2024 Instructional Material Summer Review Institute

Review Team Appraisal of Title

Fifth Grade Science

This appraisal form is provided for use by educators responsible for the selection of instructional materials for implementation with districts and charter schools across New Mexico to meet the need of their student populations.

NMPED Adoption Information

Text Title	1-Year Digital License only—Grade 5 (one per student) Student Digital License (Modules 1–4)	Publisher	Twig Education Inc.
SE ISBN	9781789163292	TE ISBN	9798889500568
SW ISBN	9798889500629	Grade Level/Content	Fifth Grade Science

Core Instructional Material Designation *(Core Instructional Material is the comprehensive print or digital educational material, including basal material, which constitutes the necessary instructional components of a full academic course of study in those subjects for which the department has adopted content standards and benchmarks.)*

Recommended (90% and above)	☑	**Recommended with Reservations** (80-89%)	☐	**Not Recommended and Not Adopted** (below 80%)	☐

Total Score - *The final score for the materials is averaged between the team of reviewers.*	Average Score
	98%

Cultural and Linguistic Relevance Recognition - *Materials are reviewed for relevant criteria pertaining to the support for teachers and students in the material regarding cultural relevance and the inclusion of a culturally responsive lens. Those materials receiving a score of 90% or above on the CLR portion of the review are recognized as culturally and linguistically relevant.*

CLR Recognized	☑	Average Score	95%

FOCUS AREA 6: CULTURAL AND LINGUISTIC PERSPECTIVES
Instructional materials represent a variety of cultural and linguistic perspectives.
Statements of appraisal and supporting evidence:

The materials have resources available in Spanish included in the digital platform, teacher editions, student Twig books, readers, family outreach, videos, and prior knowledge read-alouds. The section “Extension” provides additional activities for students to make interdisciplinary connections and connections to real-life experiences. The materials also contain resources that include information about professionals in different areas of science to connect students in the STEM pathway. There is a "Cultural Connections" section with links to cultural contexts and language resources that address word roots, cognates, and differentiation techniques for vocabulary.

FOCUS AREA 7: INCLUSION OF CULTURALLY AND LINGUISTICALLY RESPONSIVE LENS
Instructional materials highlight diversity in culture and language through multiple perspectives.
Statements of appraisal and supporting evidence:

The materials offer diverse perspectives through comparative readings, critical reflection on students' lives and roles in the environment, and cultural connections that emphasize cultural and linguistic diversity. One of the modules included in the material titled "Yellowstone: Uncovered" offers optional content specific to New Mexico. Additionally, online materials include activities to encourage students to investigate the contributions of scientists and engineers in New Mexico. The materials include opportunities for students to investigate cases related to real places or monuments, such as determining scientific reasons why the Statue of Liberty has changed color. Finally, the materials provide connections to real experiences by presenting different professional jobs related to the STEM field, such as Meet an Ecologist, which is included at the end of each of the guided reading books as an extra chapter.

Science Standards Review - *Materials are reviewed for alignment with the state adopted content standards, benchmarks and performance standards. The science standards include the performance expectations (PEs), disciplinary core ideas (DCIs), science and engineering practices (SEPs), crosscutting concepts (CCCs), and connections (CONNs) of the Next Generation Science Standards (NGSS). They also include the six NM StemReady! science standards.*

Average Score
97%

OVERALL ALIGNMENT
Materials align with the science standards overall.
Statements of appraisal and supporting evidence:

The Twig 5th grade science materials align with NGSS, NM STEM Ready! standards, and the three-dimensional practices: engineering practices, crosscutting concepts, and the disciplinary core ideas. The materials provide students the opportunity to continually practice using claims, evidence, and reasoning to connect prior knowledge to new skills, concepts, and ideas. They are coherent and make meaningful connections for students in the sections Connect, Reflect, and Extensions, which are incorporated in each lesson of all four modules.

MATTER AND ITS INTERACTIONS
Materials align to the physical science performance expectations (PEs) and related components (DCIs, SEPs, CCCs, CONNs, and NM Standards) for this focus area.
Statements of appraisal and supporting evidence:

The instructional materials align with the physical science performance expectations and related components (DCIs, SEPs, CCCs, CONNs, and NM standards), as demonstrated through the variety of activities included in the materials. They include opportunities for students to learn about, describe, and investigate physical science concepts and reactions through hands-on activities. The materials require students to experiment and record their findings using observation, graphs, data, and written reports. These activities are centered around real-life problems in our world, country, community, and home.

