**2024 Instructional Material Summer Review Institute**

## Review Team Appraisal of Title

## Fourth 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

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|---|---|---|---|
| Text Title | 1-Year Digital License only—Grade 4 (one per student)<br>Student Digital License (Modules 1–4) | Publisher | Twig Education Inc. |
| SE ISBN | 9781789162950 | TE ISBN | 9798889500551 |
| SW ISBN | 9798889500612 | Grade Level/Content | Fourth 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.)*

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|---|---|---|---|---|---|
| **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 |
|---|---|
| | 99% |

**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:***

Within various portions of the lessons, the material provides an "English Learners" resource to aid students in connecting with the material. This "Cultural Connections" resource includes equitable and inclusive texts and images. Under the "Cultural Connections" tab it suggests displaying images from other countries in case students have more familiarity with them. The instructional material also includes a resource labeled "Cross-Curricular Connections", which includes links to ELA, WIDA, Math, and Arts. The "Twig Science Reporter" resource provides real-world and current STEM news.

**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 instructional materials align with this focus area. The materials include Spanish resources to support dual-immersion and bilingual programs. The leveled readers, anchor texts, and videos provide multiple perspectives on specific concepts. The instructional materials engage students in reflections about their own lives through the reading and activities. Under the "Cultural Connections" tab, it is suggested to share some stories of how people from around the world have addressed the problems in the module. The text provides information on the Tarahumara people in northwestern Mexico and how they send long-distance runners through the mountains to deliver messages and how "talking drums" are used in parts of Africa to communicate. However, the lessons are not specific to New Mexico's past and present cultures.

**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 |
| --- |
| 99% |

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

The materials align with the science standards overall as demonstrated by the complex texts, varied activities, investigations, and research and writing projects throughout. The videos, supplementary texts, images, and digital components add information for students to make connections with phenomena around them. The instructional materials provide learning experiences through hands-on activities, digital investigations, research opportunities, close readings, writing assignments, and engineering design challenges to support rigorous content acquisition.

**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 instructional materials align with the energy performance expectations and related components. The materials provide opportunities for students to relate the speed of an object to the energy of that object. Students are asked to create car models and carry out races. The lesson asks the students to observe their cars and their peers' cars to determine which racing team's car gained the most energy from its propulsion mechanism. Students are also provided opportunities to learn about energy transfer by carrying out investigations with ice cubes. The materials also provide an opportunity for students to investigate energy transfer by lighting a bulb and making a motor spin. The materials require students to investigate what happens when a moving ball collides with a motionless ball, then investigate what happens when two moving balls collide. The materials provide different texts on how energy can be transferred (light, heat, sound, and motion) and the evidence of that energy.

**WAVES AND THEIR APPLICATIONS IN TECHNOLOGIES FOR INFORMATION TRANSFER**
**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 performance expectations for this science topic by providing students with opportunities to investigate and identify patterns of amplitude and wavelength. The activities include exploring waves using ropes and measuring their approximate height, length, and number. The materials also provide students the opportunity to investigate how waves affect the movement of boats in open water by blowing on them with a straw. Additionally, the materials provide opportunities for students to write their observations and reflect on how sound waves impact our ability to communicate. The materials guide students to draw the path of light, ensuring a clear understanding of light pathways.

**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 instructional materials align with the performance expectations for this science topic. They provide opportunities for students to learn about the internal and external structures that help plants and animals survive. Students use this information to write about the structures of an imaginary prey animal. Students are asked to include how these structures will help the animal escape from a predator. The materials also guide students in learning about sensory inputs (stimuli) and possible responses linked to the stimuli. Additionally, the materials help students learn about systems through an investigation to calculate their reaction time.

**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 performance expectations and related components for Earth's Place in the Universe. Students are given the opportunity to explain how rock layers are formed. After reading two passages about rock formation, they brainstorm, collect evidence, and construct explanations based on evidence to explain the reason behind the different rock layers in the Grand Canyon. Additionally, the materials contain an informative text explaining the pattern of rock layers, highlighting that the oldest rocks are found at the very bottom.

