## Designed for CA NGSS: Foundations

<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
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</thead>
</table>
| **F1. Presence of Phenomena/Problems.** | The materials include phenomena/problems:  
• that have the potential to drive student learning.  
• have the potential to relate across the dimensions. | **Grade 4: Unit 3: Earth’s Changing Surface Unit Page:** |

**Unit Pages:** The Unit Page provides teachers and students direct access to Anchor Phenomena for the unit, as well as Investigative Phenomena for each concept found within the unit. The Unit pages are available both in print and digital, and include additional support for teachers, in the Teacher Guide, on how to launch the anchor phenomenon with students. The anchor phenomenon provides students with real-world instances of phenomena, which serve as the context for the unit project. Students communicate their initial ideas, related to the unit project, before engaging with the investigative phenomena in each concept. Investigative phenomena are carefully selected to elicit student scientific questions. As students move through the learning progression, students apply three-dimensional thinking to communicate their ideas about both the anchor phenomenon and each investigative phenomenon, with the intent of constructing explanations to their own questions.

**Print:**

<table>
<thead>
<tr>
<th>TE Pages</th>
<th>SE Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchor Phenomenon Launch: p. 22-23</td>
<td>Anchor Phenomenon: p. 2-3</td>
</tr>
</tbody>
</table>

**Digital:**

Enter Quick Code: ca4605s
### DISCOVERY EDUCATION NGSS TIME RESPONSE

<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
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</thead>
</table>
| **F1. Presence of Phenomena/Problems.**| **Examples**  
 **Unit Level Alignment:**  
 Grade 4: Unit 3: Earth’s Changing Surface: In this unit, students will explore how fossils give us clues about the types of animals that lived in the past and where they lived. Students will also investigate how changes to the environment cause changes in the traits of living organisms.  
 **Investigative Phenomenon Example:**  
 Each of the concepts has an investigative phenomenon to kick off the concept. Below is an example of an investigative phenomenon from Unit 3, Concept 2:  
 Concept 2: Changing Landscapes: In this concept, students will learn that water, ice, and wind change the shape of Earth’s surface and produce many of Earths’ landforms. They will also learn that layers of sediment and patterns in rock formation reveal environmental changes over time. | **Investigative Phenomenon Examples:**  
 **Print:**  
 | TE Pages | SE Pages | Concept 3.2: Changing Landscapes: p. 36-37  
 | Digital: | | SE: Concept 3.2: Changing Landscapes: p. 52-53  
 | **Activity 2**  
 **Ask Questions Like a Scientist**  
 **Rain after a Drought**  
 **Watch the video. Then, complete the activity:**  
 | **3.2 | Wonder**  
 **How are canyons formed?**  
 **Quick Code: ca4628s** | **View** | **Explore** |
<table>
<thead>
<tr>
<th>Component</th>
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</tr>
</thead>
<tbody>
<tr>
<td>F1. Presence of Phenomena / Problems.</td>
<td><strong>Phenomenon-Based Unit Assessments</strong> (IN ENGLISH AND SPANISH): Grade 4: Unit 3: Students apply the SEPs developed through the Unit to engage in a three dimensional Performance Based Assessment in which they are presented with text and graphic materials related to the different landforms present in a small but incredibly varied country, Iceland. After considering the volcanic activity of the island, students are asked to interpret maps and analyze photos to recognize the patterns related to the natural processes shaping Iceland’s surface and the natural hazards connected to them. Finally, students must apply their knowledge of the processes affecting the landscape and their reasoning skills to build a basic model of the rock cycle.</td>
<td><strong>Phenomenon-Based Unit Assessments:</strong> Digital: <a href="https://tinyurl.com/phenomenonassessment">https://tinyurl.com/phenomenonassessment</a></td>
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</table>
**Component**

F2. Presence of Three Dimensions.

**Strengths**

The materials include the three dimensions, such that:

- the DCIs, SEPs, and CCCs are present and have the potential to support student learning.
- when engineering design is a learning focus, it is integrated with the appropriate dimensions (i.e., engineering is not isolated).

Each concept has a multitude of resources and materials to support learning of the DCIs, SEPs and CCCs. Specific examples of California Science Techbook assets include, but are not limited to:

**Course Level Alignment:**

The course level development of the Performance Expectations, including the DCIs, SEPs, and CCCs can be found in the Next Generation Science Standards and Three Dimensions at a Glance pages within the Scope & Sequence area of the print Teacher’s Edition.

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### Concepts and Standards

<table>
<thead>
<tr>
<th>Concept 1: Breaking Down and Moving Rocks</th>
<th>Progression of Three Dimensions</th>
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</table>

<table>
<thead>
<tr>
<th>Concept 2: Changing Landscapes</th>
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<table>
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<tr>
<th>Concept 3: Mapping Landforms</th>
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### Citations

**Grade 4: Unit 3: Earth’s Changing Surface**

Print: TE

Grade 4, Vol 1, Scope & Sequence overview: p. xlii-xliii
Unit 3: p. 2
Three Dimensions p. 4-5

**Course Level Alignment:**

Print: TE

Unit: Earth’s Changing Surface, p. xliii
Unit: Earthquakes, p. xlv
<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
</tr>
</thead>
</table>
| F2. Presence of Three Dimensions. | **Unit Level Alignment:** Unit level three dimensional expectations include the Unit project, tied to the Unit Anchor Phenomenon, as well as the Summative Performance Based Assessment (PBA). In the unit project, students will demonstrate the SEPs and CCCs to apply their newly acquired DCIs for the unit to both science and engineering-based problems and scenarios. The three-dimensional PBA expects students to apply the ideas of the unit to a new storyline, in order to demonstrate transfer of learning. A teacher guide for the PBA outlines the evidence students demonstrate across the three dimensions.  

*Example: Grade 4: Unit 3: Earth’s Changing Surface:* Students are introduced to the Anchor Phenomenon by using an image of the Grand Canyon taken from the upper atmosphere. Students are asked how the Grand Canyon might have been formed and why the canyon has so many colors. The Unit Project allows students to return to the anchor phenomenon for the unit, The Grand Canyon from Space, and apply the performance expectations for the unit to model changes that could occur in the landscape. This Unit Project is a summative assessment that provides students with the opportunity to consider how volcanic activity affects the environment. Students propose hypotheses and consider models of how volcanic activity could have played a role in shaping the Grand Canyon. Students carefully consider the CCCs lens throughout their investigations, as they consider cause and effect through assessing the impact of lava flows on the development of the Grand Canyon and how lava flow impact is different from erosion. | **Unit Level Alignment:** Print: TE Pages, Unit 3: Earth’s Changing Surface  
Unit Outline: p. 20-21 |
<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
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</thead>
<tbody>
<tr>
<td><strong>F2. Presence of Three Dimensions.</strong></td>
<td>Science and Engineering Practices are integrated as students use liquid glue to model and predict future impact of erosion on the Grand Canyon.</td>
<td></td>
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</tbody>
</table>

- **Unit Project**
  - **Lava Flows and the Grand Canyon**
    - In this project, students have the opportunity to consider how volcanic activity affects the environment. Students propose hypotheses and conduct models of how volcanic activity could have played a role in shaping the Grand Canyon. Students are presented with an image of the Grand Canyon taken from space. Students must predict what would happen if lava flows down the canyon walls into the canyon. They must then construct a model to predict what will happen to the Grand Canyon.

- **Unit Performance-Based Assessment**
  - **Exploring Iceland’s Landscape**
    - In this activity, students are presented with text and graphic materials related to the diverse landforms present in a small but incredibly varied country, Iceland. After considering the volcanic activity of the island, students are asked to interpret maps and analyze photos to recognize the patterns related to the natural processes shaping Iceland’s surface and the natural hazards connected to them. Finally, students must apply their knowledge of the processes affecting the landscape and their reasoning skills to build a basic model of the rock cycle.
<table>
<thead>
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</table>
| F2. Presence of Three Dimensions.             | **Concept Level Alignment:**  
• Three-dimensional learning objectives drive the design and sequence of the activities within each concept  
• Teacher support for the alignment to the SEP and CCCs is included at the activity level:  
  o Bolded text highlights the specific dimension of the PE addressed during each activity  
  o Instructional Focus provides details on the element level of the SEP and CCC students will demonstrate at the completion of the activity  
  o NGSS call-outs highlight for both teachers and students the specific SEP and CCC being addressed within the activity  
  o Strategies to set up the learning environment for students to demonstrate the SEPs and CCCs related to the concept DCIs | **Concept Level Alignment:**  
**Print:**  
| TE Pages | SE Pages |  
|-----------------------------------------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|

![Image](image-url)
### DISCOVERY EDUCATION NGSS TIME RESPONSE

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| F2. Presence of Three Dimensions. | • Pathways for Learning guidance provides options for students to meet the element level of the SEP and CCC in a variety of technology settings.  

**Pathways for Learning**

- **Print**
  - As a class, discuss the following terms: deposition, erosion, and weathering. The class has three terms and three descriptions of each term. The teacher will ask which term corresponds to each description, and the terms should be placed on the board. Can the class come up with a consensus for each term? Once they have made a decision, ask them for different ideas. Have students justify their decisions.

- **Blended**
  - As a class, discuss the following terms: deposition, erosion, and weathering. In groups of three, students will complete the online assessment. Prior to submitting their answers, all members of the group must agree on the answer choices. Have the groups review their answers. Can they come up with a consensus on the correct answers?

- **Digital**
  - As a class, discuss the following terms: deposition, erosion, and weathering. Individually, students will complete the online assessment. Present the student results from the dashboard to the class. Challenge the data to come up with a consensus on the correct answers. | |
| | • Teacher reflection questions encourage reflection on students' performance across the three dimensions. | |

**Teacher Reflection**

- Did this activity engage the students?
- How would you organize this differently next year?
- Were students able to think about what forces or Earth processes can weather and erode rocks?

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**Day 2**

**Day 2: Instructional Focus**

Students focus on what Mars rovers do and how they get their energy.

**Activity 3: Analyze Like a Scientist**

**Mars Rover**

**NGSS Alignment**

- 4-PS3-2: Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

**Instructional Focus**

In this activity, students will use an image of a Mars Rover and a text section about Mars Rovers as evidence to predict how a rover might get its energy.