MOTION AND STABILITY: FORCES AND INTERACTIONS
Materials align to the physical science performance expectations (PEs) and related components (DCIs, SEPs, CCCs, CONNs, and NM Standards) for this focus area.
Statements of appraisal and supporting evidence:

The materials align with the motion and stability performance expectations and related components (DCI, SEP, CCC, CONN, and NM standards). The materials provide opportunities for students to explore the downward gravitational force of earth's gravity on objects. The materials task students with supporting an argument using evidence, data, and models. Additionally, they include activities in which students must verify the cause and effect produced by testing different amounts of substances, recording the effects of each mixture, and then use their findings to improve the model.

ENERGY
Materials align to the physical science performance expectations (PEs) and related components (DCIs, SEPs, CCCs, CONNs, and NM Standards) for this focus area.
Statements of appraisal and supporting evidence:

The materials align with the energy performance expectations and related components (DCI, SEP, CCC, CONN, and NM standards). They provide opportunities for students to read, research, model, and explore the flow of matter through ecosystems and organisms. The materials demonstrate how energy is transferred in various ways and objects, such as the food chains of animals on land and in the ocean. The materials begin by exploring how plants and animals grow and moves forward in progression to what happens to matter in an ecosystem and how an ecosystem changes.

FROM MOLECULES TO ORGANISMS: STRUCTURES AND PROCESSES
Materials align to the life science performance expectations (PEs) and related components (DCIs, SEPs, CCCs, CONNs, and NM Standards) for this focus area.
Statements of appraisal and supporting evidence:

The materials align with the molecules to organisms performance expectations and related components (DCI, SEP, CCC, CONN, and NM standards). They provide opportunities for hands-on investigation, monitoring, and modeling of the flow of matter and energy through organisms. Using models, the materials provide opportunities for students to learn about food chains that begin with the sun, plants, animals, consumers, and decomposers and how energy can be transferred in numerous ways and from one object to another. The materials task students with conducting hands-on experiments with plants and then writing a reflection on the importance of water, air, sunlight, and soil in plant growth.

ECOSYSTEMS: INTERACTIONS, ENERGY, AND DYNAMICS
Materials align to the life science performance expectations (PEs) and related components (DCIs, SEPs, CCCs, CONNs, and NM Standards) for this focus area.
Statements of appraisal and supporting evidence:

The materials align with the ecosystems: interactions, energy, and dynamics performance expectations and related components (DCI, SEP, CCC, CONN, and NM standards). The materials guide students in understanding dependent and independent relationships in ecosystems as matter moves among plants, animals, decomposers, and back into the cycle. The instructional materials include activities to develop models to describe phenomena, such as the matter and nutrient cycling model that is included to help students visualize the cycle of matter in ecosystems.

EARTH'S PLACE IN THE UNIVERSE
Materials align to the earth and space science performance expectations (PEs) and related components (DCIs, SEPs, CCCs, CONNs, and NM Standards) for this focus area.
Statements of appraisal and supporting evidence:

The materials align with the earth's place in the universe performance expectations and related components (DCI, SEP, CCC, CONN, and NM standards). The materials provide opportunities for students to read, model, explore, and elaborate on the earth's place in the universe. They contain information to help students understand the interaction between size, distance, and brightness. They also provide activities that drive students to collect evidence that supports their scientific claims regarding the brightness of the Sun. The materials support students in understanding that natural objects exist from the very small to the immensely large by incorporating reading comprehension passages in which students analyze the text and summarize its ideas about the size of the sun in comparison to other objects in the solar system.

EARTH'S SYSTEMS
Materials align to the earth and space science performance expectations (PEs) and related components (DCIs, SEPs, CCCs, CONNs, and NM Standards) for this focus area.
Statements of appraisal and supporting evidence:

The materials align with the earth's systems performance expectations and related components (DCI, SEP, CCC, CONN, and NM standards). The materials provide opportunities for students to observe the brightness of the sun and stars related to the distance. The materials provide opportunities for students to closely analyze images of the Mojave geosphere focusing on sphere interactions. Components of the three spheres (hydrosphere, biosphere, and atmosphere) are part of the study. Developing and using models is incorporated in the materials through tasks in which students draw rain and cloud models, as well as a model of an ecosystem that contains the three spheres. The use of mathematical and computational thinking is presented using an x and y-axis table to graphically represent different amounts of water from different water sources.

