**This advisory recommendation has not been approved by the Instructional Quality Commission or the State Board of Education.**

# REVIEW PANEL ADVISORY RECOMMENDATION 2018 SCIENCE ADOPTION OF INSTRUCTIONAL MATERIALS

| **Publisher** | **Program** | **Grade Level(s)** |
| --- | --- | --- |
| Accelerate Leaning, Inc. | STEMscopes CA NGSS 3D | K–5 |

## Program Summary:

STEMscopes CA NGSS 3D includes: a digital subscription; student notebook; STEMscopedia, and Teacher Planning Companion (TPC).

## Recommendation:

STEMscopes CA NGSS 3D is recommended for adoption for K–5 because the instructional materials include content as specified in the Next Generation Science Standards for California Public Schools (CA NGSS) and meet all the criteria in Category 1 with strengths in categories 2–5.

## Criteria Category 1: Alignment with the CA NGSS Three-Dimensional Learning

The program includes content as specified in the CA NGSS and includes a well-defined sequence of instructional opportunities that provides a path for all students to become proficient in all grade-level performance expectations.

**Citations:**

* Criterion #1: Grade K, Weather Patterns> Explore 2; Grade 1, Patterns in Space> Explore 1; Grade 2, Changes from Heat> Explore 1; Grade 3, Social and Group Behavior >Explore 1; Grade 4, Renewable and Nonrenewable Resources> Explore 3; Grade 5, Matter and Energy in Plants> Explore 1. These are exemplars of SEPs, CCCs, and DCIs being integrated into the PEs as expressed in the CA NGSS for kindergarten through grade five.
* Criterion #7: Grade 4, Plate Tectonics> Explore 3. This is an exemplar of a primary source, a TUVA data set, being integrated into the three-dimensional learning.
* Criterion #12: Grades K – 5, Elaborate> Math Connections sections of each scope are linked to the CA CCSSM. Example: Grade 3, Objects in Motion> Math Connections A, B, and C.

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* Criterion #13: Grades K – 5, Elaborate> Reading Science sections provide leveled readers to develop grade-level appropriate language and vocabulary. Example: Grade 2, Mapping Our World> Reading Science A, B, and C.
* Criterion #15: Grades K – 5, Standards> California Environmental Principles and Concepts are linked to specific learning opportunities. Example: Principle II, Concept B is linked to Grade 5, Explore 2> Reducing Human Footprints.

## Criteria Category 2: Program Organization

The organization and features of the instructional materials support instruction and learning of the CA NGSS.

**Citations:**

* Criterion #1: Grades K-5, CA NGSS 3-D Segments; Grade 2, Teacher Planning Companion Storyline; Grade K, Animal Needs. We found evidence in all grades where the sequential organization of the material provides structure concerning what students should learn each year and allows teachers to convey the science content incorporating the three-dimensional learning expressed in the CA NGSS.
* Criterion #3: Grade 4, Standards> CA NGSS> Performance Expectations> 4PS3-1; Grade 1, Seasonal Patterns> Standards Alignment; Grade 5, Mixtures> Standards Alignment. There is exemplary evidence in Grades K-5 Grade Band Endpoints. The examples provided show instructional resources that explicitly state which knowledge and skills learned in prior grades or units are applied and extended to accommodate new knowledge and skills.
* Criterion #4: Grade 2, Properties and States of Matter> Hook-Sharing Properties; Grade 3, Processes and Impacts of Natural Hazards> Explore 2: Engineering Solution-Rising Expectations; Grade 5, Gravity> Explain> Linking Literacy. We found evidence that teacher resources provide support to engage students in three-dimensional learning and suggest research-based strategies to elicit student thinking and support student discourse.
* Criterion #9: Grade K, Animal Needs> Elaborate> Career Connections-Zoo Education Program Specialist (video); Grade 3, Inheritance and Variation of Traits> Explore 3, Tuva-Cicadas (simulation); Grades K-2, Elementary Teacher Toolbox> Interactives> Insect Life Cycles; Grades 3-5, Elementary Teacher Toolbox> Interactives> Food Chains and Webs. There is exemplary evidence in Grades K-5 resources that encourage the meaningful use of technologies such as video clips or computer simulations to investigate phenomena that cannot be directly experienced in the classroom. In these contexts, the materials support teachers as they introduce students to computational thinking and provide guidance to teachers on how science instruction may be improved by the effective use of library media centers and information literacy skills.
* Criterion #10: Grade 1, Communication> Explore 3: Engineering Solution-Let’s Talk and Acceleration> Project-Based Learning (PBL); Grade 4, Natural Processes> Explore 2: Engineering Solution-Volcano Island; Grade 2, Mapping Our World> Explore 2: Engineering Solution-Real Estate Model; Grade 5> Reducing Human Footprint> Explore 4: Engineering Solution-NASA Needs Our Help and Acceleration> Project-Based Learning (PBL). We found evidence of resources that suggest appropriate engineering design tasks in varied contexts as a path to understanding and applying the science ideas being learned.

