

## Frequently Asked Questions About the Transition to NGSS

[Link](#) to NGSS Parent Night Presentation (Elementary)

[Link](#) to NGSS Parent Night Presentation (Secondary)

[FAQ's](#) Specific to Elementary Level

### ***What are the NGSS?***

- In 2013, the California State Board of Education adopted the **Next Generation Science Standards (NGSS)**.
- The NGSS describe the key scientific ideas and practices that all students should learn by the time they graduate from high school. The NGSS detail performance expectations for kindergarten through grades 8 and high school. The NGSS are not curriculum. How students reach those performance expectations are left to teacher's expertise.
- **The NGSS** are now the **required science content standards** for **all** districts in California
- The NGSS require "**all standards for all students.**"
- The NGSS outline the essential **knowledge** and **skills** that all students need in order to be truly ready for college and careers in science in the 21st century

### ***Questions about the purpose and development of the NGSS:***

An in depth explanation of the purpose, development, and content of the Next Generation Science Standards can be found [here](#).

### ***How will instruction change in an NGSS aligned classroom?***

Students making sense of phenomena and explaining their observations will be front and center. In structuring classroom instruction this way, there is an authentic need for students to develop the scientific understanding, concepts, and vocabulary needed to explain the phenomena and student observations. This helps students to build a conceptual framework around science concepts and their classroom experiences. K-12 Science Education should reflect the interconnected nature of science as it is practiced and experienced in the real world. As a result, students will be emulating the practices that a scientist engages in as he or she is reasoning and thinking about data. Overall, student's science classes should be more student centered, engaging, meaningful, and relevant.

Click [here](#) to learn more about phenomena and NGSS aligned lessons and units.

### ***What are Scientific and Engineering Practices?***

Scientific practices are the behaviors that scientists engage in as they investigate and build models and theories about the natural world. The NRC uses the term "practices" instead of a term such as "skills" to emphasize that engaging in scientific investigation requires not only skill but also knowledge that is specific to each practice. (NRC Framework, 2012, p. 30)

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

### ***What are Crosscutting Concepts?***

Crosscutting Concepts help provide students with an organizational framework for connecting knowledge from the various disciplines into a coherent and scientifically based view of the world.

The Crosscutting Concepts in the NGSS are:

- Patterns
- Cause and effect: mechanism and explanation
- Scale, proportion, and quantity
- Systems and system models
- Energy and matter: flows, cycles, and conservation
- Structure and function
- Stability and change

### ***Why are the high school science courses changing?***

The new state science standards require the addition of new science content and significant pedagogical shifts. This new content warrants the development of new science courses. Previous standards applied only if the student took the class. The new standards must be taught to all students.

Shifts of the NGSS:

- All standards (Earth and Space, Biology, Chemistry, and Physics) for **all students**.
- Science and Engineering Practices and Crosscutting Concepts receive equal attention and development as the disciplinary core ideas.
- Class content driven by real-world phenomena and application.
- Student-centered instruction.
- The pace of the course is driven by students' ability to make sense of the information.
- Students frequently engage in discussion.

- Aligned to state standards for ELA and math.