EARTH AND HUMAN ACTIVITY
Materials align to the earth and space science performance expectations (PEs) and related components (DCIs, SEPs, CCCs, CONNs, and NM Standards) for this focus area.
Statements of appraisal and supporting evidence:

The materials align with the earth and human activity performance expectations and related components (DCI, SEP, CCC, CONN, and NM standards) by providing opportunities for reading, watching videos, conducting virtual experiments, modeling, and writing about human impacts on the earth's system. They also include activities focused on the interaction of the hydrosphere, geosphere, biosphere, and atmosphere in developing water conservation campaigns. The materials instruct students to collect data from three different articles and use it to find solutions to help the hydrosphere. After analyzing the importance of the hydrosphere and identifying specific organisms that depend on freshwater, the materials provide opportunities for students to engage with human problems and find solutions by working with peers and looking for the best audience to present their solutions.

ENGINEERING DESIGN
Materials align to the engineering design performance expectations (PEs) and related components (DCIs, SEPs, CCCs, CONNs, and NM Standards) for this focus area.
Statements of appraisal and supporting evidence:

The materials align with the engineering design performance expectations and related components (DCI, SEP, CCC, CONN, and NM standards). The materials take students through the design process of defining problems, carrying out fair testing to determine possible solutions, asking questions, and modeling a prototype. The materials include opportunities for peers to give each other feedback and for students to make edits to their design based on the information gathered from their peers.

CCSS for ELA and Math Grade 1 NGSS **Materials align to the ELA and math standards identified in the first grade NGSS.** *Statements of appraisal and supporting evidence:*
The materials are aligned with ELA standards, as evidenced by the inclusion of literacy activities that support students in delving deeper into the concepts of each science topic. The instructional materials include close reading activities, opportunities for students to practice summarizing the main idea of an article and recording key details, and support for students to learn how to make scientific claims and use different sources to obtain evidence to support these claims. The material is also aligned with the mathematics standards, as evidenced by the consistent use of numerical concepts and mathematical and computational thinking. The materials incorporate standard units to measure and describe physical quantities such as weight, time, temperature, and volume through a mathematical connection in which this knowledge is reinforced and/or expanded.

Science Content Review- *Materials are reviewed against relevant criteria pertaining to the support for teachers and students in the specific content area reviewed.*

Average Score
100%

FOCUS AREA 1: PHENOMENA-/PROBLEM-BASED AND THREE-DIMENSIONAL APPROACH
Instructional materials are centered around high quality phenomena and/or problems and require a three dimensional approach to make sense of the phenomena or to solve the problems.

The materials are focused around an anchoring phenomenon and follow the three-dimensional approach to investigate, make sense of the phenomenon, solve problems through testing procedures, and propose solutions to problems. The materials provide opportunities for students to read articles, watch videos, engage in virtual labs, and make connections to other disciplines. Every module includes a scope and sequence, which includes aligned SEPs and CCCs. The DCIs and Common Core Math and ELA standards connections are appropriate to the grade level. The three dimensions are identified using a color coded system with blue for SEPs, orange for DCIs, and green for CCCs, which helps with cohesion across the materials.

FOCUS AREA 2: THREE-DIMENSIONAL ASSESSMENT
Assessments provide tools, guidance and support for teachers to collect, interpret and act on data about student progress toward the learning goals of the 3 dimensional standards.

The material includes a variety of assessments. These range from pre-assessments, informal assessments, formal assessments, benchmark and multiple choice assessments, peer assessments, and self-assessments. Additionally, the materials provide students the opportunity to participate with creative assessment tasks. For example, students are tasked with making a poster model of the sphere interactions involved in ocean salination. The digital resources include a guide to 3D assessment. The materials also include instructions for teachers on what to look for in students struggling to understand a topic and how to follow up with these students.

FOCUS AREA 3: TEACHER SUPPORTS
Materials include opportunities for teachers to effectively plan and utilize materials.

