcourtschool.com/menus/science/nyc/video/video_menu.html#) to view videos
- National Science Teacher's Association. <http://www.nsta.org>
- American Museum of natural history. <http://www.amnh.org>
- Science learning site for resources – <http://www.learningscience.org>
- Teacher Source/PBS <http://www.pbs.org/teachersource/>
- New York Times – Science Tuesday section: [www.nytimes.com](http://www.nytimes.com)
- Scientific American has daily/weekly news updates: [www.sciam.com](http://www.sciam.com)
- <http://jc-schools.net/tutorials/vocab/>
- <http://www.nationalgeographic.com/>
- <http://jc-schools.net/PPTs-science.html>
- <http://www.pbs.org/wgbh/nova/hotscience/>

#### D. ASSIGNMENTS AND GRADING PLAN

Assignments will be graded on a points system. The points will be added up and converted to a letter grade for the final course grade.

100-97	A+	89-87	B+	79-77	C+	69-67	D+
96-93	A	86-83	B	76-73	C	66-60	D
92-90	A-	82-80	B-	72-70	C-	59-0	F

You will be evaluated through a variety of formative and summative assessments including:

- |  |     |
|--|-----|
| 1) Class participation:                          | 200 |
| 2) Blog posting of feedback on articles:         | 100 |
| 3) Moon Observation (descriptive investigation): | 100 |
| 4) Beanarium (experimental investigation):       | 100 |
| 5) Individual Science Lesson plans:              | 300 |
| 6) Video comments:                               | 200 |
| 7) Co-teaching:                                  | 300 |
| 8) Culture and Science Book:                     | 100 |
| 9) NGSS lesson analysis:                         | 200 |

Total points: 1,600

**1) Class participation (200 points):** Students are expected to engage fully in all activities. This includes assigned readings that are necessary for discussions. You must be present, punctual and active participant at all times. You should not be completing assignments for other courses during this class. Doing so, will lower your participation grade.

In class sessions (80% of the points): The interactive nature and structure of this course requires **regular attendance**. Absences are neither excused nor unexcused; they just are. If you're not present, you cannot participate in class

discussions and activities. **Poor attendance means poor participation and thus will lower your grade or preclude you receiving credit for this course.** Students are allowed **two absences** throughout the semester and are expected to turn in work via email or drop box or via arrangements with a group member. Three (3) absences earn a C in the course; four (4) or more absences will result in failing the course. If you are tardy more than 30 minutes or leave 30 minutes early, it will count as half an absence. You are expected to fully participate in all class activities and discussions.

Face-to-face sessions will be held in PowderMaker Hall, room PH013 on Thursdays, except for our field trip at Alley Pond Environmental Center (APEC).

Online sessions (20% of the points): About thirty-five percent of required coursework is conducted on the Internet making it convenient and flexible to choose the time and place that you complete part of the coursework. As a result it is easy to fall behind, so carefully plan your study schedule. You must be disciplined to complete the work of each week online. If you do not submit any online activities/coursework for a 7-day period (from Thursday to Wednesday) when assigned, this inactivity will be counted as an absence for that week.

**2) Blog posting of feedback on articles (100 points):** You will post eleven 500-700 words feedbacks (not summaries) on the assigned articles (posted on BB). You will write *only one* feedback for the articles including articles 11 to 14. So each week you have to write one feedback on either 2 or more articles. Feedback less than 500 words will not receive credit. APA citation for the articles read should be at the beginning of the feedback. See example on BB. One feedback will be dropped but *you must do the feedback for the field trip articles*. All feedbacks should be posted on the class blog from Blackboard by midnight on the Tuesday *before* the class when the articles will be discussed. You will not be able to post feedbacks after this time. **Please plan accordingly.**

**3) Moon Observation (descriptive investigation) (100 points):** You will observe the moon for a period of **six weeks** and record your observation by drawing (35pts) and writing (35pts) in your science composition notebook (not spiral). You are encouraged to discuss and write questions about your observations. After the six weeks period, you'll fill out the provided calendar (10) posted on Blackboard and will generate at least five questions you have from your overall observation (15pts). The calendar sheet must be stapled to the notebook at the end of the observation period. I recommend that you start either the week of 9/12 or 9/19. See examples on Blackboard. You should staple (5pts) the rubric example at the end of the experiment as well (Note: you will not be assessed based on the rubric, it is provided for your understanding and records)

