

Curricular and Instructional Resources for K-12 Science

Curriculum Adoption Tools

Edreports. Provides curriculum adoption protocols and comparisons for instructional materials
<https://www.edreports.org/>

Instructional Materials Evaluation Tool. Designed by some of the lead writers of the Common Core, the IMET is a free tool that states and districts are using to evaluate the alignment of instructional materials to the Common Core <https://achievethecore.org/aligned/intro-to-the-imet/>

Educators Evaluating the Quality of Instructional Products (EQIP). The EquIP suite of tools can help educators evaluate materials so that they can ensure only materials of high quality are used in the classroom. <https://www.achieve.org/our-initiatives/equip/equip>

Evidence-Based Resources for Evaluating Curriculum

Recommended Instructional Materials System (RIMS): Searchable Database. The Utah State Board of Education provides state recommendation of instructional materials to provide the stakeholders with reviews core-related materials and to eliminate instructional materials that violate Utah Administrative Code or Utah State Board Rules. <https://delleat.schools.utah.gov/>

Best Evidence Encyclopedia. Provides reviews of evidence for curricular programs
<http://www.bestevidence.org/>

Evidence for ESSA. Provides clear and authoritative information on programs that meet the ESSA evidence standards and enable educators and communities to select effective educational tools to improve student success. <https://www.evidenceforessa.org/>

National Center for Intensive Intervention The academic interventions tools chart presents information about academic intervention programs including information and ratings on the technical rigor of the studies such as quality, results, intensity, and additional research.
<https://charts.intensiveintervention.org/chart/instructional-intervention-tools>

Resources for Best Practices

Institute for Science+Math Education: STEM Teaching Tools. A site containing tools that support the teaching of three-dimensional science. Each tool is focused on supporting a specific issue and leverages the best knowledge from research and practice. <http://stemteachingtools.org/>

Next Generation Science Standards. Resources for three-dimensional science instruction.
<https://www.nextgenscience.org/>

Disciplinary Core Ideas in the Next Generation Science Standards. Suggested grade-band progressions of disciplinary core ideas as described in *A Framework for K-12 Science Education*.
<https://drive.google.com/file/d/1LwKO3Ic4ApWud8EuH-lyRglYHgXMyENr/view?usp=sharing>

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Crosscutting Concepts in the Next Generation Science Standards. Suggested grade-band progressions of crosscutting concepts as described in *A Framework for K-12 Science Education*.

https://drive.google.com/file/d/1_F8HJrjncuybjW97Du3z8Wr5jdT7B_t/view?usp=sharing

Science and Engineering Practices in the Next Generation Science Standards. Suggested grade-band progressions of the Science and Engineering practices as described in *A Framework for K-12 Science Education*.

<https://drive.google.com/file/d/1YYx72Gx1mHuiq6sjVL4bV3E9YFrCXxtC/view?usp=sharing>

USBE Science Listserv Sign-up. Listserv that provides current information and resources related to the new SEEd standards. <https://lists.uen.org/mailman/listinfo/science>

GRC Lesson Resources. The Gather, Reason, Communicate (GRC) framework is a student-centered instructional approach that engages students in making sense of a phenomenon through the science and engineering practices.

<https://sites.google.com/3d-grcscience.org/going3d/grc-lesson-resources?authuser=0>

The World of Wonder Science. A website that supports science teachers by aggregating resources (e.g., phenomena, lesson plans, assessments) developed by Paul Andersen and other science teachers implementing standards based on *A Framework for K-12 Science Education*. All of the resources are licensed under Creative Commons licensing. <https://thewonderofscience.com/>

High Leverage Practices. High-leverage practices are the basic fundamentals of teaching. These practices are used constantly, critical to helping students learn important content, and useful for supporting students' social and emotional development. These high-leverage practices are used across subject areas, grade levels, and contexts.

<http://www.teachingworks.org/work-of-teaching/high-leverage-practices>

High Leverage Practices in Special Education. In partnership with the Collaboration for Effective Educator Development, Accountability and Reform (CEEDAR), the Council for Exceptional Children has developed a set of High Leverage Practices (HLPs) for special educators and teacher candidates. The HLPs are organized around four aspects of practice: collaboration, assessment, social/emotional/behavioral, and instruction. <https://highleveragepractices.org/>

High-Leverage and Evidence-Based Practices: A Promising Pair for All Learners. An article on how to integrate high-leverage practices and evidence-based practices.