**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 PEs for Earth's Systems. They provide students with the opportunities to observe, investigate, and explain the process of weathering and erosion using evidence. The materials include a reading activity about the Earth Movers in which students must write the cause and effect relationships that are found in the text. Additionally, the material offers a digital Time-Lapse Tour that shows what happened to a specific area over time and students write possible causes of these changes. Moreover, the materials provide students the chance to describe patterns of the earth's features as they use the Earth Explorer Interactive. To analyze the data, students are assigned a reflective writing activity to discuss which part of the world experiences both the highest frequency and the greatest magnitude of earthquakes.

**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 instructional materials align with the performance expectations in this focus area. They include lessons on energy and how fuels are derived from natural resources as well as how their uses affect the environment. One of the lessons includes a video on fossil fuels and nuclear fuels. Students are asked to discuss and write about the similarities and differences between the two including the pros and cons for each. Students are asked to use what they learn from this module to write an article on energy resources. Another lesson instructs students to watch and discuss a video about Easter Island. Students use the video to discuss the cause and effects to what happened to the wood on Easter Island. Students are then guided to write a paragraph about wood as an energy resource.

**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 instructional materials align with the performance expectations and related components for this focus area. They provide opportunities for students to learn about defining a simple design problem reflecting a need or a want by challenging students to create their own designs. The materials provide content to help students learn about earthquakes and the devastation they cause. They include a connection to real-world engineering by having students watch a video on civil engineers designing earthquake-proof buildings. Students are then tasked with designing and building an earthquake-resistant structure by using limited materials and following specific criteria and constraints. Students test their structure by applying a downward compression force, placing a bag of sand on top. After designing their structures, students are instructed to share concerns or questions they may have about their own design and have the whole class propose solutions.

**CCSS for ELA and Math Grade 4 NGSS**
**Materials align to the ELA and math standards identified in the fourth grade NGSS.**
*Statements of appraisal and supporting evidence:*

The instructional materials align with the fourth grade NGSS ELA standards. The materials provide opportunities for students to read informational texts, discuss the main idea, interpret information and paraphrase information. Additionally, the materials guide students in writing an opinion piece letter to a racing driver describing the best way to get the car to move and win based on the information they learned. The materials partially align with the fourth grade NGSS math standards. Some of the lessons incorporate opportunities for students to reason abstractly and to measure width, length, and depth of a model river bed using a ruler. Students also have the opportunity to practice making sense of multiplication equations solving multi-step problems. The one standard that is not covered in any of the lessons is symmetry.

**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 instructional materials align with the phenomena/problem-based and three-dimensional approach. The materials use real-world scenarios to provide engaging and meaningful connections for students. Each module contains a phenomena tracker showing the SEP, DCI, and CCC for each driving question addressed in the module. Examples are provided for possible discussion questions and answers. They also include sentence starters to help students ask and respond to questions. The link labeled "Assessments" within each module's "Driving Question" lists the standards and alignment to other subjects.

**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 materials align with the three-dimensional assessment focus area. They provide multiple assessment opportunities, including whole class, small group, partner discussions, and self-assessment through reflection. They also provide criteria rubrics for projects. The materials contain a full, customizable digital assessment tool with multiple report options and links to specific NGSS performance expectations. The materials provide teachers with many options to collect, interpret, and act on student progress. The instructional materials provide opportunities for students to receive and provide feedback from peers and teachers as well as to self-reflect.

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

The instructional materials guide teachers in planning and utilizing the materials effectively. They provide a "Guide to Lab Safety" resource to remind teachers about the safety protocols and lab set up criteria. In addition, the materials provide opportunities to utilize appropriate technology to support student learning. Teachers are also provided with ideas of materials and assessment tools that they can use to assess students at different levels. Moreover, the materials include a guide on how to interpret students' learning with suggestions for how teachers can provide feedback and modification of instruction.