**4) Beanarium (experimental investigation) (100 points):** You'll conduct an experimental investigation with seeds in a beanarium (3-5 weeks). You will record your daily observations (50pts = drawing 25, writing 25) in your science composition notebook, then answer the questions separately (10pts) then discuss your results based on your predictions/hypotheses/conditions, observations and possible explanations for your results separately (15pts). If your seeds do not germinate or get spoiled, please repeat the investigation with other seeds. See examples on Blackboard. You should staple the instruction sheet and the KWL chart at the beginning of the experiment (5pts), predictions/hypotheses and experimental conditions in one page (5pts). Using your phone, take a picture at the beginning, on day 10<sup>th</sup> and last day of your experiment. Staple the pictures to your notebook to the page of the day the pictures were taken instead of your drawing and writing – except if something that really makes a difference happened between the two days. So the pictures taken on the 10<sup>th</sup> day is your observation for the 10<sup>th</sup> day and should staple the pictures on the page for this day (15pts). More pictures can be added but cannot exceed five days. Each picture should be 2x3 inches.

**5) Individual Science Lesson plans (300 points):** In this assignment you will **use three units from the Scope and Sequence of NYC** and **write one lesson plan for three different grade level** using the topics and grade given below, a total of three (3) lesson plans, each for a different grade. Refer to the given 5E model to develop the lesson plans (see examples on Blackboard). For each lesson plan, points will be distributed as follow: format (10pts); content knowledge (30pts); pedagogical content knowledge (30pts); assessment (10pts), Integration (10pts), and differentiation (10pts).

Grade levels	Topics (2018 NYC Science Scope and sequence PK-8)
1, 3 and 5	Living things
2, 3 and 5	Water

3, 4 and 6	Change over time
2, 3 and 4	Interdependence
1, 4 and 5	Solar system
2, 4 and 5	Earth surface

### **6) Video comments on the Discussion Board (BB) (200 points):**

For the semester, you will watch and comment on two (2) videos on [www.learner.org](http://www.learner.org) on designated forum (Discussion Board-BlackBoard). Please understand that you have to comment on only two of the videos assigned. You should only watch two videos for the semester – You will not receive credits for videos not assigned or for multiple comments on the same video. You must have comments on two different videos. For each video comment, you must find two to three peer reviewed journal articles related to the content of the video about children science teaching and learning of different journals, briefly connect the articles to the video on your comment. Each video comment should be 1000 words (about 350 words per section) and counts for 100 points, with content/summary (30pts), Children ideas/learning (30pts), your own learning from the video (content knowledge and pedagogical content knowledge) (30pts) and the articles (10pts). See Blackboard for a list of assigned videos and examples of the assignment. Comments on videos should be posted by midnight on the due date and submitted as hard copy on the following class. Hard copy will not be accepted if you didn't post on BB by the due date. You should also read the other students comments. If you post your comment on BB and did not submit a hard copy, your comment will be grade for half of the grade. You should commit one to two hours to watch each video.

**7) Culture and Science Book (100 points):** You will compile information and pictures to write a book about your culture and science (90pts). The book should be written for grade level 1-6, should have 12-16 pages and be at least 8in x 10in and at most 9in x 14in. You are encouraged to be very creative and original. Guidelines will be discussed in class and can be found on Blackboard. You will also share your experience doing this assignment with your peers by posting a **500-word** entry on the class blog (10pts). You should submit the rubric with the book as a separate loose sheet, do not staple or glue it to the book.

**8) Students coteaching lesson (300):** Groups of 3 students will work on a science lesson to teach at the end of the semester. Each group will choose from the list below, a grade (1-6) and a topic from the NYC Scope and Sequence to write and teach a science lesson to the class as if you were teaching elementary students for the chosen grade. The group will have 40 minutes to teach the lesson to our class on the last three days of class (see schedule). Group members and chosen date and topic should be submitted via email by October 10<sup>th</sup>. Please arrange for the members of the group to meet with me on the assigned date, with a draft of the lesson plan. You will not be allowed to teach the lesson without all the members of the group meeting with me.