## Criteria Category 3: Assessment

The program includes multiple models of both formative and summative assessment tasks for measuring what students know and are able to do and provides guidance for teachers on how to use scoring rubrics and interpret assessment results to guide instruction.

**Citations:**

* Criterion #1: Grade K, Segment 1> Teacher Guide> Action Plan; Grade 1, Plant Survival> Evaluate> Claim-Evidence-Reasoning (CER), Open-Ended Response Assessment (OER), and Multiple Choice Assessment; Grade 3, Segment 1> Teacher Guide> Action Plan and Assessment> 3D Interactive Assessment; Grade 5, Properties of Matter> Evaluate> Claim-Evidence-Reasoning (CER), Open-Ended Response Assessment (OER), and Multiple Choice Assessment. We found evidence of assessments in the instructional resources that reflect the three-dimensional nature of the CA NGSS and CA Science Framework. Assessment tools measure what students know and are able to do, as defined by the PEs in the CA NGSS. Assessments stress performance tasks rather than rote memorization.
* Criterion #3: Grade K, Weather Hazards> Access Prior Knowledge (APK), Explore 1> Claim-Evidence-Reasoning (CER), Evaluate> Claim-Evidence-Reasoning (CER), Acceleration> Extensions and Project Based Learning; Grade 1, Seasonal Patterns> Acceleration>Science Art; Grade 3, Plant and Animal Extinction> Accessing Prior Knowledge (APK), Explore 1> Claim-Evidence-Reasoning (CER), Intervention> Independent Practice, Acceleration> Extensions and PBL; Grade 4, Changing Land> Extensions> Science Art and Problem Based Learning (PBL). Additionally, in Grades K-5, there are scripted formative assessments that are included throughout all Engage and Explore activities. There is exemplary evidence that includes teacher materials that provide support to engage students in tasks that afford both learning and formative assessment opportunities at the same time and provide guidance to teachers on how to embed formative assessment activities in the broader learning activity.
* Criterion #6: Grade 2, Mapping Our World> Engage> Accessing Prior Knowledge (APK), Explore 2, Claim-Evidence-Reasoning (CER), Open-Ended Response Assessment (OER), and Evaluate> Claim-Evidence-Reasoning (CER), Intervention> Guided Practice, Independent Practice, Concept Attainment Quiz, Acceleration> Science Art, Extensions, and Books on Topic; Grade 5, Ecosystems> Accessing Prior Knowledge (APK), Explore 2> Formative Claim-Evidence-Reasoning (CER), Open-Ended Response Assessment (OER), Evaluate> Claim-Evidence-Reasoning (CER), Intervention> Guided Practice, Independent Practice, Concept Attainment Quiz, Acceleration> Science Art and Project Based Learning. We found evidence of teacher resources that supply a differentiated path for diverse students to build toward the PEs of the CA NGSS. In particular, formative assessment tasks are designed to support teachers in collecting and analyzing data about student conceptual understanding.
* Criterion #10: Grade 1, Patterns in Space> Explore 1 (scientific investigations); Grade 2, Diversity of Living Things> Acceleration> Project Based Learning (PBLs); Grade 4, Information Technologies> Explore 3 (Engineering design); Grade 4, Energy and Speed> Evaluate> Multiple Choice Assessments; Grade 5, Gravity> Evaluate> Open-Ended Responses, Earth’s Rotation> Explore 2 (Tuva simulations). There is exemplary evidence that includes assessment tools that include multiple measures of student performance as addressed in the assessment chapter in the CA Science Framework, including, but not limited to, engineering design and lab practical tasks; performance-based tasks; open-ended, short answer and essay responses; lab reports; research projects; computational simulations; and oral presentations.