<http://www.readingrockets.org/article/high-leverage-and-evidence-based-practices-promising-pair-all-learners>

Doing and Talking STEM. A resource for supporting English Learners to communicate in science through utilizing the WIDA standards. <http://stem4els.wceruw.org/resources.html>

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Technology Integration

Triple E Framework. A framework for educators to measure how well technology tools integrated into lessons are helping students engage in, enhance and extend learning goals.

<https://www.tripleeframework.com/>

Integrating Technology with Student-Centered Learning. A report to the Nellie Mae Education Foundation for the intent of expanding education beyond traditional boundaries. Student-centered learning focuses on educational practices and principles that: provide all students equitable access to the knowledge and skills necessary for college and career readiness in the 21st century, focus on mastery of skills and knowledge, and align with current research on how people learn.

<https://www.nmeffoundation.org/getmedia/befa9751-d8ad-47e9-949d-bd649f7c0044/Integrating-Technology-with-Student-Centered-Learning>

Recommended Reading

A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Disciplinary Core Ideas (NRC, 2012). This research report outlines a broad set of expectations for students in science and engineering in grades K-12. These expectations will inform the development of new standards for K-12 science education and, subsequently, revisions to curriculum, instruction, assessment, and professional development for education. <https://www.nap.edu/catalog/13165/a-framework-for-k-12-science-education-practices-crosscutting-concepts>

A Vision and Plan for Science Teaching and Learning (Moulding, Bybee, & Paulson, 2015). This book is an educator's guide to *A Framework for K-12 Science Education* and state science standards.

Teaching Science is Phenomenal (Boulding & Bybee, 2017). A book that focusing on using phenomena to engage students in three-dimensional science performances consistent with *A Framework for K-12 Science Education*.

Helping Students Make Sense of the World (Schwarz, Passmore, & Reiser, 2017). A book that provides in-depth knowledge about how each of the Science and Engineering Practices is implemented into science instruction.

Guide to Implementing the Next Generation Science Standards (NRC, 2015). A book that provides in-depth information about achieving the new vision of 3-Dimensional science found in SEEd Standards and ideas for state, district, and school implementation.

Videos of High-Quality Instruction

Massachusetts Department of Education. The videos depict a *range* of practice to support within-district calibration activities that promote a shared understanding of instructional quality. Select the video(s) that best meet your needs by grade, content area, or length.

<http://www.doe.mass.edu/eval/resources/calibration/videos.html>

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The Teaching Channel. A collection of teacher videos, strategies and lesson plans.

<https://www.teachingchannel.org/videos>

District Science Website Resources

Alpine School District. District site that includes teacher resources to support three-dimensional SEEd instruction. <https://sites.google.com/alpinedistrict.org/asdseed/6th-grade-seed>

Davis School District. District site that includes SEEd Storylines. <https://www.seedstorylines.org/>

San Juan School District. District site that includes teacher resources to support three-dimensional SEEd instruction. <https://www.seedutah.org/>

Science Instruction Enhancement Resources

iSEE (Informal Science Enhancement Experience). Informal science centers (e.g., museums, science centers, planetarium, aquarium, zoo) that have extension programs that do field trips at the centers and as outreach experiences at schools.

<https://docs.google.com/spreadsheets/d/1E3zhNVZ5Gz1RqsydJmxqQ0dek4eofSkuZ6WU0FdRmYw/edit#gid=0>

Bozeman Science - NGSS Introduction. These videos introduce each of the Science and Engineering Practices (SEPs), Crosscutting Concepts (CCCs), and Disciplinary Core Ideas (DCIs) for curriculum leaders, teachers, and students alike.

<http://www.bozemanscience.com/next-generation-science-standards>

Breathe Utah. Air Award School Programs that offer lesson plans and school presentations.

<https://www.breatheutah.org/education/seed-lesson-plans>

Geology.utah.gov. Resource bins and lesson plans provided by the Utah Geological Survey, a Division of the Utah Department of Natural Resources. <https://geology.utah.gov/teachers/>

Natural History Museum Utah. Programs and field trips. <https://nhmu.utah.edu/mom>

Red Butte Garden. Resource bins, lesson plans, and field trips.

<https://www.redbuttegarden.org/teachers-and-students/>

Utah State University Extension-Utah Agriculture in the Classroom. Programs, lesson plans, and resource bins. <https://utah.agclassroom.org/>

PHET Simulations. Free online simulations to support science instruction. <https://phet.colorado.edu/>