Grades/groups	NYC Scope and Sequence
1	Unit 2 – Light, Sound and waves
2	Unit 2 – Plant and animal interactions
3	Unit 4 – Interacting Forces
4	Unit 2 – The structure and functions of organisms
5	Unit 4 – Matter and Energy in Eco-Systems
6	Unit 3 – Electricity and Magnetism

**9) Lesson Analysis (200 points):** You will watch and analyze elementary science lessons, identifying the three dimensions of the NGSS, any integration and differentiation in the lesson. You should also write on how the lessons can be improved and why. The analysis of the lessons must be posted by midnight on the due date and a hard copy must be submitted on the next scheduled class. Please use the analysis protocol and chart posted on BB.

**Optional: Field trip assignment (50 points):** From what you will learn visiting to the Alley Pond Environmental Center and using the articles on field trips, write (two pages) on how you would prepare your class to go on a trip *there* and explain how you will follow up with the learning experience. You should include pre and post activities, the objectives of the lesson(s) and a note/letter to the parents (on a separate sheet). This is not a lesson plan but a narrative assignment. This assignment will be accepted only and only if the student has completed all the assignments and has a C average for the class.



**Extra credit** is earned credit beyond a completed assignment. Replacement credit is credit for not completing the original assignment. That is to say the only way you can earn extra credit points is to have completed all the assignments. The idea of extra credit is to supplement the points you already have to pull up your grade. You cannot earn extra credit, if you fail to submit all assignments. Students can only earn one (1) credit (extra or replacement) during the semester and no more than 50 points. No extra credit or credit replacement will be given to students with an A or B average.

Assignment dates are given to the entire class in advance, individuals can request additional time if needed. Penalties will be negotiated individually with regards to extension requests. Failure to negotiate extension requests will result in an automatic loss of 100% of the assignment grade. The assignment will not be accepted. The instructor has the option to grant or not to grant an extension for an assignment.

**Format for assignments to be submitted in class:** All written work should be Word Processed in 12 pt. font, 1 ½ line space, 1” margin all around, Times Roman. No download please, except for activity sheets. Sources of materials must be credited. Format and length of assignments are important parts of your grade. You are strongly encouraged to use words from the glossary for the initial certification in your assignments.

Please turn your cell phone and other personal communication devices on silent before entering the classroom. Please refrain from texting. You can use any electronic device to take notes during class. You should not be working on assignment not related to what it’s being done in class or surf the web. This prevents you from contributing to class discussion.

#### **E. FIELDWORK REQUIREMENTS**

Everyone in this class should also be registered for EECE 360, known as the student teaching course.

#### **F. REASONABLE ACCOMMODATIONS FOR CANDIDATES WITH DISABILITIES**

Candidates with disabilities needing academic accommodation should: 1) register with and provide documentation to the Special Services Office, Frese Hall, Room 111; 2) bring a letter indicating the need for accommodation and what type. This should be done during the first week of class. For more information about services available to Queens College candidates, contact: Special Service Office, Frese Hall, Room 111; 718-997-5870 (Monday – Thursday 8:00 a.m. to 5:00 p.m. & Friday 8:00 a.m. to 4 p.m.).

#### **G. COURSE EVALUATION**

During the final four weeks of the semester, you will be asked to complete an evaluation for this course by filling out an online questionnaire. Please remember to participate in these course evaluations. Your comments are highly valued, and these evaluations are an important service to fellow students and to the institution, since your responses will be pooled with those of other students and made available online, in the [Queens College Course Information System \(http://courses.qc.cuny.edu\)](http://courses.qc.cuny.edu). Please also note that all responses are completely anonymous; no identifying information is retained once the evaluation has been submitted.

#### **H. USE OF CANDIDATE WORK**

All teacher education programs in New York State undergo periodic reviews by accreditation agencies and the state education department. For these purposes, samples of candidates’ work are made available to those professionals conducting the review. Candidate anonymity is assured under these circumstances. If you do not wish to have your work made available for these purposes, please let the professor know before the start of the second class. Your cooperation is greatly appreciated.