**Strategy**

- Ask students to share with a partner their ideas of what the Mars Rover looks like and how that object gets its energy.
### Component: F2. Presence of Three Dimensions

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<thead>
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<th>Strengths</th>
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<tbody>
<tr>
<td><strong>Formative Assessment Items:</strong> Teachers have the opportunity to gather formative assessment data related to students’ progress of the three dimensions at various points within each concept.</td>
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<tr>
<td>- Technology Enhanced Items (TEIs) have been embedded throughout each concept to uncover what students know and allow students to demonstrate three-dimensional proficiency of the performance expectations. Student responses feed directly to the teacher dashboard, providing instant access to data to inform instruction and drive differentiation strategies. Each TEI has built-in scaffolded feedback for students.</td>
<td></td>
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<tr>
<td>- Summative Concept Assessments, focused on the DCIs, are found at the end of each concept. These assessments can be assigned to students, taken by students on their own as a practice test, or printed and given to students to complete as an assessment or an assignment. The results of these assessments are provided within the teacher dashboard. Teachers are able to identify areas of strength and weakness and adjust pacing of instruction to achieve proficiency for all students.</td>
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</table>

**Formative Assessment Items:**

<table>
<thead>
<tr>
<th>Print</th>
<th>Digital: Concept 2.1: Devices and Energy: ca4412s</th>
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<tbody>
<tr>
<td>TE Pages</td>
<td>SE Pages</td>
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![Shaping the Earth](image_url)
Components | Strengths | Citations
---|---|---
F2. Presence of Three Dimensions. | • Record Evidence activity expects students to analyze complex text and authentic data and evaluate information to support a student-generated claim to their own questions or the Can You Explain question for the concept. As students refine their scientific explanations throughout a course, they will refine their understanding of science content as well as their understanding of the nature of science. Students and teachers can review and provide feedback to one another to increase the rigor of the response throughout a concept, unit, or course. These activities have been scaffolded across a course to support students in achieving proficiency for the grade-band expectation. |  
• Hands-On Activities (HOAs) provide opportunities for students to demonstrate the science and engineering practices and analyze data to look for evidence of cross-cutting concepts. Hands-On Activities contain student sheets that allow students to observe, predict, classify, communicate, and analyze materials and practices from science investigations. Analysis and conclusion questions provide teachers with insight into the progression of students related to the three-dimensions. |
## F2. Presence of Three Dimensions

**Teacher Note**

**Material List (per group):**
- 3 to 4 ice cubes
- 1 spoonful of sand
- Plate of clay that is 4 - 4.5 inches and at least 1/4 inch thick
- Paper towels
- Baking tray

**Safety:**
- Follow all lab safety guidelines.
- Clean up any spills immediately.

### Instructional Focus

In this activity, students develop a model to observe the effects of glacial erosion. Then, they identify the limitations of their model to explain how it can be improved.

**Developing a Model**

**Activity Procedure: Make a Prediction**

In this investigation, students will work in a group to create a model showing the effects of glacial erosion. Then, they will draw a picture of the model indicating how the glacier causes erosion.

Before beginning their investigation, have students predict predictions to the following questions:

- What evidence might you observe that would indicate a glacier was once present in a location?
- What happens to Earth’s surface as a glacier moves across it?

When students have finished, have them discuss the limitations of their model as a representation of the real process.

**Activity Procedure: What Will You Do?**

Prepare the first four materials on the baking tray when you are ready to begin.

To allow each group to work independently to complete the activity, provide a copy of the following directions for each group. Each group should work on the baking tray to contain melted water and write their observations in their notebooks. Paper towels should be provided for cleanup. Each student should be provided with a copy of the student investigation sheet for use before, during, and after the investigation:

1. Place an ice cube lightly on the flat surface of the modeling clay. Move it back and forth several times. Does anything happen to the clay? To the ice?

**Citations**

Wind can blow sand into piles. These make small dunes on a beach. Wind forms large sand dunes in places such as Death Valley. Glaciers leave piles of rocks where they melt. Sediments may be deposited in layers. These can turn into sedimentary rock over time.
## F2. Presence of Three Dimensions.

### What Will You Do?
As you complete the following steps, write your observations in your notebook.

1. Press an ice cube on the flat surface of the modeling clay. Move it back and forth several times. Does anything happen to the clay? To the ice?
2. Place a small pile of sand on the surface of the clay. Place the ice cube over the sand on the clay. Let it sit for about one minute. Pick up the ice cube and look at the surface that had been on the sand. Describe what you see. Hypothesize what will happen when this piece of ice is rubbed over the surface of the clay.
3. Now, place the ice cube back in the same position on the sandy surface of the clay and move the ice back and forth a few times. Remove the ice cube and gently wipe the excess.

### What materials do you need?
- 3 to 4 ice cubes
- 1 spoonful of sand
- Piece of clay that is 4 x 4 inches and at least ⅛ inch thick
- Paper towels
- Baking tray

### What materials do you need?
- 2 crackers
- Cup of water
- 2 antacid tablets
- Writing utensil
- Napkin

### Make a Prediction

<table>
<thead>
<tr>
<th>Question</th>
<th>My Prediction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imagine you were searching for a site where a glacier once flowed. What evidence might you observe that would indicate a glacier was once present?</td>
<td>Student predictions will vary.</td>
</tr>
<tr>
<td>What happens to Earth’s surface as a glacier moves across?</td>
<td>Answers will vary. Student focus should be on mechanisms of erosion, such as eroded rocks and changed landforms.</td>
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<tr>
<td>Component</td>
<td>Strengths</td>
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</table>
| F3. Presence of Environmental Principles & Concepts (EP&Cs). | The materials include (as applicable):  
  - instructional content that incorporates the California EP&Cs.  
  - opportunities for students to examine the interactions and interdependence of human societies and natural systems.  
  - opportunities for students to develop and implement solutions to real-world environmental problems. | Course Level Alignment: https://tinyurl.com/y28p53fb |

The Discovery Education Comprehensive Science Program includes varied resources that identify, include, and authentically align the instructional content to the California EP&Cs. See examples below:

**Course Level Alignment:**
EP&C Map demonstrates specific resources and activities within each course that target the California EP&Cs.

<table>
<thead>
<tr>
<th>Grade 4: Unit 3: Earth’s Changing Surface</th>
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<tbody>
<tr>
<td>Unit Page:</td>
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<tr>
<td>Print:</td>
<td></td>
</tr>
<tr>
<td>TE Pages</td>
<td>SE Pages</td>
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<tr>
<td>Grade 4, Unit 3, Scope &amp; Sequence overview: xxxviii-xlxi</td>
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</table>

**Concept Level Content:**

| TE Pages | SE Pages |

Digital:  
- Concept 3.2: Reducing Earthquake Impacts: The Aftermath of an Earthquake: ca4810s
<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
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</thead>
</table>
| F3. Presence of Environmental Principles & Concepts (EP&Cs). | **Concept Level Content:** Grade 4: Unit 4: Earthquakes, Concept 3.3: Reducing Earthquake Impacts: In this concept, students will explore the impact of earthquakes and what they can do to reduce the hazards of them. As per the Environmental Principles and Concepts, students should be developing an understanding of: Principle V Concept a: “the spectrum of what is considered in making decisions about resources and natural systems and how those factors influence decisions.” In this concept, students will apply engineering design principles to make houses and bridges that are safe and also indicative of their understanding of making decisions about resource and natural systems. | ![Record Evidence Like a Scientist](attachment:record_evidence_like_a_scientist.png)  
**The Aftermath of an Earthquake**  
Now that you have learned about the effects of an earthquake, watch the video again. You first saw this in Wonder.  
![Let's Investigate the Aftermath of an Earthquake](attachment:let_s_investigate_the_aftermath_of_an_earthquake.png)  
Let's Investigate the Aftermath of an Earthquake |
**Component** | **Strengths** | **Citations**
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F4. Presence of a Logical Sequence of Learning. | Materials demonstrate appropriate sequencing of three dimensions when:  
- they include a targeted set of DCIs, SEPs, and CCCs within a sequence; the sequence is clear and logical across the DCIs; and the SEPs and CCCs are potentially sufficient and appropriate for students to figure out the phenomena or problems.  
- phenomenon or problems are linked to each other.  
The three dimensions (SEP, DCI, CCC) are sequenced across each course and designed with scaffolds across the grade bands.  
**Unit Level Alignment:**  
Each unit in Grades K-5 aligns to the standard bundles found in the California Framework for Science. Example of building SEPs across the course: 4th Grade, Unit 3: Earth’s Changing Surface: The Unit Project allows students to return to the anchor phenomenon for the unit, The Grand Canyon from Space, and apply the performance expectations for the unit to model changes that could occur in the landscape. Students are given the opportunity to consider how volcanic activity affects the environment. They propose hypotheses and consider models of how volcanic activity could have played a role in shaping the Grand Canyon. As students progress to Unit 4: Earthquakes, they learn about the engineering and technology that helped design an earthquake-proof bridge.  
Course Level Alignments: https://tinyurl.com/y5xbkfjv  
**Grade 4: Unit 3: Earth’s Changing Surface**  
Unit Page:  
Print: TE Pages:  
Grade 4, Unit 3, Scope & Sequence Overview: p. xxviii-xxxviii  
Unit 3: p. 1  
Three Dimensions p. 4-5  
Digital:  
Unit Page: Enter Quick Code: ca4605s  
Concept Pages:  
- Within each concept, reference tagged activities in Learn and Share (Explore, Explain, and Elaborate) for additional evidence of three dimensions.  
Print:  
<table>
<thead>
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**F4. Presence of a Logical Sequence of Learning.**

**Unit Project: Lava Flows and the Grand Canyon**

In this project, you will use what you know about Earth’s surface changes to model how lava affected the Grand Canyon.

The Grand Canyon is formed partially by the erosion and weathering forces of the Colorado River. In addition, volcanic activity near the Grand Canyon has influenced its geography. Using special cameras, scientists can detect minerals indicative of lava flows. These lava flows spill down the walls of the canyon all the way to the river.

Look at the image below taken by NASA of the lava flows around the Grand Canyon. Think about how lava flows can affect the Grand Canyon and consider a model that can show this event. Then, complete the activity that follows.

**Digital:**
- Concept 4.1: Breaking Down and Moving Rocks: Chemical and Mechanical Weathering: ca4617s

**Print:**
- SE Pages: Concept 3.2: Changing Landscapes: Visual Walkabout: p. 64-65

**Digital:**
- Concept 3.2: Changing Landscapes: Visual Walkabout ca4632s
### Component

**F4. Presence of a Logical Sequence of Learning.**

### Strengths

**Concept Level Sequence Examples:**

Students are introduced to grade appropriate, linked phenomena, that are developmentally scaffolded and in a logical sequence to facilitate engagement in the three dimensions to drive students toward the learning goals.

Unit 3: Concept 3.4: Volcanoes: This concept provides an example of the sequence of concepts. Throughout Explore, students complete a series of activities where they identify investigate how volcanoes are formed. In Activity 8, they analyze various images of volcanoes using robust digital content that makes Discovery Education stand out from other programs. They utilize the CCC of cause and effect which they then carry into a hands-on activity in Activity 9. Students develop a volcano model with lava using cake batter while in Activity 10, they read, write and think like a scientist as they learn about what volcanologists do. Finally, in Activities 11 and 12, focusing on the CCC of patterns, students investigate and analyze different types of volcanoes using engaging multimedia.

