**Course Description**

This course provides elementary (TK-6) teacher candidates an overview of key dimensions of curriculum and instruction theory and practice in mathematics and science in accordance with State and National STEM Standards. Using pertinent contributions from research in learning theory, motivation, social-emotional learning, individual differences, candidates will be provided with opportunities to observe, teach and self-reflect on student learning in culturally diverse and inclusive settings. Emphasis will be placed on demonstrating understanding of content-specific pedagogical practices including reasoning, questioning, modeling, developing arguments, and communicating conclusions. Candidates will learn to build equitable learning environments through Universal Design for Learning (UDL), to plan inclusive lessons and units, to construct formative and summative assessments, to use appropriate digital tools, and to provide for accommodations and/or modifications to promote student access to the curriculum.

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**DLT Program Meta-Values**

**Diversity and Inclusion**

**Critical Inquiry**

**International and Global Citizenship**

**Change for a More Just World**

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Professor: C. Bobbi Hansen, Ed.D.
E-mail: chansen@sandiego.edu
Phone: 619-260-2381
Office Hours: M 3:00-4:00
W 12:00-4:00
and by appointment
Office: MRH – 255
Class: EDTE 302-502
Schedule: M: 7:00-9:50
Room: MRH 127
Practicum

Complete a practicum in a TK-6 Grade Classroom

- Observe and support instruction in the classroom of the cooperating teacher (CT)
- Teach a minimum of two lessons and engage in self and peer reflection. These lessons should be planned with the guidance of the cooperating teacher.
- Observe and reflect upon data demonstrating evidence of student learning.
- Draw connections between practicum, course readings and experiential activities.
- Candidates cannot successfully complete EDTE 302-502 without a satisfactory practicum evaluation.

Blended Learning Goals

This course will model practices of blended learning (also known as hybrid learning) that allows students to integrate face-to-face learning with technology-based, digital instruction. Learning takes place in settings (or in a combination of settings) that include the classroom, home, or mobile environments and gives students an element of control over the time and the pace of their learning. In addition to having a portion of our own course content online, we will discuss the theory and practice of blended learning in the TK-6 classroom.

Textbooks

Required:
California Standards (all online):


3. Packet of Readings to be purchased at the USD bookstore

4. Student membership in both NSTA (National Science Teachers Association-https://www.nsta.org) & NCTM (National Council of Teachers of Mathematics-
5. Selected digital readings and/or videos for group discussions

**Supplemental:**


**COURSE OBJECTIVES**

Course objectives are linked to specific State of California's Teaching Performance Expectations (TPEs). By the end of the semester, students will understand and be able to demonstrate the following:

*Teaching Performance Expectations (TPEs)*

**TPE#1** Engaging and supporting students in learning

**TPE #2** Creating and maintaining effective environments for student learning
TPE #3 Making subject matter comprehensible to students

TPE #4 Planning instruction and designing learning experiences for students

TPE #5 Assessing student learning

TPE #6 Developing as a Professional Educator

After completing this course, candidates will be able to:

I.) Demonstrate knowledge of the state frameworks, standards and assessments related to the teaching of mathematics & science, (TPE 1, 5)

II.) Demonstrate uses of a variety of subject-specific pedagogical approaches such as simulations, debates, project-based learning, to the teaching of mathematics, science. (TPE 1, 5)

III.) Demonstrate an understanding of lesson plan development, implementation and evaluation. (TPE 1, 2, 4, 6)

IV.) Apply knowledge of lesson plan development using developmentally appropriate teaching strategies and are based on theories of motivation and learning (TPE 1, 4, 5, 6, 8)

IV.) Demonstrate awareness of and ability to evaluate the material and community resources available in the teaching of mathematics, science. (TPE 3)

V.) Demonstrate an understanding of appropriate use of a variety of assessments, including criterion referenced tests and alternative measures such as formative and summative evaluations, work samples, observation, portfolios, and standards-based. (TPE 5)

VI.) Interpret a variety of assessments in content subject areas. (TPE 5)

VII.) Demonstrate an understanding of assessment techniques and tools appropriate for individuals with diverse backgrounds and varying language, communication and cognitive abilities. (TPE 5)

VIII.) Demonstrate awareness of and ability to evaluate the material and community resources available in the teaching of mathematics, science. (TPE 4)

IX.) Know and apply strategies for supporting reading in the math and science.
X.) Apply knowledge of lesson plan development to an integrated unit of study. (TPE 4)

XI.) Demonstrate ability to cultivate critical thinking and problem-solving skills in students (TPE 1, 3)

XII.) Demonstrate competence in the use of electronic teacher management resources (TPE 6)

XIII.) Demonstrate competence in examining and evaluating internet and software resources for mathematics and science. (TPE 1, 3)

XIV.) Demonstrate ability to engage in cycles of self-evaluation of planning and teaching practices, alone and in collaborative groups (TPE 4, 6)