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

The materials are designed to provide active student participation and engagement. Lessons begin with a pre-exploration to gauge prior knowledge and spark curiosity and inquiry. The materials provide hands-on activities, opportunities for collaboration with peers, and ongoing projects that continue over an extended amount of time. Students are provided with a variety of graphic organizers to track their data. Lessons are set up in a predictable manner (Spark, Investigate, Report, Connect, Reflect), which facilitates an easy, predictable flow for students.

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

The materials are designed to meet the needs of all learners. The materials provide multi-modal assessments and the digital components offer text-to-speech. There are tabs to provide more information and ideas for cultural connections, cross-curricular connections (ELA, WIDA, Math, and Arts), and how to accommodate for special needs such as fine-motor skills, physical disabilities, processing and executive functioning, and visual-spatial processing. The materials also provide challenge suggestions for advanced and gifted students. They provide teachers with engaging questions and provide students many opportunities for discussion in partners, small groups, and whole groups. Videos and digital activities are provided in English and Spanish. Opportunities are provided to design and build models. Each lesson also includes multiple ways to for students to access the content and to reflect on their learning.

**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 the New Mexico content standards to prepare all students to be college- and career-ready. They provide a consistently structured set of lessons that begin with student prior knowledge and gradually introduce more advanced science concepts, encouraging students' learning through hands-on investigations and collaboration. The activities are grade-level appropriate and include opportunities for students to design, build, and test their projects. Every lesson follows a consistent structure: Spark, Investigate, Report, Connect, and Reflect, to ensure coherence and progression. Additionally, the materials include opportunities for students to engage in speaking, listening, reading, and writing. The materials contain detailed "Scope and Sequence" charts that outline the content and standards covered, while performance expectation progressions clarify learning continuity across grade levels.

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

The materials provide teachers with a clear guide and tools for planning lessons. Each module includes ready-made "Performance Expectation Progressions" to help teachers link prior knowledge to current and future instruction. Under the "Overview" tab, each lesson states the standards, 3D Learning objectives, and language objectives it covers. Additionally, the materials provide lists of academic and content-specific vocabulary words, along with opportunities for how and when to use them within the lesson. They also include a variety of ways to support student engagement through collaboration. Each lesson incorporates features such as graphic organizers, digital resources, and visuals. Each lesson also includes a tab labeled "Teacher Background Knowledge", which provides the teacher with necessary information to make meaning of the content and text. Each module includes at least one lesson that provides an "Anchor Phenomenon" section. This allows students to connect their ideas to previously learned content.

**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 materials contain detailed pacing guides for both full-course and fast-track courses. These guides contain suggested time allotments for each portion of the lesson to help the teacher budget the time. The teacher edition provides ready-made questions that teachers can use to support student learning paired with possible responses students may give. In addition, the teacher edition contains notes and tabs leading to connected content in the student edition. Each lesson includes a "Digital Resources" tab which lists the digital components including videos, read alouds, Google slides or Powerpoint presentations, digital graphic organizers, digital handouts and other resources.

**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 a variety of assessment resources and tools, such as performance assessments, multiple-choice tests, open-response questions, and oral and written tests. Ready-made formative and summative assessments are provided in every module to allow teachers to edit the questions and assign them online. Performance assessments are paired with criteria to help teachers quantify student progress as they design and create projects. The materials also provide alternative assessments to cater to English learners, advanced students, students with special needs, and culturally and linguistically diverse populations.

**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 support struggling students by providing rephrased questions and opportunities to collaborate with a partner, while advanced learners are offered challenging activities like designing another model and responding to additional prompts. Two pathways are available for teachers to select from based on what the students need. Additionally, the materials offer differentiation for English learners and students with special needs by providing them with leveled books that match their reading abilities as well as sentence starters to support their writing and discussion. Moreover, the materials feature resources to involve families through "Family Outreach" letters so families can extend student learning at home.