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### Citations

- [Concept Level Sequence Examples](#)
## Designed for CA NGSS: Monitoring Student Progress

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<thead>
<tr>
<th>Component</th>
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| SP1. Quality of supports for monitoring 3D learning and EP&Cs integration. | **Assessments are designed to:**  
  • ensure that students use SEPs integrated with DCIs and CCCs to demonstrate their understanding of phenomena and/or design solutions to problems.  
  • connect student learning experiences to the targeted learning goals.  
  • elicit observable evidence of students’ knowledge of and ability to use grade-level-appropriate elements of the three dimensions.  
  • ensure that students use EP&Cs where applicable to demonstrate their understanding of environmental phenomenon/problem solution. | Student Work Tagged by SEP and CCC throughout the Wonder, Learn and Share instructional activities for both Teacher and Student:  
  Grade 4: Unit 3: Earth’s Changing Surface  
  • Digital: Learn Tab: [https://tinyurl.com/mappinglandforms](https://tinyurl.com/mappinglandforms)  

California Science Techbook fosters a dynamic classroom environment where students interact with printed text, digital resources, and hands-on activities, all which create three-dimensional learning experiences. Each concept in California Science Techbook purposefully layers each dimension of the NGSS, so students can authentically demonstrate the SEPs and CCCs. Student progression against all three of the dimensions can be achieved through a system of assessment opportunities.

PBA Teacher Guides with Sample Student Responses  
Digital: [https://tinyurl.com/PBAStudentResponses](https://tinyurl.com/PBAStudentResponses)
### Component: Quality of supports for monitoring 3D learning and EP&Cs integration.

<table>
<thead>
<tr>
<th>Strengths</th>
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<tbody>
<tr>
<td><strong>Unit Level Alignment:</strong> Performance-Based Assessments (PBA):**</td>
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<tr>
<td>Students demonstrate three-dimensional learning through multiple three-dimensional prompts associated with a common scenario. Teacher Guides for each PBA describe the multidimensional nature of each item and provide sample student responses.</td>
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<tr>
<td><strong>Concept Level Alignment:</strong> Teacher Dashboard: Real Time Data &amp; Differentiation</td>
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<tr>
<td>Each activity is tagged by SEP and CCC designations for both the teacher and the student to help them focus on the evidence of the dimension within the activity.</td>
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Throughout the learning progression, each tab of each concept includes Technology Enhanced Items that have students connect to what they already know about the topic (Wonder), and then as they progress, to monitor what they do learn as they explore and learn through a variety of multimodal resources (Learn, Share). Students receive feedback on their knowledge, and the teacher has real-time access to this data in the Dashboard. This real-time data allows teachers to remediate, accelerate or reinforce learning as needed, in order to help students develop metacognitive abilities.

Based on this real-time data, teachers can then make decisions about the needs of each student and select an appropriate instructional resource within the concept to meet the students’ needs. Discovery Education Experience resources deepen the pool of assets that can be assigned to students.
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<tr>
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<tbody>
<tr>
<td>SP1. Quality of supports for monitoring 3D learning and EP&amp;Cs integration.</td>
<td>In addition to the full Dashboard, teachers have a Results View for all individual Technology Enhanced items at point of use as well. <strong>Builder Tools:</strong> Assessment Builder and Discovery Studio give teachers flexibility to create customized assessments. <strong>Hands-on Activities and Hands-on Labs:</strong> Essential to the integration of a majority of science and engineering practices, hands-on activities and labs allow students to design and conduct investigations, develop models, and use the crosscutting concepts to reflect on their learning through the analysis and conclusion questions accompanying each activity. The student investigation sheet in the digital product purposefully does not provide the procedures for the investigation to encourage students to develop their own methods and processes. Scaffolded student sheets are provided in print if students require more scaffolding with the specific SEP or CCC being addressed in the activity.</td>
<td><strong>PBA Teachers Guide:</strong> Digital: <a href="https://tinyurl.com/TGEarthquakesPBA">https://tinyurl.com/TGEarthquakesPBA</a></td>
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<tr>
<td>Component</td>
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</table>
| SP1. Quality of supports for monitoring 3D learning and EP&Cs integration. | **Online Interactive Models:** Students have the opportunity to manipulate various online models found in every concept to collect data and test out their ideas. The analysis of the data collected from the interactives serves as an assessment opportunity for teachers and student reflection. | Performance-Based Assessment  
**Grade 4: Earthquakes**  
**Ready for the Big One?**  In this performance-based assessment (PBA), students are presented with text and data related to the seismic risk level of California, its relationship to the San Andreas Fault, and the history of earthquakes in Los Angeles. Students analyze the data, use tools and resources provided for their investigation, and present their conclusions to the class. The PBA is designed to assess students' ability to collect and analyze data, apply problem-solving skills, and communicate effectively. The assessment is linked to the NGSS standards. Students are required to complete the PBA during the course and submit it with the information provided by the state or city. The completion of each task supports students in the assessment cycle.  |
<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP1. Quality of supports for monitoring 3D learning and EP&amp;Cs integration.</td>
<td><strong>STEM Project Starters:</strong> Options for students to further elaborate on the disciplinary core ideas through the application of various SEPs and CCCs can be found in the STEM Project Starter section under Beyond as well as in the STEM Connect resource within the Science Techbook bundle. Many of the STEM Project Starters allow students the opportunity to dive deeper into the CA EP&amp;C and research related topics or design engineering solutions to problems related to the environment.</td>
</tr>
</tbody>
</table>

**Erosion** can cause land to shift and change. Park rangers work to maintain the natural beauty and flora in parks. Erosion can threaten this natural beauty and flora. As a result, some park rangers are responsible for maintaining land to prevent erosion. This takes many forms: designing trails so that they do not contribute to erosion, building retaining walls, and devising other creative strategies. In the activity below, you will try to prevent erosion at a local park.
### DISCOVERY EDUCATION NGSS TIME RESPONSE

<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
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</table>
| SP2. Quality of capturing student progress over time. | **Assessments are designed to:**  
- ensure that students use SEPs integrated with DCIs and CCCs to demonstrate their understanding of phenomena and/or design solutions to problems.  
- connect student learning experiences to the targeted learning goals.  
- elicit observable evidence of students’ knowledge of and ability to use grade-level-appropriate elements of the three dimensions.  
- ensure that students use EP&Cs where applicable to demonstrate their understanding of environmental phenomenon/problem solution. | **Student and Teacher Learning Dashboards**  
Video of Dashboard functionality:  
- [https://tinyurl.com/y4chmhbz](https://tinyurl.com/y4chmhbz)  
- Step By Step Guide to the Assessment Builder:  

California Science Techbook is an interactive, digital resource designed to provide students with multimodal content to enhance and personalize the learning experience. The entire Wonder, Learn, Share (5E) learning cycle described in previous responses utilizes digital content to construct meaningful, interactive lessons—with embedded assessment.

Examples of these formative and summative types of assessments include, but are not limited to:

**Multidimensional Technology Enhanced Items (TEIs)**  
TEIs have been embedded throughout each concept to uncover what students know and allow students to demonstrate three-dimensional proficiency of the academic standards. Student responses feed directly to
<table>
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<tr>
<th>Component</th>
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</thead>
<tbody>
<tr>
<td>SP2. Quality of capturing student progress over time.</td>
<td>the Teacher Dashboard, providing instant access to data to inform instruction. Each TEI has three distinct features: an evidence statement, instructional feedback, and scoring expectations.</td>
<td>Digital: ca4633s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Agree</th>
<th>Disagree</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>The bigger the stream, the more erosion it causes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rivers erode rocks and can form valleys and canyons.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Canyon walls are not very tall and have gentle slopes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A canyon is a type of valley.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rivers can change a landform very slowly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fast-moving rivers can cause a lot of erosion.</td>
</tr>
</tbody>
</table>

**Assessment Builder**
Discovery Education’s Assessment Builder offers a unique opportunity to effectively assess individual student performance, both on the part of the teacher and for student self-assessment. The Assessment Builder tool also provides remediation content suggestions for areas in which students may need further work. Class and individual reports serve as a
<table>
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<th>Component</th>
<th>Strengths</th>
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</thead>
<tbody>
<tr>
<td>SP2. Quality of capturing student progress over time.</td>
<td>A mechanism to measure performance easily in all content areas, provide feedback, and inform educators how to best support individual student growth and improvement. Teachers can utilize pre-created concept and unit assessments or create their own, including standards-based assessments and teacher-created items.</td>
<td></td>
</tr>
</tbody>
</table>

Because the assessment of students is an ongoing process that occurs throughout each lesson, other formative and self-assessment types are embedded throughout digital and print lessons in order to provide benchmarks that show student progress in preparation for the final measure, the summative assessment. Constructed response items, hands-on lab worksheets, and Scientific Explanation sheets include rubrics for scoring, visible to teacher and student. Online responses are compiled and displayed for teachers in a dashboard. Names can be removed from the dashboard and the response order randomized so that responses can be used for class discussion and the selection of student exemplars. The Teaching Learning Dashboard...
<table>
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<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
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<tbody>
<tr>
<td>SP2. Quality of capturing student progress over time.</td>
<td>in California Science Techbook allows teachers to track student progress on assessment items, with easy-to-read color coding, also known as traffic light scoring.</td>
<td></td>
</tr>
</tbody>
</table>

The studio tool allows students to collect their evidence and progression throughout the course, as well as serve as a collaborative tool for students to share their work with their classmates and teachers. Templates within Studio, such as the scientific explanation, allow students to document their explanations over time. Students can use this evidence to reflect on their progression with the three dimensions.

**Teacher Reflection Questions:**
Within critical points in the learning sequence, teachers are provided with questions that ask them to reflect on the three-dimensional learning of their students. These reflection questions are found in both the digital and print teacher resources.

**Teacher Reflection**
- Did my students identify the appropriate cause for an object to be in and change motion?
- What misconceptions do my students have at this point in the course?
- Are any of my students ready for extension at this point in the lesson?