XV.) Know and apply strategies for learning that meet the learning styles, interests and cognitive abilities of all students. (TPE 1)

XVI.) Demonstrating an awareness of privacy issues and confidentiality concerns related to electronic record keeping. (TPE 6)

XVII.) Know and apply strategies for creating a positive learning environment. (TPE 1)

XVIII.) Engage in cycles of self-evaluation of planning and teaching practices, alone and in collaborative groups. (TPE 6)

Alignment with TPE elements
TPE 1: Engaging and Supporting All Students in Learning
1.1 Apply knowledge of students, including their prior experiences, interests, and social- emotional learning needs, as well as their funds of knowledge, cultural, language, and socioeconomic backgrounds to engage them in learning.  
1.2 Maintain ongoing communication with students and families, including the use of technology to communicate with and support students and families, and to communicate achievement expectations and student progress.  
1.3 Connect subject matter to real-life contexts and provide hands-on experiences to engage student interest, support student motivation, and allow students to extend their learning.  
1.4 Use a variety of developmentally and ability-appropriate instructional strategies, resources, and assistive technology, including principles of Universal Design and Multi-tiered System of Supports (MTSS), to support access to the curriculum for a wide
range of learners within the general education classroom and environment. K

1.5 Promote students’ critical and creative thinking and analysis through activities that provide opportunities for inquiry, problem solving, responding to and framing meaningful questions, and reflection. S

1.6 Provide a supportive learning environment for students’ first and/or second language acquisition by using research-based instructional approaches, including focused English Language Development, Specially Designed Academic Instruction in English (SDAIE), scaffolding across content areas, and structured English immersion, and demonstrate an understanding of the difference between students whose only instructional need is to acquire Standard English proficiency, students who may have an identified disability affecting their ability to acquire Standard English proficiency, and students who may have both a need to acquire Standard English proficiency and an identified disability. S

1.8 Monitor student learning and adjust instruction while teaching so that students continue to be actively engaged in learning. K

TPE 2: Creating and Maintaining Effective Environments for Student Learning

2.2 Create physical/online learning environments that promote productive student learning, encourage positive interactions among students, reflect diversity and multiple perspectives, and are culturally responsive. S

2.5 Maintain high expectations for learning, with appropriate support for the full range of students in the classroom. K

TPE 3: Understanding and Organizing Subject Matter for Student Learning

3.1 Demonstrate knowledge of subject matter, including the adopted California state standards and curriculum frameworks. K

3.2 Use knowledge about students (e.g., IEP, IFSP, ITP, and 504 plans) and learning goals to organize curriculum to facilitate student understanding of subject matter, and make accommodations and/or modifications as needed to promote student access to the curriculum. K

3.3 Plan, design, implement, and monitor instruction consistent with current subject-specific pedagogy in the content area(s) of instruction, and design and implement disciplinary and cross-disciplinary learning sequences, including integrating the visual and performing arts as applicable to the discipline. K

3.4 Individually and through consultation and collaboration with other educators and members of the larger school community, plan for effective subject matter instruction and use multiple means of representation, expression, and engagement for students to demonstrate their knowledge in a range of ways. K

3.5 Adapt subject matter curriculum, organization, and planning to support the acquisition and use of academic language within learning activities to promote the subject matter knowledge of all students, including the full range of English learners, Standard English learners, students with disabilities, and students with other learning needs in the least restrictive environment. K
3.6 During in-person or online subject matter instruction, use and adapt resources, standards-aligned instructional materials, and a range of technology, including assistive technology, to facilitate students’ equitable access to the curriculum.

3.7 Model and develop digital literacy by using technology to engage students and support their learning, and promote digital citizenship, including respecting copyright law, understanding fair use guidelines, the use of creative commons licenses, and maintaining internet security.

3.8 Demonstrate knowledge of effective teaching strategies aligned with the internationally recognized educational technology standards of the International Society for Technology in Education (ISTE) and the International Association for K-12 Online Learning (iNACOL).

TPE 4: Planning Instruction and Designing Learning Experiences for All Students

4.1 Locate and apply information about students’ current academic status, content- and standards-related learning needs and goals, assessment data, language proficiency status, and cultural background for both short-term and long-term instructional planning purposes.

4.3 Design and implement instruction and assessment that reflects the interconnectedness of academic content areas and related student skills development in literacy, mathematics, science, and other disciplines across the curriculum, as applicable to the subject area of instruction.

4.4 Plan, design, implement, and monitor instruction, making effective use of instructional time to maximize learning opportunities and provide access to the curriculum for all students by removing barriers and providing access through instructional strategies that include:
   a. appropriate use of instructional technology, including assistive technology;
   b. applying principles of Universal Design and Multi-tiered System of Supports;
   c. use of developmentally, linguistically, and culturally appropriate learning activities, instructional materials, and resources for all students, including the full range of English learners;
   d. appropriate modifications for students with disabilities in the general education classroom;
   e. opportunities for students to support each other in learning; and,
   f. use of community resources and services as applicable.