The materials include suggestions for modifications to accommodate students with specific needs through the use of a progress tracker. The materials also include resources to help challenge advanced and gifted students. The materials provide teachers with resources to prepare for their lessons, including vocabulary cards, a list of needed materials, and specific steps to follow in each of the different sections of the lesson.

FOCUS AREA 4: STUDENT CENTERED INSTRUCTION
Materials are designed for each student's regular and active participation in science content.

The instructional materials incorporate a section called "Review Prior Knowledge", under the title Spark, to provide opportunities to engage students' curiosity and participation and support them in connecting new learning to relevant phenomena and problems. The materials provide a driving question at the beginning of each lesson. This question is interconnected with the others that lead investigations throughout the complete module. Modules progress through topics and culminate with opportunities for students to apply the acquired knowledge to solve real problems in their community. Students are encouraged to share their learning at home through the use of family outreach letters.

FOCUS AREA 5: EQUITY
Materials are designed for all learners.

The materials are designed for all learners and equity is emphasized throughout each module. They incorporate materials for English learners, culturally and linguistically diverse learners, and advanced learners. They also provide additional support materials for students with IEPs. There are resources to help all students develop their academic vocabulary. Additionally, the materials include social-emotional connections. They also include opportunities for hands-on learning with activities like mixing substances and using interactive tools like the Stargazer to observe and identify patterns in constellations over the course of a night. Equity is also seen in the use of images depicting students from different cultures, races, and ethnic backgrounds in the student and teacher editions of each of the included modules.

All Content Review - *Materials are reviewed against relevant criteria pertaining to the support for teachers and students in the material regarding the progression of the standards, lesson structure, pacing, assessment, individual learners and cultural relevance.*

Average Score
98%

FOCUS AREA 1 COHERENCE:
Instructional materials are coherent and consistent with the New Mexico Content Standards that all students should study in order to be college- and career-ready.
Statements of appraisal and supporting evidence:

The materials are coherent and consistent with NGSS and NM STEM Ready! standards, providing opportunities for students to practice skills for college- and career-readiness. Each performance expectation is addressed through grade-level appropriate tasks in a consistent format across all units. The materials provide opportunities for students to investigate problems using prescribed procedures that ensure fair and reliable outcomes. The materials introduce students to design practices that provide opportunities to investigate real-world problems and test solutions.

FOCUS AREA 2 WELL-DESIGNED LESSONS:
Instructional materials take into account effective lesson structure and pacing.
Statements of appraisal and supporting evidence:

Each lesson includes the applicable NGSS, cross-curricular connections, and three-dimensional learning objectives. The online resources include language objectives. The materials include a section called Academic Vocabulary Check (Language Routine), which provides instruction to connect the general academic vocabulary with the content-specific vocabulary. The videos and pictures in the instructional materials maintain a consistent layout that supports student engagement with the subject.

FOCUS AREA 3 RESOURCES FOR PLANNING:
Instructional materials provide teacher resources to support planning, learning, and understanding of the New Mexico Content Standards.
Statements of appraisal and supporting evidence:

The instructional materials provide teacher resources to support the New Mexico content standards. Every module includes a list of lessons in the teacher edition that cross references the standards addressed and incorporates an estimated time each lesson should take. Every module includes short introduction videos with an overview of the module anchor phenomenon or investigative problem, the sequence of learning, and a breakdown of how the performance expectations are addressed. In addition, in the online mode, the materials include a section called "Teacher Background Knowledge" that provides a glossary and a full explanation about the content of the topic.

FOCUS AREA 4 ASSESSMENT:
Instructional materials offer teachers a variety of assessment resources and tools to collect ongoing data about student progress related to the standards.
Statements of appraisal and supporting evidence:

The materials provide teachers with a variety of assessments. Each "Driving Question" unit includes formative and summative assessments, both digitally and in print. An electronic grading system is also included in the digital resources. The materials also include opportunities for teachers to collect data regarding student progress and provide support on how to use this data to drive instruction. Additionally, they provide student activities for remediation, modification, and extension. Rubrics are included for student written responses and projects.

FOCUS AREA 5 EXTENSIVE SUPPORT:
Instructional materials give all students extensive opportunities and support to explore key concepts.
Statements of appraisal and supporting evidence:

The materials include modifications in the sections Challenge, Connect, and Reflect to accommodate students with mild to moderate needs. For example, the materials provide instructions for teachers to frequently pause videos and to provide extra time to record students' observations before resuming the video again. They also provide different sentence frames to support students according to their needs. Additionally, the materials include additional tasks to challenge advanced and gifted students. The materials provide a family outreach section with letters that can be edited to make connections from school to home. This resource is available in several different languages to meet the needs of all students and families.