### ***What are the new high school science courses?***

[Link](#) to general course overviews

### ***What is the high school science transition plan?***

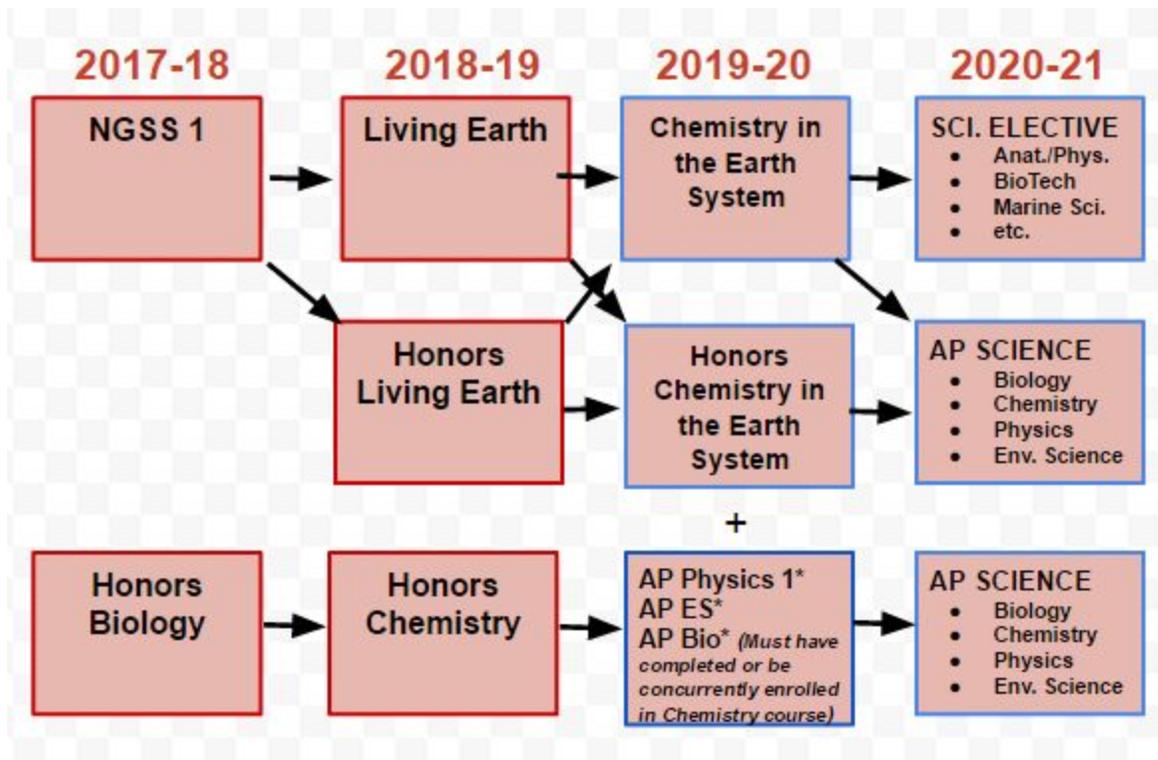
***As a result of newly announced requirements by the California Commission on Teacher Credentialing (CCTC), Fremont Unified is delaying full implementation of NGSS aligned high school science courses. The information received from CTCC on February 2 was a significant change in long standing credentialing requirements. Fremont Unified is carefully reviewing our high school science course sequence options in order to make sure they will be sustainable.***

***The course sequence in place for the 2016-17 school year will remain in place for the 2017-18 year. Some important points to note:***

- Biology (Honors or College Prep) is a life science course and the majority of students take it in either 9th or 10th grade.
- Prior to the CTCC announcement, Fremont's NGSS Transition Plan looked like this:
  - ***Grade 9: NGSS 1 --> Grade 10: Living Earth (Honors or College Prep) --> Grade 11: Chemistry of the Universe (H or CP)***
- The path for students who took NGSS 1 in 2016-17 now looks like this:
  - ***Grade 9: NGSS 1 --> Grade 10: Biology (Honors or College Prep) --> Grade 11: Chemistry (H or CP)***
- The topics taught in Living Earth are largely the same topics as are currently taught in Biology.
- Living Earth also includes Earth Science topics. Some of those topics will also be added to the Biology courses in 2017-18.
- In order for a student to have a strong foundation in both life and physical science, an NGSS 1 student should next take a life science based course.
- NGSS 1 has received "d" level credit for the UC "a-g" requirements. This means the course counts as a full year, laboratory science class. NGSS 1 will count as a physical science course.
- Biology is also a "d" level course and counts as a life science course.
- Students are required to complete one physical and one life science class in order to meet graduation requirements.

	9 <sup>th</sup> GRADE	10 <sup>th</sup> GRADE	11 <sup>th</sup> GRADE <i>Elective Options</i>
<b>2016-17</b>	<ul style="list-style-type: none"> <li>· NGSS 1</li> <li>· Honors Biology</li> </ul>	<i>Course offerings remain the same</i>	<i>Course offerings remain the same</i>
<b>2017-18</b>	<ul style="list-style-type: none"> <li>· NGSS 1</li> <li>· Honors Biology</li> </ul>	<i>Course offerings remain the same</i> Biology Honors Biology Chemistry Honors Chemistry	<i>Course offerings remain the same</i>
<b>2018-19</b> <b>Tentatively Proposal*</b> <b>(Dependent on district science teacher credentials.)</b>	Physics in the Universe <ul style="list-style-type: none"> <li>· Honors Physics in the Universe</li> </ul>	Living Earth Honors Living Earth	<ul style="list-style-type: none"> <li>· Chemistry of Earth Systems</li> <li>· Honors Chemistry of Earth Systems</li> <li>· AP Physics I</li> <li>· AP Environmental Science</li> <li>· AP Biology*</li> <li>· AP Chemistry*</li> </ul> <i>(*Must be concurrently enrolled or have completed Chemistry)</i>
<b>2019-20</b>	Physics in the Universe <ul style="list-style-type: none"> <li>· Honors Physics in the Universe</li> </ul>	Living Earth <ul style="list-style-type: none"> <li>· Honors Living Earth</li> </ul>	<ul style="list-style-type: none"> <li>· Chemistry of Earth Systems</li> <li>· Honors Chemistry of Earth Systems</li> <li>· AP Physics I</li> <li>· AP Environmental Science</li> <li>· AP Biology*</li> <li>· AP Chemistry*</li> </ul> <i>(*Must have be concurrently enrolled or have completed Chemistry)</i>