4.6 Access resources for planning and instruction, including the expertise of community and school colleagues through in-person or virtual collaboration, co-teaching, coaching, and/or networking.

4.7 Plan instruction that promotes a range of communication strategies and activity modes between teacher and student, and among students, that encourage student participation in learning.

4.8 Model how to use digital tools to learn and create new content, and provide
personalized and integrated technology-rich lessons to engage students in learning, promote digital literacy, and offer students multiple means to demonstrate their learning.  

TPE 5: Assessing Student Learning  
5.1 Apply knowledge of the purposes, characteristics, and appropriate uses of different types of assessments (e.g., diagnostic, informal, formal, progress monitoring, formative, summative, and performance) to design and administer classroom assessments, including use of scoring rubrics.  
5.2 Collect and analyze assessment data from multiple measures and sources to plan and modify instruction and document students’ learning over time.  
5.3 Involve all students in self-assessment and reflection on their learning goals and progress and provide students with opportunities to revise or reframe their work based on assessment feedback.  
5.5 Use assessment information in a timely manner to assist students and families in understanding student progress in meeting learning goals.  

TPE 6: Developing as a Professional Educator  
6.1 Reflect on their own teaching practice and level of subject matter and pedagogical knowledge to plan and implement instruction that can improve student learning.  
6.2 Recognize their own values and implicit and explicit biases, the ways in which these values and implicit and explicit biases may positively and negatively affect teaching and learning, and work to mitigate any negative impact on the teaching and learning of students. Beginning teachers recognize and appropriately address instances of intolerance and harassment among students such as bullying, racism, and sexism.  
6.5 Demonstrate professional responsibility for all aspects of student learning and classroom management, including responsibility for the learning outcomes of all students, along with appropriate concerns and policies regarding the privacy, health, and safety of students and families. Beginning teachers conduct themselves with integrity and model ethical conduct for themselves and others.
# COURSE OUTLINE

<table>
<thead>
<tr>
<th>ASSIGNMENT</th>
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<td>Science Lesson Due</td>
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<td>Family STEM Night Teaching</td>
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<td>STEM Unit Due</td>
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<td>Online readings and assignments</td>
<td>Throughout course</td>
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<td>Practicum Analysis and Synthesis</td>
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<tr>
<td>Final Portfolio Due: Finals week</td>
<td>12/17</td>
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1. **M-9/10 Introduction**
   
   **Big Idea: HOW DO YOU WANT TO BE AS A TEACHER?**
   
   K/W/L
   
   What do you know about teaching and learning?
   
   What do you want to learn?
   
   What are you going to learn?
   
   - 21st Century Skills and digital learning environment
   - CA Common Core Standards State and National NGSS Standards
   - CalTPA
   - Designing your classroom to facilitate a global learning community
   - Equity and Access so that ALL students may learn: Universal Design for Learning
   - Classroom Management and creating a positive classroom community and social support for students
   
   **Going Digital**
   
   Video: 21st Century Skills
   
   [https://www.youtube.com/watch?v=qMG5dvhEzyo](https://www.youtube.com/watch?v=qMG5dvhEzyo)

   
   - Constructivist Teaching Practices in Science
   - Examining Global Issues in Science from a Changemaking Perspective
   - Teaching science to special populations
   - Classroom Management for Science: Using spaces and materials for learning
   - State-adopted Standards, Textbooks, Digital Resources, Community Resources

   **Disciplinary Core Ideas (DCI)**
   
   - Physical Science
   - Life Science
   - Earth and Space Science
   - Engineering

   **Science and Engineering Practices (SEP)**
   
   The eight practices of science and engineering that the Framework identifies as essential for all students to learn and describes in detail are listed below:
1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Description of Crosscutting Concepts from NGSS document

Crosscutting Concepts (CCC)

1. Patterns. Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them.

2. Cause and effect: Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts.

3. Scale, proportion, and quantity. In considering phenomena, it is critical to recognize what is relevant at different measures of size, time, and energy and to recognize how changes in scale, proportion, or quantity affect a system’s structure or performance.

4. Systems and system models. Defining the system under study—specifying its boundaries and making explicit a model of that system—provides tools for understanding and testing ideas that are applicable throughout science and engineering.

5. Energy and matter: Flows, cycles, and conservation. Tracking fluxes of energy and matter into, out of, and within systems helps one understand the systems’ possibilities and limitations.

6. Structure and function. The way in which an object or living thing is shaped and its substructure determine many of its properties and functions.

7. Stability and change. For natural and built systems alike, conditions of stability and determinants of rates of change or evolution of a system are critical elements of study.

Read: Locate an article about NGSS on the internet and read for Class 2.