FOCUS AREA 6 CULTURAL AND LINGUISTIC PERSPECTIVES: **Instructional materials represent a variety of cultural and linguistic perspectives.** *Statements of appraisal and supporting evidence:*
The materials have resources available in Spanish included in the digital platform, teacher editions, student Twig books, readers, family outreach, videos, and prior knowledge read-alouds. The section “Extension” provides additional activities for students to make interdisciplinary connections and connections to real-life experiences. The materials also contain resources that include information about professionals in different areas of science to connect students in the STEM pathway. There is a "Cultural Connections" section with links to cultural contexts and language resources that address word roots, cognates, and differentiation techniques for vocabulary.
FOCUS AREA 7 INCLUSION OF CULTURALLY AND LINGUISTICALLY RESPONSIVE LENS: **Instructional materials highlight diversity in culture and language through multiple perspectives.** *Statements of appraisal and supporting evidence:*
The materials offer diverse perspectives through comparative readings, critical reflection on students' lives and roles in the environment, and cultural connections that emphasize cultural and linguistic diversity. One of the modules included in the material titled "Yellowstone: Uncovered" offers optional content specific to New Mexico. Additionally, online materials include activities to encourage students to investigate the contributions of scientists and engineers in New Mexico. The materials include opportunities for students to investigate cases related to real places or monuments, such as determining scientific reasons why the Statue of Liberty has changed color. Finally, the materials provide connections to real experiences by presenting different professional jobs related to the STEM field, such as Meet an Ecologist, which is included at the end of each of the guided reading books as an extra chapter.

Reviewers' Professional Summary - *These materials are reviewed by Level II and Level III educators from across New Mexico. The reviewers have brought their knowledge, experience and expertise into the review of these materials. They offer here their individual summary of the material as a whole.*

Reviewer #: 34

Background and experience:

I hold two level III licenses in New Mexico, one for K-8 and one for K-12. I have two master's degrees, one in educational leadership and another in education. I am a teacher with 15 years of experience including teaching science. I have been part of the ISEC Teaching Leadership Team of the Los Alamos Laboratory Foundation for several years and served as the science coordinator for 3 years. I became a review team leader for Spanish language arts instructional materials in 2021 and was a review team leader for career and technical education in finance in 2023. I have been working on standards benchmark scores at my school and district for approximately 6 years. I was part of the curriculum design team in my district in 2018. Currently, I am the lead teacher of my department as a bilingual teacher in the high school.

Professional summary of material:

These educational materials address the three dimensions of the science standards. They include a variety of activities to investigate, inform, connect, and reflect. They use practical experiments to explore, ask questions, research, and report to understand phenomena and are connected to real-life problems in the world, country, community, and home. These materials challenge students to another level of performance and provide different reinforcements for students with special needs. It is rich in content and provides teachers with all the resources necessary to teach with confidence. The videos and online activities are carefully designed. The instructional materials incorporate many technological resources, including videos, sounds, online readings, images, and vocabulary cards, among others. Leveled reading books include chapters at the end in which students can meet professionals who help them envision, from an early age, a path in one of the many areas of study in STEM. The materials connect learning objectives with language objectives. They include a variety of assessments that can be modified by teachers depending on the student's performance level. The materials are also offered in Spanish and the family letters can be edited and used in different languages. The cultural connection gives meaning to the lesson through the use of word roots, cognates, and the use of flashcards.

Reviewer #: 35

Background and experience:

I am a licensed teacher from the Philippines and hold a level III instructional leader New Mexico license for preK-12 in special education, preK-3 in early childhood and K-8 elementary. I've been teaching in the Philippines for 10 years and this will be my 4th school year as a teacher here in New Mexico. I am a school paper adviser, English coordinator and was one of the writers for 5th grade English modules in my home country during the COVID pandemic. I taught 6th grade ELA and science last school year and at present I am a self-contained teacher working with 3rd grade students.