**Transition Year Pathway:**

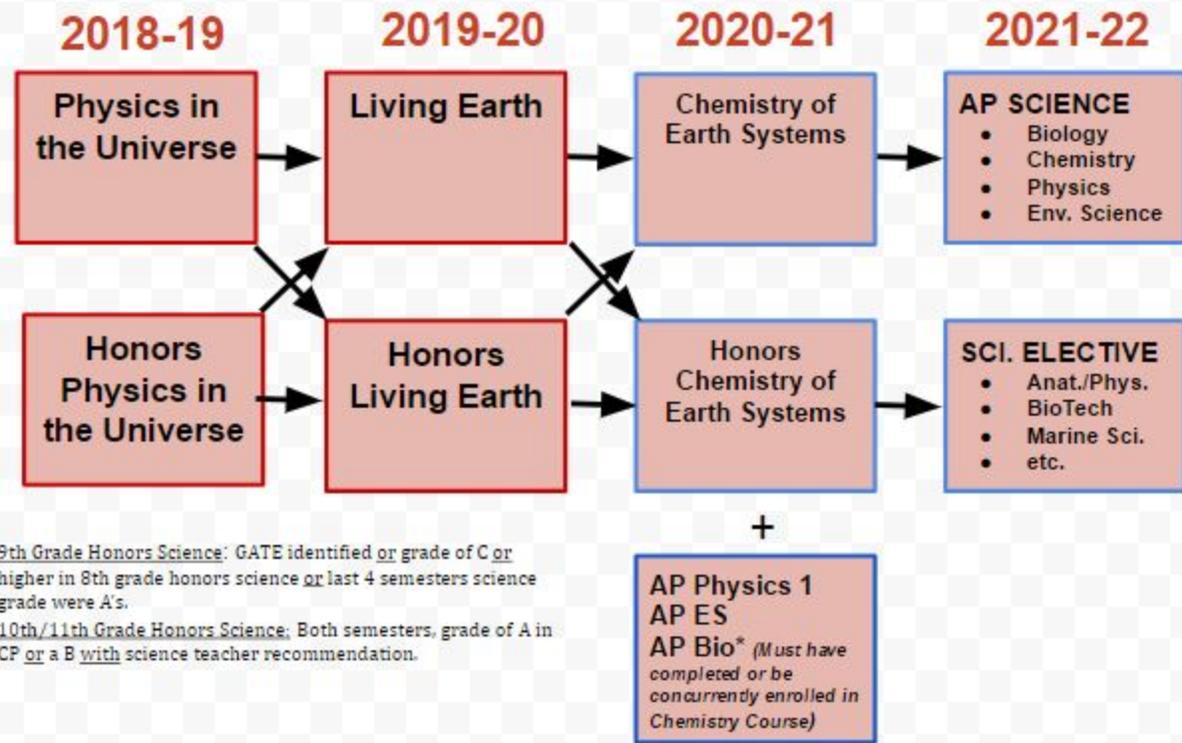


2016/17	2017/18	2018/19
7th Grade Science	8th Grade Science	Physics in the Universe <i>New</i>
		Honors Physics in the Universe <i>New</i>
8th Grade Science	NGSS 1	Living Earth
		Honors Living Earth
	Honors Biology	Chemistry of Earth Systems <i>New</i>
		Honors Chemistry of Earth Systems <i>New</i>

NGSS 1 (9th Grade)	Biology	Chemistry of Earth Systems
		Honors Chemistry of Earth Systems
	Honors Biology	Chemistry of Earth Systems
		Honors Chemistry of Earth Systems
Honors Biology	Chemistry	Science Elective (AP's, etc.)
	Honors Chemistry	Science Elective (AP's, etc.)
Biology (not 9th graders)	Chemistry	Science Elective (AP's, etc.)
	Honors Chemistry	Science Elective (AP's, etc.)
Chemistry	Science Elective	Science Elective (AP's, etc.)
Honors Chemistry	Science Elective	Science Elective (AP's, etc.)