Going Digital
- Explore website(s)
  - Understanding of the content, intent and vision of the Next Generation Science Standards. [http://www.nextgenscience.org](http://www.nextgenscience.org)
- San Diego County Office of Education [https://ngss.sdcoe.net](https://ngss.sdcoe.net)

**Video: The Case for NGSS**
http://www.lawrencehallofscience.org/services_and_expertise/ngss

**Supplemental Videos**

- 3 Dimensions of NGSS
  1. **Disciplinary Core Ideas (DCI)**
  2. **Science and Engineering Practices**
  3. **Crosscutting Concepts**

### 3. M 9/24 – Explorations in Life, Earth and Physical Science Next Generation Science Standards (DCIs and CCCs)

- Providing students opportunities to use science concepts and investigation skills to make sense of a real-world phenomenon.
- Teaching the Content of Science
  Physical Science, Life Science, Earth and Space Sciences
- Science Note-booking
- Claim/Evidence/Reasoning (CER)

**Read: One of the two articles below for Class 3**

1. **NSTA-Making and Recording Observations April 1, 2016**
   [https://s3.amazonaws.com/nstacontent/sc1608_54.pdf?AWSAccessKeyId=AKIAIMRSQAV7P6X4QIKQ&Expires=1534099012&Signature=a%2fFQD38j6TOgjJipJlokJR2pMLE0%3d](https://s3.amazonaws.com/nstacontent/sc1608_54.pdf?AWSAccessKeyId=AKIAIMRSQAV7P6X4QIKQ&Expires=1534099012&Signature=a%2fFQD38j6TOgjJipJlokJR2pMLE0%3d)

2. **NSTA- Claims and Evidence: Creating opportunities for students to practice speaking and writing about science -December 2016**
   [https://s3.amazonaws.com/nstacontent/sc1604_64.pdf?AWSAccessKeyId=AKIAIMRSQAV7P6X4QIKQ&Expires=1534179653&Signature=Rrg%2b71Bq60saLAB7dhEwRW7uA1c%3d](https://s3.amazonaws.com/nstacontent/sc1604_64.pdf?AWSAccessKeyId=AKIAIMRSQAV7P6X4QIKQ&Expires=1534179653&Signature=Rrg%2b71Bq60saLAB7dhEwRW7uA1c%3d)
Phenomenon-based Science
- Students as Scientists/ Higher Order Thinking
- SEPs - Obtaining, evaluating, and communicating information
  Observing/ Comparing/ Classifying/ Inferring Hypothesizing/ Drawing Conclusions/ Communicating
  - Investigating Global Environmental Problems
  - Science Inquiry
  - Science and the Common Core Literacy Standards - Reading information texts

Videos:
- CCSS Reading Informational texts
  https://www.teachingchannel.org/videos/informational-text-lesson-equip/?utm_source=newsletter20150411
- Teaching Text Features https://www.teachingchannel.org/videos/teaching-text-features-nea

Video(s): Claim evidence reasoning (CER)
https://www.teachingchannel.org/videos/support-claims-with-evidence-getty (with text)
https://www.teachingchannel.org/videos/claims-evidence-science-lesson-achieve (investigation)

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<tr>
<th>4</th>
<th>M 10/1 - Module 1: Planning Curriculum for Students’ Learning Needs &amp; Module 2: Universal Access and UDL (Universal Design for Learning)</th>
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<tbody>
<tr>
<td>Module 1: Unit and Lesson Planning</td>
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<td>- Mapping Curriculum for Long Range (Yearly Planning and Curriculum Units)</td>
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<tr>
<td>- Short-range planning: Lesson plan development, implementation and evaluation</td>
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<td>- Planning using content textbooks</td>
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<td>- Higher-order thinking</td>
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<td>- Students’ prior knowledge, experience and learning styles</td>
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Explore Lesson Plan Sites:
https://www.teacher.org/lesson-plans/science/

Module 2: Universal Design for Learning: Planning for the success of ALL Learners
- What is UDL?
- Neurodiversity: What is it and Why the switch to this term?

1. Read article http://www.ascd.org/publications/educational-leadership/apr17/vol74/num07/Neurodiversity@-The-Future-of-Special-
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<tr>
<th>Education.aspx</th>
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<td>3. UDL</td>
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<tr>
<td><a href="https://www.youtube.com/watch?v=bDvKnY0g6e4">https://www.youtube.com/watch?v=bDvKnY0g6e4</a></td>
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5  **10/8 Micro-teaching #1: Teaching an NGSS lesson (Self and Peer-Mediated Reflections)**

Pick one area (Life, Physical, or Earth and Space Science)

- Identify specific CA –NGSS Standards that apply to this lesson.
- Lesson should use one or more Science and Engineering Practices (SEP)
  1. Asking questions (for science) and defining problems (for engineering)
  2. Developing and using models
  3. Planning and carrying out investigations
  4. Analyzing and interpreting data
  5. Using mathematics and computational thinking
  6. Constructing explanations (for science) and designing solutions (for engineering)
  7. Engaging in argument from evidence
  8. Obtain, evaluate and communicate information

Lesson should be aimed at a specific grade level K-6

Bring all materials to class for lesson.

