

Next Generation Science Standards Resource Guide



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Next Generation Science Standards Resources

WEBSITE	DESCRIPTION	INTENDED USE	GRADE/ SUBJECTS
CALIFORNIA DEPARTMENT OF EDUCATION	Science standards page for CDE gives access to the CA NGSS and the Science Framework. http://www.cde.ca.gov/ci/sc/	The Science Framework “unpacks” the NGSS for teachers to aid with curriculum planning.	K-12 All Science Subjects
CA4NGSS	This site offers digital, downloadable toolkits to inform stakeholders about the NGSS. http://cdefoundation.org/steam/ca4ngss/	Teachers and administrators can use the resources here to offer local orientation sessions about NGSS and their vision of scientific literacy.	K-12 All Science Subjects
NGSS FOR CALIFORNIA PUBLIC SCHOOLS	This site provides the curriculum guidelines for the State of California. California adopted the NGSS in 2013 and now has standards arranged by Disciplinary Core Ideas for Life, Earth and Space, and Physical Sciences. http://www.cde.ca.gov/pd/ca/sc/ngsstandards.asp	The intended use for this site is to plan for the NGSS and to understand the assessment constraints teacher should expect for the state assessment.	K-12 All Science Subjects
CA NGSS EARLY IMPLEMENTATION INITIATIVE	This report provides learnings from eight California districts that began implementing NGSS in 2014. They also have a Twitter feed, @EarlyImplement. http://k12alliance.org/docs/needle-moving-ca-k8.pdf https://twitter.com/earlyimplement	Teachers and administrators can gain valuable insight into what it takes to support implementation of NGSS. Check out the Twitter feed for ideas and discussions about NGSS implementation.	Grades K-8 All Science Subjects

Next Generation Science Standards Resources

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CSTA AND CLASSROOM SCIENCE	<p>California Science Teachers Association website and its magazine, <i>Classroom Science</i>, aimed at California teachers of science.</p> <p>http://www.casience.org http://www.classroomscience.org/category/ngss</p>	Gain access to California-specific resources and learn about statewide efforts to implement NGSS.	K-12 All Science Subjects
NGSS HUB	<p>This website is a digital version of the NSTA Quick Reference Guide to the NGSS K-12. The website is organized by grade and offers detailed descriptions about each performance expectation.</p> <p>http://ngss.nsta.org/AccessStandardsByTopic.aspx</p>	This website provides the thinking behind each performance expectation and many of the standards offer free or near free teaching materials.	K-12 All Science Subjects
BOZEMAN SCIENCE	<p>This website was created by Paul Anderson, a science teacher from Bozeman, Montana who has taught science for over 20 years. He has created hundreds of YouTube videos on a range of science topics including a library of videos for the NGSS.</p> <p>http://www.bozemanscience.com/next-generation-science-standards</p>	This site provides information about NGSS for teachers to use in planning lessons and units. In some cases the materials can serve as supplemental material in the classroom.	Grades 6-12 All Science Subjects
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE	<p>This article, "Outside the Pipeline: Reimagining Science Education for Nonscientists," contextualizes the new goals of science teaching and learning in light of the NGSS.</p> <p>http://science.sciencemag.org/content/340/6130/314 (register for free to view full text)</p>	Teachers can read this article in order to construct overarching goals for units and to assess whether or not the anchoring activities and assignments are relevant to the science students will do in everyday life.	K-12 All Science Subjects

Next Generation Science Standards Resources

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SCIENCE NET LINKS	<p>This site has searchable links to science topics for K-12 lessons. It offers explorations, videos, tools, and news about science. It is sponsored by the American Academy for the Advancement of Science (AAAS).</p> <p>http://sciencenetlinks.com/</p>	Teachers can explore this site to find ideas to inform lessons and units.	K-12 All Science Subjects
THE NATIONAL SCIENCE DIGITAL LIBRARY	<p>A data bank of online educational resources for teaching science with an overall STEM emphasis. This is a metadata based resource that organizes different providers offering a number of teaching and learning resources. Most resources adhere to the principles of Open Education Resource (OER).</p> <p>https://nsdl.oercommons.org/browse?f.ngss_alignment_standard=1</p>	This site is used to help research curriculum materials, ideas about how to plan and enact the NGSS, and to develop assessments.	K-12 STEM
NASA	<p>This site provides free science education resources for teachers of science.</p> <p>https://www.nasa.gov/audience/foreducators/index.html</p>		K-12 All Science Subjects
STEM TEACHING TOOLS	<p>This site provides research links and practice links for teachers implementing the NGSS. They also offer Open Education Resources for professional development.</p> <p>http://stemteachingtools.org/</p>	<p>Teachers can come here to learn about strategies for planning, teaching, and assessing NGSS-aligned lessons. Administrators will find resources to support outreach to education stakeholders.</p>	K-12 All Science Subjects