#### **I. TECHNICAL SUPPORT**

The [Queens College Helpdesk \(http://www.qc.cuny.edu/computing/\)](http://www.qc.cuny.edu/computing/), (718) 997-4444, [helpdesk@qc.cuny.edu](mailto:helpdesk@qc.cuny.edu) is located in the I-Building, Room 151 and provides technical support for students who need help with Queens College email, CUNY portal, Blackboard, and CUNYfirst.

#### **J. CUNY POLICY ON ACADEMIC INTEGRITY**

The Policy on Academic Integrity, as adopted by the Board is available to all. Academic Dishonesty is prohibited in The City University of New York and is punishable by penalties, including failing grades, suspension, and expulsion. This policy and others related to candidates' issues are available to you at: <http://qc.cuny.edu/?id=IUHC>

### K. WEEKLY TENTATIVE SCHEDULE AND DUE DATES (Red = Online activities)-

Class	Date	Reading/topic	Class focus	Readings and Assignments due
1	8/29	Introduction to course  The nature of science	Syllabus Introducing the Culture and Science book  <b>Always bring your composition notebook to class</b>  The nature of science Scientific method	Read syllabus <b>Check documents and assignments on Blackboard</b> Number notebook pages  Reading: Science literacy for all in the 21 <sup>st</sup> century <b>Watch: the nature of science</b> <a href="https://www.youtube.com/watch?v=TkvjDZseD4k">https://www.youtube.com/watch?v=TkvjDZseD4k</a> (7:58 min)
2	9/12	Science and Science Education  Science Standards	Overview of science education in the USA  The Next Generation of Science Standards – NGSS <a href="https://www.nextgenscience.org">https://www.nextgenscience.org</a>  Grade 1: Physical sciences (the universe and its stars) Descriptive investigation: Moon observation (prep)  Processes skills-(observation, classification, etc.)	<b>Feedback on articles 1a and 1b – class blog</b>  Reading: Framework to NGSS NGSS basics (SEPs, DCIs, CCCs) Why science, what science? <b>Watch:</b> <b>What is the NGSS and why is it important?</b> <a href="https://www.youtube.com/watch?v=GHTIhX527jQ">https://www.youtube.com/watch?v=GHTIhX527jQ</a> (8:41 min)
3	9/19	Inquiry Levels of inquiry	Scientific inquiry and how people learn  Grade 2: Life sciences (interdependent relationships in ecosystems) Experimental investigation: germination (Beanarium prep) Children book: A fruit is a suitcase	<b>Feedback on articles 2a and 2b – class blog</b>  Reading: Chapter book: Scientific inquiry and how people learn (from How students learn: science in the classroom)
4	9/26	<b>Learning theories and learning styles</b>	<b>Educational learning theories: 2<sup>nd</sup> Edition, GALILEO Open Learning Materials (behaviorism, cognitive, sociocultural, multiple intelligences, Bloom's taxonomy)</b>  <b>Watch and write the comment on either video 6, 7, 8 or 9</b>  You can discuss your ideas and views on the two YouTube videos as you please on the discussion board	<b>Feedback on article 3 – class blog</b> <b>Comment on video – discussion board</b> <b>Watch:</b> A brief overview of 4 learning theories, <a href="https://www.youtube.com/watch?v=ACowHxGEAUg">https://www.youtube.com/watch?v=ACowHxGEAUg</a> (5:48 min) <b>Learning styles and the importance of self-reflection,</b> <a href="https://www.youtube.com/watch?v=855Now8h5Rs">https://www.youtube.com/watch?v=855Now8h5Rs</a> (18:14 min)
5	10/3	Engaging in inquiry-based instruction and using the 5E model	5E model of instruction NGSS - SEPs  Grade 3: Life sciences (inheritance of traits)	<b>Feedback on articles 4a and 4b – class blog</b>  <b>Culture and Science Book</b>