6  **M 10/15 Why Engineering in the new NGSS Standards?**

- STEM and Engineering Practices for Elementary Students
- Bridge Building Engineering Project

**Read:**

1. **Read: New York Times** Engineering Article: Kids Learn Engineering before They Can Spell It

2. **Read NSTA article: Engineer It, Learn It: Science and Engineering Practices in Action** (Publication Date, 11/1/2013, Volume 051, Issue 03)
   [https://s3.amazonaws.com/nstacontent/sc1303_70.pdf?AWSAccessKeyId=AKIAIMRSQAV7P6X4Q1KQ&Expires=1534077588&Signature=8QMdAxL8pv%2fHivbwYdFax2Ja5s%3d](https://s3.amazonaws.com/nstacontent/sc1303_70.pdf?AWSAccessKeyId=AKIAIMRSQAV7P6X4Q1KQ&Expires=1534077588&Signature=8QMdAxL8pv%2fHivbwYdFax2Ja5s%3d)

**Going Digital:**

- TK-6 science units with an engineering problem to solve
  [https://www.pltw.org/pltw-launch-curriculum](https://www.pltw.org/pltw-launch-curriculum)

**Explore site:** [http://www.eie.org](http://www.eie.org)

- Engineering Investigation-Getting to the Other Side: Designing Bridges
Background information on types of bridges-

Supplemental
Additional Engineering Projects
https://www.teachingchannel.org/engineering-curriculum-boeing

7 M 10/22 Mathematics-Examining the Common Core
Read: Teaching Common Core Math Standards
https://www.edutopia.org/blog/teaching-common-core-math-standards-alice-keeler
Read: Growth Mindset-Common Core https://www.edutopia.org/blog/growth-mindset-common-core-math-cindy-bryant

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<tr>
<th>CCSS in Mathematics DOMAINS</th>
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<tbody>
<tr>
<td>1. Counting and Cardinality (K)</td>
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<tr>
<td>Number &amp; Operations in Base Ten</td>
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<td>2. Number &amp; Operations-Fractions</td>
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<td>3. Operations and Algebraic Thinking</td>
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<td>4. Measurement and Data</td>
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<td>5. Geometry</td>
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</tbody>
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Eight Mathematical Practices-
- 1. Make sense of problems and persevere in solving them.
- 2. Reason abstractly and quantitatively.
- 3. Construct viable arguments and critique the reasoning of others.
- 4. Model with mathematics.
- 5. Use appropriate tools strategically.
- 6. Attend to precision.
- 7. Look for and make use of structure.
- 8. Look for and express regularity in repeated reasoning.

Read Article:
http://www.scholastic.com/teachers/top-teaching/2013/03/guide-8-mathematical-practice-standards

Number and Operations in Base Ten
- Counting and Cardinality (K)
- Number & Operations in Base Ten

Assist students to develop conceptual understanding and skills, use math vocabulary as they talk about their mathematical thinking, and connect big ideas to meaningful independent exploration and practice.
**Going Digital:**

Websites to build number sense

*http://list.ly/list/1uC-elementary-math-websites-to-build-number-sense*

- Explore website(s)
  *http://www.cde.ca.gov/be/st/ss/documents/ccssmathstandardaug2013.pdf*

Fractions-What’s the problem with Fractions?

- Read-You can’t do that with a worksheet.
  *http://www.ascd.org/ascd-express/vol8/824-livers.aspx*

- Video(s)
  *https://www.teachingchannel.org/videos/teaching-fractions*

Supplemental Videos:

1. Number Sense-Grade 3 patterns, skip counting by 200s-
   *https://www.teachingchannel.org/videos/teaching-number-patterns?fd=1*

2. Number Sense 3-5 multiplication and division-
   *https://www.teachingchannel.org/videos/multiplication-division-in-the-core*

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**8**

M 10/29 Geometry and Spatial Reasoning

Measuring: Time/ Length/ Volume/ Weight/ Distance

Going Digital

Grade 6: Perimeter and area: 22 at a table

*https://www.teachingchannel.org/videos/real-world-geometry-lesson?fd=1*

Prep for Mueller STEM Night

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**9**

11/5 Family STEM Night-Mueller Charter School-

More Information will be given in class

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**10**

M 11/12 Using Assessments to Drive Instruction

How do you want to be as a teacher? The Power and Responsibility of Assessing Students

- Formative (Informal) and Summative (Formal) Assessment
- Data driven decision making using student work samples
- Issues of Equity in Assessing ALL Students

Going Digital

- Read: Formative Assessment: one or the other and discuss with partner
  2. *http://www.edutopia.org/blog/dipsticks-to-check-for-understanding-todd-finley*
Supplemental Video - Travel Journals as Student Portfolios