---

**Hurricanes: Katrina**

**Strategy: Tweet, Tweet!**

**DIRECTIONS**
- Today you will participate in a Twitter chat about events surrounding Hurricane Katrina.
- As you watch the media below, think about what information you would have included in your conversation.
- Remember, Tweets should be short. They should have approximately 140 characters but no more than 280 characters.
- Join the thread by adding your own tweet in response to the initial message and replies on the board. Remember, these social media posts have limited characters, so be concise. You may also want to @ another real or imagined user, or include relevant hashtags.
<table>
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</table>
| **SP3. Quality of guidance and tools that use a variety of measures.** | Assessments are matched to targeted learning goals and elicit a full range of student thinking by:  
• providing clear expectations (e.g., rubric) to students so they understand how they can demonstrate their knowledge.  
• using a variety of measures (e.g., performance tasks, discussion questions, constructed response questions, project- or problem-based tasks, portfolios, and justified multiple choice).  
• providing set(s) of tasks so that students can demonstrate their understanding of the same learning goals in multiple ways. | **Summative Assessments**  
**Grade 4: Unit 3: Earth’s Changing Surface**  
Digital: [https://tinyurl.com/phenomenonassessment](https://tinyurl.com/phenomenonassessment) |

**Discovery Education Evidence:**  
Discovery Education supports students throughout their learning journey, with an end goal of students achieving proficiency in defined learning goals. Within the Discovery Education Comprehensive Science Program, varied formative and summative assessments are embedded into the Wonder, Learn, Share (5E) learning cycle for each concept, along with assessments at the unit level.  

**Learning Targets:**  
Every concept in the Student Edition begins with learning targets written in the form of “I Can” statements. These are used to articulate clear learning expectations for students.  

**Scientific Explanations:**  
**Grade 4: Unit 4: Earthquakes**  
- Print: SE: Concept 4.1: Analyze: Faults
**Component**  | **Strengths** | **Citations**
---|---|---
SP3. Quality of guidance and tools that use a variety of measures. | Various Measures: There are a variety of measures throughout California Science Techbook that allow students to demonstrate their learning. Examples of these various assessments include, but are not limited to: |

**Technology Enhanced Items (TEIs)** in each concept allow students to demonstrate three-dimensional proficiency of the performance expectations. Student responses feed directly to the Teacher Dashboard, providing instant access to data to inform instruction. Each TEI has built-in scaffolded feedback for students, and a variety of TEI types that are aligned to the CAST item types are integrated across each concept.

**Student Learning Objectives**

By the end of this concept,

- I can explain where earthquakes occur based on patterns in plate tectonics.
- I can analyze data to locate earthquakes and model patterns of where earthquakes occur.
- I can describe the data sources and technologies scientists use to predict earthquakes.
- I can interpret patterns in rock formations to explain why earthquakes have occurred in the past.
- I can reason to predict which plate boundaries might experience strong earthquakes and which plate boundaries might remain stable.

**Can You Explain?**

In this concept, you will uncover what causes earthquakes and how they impact people and landscapes. Begin by selecting the Wonder tab.

**What Are Earthquakes, and Where Do They Happen?**

**Faults**

As their name suggests, earthquakes are the shaking of the earth. Most earthquakes are of short duration—less than a few minutes. Many last only a few seconds. This is because they are produced by a sudden release of energy. This release of energy normally occurs when there is movement in Earth’s crust. Usually, this movement occurs along cracks in Earth’s crust. These cracks are called faults. The energy from this sudden movement spreads out from the fault.

- Digital: Concept 4.1: Analyze: Faults Quick Code ca4763s
**Component** | **Strengths** | **Citations**
--- | --- | ---
SP3. Quality of guidance and tools that use a variety of measures. | 

**Earthquake Zones**

While earthquakes occur along all plate boundaries, some types of boundaries are more likely to cause strong earthquakes. Examine the map of tectonic plates. The arrows indicate which direction each plate is moving. Select all of the areas that are likely to have strong earthquakes.

Select the objects by clicking on the title. Clicking on a selected object will deselect it.

- **Summative Assessments** are in each concept’s Share section, with their results displayed in the Teacher Dashboard. These assessments include multiple types of TEIs, including drag and drop, select all that apply, and read and highlight items, to name a few. Teachers are able to identify areas of strength and weakness on each assessment for each student and subsequently provide remediation to ensure the achievement of proficiency for all students.

- **Scientific Explanation Teacher Rubric:** [https://tinyurl.com/y6mmhlhrz](https://tinyurl.com/y6mmhlhrz)
### DISCOVERY EDUCATION NGSS TIME RESPONSE

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**Scientific Explanations:**
Scientific Explanations allow students to analyze complex text and authentic data and evaluate information to support a student-generated claim. Following the Claim-Evidence-Reasoning format, students and teachers can review and provide feedback to one another to increase the rigor of the response throughout a concept, unit, or course.

**Hands-On Activities and Hands-On Labs (HOAs and HOLs)** provide opportunities for students to demonstrate the science and engineering practices and analyze data to look for evidence of crosscutting concepts. Based on the proficiency of the students, teachers can determine the appropriate amount of scaffolding to provide. Analysis and conclusion questions allow students to reflect on their learning.

**STEM Connect** projects use an interdisciplinary approach to push students to seek solutions to important real-world challenges such as sustainable farming, water conservation and other environmental critical issues. STEM Connect is built using a 4Cs STEM framework to allow students to develop the 21st-century skills of creativity, critical thinking, problem-solving, and collaboration.

**Hands-On Activities and Hands-On Labs**
Grade 4: Unit 3: Earth's Changing Surface
- Print: SE: Page 31-33
- Concept 3.1: Hands-On Activity: Glacial Erosion
<table>
<thead>
<tr>
<th>Component</th>
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<tbody>
<tr>
<td>SP3. Quality of guidance and tools that use a variety of measures.</td>
<td>communication, and collaboration. Using STEM Connect projects to assess students’ science learning provides the teacher with set(s) of tasks so that students can demonstrate their understanding of the same learning goals in multiple ways. <strong>Assessment Tools</strong>, including Discovery Experience Resources, provide teachers and students with ample resources not only to build different types of assessments but also to provide students with a unique set of tools that allows them to demonstrate their learning in unique ways. Tools like Assignment Builder, Assessment Builder, Writing Prompt Builder, and Discovery Studio give teachers flexibility to create customized assessments. Discovery Education’s Studio also provides students with a “digital poster” to make their learning collaborative and public while also using the 200,000 Experience robust digital content assets to build, enhance, and enrich their understanding.</td>
<td>Digital: Concept 3.1: Hands-On Activity: Glacial Erosion Quick Code ca4620s</td>
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<tr>
<td>Component</td>
<td>Strengths</td>
<td>Citations</td>
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<tr>
<td>SP3. Quality of guidance and tools that use a variety of measures.</td>
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<td><strong>STEM Connect</strong></td>
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<td>• Grades 4-5: Water: Buckets, Barrels, and Bathtubs:</td>
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<td><a href="https://tinyurl.com/STEMSolutionSeekers">https://tinyurl.com/STEMSolutionSeekers</a></td>
</tr>
</tbody>
</table>
Assessments are designed to be:
- free from bias (e.g., gender, racial, socioeconomic status, cultural).
- accessible to all students (e.g., reading level, accommodations).

Assessment items developed for California Science Techbook allow all students the ability to demonstrate their disciplinary core knowledge. Math tools such as the scientific calculator, unit converter, and graphing calculator are available for use at all times by students, including in the unit-level performance-based assessment (PBA). The students do not need to access prior experiences to complete the unit assessments and are provided with all necessary text and factual information needed to meet the intent of each item.

Summative unit-level performance-based assessments are available in Spanish. For Technology Enhanced Items (TEIs) within each concept, the adaptability of the Discovery Education platform to work with Google Translate allows students to access additional languages beyond Spanish.
**Component**  
SP5. Quality of use of formative and summative assessments.

**Strengths**  
The materials provide self- or peer-assessments that allow students to reflect on and monitor their learning over time.

Students can monitor their progress across a course using the student level dashboard. The dashboard includes color-coded, or traffic light scoring, for each technology-enhanced item found within a concept.

As students progress through concepts, there are many opportunities that are provided for reflection throughout the Student Edition. Teacher embedded notes throughout also guide students to reflect on their new thinking.

**Citations**  
Grade 4: Unit 3: Earth’s Changing Surface  
Print:  
- Digital: Quick Code ca4653s

Grade 4: Unit 3: Earth’s Changing Surface  
Print:  
SE: Concept 3:1 Can You Explain?: Breaking Down and Moving Rocks: pg. 8-9  
- Digital: Quick Code: ca4610s
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<th>Component</th>
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<th>Citations</th>
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<tbody>
<tr>
<td>SP5. Quality of use of formative and summative assessments.</td>
<td>Additionally, students can reflect on their growth in the development of scientific explanations constructed during the Explain portion of each lesson. Students will learn to increase the rigor and relevance of the evidence embedded within their explanations. The “your ideas” item found in Wonder (Engage) under the Can You Explain (CYE) question allows students to record initial ideas or responses to the questions. Students can compare their initial responses after constructing their explanations in Share (Explain). Students can review and provide feedback to one another throughout. The Discovery Education Studio creation tool allows students to create portfolios of their work over a course, unit, or concept. Students can collaborate with other students using the Studio tool, as well as share examples of their work with the teacher and their classmates.</td>
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### Component

**TS1. Phenomena/problems Driven Three-Dimensional Learning.**

### Strengths

Teacher materials provide background information about the phenomena or problems included in the learning sequence and across sequences provide:

- an explanation of the role of phenomena or problems in driving student learning.
- rationale for why the unit phenomena or problems were selected for the targeted DCIs, SEPs, CCCs, and EP&Cs (when applicable).

Anchor and Investigative Phenomena were identified for each unit and concept based on their ability to demonstrate the disciplinary core ideas of the required performance expectations of the instructional segment bundles. Writers of California Science Techbook also considered the age appropriateness of topics to select real-world phenomena that would engage students within each grade level.

**Unit Level Support:**

Within each Unit, a real-world anchor phenomenon piques students’ curiosity and sets a purpose for learning across concepts. A Unit Project, expects students to return to the anchor phenomenon to summarize learning across the Unit Storyline. In the print Teacher Edition, teachers are provided with several options on how to use the anchor phenomenon to engage students with asking questions and defining problems. Print and digital teacher supports also provide Unit Storylines and conceptual maps as

### Citations

**Three Dimensions at a Glance**

**Grade 4: Unit 3: Earth’s Changing Surface**

- Print: TE
  - Three Dimensions at a Glance: pg. 4-5

![Three Dimensions at a Glance](image-url)
<table>
<thead>
<tr>
<th>Component</th>
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<tbody>
<tr>
<td>TS1. Phenomena/ problems Driven Three-Dimensional Learning.</td>
<td>resources of how the concepts build upon one another, related to the Anchor Phenomenon and the Unit Project. The Unit Outline digitally also allows teachers to quickly view the PEs associated with the investigative phenomena for each concept. <strong>Concept-Level Support:</strong> Each concept begins with a smaller, real-world investigative phenomenon allowing students to dive into the remainder of content across Wonder, Learn, Share, looking for evidence to explain the investigative phenomenon. Teachers are supported through the use of embedded teacher notes and additional strategies found in the print Teacher Edition. For example, the first teacher note found in Wonder (Engage) provides a strategy to utilize with students. A teacher can use the Can You Explain? question as a frame for learning or can encourage students to develop their own questions to explore within the concept. In California Science Techbook teachers receive additional support through teacher notes. Point-of-use teacher notes within each tab, additional assessments, student misconceptions, background material, and more are visible by turning on the Teacher View toggle.</td>
<td><strong>Anchor Phenomenon</strong>  Grade 4: Unit 3: Earth's Changing Surface  Print: TE: Anchor Phenomenon: The Grand Canyon from Space: pg. 22-23  <strong>Unit Storyline and Outline</strong>  Grade 4: Unit 3: Earth's Changing Surface  Print: TE:  - <strong>Unit Storyline</strong>: Breaking Down and Moving Rocks: pg. 19</td>
</tr>
</tbody>
</table>
### TS1. Phenomena/problems Driven Three-Dimensional Learning

Activities. These strategies help both the teacher and student focus on the components of the phenomenon related to the associated DCIs for the concept.