## Criteria Category 4: Access and Equity

Program materials ensure universal and equitable access to high-quality curriculum and instruction for all students and provide teachers with suggestions for differentiation for students with special needs.

**Citations:**

* Criterion #1: Grade 2, Properties of Materials> Acceleration> PBL> Super Soles! and Properties of Materials> Acceleration> PBL> Extension activities provide good examples of how the instructional resources reflect the goals of access and equity outlined in Chapter 10 of the CA Science Framework.
* Criterion #2: Grades K, Pushes and Pulls> Engage> Hook (English Language Development box, “Let’s Play Ball”) is an exemplar of how the resources address the needs of English Learners consistent with the CA ELD Standards.
* Criterion #3: Grade 1, Communication> Explore 2 (Intervention Strategies Box, “Roadblock: Does Not Interact with Peers”); Grade 3, Fossils> Explore 1 (Intervention Strategies Box, “Roadblock: Sensory Overload”); Grade 5, Matter and Energy in Plants> Engage> Hook (Intervention Strategies Box, “Roadblock: Hesitant or Fails to Participate in Classroom Discussions”). The instructional resources incorporated instructional strategies to address the needs of students with disabilities in scopes (lessons), assessments, and teacher resources, as appropriate at every grade level.
* Criterion #4 Grades K-5, Scopes> Teacher Toolbox> Intervention. The Interventions tab in the Teacher Toolbox supply a differentiated path for all students. They include guidance to support students with special needs, including, standard English learners, English learners, long term English learners, students living in poverty, foster youth, girls and young women, advanced learners, students with disabilities, students below grade level in science skills, three dimensional learning, literacy skills, or mathematical skills.

## Criteria Category 5: Instructional Planning and Support

The instructional materials provide coherent guidelines for teachers to follow when planning three-dimensional instruction and are designed to help teachers provide effective standards-based instruction.

**Citations:**

* Criterion #1: Grades K-5, TPC, provides a curriculum guide and grade level Storyline for the academic instructional year.
* Criterion #4: Grade 2, Segment 2: Landscape Materials> Segment Resources> Teacher Guide, Standards Alignments, Parents Letter, Mission Log, and Action plan work together to address the articulation of three-dimensional learning by identifying the knowledge and skills learned in prior grade level and prior grade level units and address how to connect and build on these learnings to help students develop increasingly sophisticated ideas.
* Criterion #9: Grade 4, Teacher Toolbox, 3D Supports, Parent Resources, and STEMScopes Parent Letters explain three-dimensional learning and objectives to parents.
* Criterion #14: Grade 3, Inheritance and Variation of Traits> Explore 1, Explore 3, Tuva, STEMscopedia, Concept Review Game and Evaluate CER, are examples of electronic learning resources, including technology-based assessments, and support instruction that is connected explicitly to the CA NGSS. These have a well-designed user interface, provide technical support, and include suggestions for appropriate and differentiated use.
* Criterion #15: Grade 1, Parts of Animals> Scientist Spotlight, is an example of a teacher resource that provides background information about important events, diverse people, places, ideas, and scientific principles appearing in, but not limited to the CA NGSS and CA Science Framework.