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<td></td>
<td>Teaching mathematics from a problem-solving perspective</td>
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<td></td>
<td>• math computation in story context (i.e. story problems)</td>
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<td>• Authentic mathematical problem solving</td>
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<td>• Solving logic problems</td>
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<td>Read: in Teaching Children Mathematics</td>
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<td>Read: 2 Mathematical Habits of Mind <a href="https://www.edutopia.org/blog/mathematical-habits-of-mind-cindy-bryant">https://www.edutopia.org/blog/mathematical-habits-of-mind-cindy-bryant</a></td>
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<th>12</th>
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<td>Algebraic Thinking-Develop techniques to help students:</td>
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<td></td>
<td>• recognize, construct, extend, create, analyze, generalize, and describe patterns</td>
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<td>• use pattern-based thinking to understand and represent mathematical and real-world phenomena</td>
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<td>• determine mathematical rules and develop an understanding of functional relationships</td>
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Measurement and Data

Develop techniques to help students

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on data;
- understand and apply basic concepts of probability.

Web-based links:
  1. Graph Your Favorite....
     http://www.1.minn.net:80/~schubert/Graph.html
  2. National Center for Educational Statistics
     http://nces.ed.gov/nceskids
  3. Math teaching strategies

Supplemental Video:
https://www.teachingchannel.org/videos/3rd-grade-graphing-lesson?fd=1

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<td>14 M</td>
<td>12/10- Synthesis: Putting it all together</td>
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<td>Portfolio Due 12/17 Finals Week</td>
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Course Assignments and Grading

I. STEM Curriculum Unit (TPEs 1, 2, 3, 4, 5) Due 11/19
Each class member will prepare an interdisciplinary STEM (Science, Technology, Engineering and Mathematics) unit of study that will advance TK-6 students’ understanding of the sciences. The lessons in this unit will meet the California Common Core State Literacy Standards for Science, NGSS-Practices and The California Common Core State Standards: Mathematics (CA CCSSM) while addressing Universal Access for All Students.

GUIDELINES
1) Title of STEM Unit and Grade level (TK-6)
2) Introduction Letter to Parents (Address why STEM understanding is important for students in the 21st century and how the unit addresses key STEM understanding.) List California Standards and any additional goals for students.)
3) 10 individual lessons on a TK-6 grade level science topic:

Within the unit include the following:
- 1 lesson that incorporates CA-CCSS in mathematics (i.e. graphing, problem solving, measurement, statistics)
- 1 lesson that incorporates reading information text using CER techniques
- 1 lesson that incorporates global or environmental issue by one or more of the following:
  - Integrating global content and diverse perspectives and cultures into the standard curriculum
  - Providing opportunities for students to conduct inquiry-based investigations on local and global issues
  - Having students participate in Changemaking learning projects that address local community or Global topics

4) A formative and summative assessment for EACH lesson

5) A Summative Assessment for the entire unit that is Performance or Portfolio-based along with a Scoring Rubric for the Summative Assessment that allows students to show some depth of understanding with respect to the standards/objectives.

6) Evidence of Universal Design for Learning and accommodations for students with special needs

**SCORING RUBRIC FOR THEMATIC UNITS**

3. Above Standard
   Meets all of the criteria for the (2) score and goes beyond in at least 3 of the following ways:
   A. It is readily apparent that the student included many extra curriculum materials in the lessons and that the materials fit the intended objectives of the lessons.
   B. Inclusive/Differentiated Learning Strategies for UNIVERSAL ACCESS for English language learners and for students who have special needs are extremely thorough.
   C. Student has identified and utilized a wide variety of evidence-based instructional strategies (ex. Graphic organizers, simulations, inquiry, technology-enhanced)
   D. Use of the digital technology is extensively documented in lessons in unit.
   E. Unit has multiple global/international connections

2. At Standard
   A. Curriculum Integration-There is representation of interdisciplinary curriculum in lesson.
   B. Standards-based-The unit is fully aligned to specific Science, Math and Literacy standards.
   C. Lesson Clarity-Each lesson is written clearly and follows the format of the lesson design taught in class.
D. Differentiated Learning Strategies for learners with identified needs are present in every lesson
E. Assessment-Each lesson has a **Formative** (ongoing and more informal) and a **Summative** (at the end and more formal) assessment.

1. **Below Standard**
   A. Curriculum Integration- Not all required subject areas are present in the thematic unit
   B. Goals and Standards-Unit does not have goal statement and/or unit is missing standards alignment
   C. Lesson Clarity- Lesson plans are sketchy or difficult to understand

II. **Due 12/3-Practicum Assignment- LESSON ANALYSIS AND SYNTHESIS**
Complete a practicum in a TK-6 Grade Classroom
- Observe and support instruction in the classroom of the cooperating teacher
- Teach a minimum of two lessons. These lessons should be planned with the guidance of the cooperating teacher.
- Observe and reflect upon data demonstrating evidence of student learning.
- Draw connections between practicum observations, course readings and experiential activities with in-class reflective blogs.