**Teacher Guides:**
Throughout the entire 5E learning cycle, students will be exposed to activities expecting them to generate explanations or solve problems. For the scientific explanation activity found in Share (Explain), as well as all Hands-on Activities, additional detailed teacher guides support teachers in successfully preparing and carrying out the activity with their class.

**Three-Dimensional Learning Supports:**
California Science Techbook includes several tiers of support to assist teachers with planning three-dimensional learning experiences. Explicit guidance for three-dimensional learning is included throughout the print Teacher Edition and the digital notes.

NGSS standard indicators are noted at both the unit and concept level to guide teacher planning.

**Unit-Level Support**
- Unit Storyline and Outline: includes an overview of the instructional segment
- NGSS Chart: PEs listed by concept
- Three Dimensions at a Glance Chart: SEP, DCI, and CCC by concept
- ELA, ELD, and Mathematics Standards
- California Environmental Principles and Concepts

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<td>TS1. Phenomena/problems Driven Three-Dimensional Learning.</td>
<td>activities. These strategies help both the teacher and student focus on the components of the phenomenon related to the associated DCIs for the concept. <strong>Teacher Guides:</strong> Throughout the entire 5E learning cycle, students will be exposed to activities expecting them to generate explanations or solve problems. For the scientific explanation activity found in Share (Explain), as well as all Hands-on Activities, additional detailed teacher guides support teachers in successfully preparing and carrying out the activity with their class. <strong>Three-Dimensional Learning Supports:</strong> California Science Techbook includes several tiers of support to assist teachers with planning three-dimensional learning experiences. Explicit guidance for three-dimensional learning is included throughout the print Teacher Edition and the digital notes. NGSS standard indicators are noted at both the unit and concept level to guide teacher planning. <strong>Unit-Level Support</strong> - Unit Storyline and Outline: includes an overview of the instructional segment - NGSS Chart: PEs listed by concept - Three Dimensions at a Glance Chart: SEP, DCI, and CCC by concept - ELA, ELD, and Mathematics Standards - California Environmental Principles and Concepts</td>
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<td>Component</td>
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</table>
- Learning Objectives driven by the expectations of the NGSS  
- Days of Instruction:  
  - Bolded text highlights the dimensions of the PE addressed during each activity  
  - Activity-level SEP and CCC integration  
  - Pathways for Learning guidance for a variety of technology settings  
  - Teacher reflection questions encourage reflection on students' performance across the three dimensions of NGSS  
  - Embedded Teacher Notes describe strategies on how to create a three-dimensional experience for students  
  - Differentiation Strategies to support a variety of learners | |

Concept at a Glance

<table>
<thead>
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<th>Location</th>
<th>Description</th>
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<tbody>
<tr>
<td>Wonder</td>
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</tbody>
</table>
- Engage: Students reflect on how water can change things and their experiences with things wearing down in their everyday life. Students begin to formulate ideas around the Can You Explain? question.  
- Learn: Students investigate questions about the characteristics of rocks, erosion, and weathering. Students complete Hands-On Activities and an interactive about erosion.  
- Explore: Students conduct scientific explorations to the Can You Explain? question by investigating evidence of how wind, water, and weather affect Earth's surface.  
- Elaborate: Students apply their understanding of weathering and erosion as they learn about weathering and erosion.  
- Evaluate: Students compare the processes of weathering and erosion and communicate how these processes change Earth's surface. |

Concept Pacing Options
Grade 4: Unit 3: Earth's Changing Surface  
Print: TE:  
- Pacing Options: Breaking Down and Moving Rocks: pg. 30
### Component

**TS1. Phenomena/ problems Driven Three-Dimensional Learning.**

### Strengths

### Citations

**Investigative Phenomena**

Grade 4: Unit 3: Earth’s Changing Surface

Print: TE:

- Investigative Phenomena: On a Tropical Beach: pg. 110-111
- Digital: Quick Code: ca4647s
### DISCOVERY EDUCATION NGSS TIME RESPONSE

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<thead>
<tr>
<th>Component</th>
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</thead>
</table>
| TS2. Coherence | Teacher materials describe and provide a rationale for the conceptual framework and sequence of ideas, practices, and learning experiences in the learning sequences and for across sequences:  
- strategies for linking student experiences across lessons to ensure student sense-making and/or problem-solving focused on phenomena or problems is linked to learning across all three dimensions.  
- connections to other science domains, nature of science, engineering, technology, and applications of science, math, ELA, and EP&Cs (when applicable). | Course Level Alignments:  
https://tinyurl.com/y5ub84nk |

California Science Techbook provides for coherence by:  
- limiting the topics covered to the topics identified in NGSS  
- arranging experiences so that student understanding grows over the course of the unit.  
- connecting concepts over the course of the year and from one year to the next.  

Because the courses in California Science Techbook were designed to address the requirements of NGSS, they include the core ideas, science and engineering practices, and crosscutting concepts that are identified in NGSS for a given grade. California Science Techbook addresses no more and no less than the content specified within NGSS while expanding the time and depth devoted to the core concepts.  

California Science Techbook provides for coherence by

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Course Level Alignments:  
https://tinyurl.com/y5ub84nk

Grade 4: Unit 3: Earth’s Changing Surface  
Unit Page:  
Print: TE:  
- Scope & Sequence Overview: xxxviii-xl ix
<table>
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<tbody>
<tr>
<td>TS2. Coherence.</td>
<td>arranging topics so that student understanding grows over the course of a lesson and by connecting ideas from one lesson to another. Each Wonder, Learn, Share (5E) model lesson is designed for multiple sessions.</td>
<td></td>
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<tr>
<td></td>
<td>The print Teacher Edition for California Science Techbook supports teachers as they plan their instruction to build upon the appropriate progressions related to all three dimensions of the standards.</td>
<td></td>
</tr>
</tbody>
</table>
|                    | **Unit Level Support:**  
|                    | **Three Dimensions at a Glance:**  
|                    | Shows how each concept is aligned to the three-dimensional components of the performance expectations found within the unit.                                                                                      |           |
|                    | **Scope and Sequence:**  
|                    | Includes NGSS learning progression charts indicating the previous and next grade level progression based on the standards for the concept, as well as the unit storylines across the course.                          |           |
|                    | **NGSS Overviews:**  
|                    | Provides breakdowns of the performance expectations for the concept, as well as the ELA, ELD, and Math Standards, and California Environmental Principles associated with the Performance Expectation.               |           |
- SE: see SE referenced pages in TE for additional evidence  
  - Digital: Unit Page: Enter Quick Code: ca4605s |           |
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<td>TS2. Coherence.</td>
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<td>Concept 3.1: p. 20</td>
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<td>Investigative Phenomenon: p. 36-37</td>
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<td>Concept 3.2: p. 96</td>
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<td></td>
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<td>Investigative Phenomenon p. 100-101</td>
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<td>Component</td>
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</tr>
<tr>
<td>TS2. Coherence.</td>
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</tbody>
</table>

**SE:**
- Concept 3.1: p. 10-11
- Concept 3.2: p. 52-53
  - Digital:
    - Enter Quick Codes on digital Course page to be taken directly to the pages
      - Concept 3.1: ca4610s
      - Concept 3.2: ca4628s

**PBA example: Digital:**
https://tinyurl.com/phenomenonassessment
### Component: TS3. Effective Teaching

Teacher materials support the use of and provide a rationale and evidence of effectiveness for strategies that:

- support students in learning through authentic and meaningful phenomena or design problems.
- support student learning across the three dimensions.
- make student thinking visible; promote reasoning, sense-making, and problem-solving; challenge student thinking; and develop metacognitive abilities.

California Science Techbook digital and print, was designed and developed to meet the needs of students and to provide guidance and flexibility for teachers to use in a variety of classroom settings.

### Pacing and At a Glance Guides:

The print Teacher Edition includes pacing guides and flexible pathways for optimal instruction in any instructional setting. The “At a Glance” supports, provide teachers with quick overviews as they prepare for instruction ahead of time.

### Days of Instruction:

Instruction is presented in 20-minute segments by day. The NGSS performance expectations for the day are also featured with the specific aspects of each standard covered that day in bold. Daily and Activity Based Instructional Focus statements provide three-dimensional learning targets.

### Concept at a Glance: Changing Landscapes

- **Concept at a Glance**: Changing Landscapes: pg. 90-92
<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
</tr>
</thead>
</table>
| TS3. Effective Teaching.         | **Supporting 21st Century Learners:** Through every step of the learning cycle, California Science Techbook features diverse and rich multimedia resources: video, images, audio, interactives, virtual labs, online models, animations, rich informational text, and more. Marquee Discovery Education content, including MythBusters, Street Science, and Outrageous Acts of Science, blend entertainment with education to motivate students to investigate real-world phenomena. Virtual labs and online models allow students to quickly manipulate variables to test out their ideas in an online environment. Pathway to Learning charts provide options for teachers to deliver three-dimensional instruction in a one to one, blended or print based classroom.  

**Teacher Notes with Strategies:** Detailed teacher notes, for each activity, make the connection between the high-quality digital assets and activities and the SEPs and CCCs explicit for teachers through instructional guidance. Strategies elicit student thinking and guide teachers in how to design a three-dimensional learning environment. Research-based instructional strategies, such as the Discovery Education Spotlight on Strategies (SOS), promote scientific discourse around the investigative and anchor phenomenon. SEP and CCC indicators are included for activities found in each day of instruction in the both print and digital. | Concept Pacing Options  
Grade 4: Unit 3: Earth’s Changing Surface  
Print: TE:  
- Pacing Options: Mapping Landforms: pg. 168 |
**Component**: TS3. Effective Teaching.