## Edits and Corrections:

The following edits and corrections must be made as a condition of adoption:

| **#** | **Grade Level** | **Component** | **Page number(s)** | **Current text** | **Proposed corrected text** | **Reason for edit** |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | K | Pushes and Pulls (digital) | Explain | “Push it!” illustration with hand and dump truck | Illustration should depict the hands touching the truck, thereby applying a force (push or pull) to the truck | Accuracy |
| 2 | K | Pushes and Pulls | 83 | “Push it!” illustration with hand and dump truck. Red action arrows are present in the digital version but missing in printed version. | Illustration should depict the hands touching the truck, thereby applying a force (push or pull) to the truck. Include red action arrows. | Accuracy |
| 3 | K | Speed and Direction | 91 | “Pushing or pulling an object makes it move” illustration | “Pushing or pulling an object changes its speed.” | Accuracy |
| 4 | K | Speed and Direction | 91 | “A small push will make it move forward a little.” | “A small push will make its speed increase slowly.” | Accuracy |
| 5 | K | Speed and Direction | 91 | “A big push will make it move forward a lot.” | “A large push will make its speed increase quickly.” | Accuracy |
| 6 | K | Speed and Direction | 91 | “A little pull will make it move forward slowly.” | “A little pull will make its speed increase slowly.” | Accuracy |
| 7 | K | Speed and Direction | 91 | “A big pull will make it move forward quickly.” | “A big pull will make its speed increase quickly.” | Accuracy |
| 8 | K | Speed and Direction | 91 | Illustration of a car and hand not connected. | Yellow line needs to connect car to hand to depict “force” | Accuracy |
| 9 | K | Speed and Direction | Digital; 93 | “Is it the right speed and direction?” illustration | The child’s hands should be in contact with the ball and the force arrow (vector) should be acting on the ball (drawn from the ball). For the boy to apply a force to the ball, he needs to be in contact with the ball. | Accuracy |
| 10 | 1 | Parts of Plants | 3 | “Plants have roots” illustration | Blue circle needs to move to around the roots. The formatting of the photos appears to make images confusing. | Accuracy |
| 11 | 1 | Patterns in Space | Digital; 75 | Image of photoshopped rainbow | The image of the rainbow should be replaced with a photograph of an actual rainbow. For a rainbow to appear to an observer, the sun must be behind the observer and clouds (water vapor) must be in front of the observer (covering the area where a rainbow appears to come from); also, the arc of the rainbow would be larger. | Accuracy |
| 12 | 1 | Patterns in Space | Digital; 75 | Image of sun over green and moon over dark space. | Image should be replaced to represent a reality; two separate images to represent day and night would suffice. | Accuracy |
| 13 | 3 | Life Cycles | 20 | “Frog life cycle” illustration | The photos are mismatched with the captions and simply need to be rearranged to correct order. | Accuracy |
| 14 | 3 | Life Cycles | 21 | “The stages of a butterfly” illustration | The photos are mismatched with the captions and simply need to be rearranged to correct order. | Accuracy |
| 15 | 3 | Life Cycles | 21 | “Look closely. You can see butterfly wings” illustration | The photo is mismatched with the caption and simply need to be rearranged correctly. | Accuracy |
| 16 | 3 | Life Cycles | 21 | “Some insects, such as damselflies” illustration | The photo is mismatched with the caption and simply need to be rearranged correctly. | Accuracy |
| 17 | 3 | Survival of the Fittest | 41 | “Being the biggest, strongest, or fastest is very important to the survival of animals.” | Remove. Being the fittest to survive is not always- and not only- about being the biggest, strongest, or fastest; otherwise, humans would not have survived to be successful species on earth. | Accuracy |
| 18 | 3 | Plant and Animal Extinction | Digital; 79 | Image of fossilized dinosaur | Replace image with a photo of an actual dinosaur fossil. | Factual Error |
| 19 | 4 | Using Stored Energy | Digital; 15 | “What is energy?” section | The whole section is problematic and should be aligned with the 4-PS3 DCIs.  It especially struggles with the concept of “stored energy.” For example, energy can be stored kinetically, in the motion of a flywheel. | Accuracy |
| 20 | 4 | Using Stored Energy | Digital; 16 | “How do we use energy?” | “Stored energy” is confused with “potential energy”. | Factual error |
| 21 | 4 | Rock Patterns | Digital; 44 | Image of fossilized dinosaur | Replace image with a photo of an actual dinosaur fossil. | Accuracy |
| 22 | 4 | Wavelength and Amplitude | Digital; 81 | “All waves move energy, not the matter, they travel through.” | Traveling waves transport energy, but standing waves do not. | Accuracy |
| 23 | 4 | Wavelength and Amplitude | Digital; 81 | “Vibrations are rapid, back-and-forth motions.” | “Vibrations are back-and-forth motions.” | Accuracy |