Procedures:
- Design 2 lesson plans for your classroom according to the model taught in class.
- Write a reflection of your lesson according to the protocol below.

**Written Reflection**
- **Lesson revision** – If you could go back and teach this lesson again to the same group of students, what would you do differently? How would the changes improve the student learning and/or outcomes for specific sub-groups of students.
- **Theories:** Discuss educational models, theorists, and research support for the strategies used in this lesson? References to specific readings are highly encouraged.
- **What did you learn from this lesson about yourself as a teacher? How will this learning inform future lessons?**

**Oral Sharing of your lesson**- In pairs, participate in a peer sharing of your lesson reflection
- **Content Learning Objective** – What did you want students to know and be able to do at the end of this lesson? What *content* does this lesson address? (Include standards)
- **Academic language demands: Text(s)**-- Describe the academic language demands of the text(s) that will be used in this lesson. What words or
phrases were challenging for students? How did you address that in your teaching?

- Students with special Learning needs: Describe how you used elements of UDL throughout.
  - Anticipatory Set – Discuss how your introduction attempted to engage students’ curiosity and/or drew on their prior learning.
  - Instruction – Discuss your use of modeling in the lesson. What evidence-based teaching strategies did you use? How did you use elements of UDL and/or differentiated instruction so that all students would have access to the lesson?
  - Assessment - What did you do to assess students’ learning during the instruction (formative) and at the end of the lesson (summative)? Were there any misunderstandings that continued to exist after the lesson?

SCORING RUBRIC FOR LESSON ANALYSIS AND SYNTHESIS:
3 Above Standard: Analysis and synthesis are extremely insightful and provide many details and/or examples.

2 At Standard: Student has fully addressed all of the components of the lesson analysis.

1 Below Standard: Student has not fully addressed the components of the lesson analysis and/or the reflection is cursory.

III. Due 12/10-Final Synthesis of Subject Specific Pedagogical Knowledge
Throughout the semester you will be engaged in learning tasks that exemplify best practices in standards-based instruction in science and mathematics with the goal of gaining competence in (1) knowing and presenting accurate content of each discipline, (2) using subject specific pedagogical processes, (3) using elements of universal design for learning (UDL), (4) using formative and summative assessment strategies to support content and learning outcomes, and (5) selecting appropriate digital and other resources to enhance the learning goals for all students. You will compile your analysis of these tasks into a course portfolio with 8 entries. Models of this assignment will be given in class.

<table>
<thead>
<tr>
<th>Portfolio Reflection Sheet</th>
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<tbody>
<tr>
<td><strong>Activity:</strong> Address at least one of the following questions: Why did you select this entry for your portfolio? What does it demonstrate about your learning? What insights did you have about the teaching/learning process? (Note: Do not include a description of the activity since you have done that for the closure sheets.)</td>
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Web-based Learning Connection(s) (TPE 14)
List digital app or internet site that could support teachers and/or students in learning the content and give a one sentence description.

App or url:

Description:

**Theory into Practice**

To show evidence of critical thinking apply what you learned by doing this task and relate to theory (frameworks, textbook, readings, lectures, videos, etc.) and to practice via your practicum.

*Prompt: This activity is supported by course readings (or videos) as evidenced by..... (discuss specific articles or videos and how they relate to the activity) and demonstrates principles of good practice..... (discuss any practicum experiences that relate to activity.)*

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**SCORING RUBRIC FOR COURSE PORTFOLIO**

4. EXCEPTIONAL
   A. must meet all the criteria for a score of 3
   B. All writing is correct, scholarly, linked to readings, and shows that candidate has been extremely insightful regarding learnings in class.

3. ABOVE STANDARD
   A. must meet all the criteria for a score of 2
   B. Each piece of writing is detailed and routinely cites at least 2 specific pieces of information found in the readings, framework & standards documents, videos and classroom lectures.

2. AT STANDARD
   A. Portfolio is complete and has 10 required assignments.
   B. Each piece of writing cites at least one specific piece of information found in the readings, framework & standards documents, videos and classroom lectures.
   C. Student has solid attendance record.

1. BELOW STANDARD
   A. Portfolio is missing assignments
   B. Reflections are cursory and do not indicate whether or not student has read the required materials or has learned the required information.
COURSE GRADE SHEET
EDTE 302/502

<table>
<thead>
<tr>
<th>Area</th>
<th>Total Possible Points</th>
<th>Your Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. STEM Unit</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>II. Lesson Analysis and Synthesis</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>III. Portfolio Assessment</td>
<td>4</td>
<td></td>
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</tbody>
</table>

Late unit or portfolio -1 pt. for each.