Professional summary of material:

The instructional material, Twig Science grade 5, is aligned with the NGSS and the New Mexico STEM Ready! standards. The three-dimensional learning of disciplinary core ideas (DCIs), which covers what students know; science and engineering practices (SEPs--what students do); and the cross cutting concepts (CCCs), on how students think, are all covered by the material through the varied activities provided, such as digital investigation, hands-on investigation, video investigation and reading for evidence. Likewise, assessments in all modules include pre-exploration, formative assessment, performance task, multiple choice assessment and benchmark assessment to address the diverse learners' needs. Each module has a driving question that helps students find meaning and relevance of a phenomenon that will spark wonder and curiosity toward the lesson and in science in general. The lesson has an overview of structure labeled as Spark, Investigate, Report, Connect and Reflect. The material uses a multimedia approach that helps students understand the world. It is designed with grade-appropriate activities and provides real-world examples that support students learning real world science. The materials are also closely aligned with CCSS ELA standards through close reading, lesson routines for leveled readers, and language and vocabulary as well as writing. The materials for teachers incorporates CCSS math standards through student worksheets and handouts. Twig Science is both in print and digital format and also offered both in English and Spanish. It includes Family Outreach Letters (FOLs) in digital format that can be printed. The letters summarize the learning content of the driving question and provide parents with suggestions to connect with their student's learning experience outside the classroom. Twig Science grade 5 is a high-quality instructional material that helps teachers plan, teach and assess; ensures students access to grade-level content and engagement; and supports instructional equity by helping students with special needs, English learners, and gifted and talented students reach their full potential.

Reviewer #: 36

Background and experience:

This reviewer holds a Level III instructional license and K-12 administrative license with 22 years teaching experience. Reviewer has experience in vertical curriculum alignment and development of pacing guides to align scope and sequence within instructional time frames. Reviewer has collaborated to develop district level benchmark assessments aligned with standards and materials. This reviewer was involved in the revision, review, and clarification of the New Mexico social studies standards in 2020 and served as review team leader for New Mexico's Summer Review Institute for social studies materials. This reviewer has taught middle school STEM/STEAM classes and actively supported 6th grade science instruction. Currently, this reviewer serves in an administrative role that includes guiding curriculum alignment, grade-level appropriate instruction and assessments, and teacher support.

Professional summary of material:

Twig Science, Grade 5, presents well sequenced science instructional modules that are strongly aligned with the NGSS performance expectations and the three-dimensional learning of disciplinary core ideas, science and engineering practices, and crosscutting concepts. The materials align closely with Common Core State Standards (CCSS) for ELA/Literacy through reading (leveled reading available), listening, prescribed writing tasks/prompts, and oral discussion and presentation. The teacher materials provide support for CCSS math standards and deeper connections through available student handouts and worksheets. The materials are presented in hardcopy and digitally in four modules with “Driving Questions” serving as unit divisions and lessons within the driving question units. Modules, driving questions, and lessons are consistent in formatting for both the teacher and student editions. Twig Science provides student Spanish language textbooks and leveled readers as well as strategies and supports for English learners through the teacher’s edition. There are digital resources beyond the print text to include “Water Savers” interactive lab, multimedia presentations, and support resources. Each module is driven by an “Anchor Phenomenon” with lessons that follow a 5E structure labeled Spark, Investigate, Report, Connect, and Reflect, with formative and summative assessments throughout. Each report lesson focuses on a provided reading passage and encourages annotation and citing evidence to support a claim. Each lesson and driving question unit concludes with a review that is reflective on the module and anchor phenomenon. Material is presented in an unbiased, fact-based language and avoids common stereotyping such that teachers can create opportunities to affirm students’ cultures and backgrounds through discussion. The instructional materials include recommendations and activities for learners at different levels, including extension recommendations. Writing and project rubrics are included, along with suggestions for remediation or acceleration. Teacher demo and student lab materials are listed at the beginning of the lesson, with a comprehensive list including materials provided in Twig lab kits and those that will need to be supplied by the teacher. Spanish language text options are included as a choice menu in the digital edition and available as print edition, but no additional languages are supported. There are supplementary materials for teachers, including “Teacher Background Knowledge”, that serve as mini lessons so the teacher understands the content and what the student will need to know and demonstrate. Overall, the Twig Science materials comprehensively address the NGSS and NM STEM Ready standards through grade-level appropriate, high-quality instructional materials.