**Activities:**
Activity Type headers allow teachers and students to quickly identify opportunities for asking questions related to the phenomenon, communicating sensemaking, and solving problems.

- **Ask Questions Like a Scientist**: Students are presented with the investigative phenomenon and expected to generate their own questions to drive their learning in Learn/Explore.
- **Observe Like a Scientist**: Students utilize scientific discourse around “Talk Together” questions to communicate their sensemaking.
- **Record Evidence Like a Scientist**: Students reason through the evidence they have collected in Learn/Explore to construct and communicate a scientific explanation to one of their own driving questions or the Can You Explain question.
- **Design Solutions Like a Scientist**: Students are presented with design challenges and expected to research, design, test and propose solutions.

**Teacher Reflection Notes**
Grade 4: Unit 3: Earth’s Changing Surface
Print: TE:
- Hands-On: Major Landforms on Earth: pg. 188-190
- Digital: Quick Code: ca4653s
### TS3. Effective Teaching.

#### How Are Volcanoes Formed?

**Activity 1 | Observe Like a Scientist | How Are Volcanoes Formed?**

- **Visual Literacy:**
  - 35 mins
  - Struck at Edition Pages 146-157
  - Cause and Effect

In this activity, students analyze various images of volcanoes and volcanic eruptions to identify the cause and effect relationships of volcanic activity and features of the earth.

**Activity 2 | Observe Like a Scientist | Investigate Like a Scientist**

- **Hands-On Investigation: Cake Better Love**
  - 30 mins
  - Struck at Edition Pages 158-171
  - Developing and Using Models
  - Patterns

In this activity, students develop a model using cake batter to simulate the patterns of lava flows.

3.4.E1.7 - Use the evidence to support your hypothesis.
4.4.E2.7 - Examine and interpret data from maps to describe patterns of the Earth's surface.
4.4.E3.1-2 - Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

#### Teacher Reflection Questions:

Throughout each concept, professional learning questions encourage teachers to consider how activities have developed SEP and CCC proficiency with their students and how they may modify the activity to better meet the needs of their students.

**Teacher Reflection**

- Are students able to explain that forces are acting on an object not in motion and explain what happens to start it moving?
- Can students define and provide examples for balanced and unbalanced forces?
- Do students understand that when multiple forces move in the same direction, they combine?
<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
</tr>
</thead>
</table>
| TS3. Effective Teaching.          | **Quick Digital Access:** Throughout the print Student and Teacher Editions, QR Codes and short links indicate opportunities to deepen learning through rich media and/or allow students to access content in a blended print and digital environment.  
**Professional Learning Center:** The Professional Learning Center in California Science Techbook is an additional deep and rich resource for teachers to participate in interactive courses, see other Discovery Education teachers’ classrooms, and access the online DEN community. The DEN online community is a global platform where teachers can learn, share, and connect with other educators. |           |

**Teacher materials provide an array of strategies:**
- to support student access to the targeted learning goals, experiences, and performances.
- that help teachers differentiate instruction.

California Science Techbook California allows teachers to differentiate instruction, degrees of readiness, and interests and offers resources to help vary content, process, product, and learning environment through the core instructional pathway.

**Content-Specific Differentiation Strategies:**
Within the Print Teacher Edition and Digital Teacher notes, teachers are provided with differentiation strategies, including scaffolded support for English language learners, struggling students, and advanced students, specific to the concept and that include reference to the use of multimedia assets. These differentiation strategies are provided at point of use.

**Student Interactive Worktext Tools:**
- Text read-aloud features
- Lexile and language options
- Highlighting and note-taking
- Interactive glossary

### Citations

**ELD Support**
Grade 4: Unit 3: Earth’s Changing Surface
Print: TE:
- ELD Support: Volcanoes: pg. 249
<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
</tr>
</thead>
</table>
| TS4. Support for Students with Diverse Learning Needs.                   | Accommodate the differences in learners through student-centered instruction: Features such as high-quality graphics and videos, game play, virtual labs, and robust STEM challenges motivate students to think deeply about topics that are traditionally taught through direct instruction, encouraging student-centered instruction and supporting teachers as learning facilitators. Stress the collectivity of interactions as well as individuality: Throughout California Science Techbook, learning experiences are designed for student collaboration and individual exploration. Hands-On Activities, Talk Together and STEM Project Starters provide opportunities for students to work together, while technology enhanced items encourage individual accountability. California Science Techbook seamlessly incorporates Universal Design for Learning (UDL) principles, so students can access and create content and communicate their ideas using multiple means of representation. Expansive Content to Reach All Learners: The Beyond tab provides a variety of additional resources that can be used to differentiate by accelerating or remediating as needed. These related resources include the following: videos, Lexile-leveled reading passages, virtual labs, and editable Hands-on Activities/Labs. | Pathways for Learning  
Grade 4: Unit 3: Earth’s Changing Surface  
Print: TE:  
- Pathways to Learning: Changing Landscapes, pg. 151 |

**Pathways to Learning**  
Grade 4: Unit 3: Earth’s Changing Surface  
Print: TE:  
- Pathways to Learning: Changing Landscapes, pg. 151  

<table>
<thead>
<tr>
<th>Pathways to Learning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print</td>
<td>As a class, have students share what they know about landforms. Follow the discussion to deltas, sand dunes, canyons, and rivers. With the three assessment questions together. How will the students understand the formation of canyons, deltas, and sand dunes? Do they understand the role that wind, water, and ice play in the formation of landforms? As a concluding activity, have the students make up their own quiz on the formation of landforms.</td>
</tr>
<tr>
<td>Blended</td>
<td>As a class, have students share what they know about landforms. Follow the discussion to deltas, sand dunes, canyons, and rivers. In groups of three, students will complete the online assessment. Prior to submitting their answers, all members of the group must agree on the answer choices.</td>
</tr>
<tr>
<td>Digital</td>
<td>As a class, have students share what they know about landforms. Follow the discussion to deltas, sand dunes, canyons, and rivers. Individually, each student will complete the online assessment. After completing the assessment, students can save a landform image to their content. After they place the image into Studio, they should explain how the landform was formed by wind, water, or ice.</td>
</tr>
</tbody>
</table>
## DISCOVERY EDUCATION NGSS TIME RESPONSE

<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
</tr>
</thead>
</table>
| TS4. Support for Students with Diverse Learning Needs. | Discovery Education’s Experience resource, which is also part of the adoption package, provides a repository of K–12, cross-curricular resources that can be used to differentiate and enhance learning for all students in the science classroom. **Assigning Features:** Teachers can tailor instruction and meet the needs of all students by assigning appropriate content based on specific learning preferences or developmental needs. In California Science Techbook teachers can quickly assign and share instructional resources to individual students, groups of students, or the entire class. **Modalities for Learning:** Although many students prefer to consume content in a digital manner, often a print-based experience can be more effective in helping them solidify content knowledge. California Science Techbook provides flexibility for teachers to select the most appropriate mode of delivery of content for students.  
  - **Print Student Edition:** The student consumable worktext is available for all students, Grades K–8, in both English and authentic Spanish.  
  - **Print Accessibility:** Within the toolbar in the digital Science Techbook, teachers can print a page or the entire concept with one click of a button.  
  - **Pathways for Learning:** Suggestions on how to utilize digital assets in a paper-based, blended, and fully digital classroom environment are provided for each concept in the print Teacher Edition. | Technology Enhanced Items  
  - Grade 4: Unit 3: Earth’s Changing Surface
  - Digital: Quick Code: ca4650s

### Beyond Tab: Additional Resource Library of Aligned and Lexile-Leveled Content for Differentiated Instruction
- Concept 2: Changing Landscapes
- Beyond Section: Digital: [https://tinyurl.com/Concept2Beyond](https://tinyurl.com/Concept2Beyond)
<table>
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<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS4. Support for Students with Diverse Learning Needs.</td>
<td><strong>Professional Learning:</strong> Teacher professional learning is bundled in the California Science Techbook program. The face-to-face and job-embedded professional learning sessions focus on getting started with and using the resources to meet the needs of all students through effective, differentiated instruction. These sessions also utilize the Spotlight on Strategies that are available in the Discovery Education Experience. These SOS are created by teachers, for teachers and now also include videos specifically for students on how they, too, can incorporate these strategies into their learning.</td>
<td><img src="Image1.png" alt="Image" /> <strong>Assigning Features:</strong> <em>Earthquake Causes and Impacts</em> <img src="Image2.png" alt="Image" /></td>
</tr>
<tr>
<td>Component</td>
<td>Strengths</td>
<td>Citations</td>
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<td></td>
<td></td>
<td>Discovery Educator Network (DEN)</td>
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<tr>
<td></td>
<td></td>
<td>Every day, members of your DEN Community are sharing new lesson plans, sharing best practices, benefitting from valuable resources, and connecting to peers and experts through personalized learning experiences.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="https://tinyurl.com/strategyAEIOU">Digital: https://tinyurl.com/strategyAEIOU</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Professional Learning</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SOS: AEIOU</td>
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<tr>
<td></td>
<td></td>
<td>Digital: <a href="https://tinyurl.com/strategyAEIOU">https://tinyurl.com/strategyAEIOU</a></td>
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<tr>
<td>Component</td>
<td>Strengths</td>
<td>Citations</td>
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</tbody>
</table>
| TS5. Support to Monitor Student Progress.     | **Materials provide support for teachers to monitor student learning and progress over time, make decisions about instruction, and provide feedback to students.** Teachers can easily monitor student progress in California Science Techbook through different modalities of instruction, such as Hands-on Investigations, Interactives and Technology Enhanced Items embedded within the Wonder, Learn, Share (5-E) learning cycle at point of use. Teachers can easily view the formative assessment opportunities in each concept by reviewing the Concept at a Glance information in the print Teacher Edition. Summative Unit level Assessments can be located in the digital program under the Unit Resources tab. These assessments are CAST-like in that they mirror the state assessment in format, task type and content, including questions that utilize at a minimum 2 of the 3 dimensions. The assessments items are launched through an engaging real-world application and require students to apply new content understanding. | **Formative Assessment** Grade 4: Unit 3:  
Print: SE:  
- Formative Assessment Item: Types of Weathering, pg. 17-19  
- Digital: Quick Code: ca4614s |

![Formative Assessment Image](image-url)
<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
</tr>
</thead>
</table>
| **TS5. Support to Monitor Student Progress.** | **Dashboard:** Teachers are equipped with a Dashboard on the right-hand side of the screen that shows all student answers to responses from the Technology Enhanced Items (TEIs) embedded in the Interactive Student Worktext. Throughout the learning progression, each tab of each concept includes Technology Enhanced Items that have students connect to what they already know about the topic (Wonder), and then as they progress, to monitor what they do learn as they explore and learn through a variety of multimodal resources (Wonder, Learn, Share). Students receive feedback on their knowledge, and the teacher has real-time access to this data in the Dashboard. This real-time data allows teachers to remediate and differentiate as needed in order to help students develop metacognitive abilities. Based on this real-time data, teachers can then make decisions about the needs of each student and select an appropriate instructional resource within the concept to meet the students' needs. Discovery Education Experience resources deepen the pool of assets that can be assigned to students. In addition to the full Dashboard, teachers have a Results View for all individual Technology Enhanced items at point of use as well. | **With Point of Use Dashboard and Clickable Rubric:**

**Summative Assessment**
- Digital: [https://tinyurl.com/volcanoessummative](https://tinyurl.com/volcanoessummative) |
<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
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</thead>
<tbody>
<tr>
<td>TS5. Support to Monitor Student Progress.</td>
<td><strong>Builder Tools:</strong> Assessment Builder and Discovery Studio give teachers flexibility to create customized assessments.</td>
<td><img src="https://tinyurl.com/y4chmhbz" alt="Image of Builder Tools" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="https://tinyurl.com/y4chmhbz" alt="Image of Student and Teacher Learning Dashboards" /></td>
</tr>
<tr>
<td></td>
<td></td>
<td><img src="https://tinyurl.com/y4chmhbz" alt="Image of Teacher “Traffic Light Scoring” Dashboard" /></td>
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</tbody>
</table>
## SW1. Quality of opportunities to explain phenomena/solve problems.