TOTAL POINTS______   FINAL GRADE________

10 = A   7 = B
9 = A-   6 = B-
8 = B+   5 = C

BELOW 5 = Consultation with instructor - may result in D, F or I

More than 1 unexcused absence will result in one or more points deducted from total score. All absences, excused or unexcused, will need to do a make-up reflection. Please discuss with your instructor any situations that occur that will cause you to miss class.

Requests for Accommodation
Reasonable accommodations in accordance with the Americans with Disabilities Act will be made for course participants with disabilities who require specific instructional and testing modifications. Students with such requirements must identify themselves to the University of San Diego Disability Services Office (619.260.4655) before the beginning of the course. Every effort will be made to accommodate students’ needs, however, performance standards for the course will not be modified in considering specific accommodations.

Grade of Incomplete:
The grade of Incomplete ("I") may be recorded to indicate (1) that the requirements of a course have been substantially completed but, for a legitimate reason, a small fraction of the work remains to be completed, and, (2) that the record of the student in the course justifies the expectation that he or she will complete the work and obtain the passing grade by the deadline. It is the student’s responsibility to explain to the instructor the reasons for non-completion of work and to request an incomplete grade prior to the posting of final grades. Students who receive a grade of incomplete must submit all missing work no later than the end of the tenth week of the next regular semester; otherwise the “I” grade will become a permanent “F.”
A Petition for a grade of incomplete must accompany all requests for an incomplete at the end of the course term. Criteria for changing a grade of incomplete to a letter grade must be negotiated with the instructor before the final class. The criteria must be outlined on the signed Incomplete Request Form. A completed form with both the instructor and student signature must be turned in by the last session of the class. Without a student signed form the registrar requires assignment of a grade of F. A student must complete an incomplete by the 10th week of the next session or a grade of F is permanently calculated in the overall grade point average. Any attempts to complete an incomplete after the 10-week deadline requires the approval of the Associate Dean of the School of Education.

**SOLES Writing Support Services**
SOLES offers free writing coaching to all students, of all skill levels at all stages of the writing process through the SOLES Graduate Student Writing Center. For more information visit [https://www.sandiego.edu/soles/current/writing-center.php#content-accordion2](https://www.sandiego.edu/soles/current/writing-center.php#content-accordion2)

**SOLES On-line Course Evaluation**
Student evaluations in SOLES are collected via an on-line system that maintains student anonymity. SOLES uses these evaluations for continuous improvement of course content and instruction and as a component of its regular performance review of faculty members, so please take them seriously. Course evaluations are available to students in their MySanDiego accounts via the Active Registration link on the One-Stop Services tab. Your instructor will provide you with instructions on how to access the evaluations once they are activated near the scheduled conclusion of your course.

**Statement on Plagiarism**
The complete plagiarism policy is available for your review at: [http://www.sandiego.edu/associatedstudents/branches/vice_president/academics/honor_council/integrity_policy.php](http://www.sandiego.edu/associatedstudents/branches/vice_president/academics/honor_council/integrity_policy.php)

All members of the University community share the responsibility for maintaining an environment of academic integrity since academic dishonesty is a threat to the University.

Acts of academic dishonesty include: a) unauthorized assistance on an examination; b) falsification or invention of data; c) unauthorized collaboration on an academic exercise; d) plagiarism; e) misappropriation of resource materials; f) any unauthorized access of an instructor’s files or computer account; or g) any other serious violation of academic integrity as established by the instructor.

It is the responsibility of the instructor to determine whether a violation has occurred. An act of academic dishonesty may be either a serious violation, or, if unintentional,
infraction (a non-serious violation of course rules). If the instructor determines that an infraction (as opposed to a serious violation) has occurred, the instructor can impose penalties that may include: a) reduction in grade; b) withdrawal from the course; c) requirement that all or part of the course be retaken; and d) a requirement that additional work be undertaken in connection with the course or exercise. Students may formally challenge the instructor’s determination of infraction (see below).

Instructors shall report all violations, whether, infractions or serious violations, both to the Dean’s office and the student using the Academic Integrity Violation Preliminary Worksheet. The Associate Dean will contact the student and ensure she or he is aware of the Academic Integrity policy. The Associate Dean will appoint a hearing committee only when: 1) the instructor reports that a serious violation occurred, or 2) the instructor reports that an infraction occurred and the student wishes to appeal the determination of infraction.

The hearing committee will include, in addition to the Associate Dean, a faculty member and two students from the School of Leadership and Education Sciences, and a faculty member from outside the School of Leadership and Education Sciences. If the hearing committee determines that a serious violation has occurred it also will determine sanctions to be applied which may include: a) expulsion from the University; b) suspension from the University for up to one year; c) a letter of censure; and d) imposition of a period of probation. If the hearing committee determines an infraction has occurred the penalty imposed by the faculty member will be upheld. If the hearing committee determines that no serious violation or infraction has occurred, it will request the instructor to take action consistent with that determination. If the hearing committee determines that expulsion is the appropriate sanction the student may appeal to the Provost.