| 24 | 4 | Wavelength and Amplitude | Digital; 83 | “We can look at the wave’s amplitude to determine how much energy is being moved by the wave. Look at the two waves below [seismograph]. Which one is moving more energy?” | There is no way of knowing from the information presented. A seismograph measures the motion of the ground. The energy in a seismic wave can be determined if the distance of the seismograph from the epicenter is known- the wave is spreading out. Recommendation is to remove illustration and replace with a more relevant image. | Accuracy |
| 25 | 4 | Motion of Waves | Digital; 88 | “It is strange to think that the energy of the wave moves, but not the water or objects resting on top of the water.” | “It is strange to think that the energy of the wave moves, but not the water.” | Accuracy |
| 26 | 5 | Matter is Everywhere | Digital; 4 | “The particles in matter are moving!” illustration | Replace the “Solid state” regular lattice of green particles with an irregular placement of green particles showing no motion.  For the “Liquid state” and the “Gas state,” add arrows to the green particles representing motion of the particles; the gas particles would have longer arrows. | Accuracy |
| 27 | 5 | Changes to Matter | Digital; 11 | “Remember, if you had six different ingredients in the mix or salad, then you will have 750 mL in the bowl.” | mL is the unit milliliter, a unit volume, not mass. The activity should be replaced with one that measures masses of each individual ingredient and then compares these to the mass of the total mixture. | Factual error |
| 28 | 5 | Matter Cycles | Digital; 53 | Elephant illustration | Arrows are misplaced and should be rearranged. | Accuracy |
| 29 | 5 | Water Sources | Digital; 75 | “Earth is nearly three-quarters water.” | “Nearly three-quarters of earth’s surface is covered in water.” | Grammatical error |
| 30 | 5 | Earth’s Rotation | digital | “As you read this sentence, Earth is rotating around its tiltd axis at a rate of about 1,000 miles (1,609 kilometers) per hour!” | Change “tiltd” to “tilted” | Misspelling |
| 31 | 5 | Observing the Stars | 109 | “Size and Distance” illustration | The radius line of the sun does not end at the sun’s center. | Accuracy |
| 32 | 5 | Observing the Stars | 110 | “Look Out!” Illustration | The sun is missing from the illustration and should be included. | Accuracy |
| 33 | 5 | Objects in the Sky | Digital; 115 | Day/ Night earth illustration; “Daily hemisphere” | Replace “Daily hemisphere” with “Day hemisphere.” | Accuracy |
| 34 | 5 | Objects in the Sky | Digital; 116 | Seasons illustration | The illustration does not properly show the relationship between the tilt of the earth’s rotation axis and the plane of the earth’s orbit around the sun in causing the seasons. AN image properly depicting day and night hemispheres would be helpful. |  |
| 35 | K | Plant Needs | Explain | Communicate Science- Entertaining Speech handout | Insert correct handout | Mislabeled link |
| 36 | 1 | Behavior of Light | Hook | Question 10, SEP #2 answer: “It was easiest when it was dark.” | “It was hardest when it was dark.” | Accuracy |
| 37 | 3 | Life Science | Explore 3 | Link for print file “Coming to life” in Spanish under the English label | Link should direct to English print out | Link Error |
| 38 | 3 | Life Science | Explore 3 | “Coming to Life” linked Google Doc handouts only available in Spanish. | Make English Google Docs available as well | Accuracy |
| 39 | 3 | Environmental Traits | Explore 1 | Print CER posted “Environmental Changes and Effects” | Post CER for “Environmental Traits” to match answer key | Accuracy |
| 40 | 3 | Survival of the Fittest | Hook | Under number 5, last bullet, the second question is in red | Question should be in black | Consistency; All questions are in black across program |
| 41 | 3 | Weather & Climate | Explore 2 | Print file “Weather and Climate” posted is for Explore 1 | Post “Weather and Climate” Explore 2 | Accuracy |
| 42 | 3 | Weather & Climate | Explore 4 | Missing SEP and CCC callouts | Include SEP and CCC connections | Missing Connections; these have been included throughout program |
| 43 | 4 | Changing Land | Explore 2 | Under Application Cards; Desert landscape image is unclear (picture 1) | Insert a clearer picture of the changing desert | Accuracy and clarity |
| 44 | 4 | Plate Tectonics | Explore 1 | Under “Geographical Maps”, there is no key to the top black and white map | Insert key to help students interpret map | Illustration of map is unclear and formatting makes map difficult to understand |
| 45 | 5 | SE | 285 | Green Box has a yellow split | Green box needs to have a green split as every other box has their same color split. | Consistency |
| 46 | 5 | Matter Cycles | Hook | Under number 2, the answer is in black. | The answer should be in red. | Consistency |
| 47 | 5 | Matter Cycles | Hook | Question #3 5 bullet questions do not have answers | Include sample answers | Consistency |
| 48 | 5 | Life Science | Engage | Graphic Organizer labeled “Food Web” but demonstrates linear relationship. | Insert interconnecting arrows to demonstrate food web instead or relabel as “Food Chains” | Accuracy |
| 49 | 5 | Mixtures | Explore 1, 2, 3 | Google doc file is missing English version | Insert Google doc file in English | Missing file |