<table>
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<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
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</thead>
<tbody>
<tr>
<td><strong>Materials</strong> provide anchoring and investigative phenomena/problems that:</td>
<td><strong>Citations</strong></td>
<td></td>
</tr>
</tbody>
</table>
| • engage students as directly as possible in authentic and relevant experiences. | **Engage Investigative Phenomenon Examples**[
| • are matched to targeted learning goals. | [ensure that Teacher Presentation Mode is OFF by clicking the blue button in the bottom right corner. You will then see Blue Teacher notes.]: |
| • can be figured out/solved using scientifically accurate understandings and abilities. | **Grade 4: Unit 3: Earth’s Changing Surfaces** |
| • make connections beyond and to their daily lives including to their homes, neighborhoods, communities, local environment, and/or cultures. | **Print:** |

### Phenomena/Problems

The Unit Pages provide students direct access to the real world, relevant, Anchor Phenomena for the unit, as well as Investigative Phenomena for each concept found in the unit. The Unit pages are available both in print and digital. Students are engaged in real-world, often local and relatable phenomena using video, imagery, hands-on experiences, and other modalities.

As students move through the learning progression, the Anchor Phenomenon is connected to concept Investigative Phenomena, which will drive student explorations using the SEPs through the lens of the CCCs and wrap up with a real-world, relevant STEM Unit Project directly related to the anchor phenomenon. Students are encouraged to write their own questions, but phenomena are also paired with guided questions for scaffolding when appropriate.

- **Example:** Investigative Phenomena: Disappearing Sandcastles: pg. 10-11
- Digital: Quick Code: ca4610s
<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
</tr>
</thead>
</table>
| SW1. Quality of opportunities to explain phenomena/solve problems. | These questions serve as the purpose for learning in the concept and the prompt for students to construct a formal scientific explanation in Share/Explain using scientifically accurate evidence from the activities in Learn/Explore.  
The Phenomena and the STEM Unit Projects feature real world engaging connections to student’s daily lives, homes and communities and/or culture. Examples of these projects range from noticing water evaporating in a fish bowl to designing a water filtration device to reduce water pollution.  
At the end of each Unit is a performance-based Unit Assessment, found in the Unit Resource tab in the digital program. These CAST-like assessments are rooted in real world, local or relatable anchor phenomena. Students are asked to apply understanding and three-dimensional learning to complete the task items. |           |

**Unit Projects**  
**Grade 4: Unit 3: Earth’s Changing Surface**  
**Print:**  
- Unit Project: Lava Flows and the Grand Canyon: pg. 196-199  
- Digital: Quick Code: ca4689s
<table>
<thead>
<tr>
<th>SW1. Quality of opportunities to explain phenomena/solve problems.</th>
</tr>
</thead>
</table>

**Component** | **Strengths** | **Citations** |
| --- | --- | --- |

### Component Strengths

4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's climates over time.

**Scoring**

- **Type:** Machine-scored
- **Item Type:** Drop-down
- **D.O.C.:** Level 2

**Citations**

- **Phenomenon-Based Unit Assessments**
  - Digital unit assessments include the following:
  - Grade 4: Unit 3: Earth’s Changing Surface
  - 3-D Performance Based Assessment
  - Digital: [https://tinyurl.com/phenomenonassessment](https://tinyurl.com/phenomenonassessment)

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**Phenomenon-Based Unit Assessments (IN ENGLISH AND SPANISH):**

- Grade 4: Unit 3: Earth’s Changing Surface
- 3-D Performance Based Assessment
- Digital: [https://tinyurl.com/phenomenonassessment](https://tinyurl.com/phenomenonassessment)
<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
</tr>
</thead>
</table>
| SW2. Quality of building a three-dimensional conceptual framework. | Materials include learning experiences that help students build scientifically accurate understandings and abilities through opportunities for students to:  
- Link prior knowledge negotiated new understanding and abilities.  
- Do work that approximates the nature of science  
- Use reasoning to connect grade appropriate SEP, DCI, and CCC elements and EP&C’s (when applicable).  
- Ask and answer questions that link learning over time  
- Negotiate new understandings and abilities by comparing their ideas, their peers’ ideas, and ideas encountered in the learning experience(s).  
- Apply their understandings and abilities in a variety of ways | Wonder/Engage: Can You Explain? Example  
Grade 4: Unit 3: Earth’s Changing Surface  
- Print: SE: Can You Explain?: pg. 50-51  
- Digital: Quick Code: ca4690s |
<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
</tr>
</thead>
</table>
| **SW2. Quality of building a three-dimensional conceptual framework.** | **Wonder/Engage:** In California Science Techbook, the Wonder (Engage) section provides phenomena-driven or problem-based learning experiences as catalysts for the inquiry process, triggering students’ natural sense of curiosity and wonder. Students are challenged to describe real-world phenomena and to develop questions around these phenomena through Can You Explain? questions. Technology Enhanced Items (TEIs) help students show what they already know about a concept, including their preconceptions and misconceptions. **Learn/Explore:** Providing the majority of the robust scientific content, the Learn (Explore) section features text and resources that help students test predictions, collect evidence, and record observations and ideas. Learn also contains engaging Interactives and Hands-On Activities that check for understanding and provides opportunities for students to apply what they have learned. **Share/Explain:** This section encourages students to verbalize and demonstrate their conceptual understanding, new skills, and behaviors by constructing a scientific explanation related to the Can You Explain? question first posed in Wonder. | **Learn/Explore: Interactive and Hands-On Examples** Grade 4: Unit 4: Earthquakes Print: SE:  
- Digital: Quick Code: ca4814s |
SW2. Quality of building a three-dimensional conceptual framework.

Share/Elaborate and Evaluate:
By presenting opportunities for critical thinking, exploration, and summative assessments, the Share (Elaborate) section connects STEM skills to real-world problems. Share with STEM is divided into two sections: STEM in Action and STEM Project Starters. Please note that STEM Connect is also part of the Discovery Education Comprehensive Science Program. STEM Connect includes real-world projects through a Challenge, Design, and Solve model of problem-solving.

Activity Types
There are various activity types, found within the model of Wonder/Learn/Share. These activities help students recognize opportunities to apply specific SEPs with DCI and CCC for three-dimensional learning.

Activity Types in Wonder, Learn, and Share

<table>
<thead>
<tr>
<th>Icon</th>
<th>Student Edition Label</th>
<th>Activity Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can You Explain?</td>
<td>Students communicate prior knowledge to frame their learning.</td>
<td></td>
</tr>
<tr>
<td>Ask Questions Like a Scientist</td>
<td>Students begin to ask questions about the investigative phenomenon.</td>
<td></td>
</tr>
<tr>
<td>Observe Like a Scientist</td>
<td>Students make observations and connections across science ideas.</td>
<td></td>
</tr>
<tr>
<td>Analyze Like a Scientist</td>
<td>Students analyze and evaluate text to draw scientific explanations.</td>
<td></td>
</tr>
<tr>
<td>Investigate Like a Scientist</td>
<td>Students conduct investigations, collect data, and reflect on their new learning.</td>
<td></td>
</tr>
<tr>
<td>Evaluate Like a Scientist</td>
<td>Students demonstrate multidimensional learning by interpreting data, text, and images.</td>
<td></td>
</tr>
<tr>
<td>Interpret Data Like a Scientist</td>
<td>Students analyze graphical and numeric data.</td>
<td></td>
</tr>
<tr>
<td>Solve Problems Like a Scientist</td>
<td>Students apply scientific ideas to solve problems.</td>
<td></td>
</tr>
<tr>
<td>Design Solutions Like a Scientist</td>
<td>Students design solutions to real-world problems.</td>
<td></td>
</tr>
<tr>
<td>Record Evidence Like a Scientist</td>
<td>Students use evidence to construct scientific explanations of the investigative phenomenon.</td>
<td></td>
</tr>
<tr>
<td>Think Like a Scientist</td>
<td>Students deepen core scientific ideas through reasoning activities.</td>
<td></td>
</tr>
</tbody>
</table>

Unit: Earthquakes
Interactive: How It Shakes Out
Digital: https://tinyurl.com/HowItShakesOut
<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW2. Quality of building a three-dimensional conceptual framework.</td>
<td></td>
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</tbody>
</table>

**Share/Elaborate and Evaluate Example**

**Grade 4: Unit 3: Earth's Changing Surface**

**Print: SE:**
- Record Evidence: Breaking Down and Moving Rocks, p. 38-47
- Digital: Quick Code: ca4623s

![Activity Image]

*In this activity, students construct scientific explanations related to weathering and erosion and the impacts of these processes to answer the "Can You Explain?" question or a question of their own.*

![Activity Image]

*In this activity, students apply what they have learned about erosion and deposition to examine rocks for evidence of the effects of weathering and erosion and record their ideas about how Earth processes caused the characteristics of the rocks.*

![Activity Image]

*In this activity, students summarize their learning by completing a series of assessment items.*
## SW3. Quality of leveraging student prior knowledge and experiences.

**Strengths**

Materials leverage students’ prior knowledge and experiences to motivate student learning in ways that:

- make visible students’ prior knowledge and experiences related to the anchoring and investigative phenomena/problems and relevant SEPs, DCIs, and CCCs and EP&Cs (when applicable).
- revisit students’ early ideas to see how they have changed (or not) as they figure out phenomena/solve problems.
- make explicit links to new ideas and practices being developed by students.