Next Generation Science Standards Resources

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NGSS STORYLINES AND NGSS PHENOMENA	This innovative site aims to provide teachers with storylines that structure students' exploration of science phenomena. A related site is a crowd-sourced collection of phenomena intended to spark students' inquiry in science.	Teachers can come here to explore ideas for stimulating students' curiosity about scientific phenomena and using this to support student learning in the NGSS.	K-12 All Science Subjects
http://www.nextgenstorylines.org/what-are-storylines/ https://www.ngssphenomena.com/			
SCIENCE LITERACY MAPS	This website is an interactive tool for teachers to explore specific science and related math concepts. The maps illustrate connections between concepts as well as how concepts build upon one another across grade levels.	Teachers use this site to get a leg up on possible student misconceptions and gaps in knowledge that students may enter the classroom with. Teachers will be able to develop their warm-up, do nows, and entry level assessments.	K-12 All Science Subjects
http://strandmaps.dls.ucar.edu/index.html			
NATIONAL CENTER FOR CASE STUDY TEACHING IN SCIENCE	This website provides a database of case studies about science topics to make learning science relevant.	This website can be used to develop and construct anchoring activities for units of study. Cases from this site can be used instead of lecture, with many of the cases providing interactive materials, laboratory materials and in-depth text.	Grade 6 - College All Science Subjects
http://sciencecases.lib.buffalo.edu/cs/			
LITTLE DISCOVERERS	STEM explorations designed by Sesame Street for PreK-TK learners.	Teachers will find ready-made STEM explorations appropriate for pre-school and transitional kindergarten learners.	PreK and TK STEM
http://www.sesamestreet.org/toolkits/stem			

Next Generation Science Standards Resources

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SCIENCE FOR YOUNG LEARNERS	<p>This site offers resources for teachers of TK and K grades for engaging students in science learning.</p> <p>http://teachingcommons.cdl.edu/tk/modules_teachers/modscience.html</p>	<p>Teachers can watch overview videos and gain insight into what it looks like to implement NGSS in these early grades. There are many links to additional resources for planning NGSS lessons.</p>	<p>K and TK All Science Subjects</p>
BUNDLING THE NGSS	<p>This website provides standards that are arranged together to create endpoints for units of instruction. The authors provide ways to group the performance expectations that are coherent and provide continuity for the learning. Bundling by topic or phenomenon is possible.</p> <p>http://nextgenscience.org/resources/bundling-ngss</p>	<p>For teachers, this can be the first step in the curriculum development process. The bundles can be taken at face value for teacher planning or a resource for bundles that districts and states have created.</p>	<p>K-12 All Science Subjects</p>
TOOLS FOR AMBITIOUS SCIENCE TEACHING	<p>This site provides step-by-step instruction on how to plan, enact and assess the NGSS. It comes from the product of Dr. Mark Windschitl at the University of Washington.</p> <p>http://ambitiousscienceteaching.org/video-series/orientation-to-ambitious-science-teaching/</p>	<p>This site provides deconstructed real classroom lessons designed to give examples of how to enact the NGSS. The videos are intended to be a guide for teachers refining their practice in light of the NGSS.</p>	<p>K-12 Grades All Science Subjects</p>
THE SOURCEBOOK FOR TEACHING SCIENCE	<p>These websites provide extensive resources and ideas for teaching Biology, Chemistry, Physics and Earth Science. It is curated by Dr. Norman Herr of California State University, Northridge.</p>	<p>The site is aimed at science teachers who are looking for ideas for anchoring activities, modeling design, and investigations.</p>	<p>K-12 Biology Chemistry Physics Earth Science</p>