			<p>Book: Is you mama a Llama?</p> <p><a href="https://www.whatihavelearnedteaching.com/5e-model-science-instruction/">https://www.whatihavelearnedteaching.com/5e-model-science-instruction/</a>,  <a href="https://lesley.edu/article/empowering-students-the-5e-model-explained">https://lesley.edu/article/empowering-students-the-5e-model-explained</a></p>	<p>Reading: The 5E Instructional Model: a learning cycle approach for inquiry-based teaching.</p> <p>Watch: BSCS, <a href="https://www.bsos.org/bsos-5e-instructional-model/">https://www.bsos.org/bsos-5e-instructional-model/</a>  Video 1(11:05 min), video 2 (7:22 min) and video 3(6:26 min)</p>
6	10/10	Field Trip	<p>Alley Pond Environmental Center</p> <p>Workshop on Animals and their young</p> <p>Nature walk at Alley Pond park/forest/estuary/etc.</p>	<p>Feedback on articles 11 to 14 – class blog (field trips)</p>
7	10/17	Assessing science learning	<p>Performance expectations NGSS – CCCs</p> <p><a href="http://blog.nsta.org/2013/06/19/examples-of-science-assessments/">http://blog.nsta.org/2013/06/19/examples-of-science-assessments/</a></p> <p>Writing lesson plan using the 5E model – Grade 4: physical sciences (transfer of energy and information)</p>	<p>Feedback on articles 5a and 5b – class blog</p> <p>Reading: Learning assessment, Assessing science learning, 10 principles of assessment design</p>
8	10/24	Effective questioning	<p>Constructing science learning</p> <p>Watch video and write comment on video 2, 3, 4 or 5</p> <p>Other resources: CSI handout for questioning in science inquiry</p>	<p>Feedback on article 6 – class blog Comment on video discussion board</p> <p>Reading: Right question institute: <a href="https://rightquestion.org/education/facilitatestudentcuriosity">https://rightquestion.org/education/facilitatestudentcuriosity</a>  The art of questioning: <a href="https://artofteachingscience.org/mos/8.3c.html">https://artofteachingscience.org/mos/8.3c.html</a></p>
9	10/31	Connecting science with other subjects	<p>Integration: Science, Math, ELA, Social Studies and Engineering</p> <p>Examining fiction and non-fiction children science books Focus on Children books: Somewhere in the Ocean and A river ran wild</p> <p>NGSS engineering design <a href="https://www.teachengineering.org/standards/ngss">https://www.teachengineering.org/standards/ngss</a></p>	<p>Feedback on article 7a and 7b – class blog</p> <p>Reading: Connecting with other disciplines Teach Hub: <a href="https://www.teachhub.com/integrate-science-across-curriculum">https://www.teachhub.com/integrate-science-across-curriculum</a>  Watch: STEM education: <a href="https://sites.nationalacademies.org/DBASSE/BOSE/STEM_Integration_in_K-12_Education/">https://sites.nationalacademies.org/DBASSE/BOSE/STEM_Integration_in_K-12_Education/</a> (3:30 min)</p>
10	11/7	Making Science Accessible for all learners	<p>All students can learn</p> <p>Grade 5: chemical reactions (mixtures) Book: Mixtures and solutions</p> <p>Writing lesson plan using the 5E model – Grade 1: physical sciences (light, sound, waves)</p>	<p>Feedback on articles 8a and 8b – class blog</p> <p>Reading Chapter book: Making science accessible for all learners Watch: Designing effective science</p>

				instruction-All students can learn: <a href="https://www.youtube.com/watch?v=Z-hwIMnbDrw">https://www.youtube.com/watch?v=Z-hwIMnbDrw</a> (5:58 min)
11	11/14	Identifying NGSS 3 dimensions +	Lesson analysis using NGSS 3 dimensions + integration + Differentiation	Feedback on articles 9 – class blog Post analysis on the discussion board
12	11/21	NGSS and 5E model  Putting it all together	Review of the 5E model of instruction and the NGSS  Engineering design <a href="https://www.teachengineering.org/standards/ngss">https://www.teachengineering.org/standards/ngss</a>	Feedback on articles 10a and 10b – class blog  <b>Co-teaching lesson plans</b>
13	12/05	Applying inquiry -NGSS	Co-teaching: groups 1 and 2 Sharing the Culture and Science Book	Individual lesson plans due for groups 3 and 4
14	12/12	Applying inquiry - NGSS	Co-teaching: groups 3 and 4 Beanarium investigation	Individual lesson plans due for groups 5 and 6
15	12/19	Applying inquiry -NGSS	Co-teaching: groups 5 and 6 Moon observation	Individual lesson plans due for groups 1 and 2