The Wonder (Engage) section of each concept includes Technology Enhanced Items that have students identify what they already know about the topic. They receive feedback on their current knowledge, and the teacher has real-time access to this data in the Dashboard. Each concept also includes initial thoughts and ideas that might support the guiding question; this will appear at the bottom of the Wonder (Engage) page in the digital Techbook where it says “Can You Explain?”

Students use resources such as hands-on activities, images, songs, interactives, glossary animations, reading passages, and the Core Interactive Text to answer “Can You Explain” questions. They will keep track of their evidence using both print and digital supports in crafting their scientific explanations in each concept and can revisit their answer in their personal dashboard.

### Citations

**Grade 4: Unit 3: Earth’s Changing Surface**

- Print: SE: Can You Explain?: Earth’s Changing Surface: pg. 8
- Digital: Quick Code: ca4609s
- TE: Can You Explain?: Earth’s Changing Surface: pg. 34-35

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### Grade 4: Unit 3: Earth’s Changing Surface

- Print: SE: Can You Explain?: Earth’s Changing Surface: pg. 97
- Digital: Quick Code: ca4623s
<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW3. Quality of leveraging student prior knowledge and experiences.</td>
<td>Support for teachers to access student prior knowledge and check for changes in misconceptions are found within the teacher strategies at the activity level in several places within each concept.</td>
<td>Look at the Can You Explain? question. You first read this question at the beginning of the lesson.</td>
</tr>
</tbody>
</table>

Now, you will use your new ideas about disappearing sand castles to answer a question.

1. Choose a question. You can use the Can You Explain? question or one of your own. You can also use one of the questions that you wrote at the beginning of the lesson.

2. My Question

3. Then, use the graphic organizers on the next pages to help you answer the question.

Day 13 cont’d

Strategy
Display the investigative phenomenon of the image Disappearing Sandcastles and the Can You Explain? question. Ask students to discuss and share with the class or a partner their explanation for the investigative phenomenon Disappearing Sandcastles.

After allowing students to discuss,

How can this explanation help you answer the Can You Explain? question or one of your own questions?

Have students generate a scientific explanation to answer the Can You Explain? question. If students have generated their own questions, allow students to use them as the foundation for their scientific explanation.

Can You Explain?
How do wind, water, and weather erode Earth’s surface?
<table>
<thead>
<tr>
<th>Component</th>
<th>Strengths</th>
<th>Citations</th>
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</table>
| SW4. Quality of providing experiences that develop metacognition.        | Materials include learning experiences for students to:                                                                                                                                                  | Grade 4: Unit 3: Earth’s Changing Surface  
Print: SE: Interactive TEI: Generating Electricity: pg. 16, 20, 22  
Digital: Quick Code: ca4613s  
Teacher Dashboard: Traffic Light Scoring for Ease of Assessment  
Student Tools: Annotation and Highlighting  
**Mars Rover**  
Look at the picture and read the text. Then, complete the activity that follows.  
Mars never gets closer to Earth than about 54 million kilometers. That’s a long way. It takes a spacecraft about six months, usually longer, to get there. Over the past few decades, humans have sent many missions to Mars. None of these missions included people; they all used different types of remotely operated vehicles or robots. These robots have performed a variety of jobs. The most famous of these is the Mars Rover, which travels on the surface of the planet. Scientists have remotely operated four rovers on the surface of Mars. |
|                                                                          | • Set and monitor their learning in light of the targeted learning goals  
• Consider, overtime, what and how they have learned across the three dimensions  
• Articulate how the three dimensions helped them figure out anchor and investigative phenomena/solve problems |                                                                                                                                                                                                                   |
|                                                                          | Monitoring Student Progress & Metacognition  
Teachers are equipped with a Dashboard on the right-hand side of the screen that shows all student answers to responses from the Technology Enhanced Items (TEIs) embedded in the Student Interactive Worktext. Throughout the learning progression, each tab of each concept includes Technology Enhanced Items that have students connect to what they already know about the topic (Wonder), and then as they progress, to monitor what they do learn as they explore and learn through a variety of multimodal resources (Wonder, Learn, Share). They receive feedback on their knowledge, and the teacher has real-time access to this data in the Dashboard. This real-time data allows teachers to remediate and differentiate as needed in order to help students develop metacognitive abilities. |                                                                                                                                                                                                                   |
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<tr>
<td>SW4. Quality of providing experiences that develop metacognition.</td>
<td>Each Concept includes initial thoughts and ideas that might support the guiding question; this will appear at the bottom of the Wonder (Engage) page in the digital program, “Can You Explain?”. Students are encouraged to think about what they know, how they know it and what they would like to learn more about. They do this by applying their learning across the three dimensions and revisit this learning at the end of the Concept. Their new learning is then linked to confirming or modifying their initial understanding of Anchor Phenomena from the Unit launch. Students use resources such as hands-on activities, images, songs, interactive, glossary animations, reading passages, and the Core Interactive Text to answer “Can You Explain” questions. They will keep track of their evidence using both print and digital supports in crafting their scientific explanations in each concept and can revisit their answer in their personal dashboard. Tools for All Types of Learners: Students can annotate text using highlighting and notes. These annotations remain at point of use for students and are automatically populated in a Notebook that students can use for reflections and for reviewing their learning. Studio is an excellent tool that also provides an opportunity for students to demonstrate learning and revisit as they move through learning progression. Templates are provided related to constructing explanations and carrying out investigations.</td>
<td>Hands-On Investigation Example: <img src="image.png" alt="Image of Hands-On Investigation Example" /> Studio Example: <img src="image.png" alt="Image of Studio Example" /></td>
</tr>
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| SW5. Quality of providing equitable learning opportunities. | Materials ensure that all students, including those from nondominant groups and with diverse learning needs, have access to the targeted learning goals and experiences, including:  
- appropriate reading, writing, listening, and/or speaking alternatives for students who are English language learners, have special needs, read below the grade level, or have high interest and have already met the intended learning goals.  
- culturally relevant contexts and examples that support all students.  
- opportunities to cultivate interest and confidence as scientists and engineers for all students.  

California Science Techbook Program offers access to best-in-class content that meets instructional goals, inspires student engagement, and reflects the diversity of the students served. With California Science Techbook all students have full access to a robust science curriculum.  

**Reading Comprehension**  
Students interact with text, produce text, participate in discussions, and engage in research for the primary purpose of building their reading comprehension skills. Discovery Education’s digital resources were expertly crafted with tools and opportunities to support all types of learners to make meaning of informational text. Multiple forms of representation, including language alternatives; dual reading levels; and the | **Reading Comprehension**  
Grade 4 Unit 3: Earth’s Changing Surface  
Example of Reading Comprehension Activity Integrated Into Science:  
- Print: SE: Earth’s Changing Surface: pg. 121-123  
- Digital: Quick Code: ca4662s  

**Reading Comprehension and Literacy Support**  
TE: pages xxxiv - xxxvi |
## Component

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### Strengths

- Complementary use of images, videos, and audio, build students' background knowledge and strengthen their comprehension.

- California Science Techbook provides a wide array of graphic organizers and visual supports offering non-linguistic opportunities to process content. Hands-on Activities and labs provide support for interacting with science concepts making learning visual. Additional, Hands-on Labs and non-fiction Reading Passages are found in the Beyond tab of each Concept providing related content for building students' scientific understanding and development. The Reading Passages on a concept are written at different Lexiles. These passages offer different text structures such as problem-solution, cause and effect, and compare and contracts. Students not only learn to read these types of texts, but they are also used as mentor texts for writing.

### Literacy Connections Cards

- Literacy Connections Cards are integrated into the digital Techbook to save teachers time and create seamless opportunities to bring literacy into science and science into literacy. These cards, aligned to the Wonders and Benchmark reading programs, provide teachers with resources to make their reading and writing instructional multimodal, and integrate the reading and writing skills and strategies from their literacy curriculum into the science curriculum.

### Citations

- [Getting Started: The Literacy and Science Connection](https://tinyurl.com/LiteracyConnectionsCard)
## Component

| SW5. Quality of providing equitable learning opportunities. |

### Strengths

- **Multilingual Support**
  
  Video, audio, and print text resources are available in a number of languages. Digital search filters help teachers and students identify resources in other languages. Additionally, the program is available digitally and in print in both English and authentically translated Spanish to support dual immersion programs.

### Citations

- **English Language Development**
  
  California Science Techbook provides access to rich content and academic language in science. Throughout California Science Techbook ELA/ELD Standards and the California NGSS work in tandem to support the English learners. In California Science Techbook students build knowledge about science in variety of different ways, teachers are provided with point of use suggestions for meeting the needs of English Learner students with various levels of language acquisition including, Emerging, Expanding and Bridging. In addition, to the point of use lesson suggestions, tools and supports are embedded within the digital and print components to scaffold and support language and content.

  California Science Techbook supports the breadth and depth of students’ vocabulary acquisition through multiple representations. Students will see new academic language highlighted in context of the student edition in both the print and digital program. In the digital offering students can click on the word and several additional contextual supports are provided such as seeing the word in context of a sentence, viewing an image and/or video and a traditional definition.

### English Language Development

**Grade 4: Unit 3: Earth’s Changing Surface**

- Print: SE: Available in Spanish
- TE: Earth’s Changing Surface: pg. 8, 46
- Digital: SE: Available in Spanish and other languages
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| SW5. Quality of providing equitable learning opportunities. | **Discovery Education Experience**  
Saving the best for last, in addition to California Science Techbook, all students and teachers will have access to the Discovery Education Experience (formerly known as Streaming) and STEM Connect. Both programs provide access to rich content to extend and deepen students understanding.  
Through the Discovery Education Experience students have access to over 200,000 media assets to go as deep and wide as preferred. This includes:  
- appropriate reading, writing, listening, and/or speaking alternatives for students who are English language learners, have special needs, read below the grade level, or have high interest and have already met the intended learning goals;  
- culturally relevant contexts and examples that support all students; and,  
- opportunities to cultivate interest and confidence as scientists and engineers for all students. | Example: Arabic  
[Image of Arabic text]  
Example: Vietnamese  
[Image of Vietnamese text] |
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<td>SW3. Quality of leveraging student prior knowledge and experiences.</td>
<td></td>
<td><strong>Discovery Education Experience:</strong></td>
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<td>• Check out the Instructional Inspiration Channel which includes ready to go, assignable Boards.</td>
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<td>• Check out real world science with the MLB in The Science of Baseball Channel.</td>
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<tr>
<td></td>
<td></td>
<td>• Take your students to the Tundra to see the real world of Polar Bears through a Virtual Field Trip.</td>
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