Next Generation Science Standards Resources

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	http://www.csun.edu/science/biology/index.html http://www.csun.edu/science/chemistry/index.html http://www.csun.edu/science/physics/index.html http://www.csun.edu/science/geoscience/index.html		
EDUTOPIA	<p>This is blog provides guidance for teachers when developing driving questions for science units. Driving questions are a critical component of planning and enacting coherent units of study.</p>	<p>Teachers are to use this when developing driving questions that will eventually guide the lesson level questions for a unit. The intention is to plan units in such a way that students will be able to answer the driving question(s) at the end.</p>	<p>K-12 All Science Subjects</p>
	https://www.edutopia.org/blog/pbl-how-to-write-driving-questions-andrew-miller		
WEB-BASED INQUIRY SCIENCE ENVIRONMENT	<p>The Web-based Inquiry Science Environment (WISE) is a research-based digital learning platform that allows students to engage in scientific inquiry and investigation, individually and collaboratively.</p>	<p>Teachers can use this site to get ideas for inquiry-based science activities and use the digital learning platform to have students engage in exploratory science learning.</p>	<p>Grade 6-12 All Science Subjects</p>
	https://wise.berkeley.edu/		
PHET INTERACTIVE SIMULATIONS	<p>The Physics Education Technology (PhET) interactives support making sense of key concepts, processes, and relationships in the sciences. While originally physics-based, the library has grown to encompass all content areas of science.</p>	<p>The designers of PhET want K-12 teachers of science to make use of the wealth of science simulations on their site. There is a webpage of resources dedicated to tips for K-12 teachers (see below).</p>	<p>Grade K- College All Science Subjects</p>

Next Generation Science Standards Resources

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	https://phet.colorado.edu https://phet.colorado.edu/en/teaching-resources/activities-design		
LINK ENGINEERING	This website provides sample lessons, videos, and discussion forums dedicated to supporting students' engagement in California's NGSS with an emphasis on engineering practices.	The website is teacher-driven, allowing for user ratings of materials, and aims to support a community of educators who share ideas for engaging students in engineering practices.	K-12 Practices of Science and Engineering
	http://linkengineering.org/		
BOEING EDUCATION RESOURCES + CURIOSITY MACHINE	The Boeing Education website has a collection of videos, explorations, and lessons related to concepts of engineering, many of which are about flight. Curiosity Machine has a collection of engineering design tasks, some of which are inspired by Boeing.	These two websites have rich resources to support teachers with engineering design tasks and lessons about aeronautics.	K-12 Physics; Practices of Science and Engineering
	http://www.boeing.com/principles/education.page https://www.curiositymachine.org/challenges/		
MAKERSPACES	Special report from District Administration about Maker Spaces.	This report includes case examples of schools and districts creating Maker Spaces that inspire hands-on, creative exploration.	K-8 Practices of Science and Engineering
	https://www.districtadministration.com/makerspaces		

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MAKER ED	<p>This website gives information about the Maker movement and examples of how to create Maker Spaces both within and outside of schools. The blog entry, “Ideas for Sparking Maker Support from Important K-12 Stakeholders” is an invaluable guide for how to make the case for Maker at your school.</p>		<p>K-12 Practices of Science and Engineering</p>
	<p>http://makered.org/resources/getting-started/ http://makered.org/ideas-sparking-maker-support-from-important-k-12-admin-stakeholders/</p>		
DONORS CHOOSE (FUEL YOUR SCHOOL INITIATIVE)	<p>This site allows teachers to submit requests for funding for specific projects and seeks crowd-funding to make them a reality. It is open to all public schools in the U.S. Many businesses will match employee donations. Their Maker Space for Under \$1,000 offers a pre-populated set of materials you can use for a Maker Space funding proposal. The Fuel Your School targets select California communities for STEM-oriented projects.</p>	<p>When local site funding is not sufficient to provide rich STEM learning opportunities, teachers have turned to Donors Choose to fill the gap. It’s free and crowd-sourced.</p>	<p>K-12 All Science Subjects</p>
	<p>https://www.donorschoose.org/ https://www.donorschoose.org/blog/classroom-recipes-build-a-makerspace-for-under-1000/ https://www.donorschoose.org/donor/1030565/</p>		
THE TECHNOLOGY INTEGRATION MATRIX (TIM)	<p>This website illustrates how teachers can use technology to enhance learning for K-12 students. The site provides descriptions of technology use and video examples of how different levels of technology can be used in the classroom.</p>	<p>The site provides ideas about how teachers can use technology in authentic ways, self-assess the level of technology use and improve the use to enhance academic achievement.</p>	<p>K-12 All Subjects</p>
	<p>http://fcit.usf.edu/matrix/matrix.php</p>		

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TEACHING CHANNEL	This site provides videos, planning documents, and the rationale behind a several lessons aimed at supporting the NGSS practices including modeling and building scientific ideas. It has correlations to the NGSS EQuIP Rubric. https://www.teachingchannel.org/videos?page=1&categories=subjects_science&load=1	This site can be used to develop an understanding of how to approach planning, enacting and reflecting on NGSS-aligned lessons. Site can be used for professional development	K-12 All Subjects