## Social Content Citations:

The panel identified the following social content violations:

| **#** | **SC Code** | **Grade Level** | **Component** | **Page number(s)** | **Current text** | **Proposed corrected text** | **Reason for citation** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | D-2 | K-5 | All |  | All people depicted are middle-aged or younger. | Replace some of the images with older people for variance. | Proportion of Portrayals |
| 2 | E-2 | K-5 | All |  | All people depicted seem to be in good “health” | Include images of people with disabilities | Proportion of Portrayals |
| 3 | L-1 | K-5 | Numerous Teacher Set-Up videos | Explore | Commercial brands are prominently displayed throughout videos. | Blur or remove the brand logos. | Brand Names and Corporate logos |
| 4 | B-2 | 3 | Objects and Motion: STEMscopedia digital and print | 3-8 | Dominated by representations of white people. | Include images representing various ethnic backgrounds. | Proportion of portrayals |
| 5 | B-2 | 3 | Objects and Motion: STEMscopedia digital and print | 7 | In the tug-of-war illustration, all twelve children are white. | Include images representing various ethnic backgrounds. | Proportion of portrayals |
| 6 | B-2 | 3 | Weather and Climate: STEMscopedia digital and print | 85-93 | Throughout this section, all four children portrayed are white. | Include images representing various ethnic backgrounds. | Proportion of portrayals |
| 7 | B-2 | 4 | Using Stored Energy: STEMscopedia digital and print | 15 | Image portrays a white basketball player. | Given the overrepresentation of white people throughout STEMscopedia, including a basketball player from a different ethnic background would be appropriate. | Proportion of Portrayals |
| 8 | A-8 | 5 | Gravity: STEMscopedia | 97 | “How could an astronaut keep his utensils from floating away while eating?” | Change “his” to “their” | Gender-neutral language |
| 9 | B-2 | 5 | Gravity: STEMscopedia digital and print | 95-98 | Five white people plus one astronaut of unknown race represented in images. | Include images representing various ethnic backgrounds. | Proportion of portrayals |
| 10 | A-3 | K-5 | Career Connections |  | Welder: White male  Arborist: White male  Farmer: White couple  Meteorologist: White male  Oceanographer: White male  Anthropologist: White male  Civil Engineer: White male  Astronomer: White male  Heat Shield Engineer: White female  Athletic Trainer: White female  Geologist: White male  Archeologist: White male  Audio Engineer: Hispanic male  Zoo Education Specialist: White female  Eye Doctor: Two females, one Hispanic  Programmer: White male NASA Engineer: White female  Hematopathologist: White female  Doctor: African American female  Mayor: White male | Include diversity within representation of different occupations | Proportion of portrayals |

California Department of Education, August 2018