***What is the proposed NGSS aligned high school science pathway?\* (Tentatively proposed, but not board approved.)***

## NGSS High School Science Sequence: 2018-19



### When is the state requiring full implementation of NGSS?

The Next Generation Standards were adopted by California in 2013 replacing the previous standards for science. There are 3 phases in the implementation timeline:

- Awareness Phase (2013-2016) represents an introduction to the standards. Teachers learn how to use the standards with their students.
- Transition Phase (2015-2018) building foundational resources, implementing district needs assessments, teachers engaging in professional learning opportunities and expanding collaboration between stakeholders.
- Implementation Phase (2017 and beyond) teachers are engaged in professional learning opportunities. **By 2018, fully aligned curriculum and instruction.**

### When will there be new assessments for the NGSS?

California Science Test (CAST) Schedule:

<b>2016-17</b>	All districts in California will take the <b>NGSS Pilot Test</b> in grades 5, 8, and one grade in high school- either 10, 11, or 12. This test will be online and will be administered sometime in the spring.
<b>2017-18</b>	All districts will take the <b>NGSS Field Test</b> in grades 5, 8, and 11 or 12. This test will be online and will be computer adaptable. Schools and districts will likely receive assessment results.
<b>2018-19</b>	All districts will take the <b>NGSS Operational Test</b> in grades 5, 8, and 11 or 12. Students, schools, and districts will receive these results.

The CDE has said that results of the 2017 pilot test will not be released to either the district or students. Test results will not be used to place students in honors science classes in junior high.

***It doesn't seem like my student's teacher is using the textbook as much as in the past.***

***Why is that?***

The NGSS call for changes in how instruction is delivered as well as changes in some content at each grade level. As a result, our current textbooks are not entirely aligned to the new standards. In addition, the NGSS call for a focus on student sense-making of relevant (and often local) phenomenon. This means that teachers will need to supplement the current textbook and therefore may only use parts of chapters or sometimes skip around in the book.

***When will NGSS aligned textbooks be available for adoption?***

The California State Board of Education will require all textbook companies who want to submit instructional materials for state review to attend a one day training on the instructional shifts called for by the NGSS. Once the California Science Framework is approved, participants for the Instructional Quality Commission (IQC) will be chosen. Following training, textbook companies can submit materials for review by the IQC and those curricular materials that are aligned and meet the shifts called for by NGSS will be available for district adoption. **This textbook list is expected no sooner than 2018-19.**

### ***How is Fremont dealing with the lack of textbooks?***

- **Elementary**
  - Supplemental Bridge Curriculum: [Mystery Science](#)
  - Teacher/Instructional Coach created units of study
- **Middle School**
  - Supplemental Bridge Curriculum (Grades 6): STEMscopes
  - Supplemental Bridge Curriculum (Grades 7 and 8): [IQWST](#)- Investigating Questions With Science and Technology
  - Teacher/Instructional Coach created units of study
- **High School**
  - Teacher/Instructional Coach created units of study
  - California Science Framework
- **All Levels:**
  - Using the California Science Framework for instructional sequences and WestEd tools for shifting existing curricular materials.

### ***How does the rigor of the NGSS compare to the 1998 California science standards?***

- NGSS are more rigorous and are cognitively more demanding than the 1998 standards
- Students start thinking like scientists; they learn science while doing science instead of learning about science.
- Students who have reached mastery of grade-band expectations will be more prepared for the rigors of college and career.
- Embedded scientific thinking practices, SEPs, and CCCs increase the rigor of the NGSS.
- Students engage in higher level thinking skills: evaluating, modeling, explaining etc.

### ***How is Fremont preparing teachers to shift instruction and implement the NGSS?***

The Curriculum and Instruction department has been providing professional development to teachers at all levels, K-12. Training typically includes modeling instructional shifts, providing lessons that are ready for teachers to immediately use, collaboration time, and resources to align with content new to the grade level. Professional Learning Community (PLC) teams also provide a support for teachers as they transition to the NGSS. During their PLC time, teachers work together to unwrap the standards, plan NGSS aligned lessons and then look at the data from student work to determine student learning. The PLC process will also help teachers identify effective teaching strategies.

Our instructional science coaches also support teachers as they transition to the NGSS. This can include modeling lessons, co-planning lessons, and working with teachers to shift their existing curriculum to align with the NGSS.

***Will Fremont Unified continue to offer NGSS aligned honors level science courses at the secondary level?***

Yes, the district will continue to offer honors level science courses at both the junior high and high school levels.