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

Within various portions of the lessons, the material provides an "English Learners" resource to aid students in connecting with the material. This "Cultural Connections" resource includes equitable and inclusive texts and images. Under the "Cultural Connections" tab it suggests displaying images from other countries in case students have more familiarity with them. The instructional material also includes a resource labeled "Cross-Curricular Connections", which includes links to ELA, WIDA, Math, and Arts. The "Twig Science Reporter" resource provides real-world and current STEM news.

**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 instructional materials align with this focus area. The materials include Spanish resources to support dual-immersion and bilingual programs. The leveled readers, anchor texts, and videos provide multiple perspectives on specific concepts. The instructional materials engage students in reflections about their own lives through the reading and activities. Under the "Cultural Connections" tab, it is suggested to share some stories of how people from around the world have addressed the problems in the module. The text provides information on the Tarahumara people in northwestern Mexico and how they send long-distance runners through the mountains to deliver messages and how "talking drums" are used in parts of Africa to communicate. However, the lessons are not specific to New Mexico's past and present cultures.

**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 #: 31

*Background and experience:*

I am currently an elementary principal. I hold a Level III K-8 teaching license with endorsements in bilingual education, TESOL and reading. I also hold a Level 3-B Administrator License. I've earned a BA in elementary education and an MA in curriculum and instruction with an emphasis in reading. I have 14 years of experience in education as a teacher, administrator, and instructional coach at the district, REC and NMPED level. I have also been a instructional material reviewer for NMPED for four years.

*Professional summary of material:*

I highly recommend the Twig Science fourth grade instructional materials for New Mexico teachers and districts. They are very comprehensive materials that provide teachers with the necessary tools to provide equitable access to rigorous material for all students. The material provides interactive, engaging, hands-on activities and projects and complex texts. Three-Dimensional learning is incorporated throughout the modules through investigations, research opportunities, reading, writing, and engineering challenges. The materials offer a variety of assessments and progress monitoring tools to guide teachers in addressing all students' needs. The materials use phenomena and real-life problems to aid students in making real-life connections and reflections on their own lives and how they can take part in STEM. EL, gifted, advanced, and special needs accommodations and modifications are provided throughout all lessons. The material is provided in hard copy as well as online.

Reviewer #: 32

*Background and experience:*

I hold an MA in teaching mathematics and a bachelor's degree in elementary education with a major in general education. I also have a diploma in special education and am currently writing my dissertation for a PhD in educational leadership and management. I have a Level III license in elementary, middle school, and special education, with endorsements in mathematics, TESOL, and language arts. I have taught at the elementary level for 12 years.

*Professional summary of material:*

The Twig Science instructional materials for fourth grade provide a wide range of student-centered activities. They are user-friendly and cover all the standards prescribed by the New Mexico Public Education Department. Additionally, they integrate other subject areas into every science lesson. The activities are fun and engaging, making students excited to learn. Each lesson is supported by resources in the teacher edition to enhance students' learning experiences. The material provides resources that help teachers plan effective lessons and offer a variety of assessment tools to measure students' progress and provide accommodations for ELs, students with special needs, and advanced students.

Reviewer #: 33

*Background and experience:*

I am currently a 5th grade teacher. I hold a Level III K-8 teaching license with a TESOL endorsement. I have a BS in animal science and a MA in elementary education. I have 20 years experience in the classroom teaching all content areas. I have taught kindergarten, first grade, second grade, fourth grade, and fifth grade.

*Professional summary of material:*

The instructional materials are a comprehensive set of materials that meet the NGSS and New Mexico content standards. Lessons provide opportunities for students to explore science topics in an engaging and meaningful way. The materials provide multimodal means of learning to meet the needs of all learning styles. The materials are presented in both print and digital formats, allowing for greater accessibility to meet the needs of both teachers and students. The CLR components within the materials include relevant and significant suggestions for making lessons and activities more culturally relevant.