

# Statement on Climate Change Instruction

## Introduction

California Assembly Bill 285, which was signed into law on October 8, 2023, amended the Education Code to require classroom instruction in climate change in the courses of study for Grades 1–6 and 7–12. To assist districts with the implementation of the new requirement, the California Department of Education (CDE) has presented the opportunity to identify materials in our Science programs published for the most recent adoption (2018) that address climate change. McGraw Hill is pleased to provide the following information for *California Inspire Science* ©2020, Grades K-12, which we hope will be a useful starting point for California educators as they plan their climate change instruction.

California adopted the Next Generation Science Standards (NGSS) as its science standards. McGraw Hill developed its K-12 suite of *California Inspire Science* programs to align with the California Next Generation Science Standards (CANGSS) and meet the requirements and content expectations set forth in the “2016 Science Framework for California Public Schools” for science instruction in California. Our K-5 and 6-8 programs were adopted by the California State Board of Education, as evidence of our programs’ alignment with the Standards, the Framework, and other adoption criteria. In addition, California *Inspire Science* addresses all of the Environmental Principles and Concepts throughout each of the programs.

The topics set forth in the NGSS and CANGSS are widely accepted as topics students should study to become scientifically literate citizens who are prepared to pursue STEM careers. *California Inspire Science* aligns with these standards. Climate change as a term is not included as an NGSS performance expectation at Grades K-5; rather, explicit instruction for climate change is introduced in the middle school grades and further explored in the high school Biology standards. Accordingly, the topic is not addressed in our elementary program but is more thoroughly covered in our middle school and Biology programs.

The following identifies coverage relating to climate change in *California Inspire Science* ©2020, Grades K-12. This includes both standards-aligned climate change coverage and coverage of related concepts that can be used as launch points to the topic. For example, our Grades K-5 program introduces science concepts related to climate change and provides students with an opportunity to build background information in preparation for deeper understanding in the higher grades.

### Grades K-5

The standards and science materials in the following Modules introduce science concepts related to climate change and provide students with an opportunity to build background information.

#### Grade 1

* Observe the Sky – students use observations to describe patterns in the sky.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 4: Sky Patterns | 3: Patterns During the Year | 42-43, 45, 49 |

#### Grade 2

* Earth’s Landscape – students identify where water is found on Earth and identify patterns in the natural world.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 1: Land and Water | 3: Water on Earth | 48-50 |

* Landscape Changes – students explain how some events happen very quickly, and others occur very slowly.

|  |  |  |  |
| --- | --- | --- | --- |
| **Component** | **Unit** | **Lesson** | **Page(s)** |
| SE/TE | 3: Earth’ s Changing Landscape | 1: Slow Changes to Earth’s Landscape | 19, 24-25 |
| SE/TE | 3: Earth’ s Changing Landscape | 2: Quick Changes to Earth’s Landscape | 38 |

* Plants in Landscapes – students understand how plants get what they need from their habitat.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 4: Living Things and Habitats | 1: What Plants Need | 16, 18-19 |

* Living Things in Habitats – students observe what living things do to survive in their habitats.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 4: Living Things and Habitats | 1: Local Habitats | 62 |
| SE/TE | 4: Living Things and Habitats | 3: Water Habitats | 108 |

#### Grade 3

* Plants – students describe how plants grow, develop, and reproduce and explain how characteristics among species provide advantages.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 2: Life Cycles and Traits | 1: Plant Life Cycles | 10, 30-31 |

* Animals – students describe how animals live, grow, and survive and explain how characteristics among species provide advantages.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 2: Life Cycles and Traits | 2: Animal Traits | 72 |

* Survive the Environment – students recognize that some organisms can survive in a particular environment while others cannot.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 3: Different Environments | 1: Survival of Organisms | 10, 13, 14, 16-17  |
| SE/TE | 3: Different Environments | 2: Adaptations and Survival | 32-33 |

* Change the Environment – students observe how changes in an ecosystem affect organisms that live there.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 3: Different Environments | 2: Changes Affect Organisms | 72-73, 76, 78-79 |

* Weather Impacts – students discover different types of weather and climate and investigate how natural hazards change environments.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 4: Observing Weather | 2: Weather and Seasons | 24-30, 32-35 |
| SE/TE | 4: Observing Weather | 3: Natural Hazards and the Environment | 42-44, 46-50 |

#### Grade 4

* Natural Resources in the Environment – students investigate how energy impacts the Earth’s environment.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 2: Using Energy | 1: Energy from Nonrenewable Resources | 95, 98-99, 101 |
| SE/TE | 2: Using Energy | 2: Energy from Renewable Resources | 110-115 |
| SE/TE | 2: Using Energy | 3: Impact of Energy Use | 128-131, 134 |

* Earth and Its Changing Features – students observe how Earth’s features change.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 3: Our Dynamic Earth | Lesson 3: Changes in Landscapes Over Time | 54-55 |

* Structures and Functions of Living Things – students explore how structures of plants and animals help them survive.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 4: Information Processing and Living Things | 1: Structures and Functions of Plants | 10-11, 16-17, 19-20 |
| SE/TE | 4: Information Processing and Living Things | 2: Structures and Functions of Animals | 32-33, 35-37 |

#### Grade 5

* Matter in Ecosystems – students investigate how matter cycles between living and nonliving parts of an ecosystem.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 2: Ecosystems | 1: Plant Survival | 11 |

* Energy in Ecosystems – students explain how the Sun’s energy is necessary for life on Earth.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 2: Ecosystems | 1: Earth’s Major Systems | 66 |
| SE/TE | 2: Ecosystems | 2: Cycles of Matter in Ecosystems | 78-80, 82, 84-85 |

* Earth’s Water System – students explore how Earth’s water resources can be conserved.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 3: Earth’s Interactive Systems | 1: Water Distribution on Earth | 12-13, 16-17 |
| SE/TE | 3: Earth’s Interactive Systems | 2: Human Impact on Water Resources | 28-31 |
| SE/TE | 3: Earth’s Interactive Systems | 3: Effects of the Hydrosphere | 45 |

* Earth’s Other Systems – students explore how Earth’s major systems interact with each other.

| **Component** | **Unit** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- |
| SE/TE | 3: Earth’s Interactive Systems | 1: Effects of the Geosphere | 73 |
| SE/TE | 3: Earth’s Interactive Systems | 2: Effects of the Atmosphere | 86-95 |

### Grades 6-8 Comprehensive

The following information includes direct references to climate change or launching points to the topic, as appropriate to the course standards.

Grade 6 Comprehensive covers a wide range of climate change topics across modules titled Human Impact on the Environment, Reproduction of Organisms, and Energy and Matter in the Atmosphere. Each module’s assets contain several targeted learning opportunities on climate change and how humans both impact and are affected by climate change, as well as other organisms and the environment. Of interest is Lesson 4: Impact on Climate, which provides a thorough discussion of climate change along with the contributing factors and supporting data.

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | Unit 2 Reproduction of Organisms | Reproduction of Organisms | 4: Reproduction and Growth of Plants | 76-78 |

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | Unit 3 Energy in the Atmosphere | Energy and Matter | 3: Thermal Energy Transfers | 65 |
| SE/TE | Unit 3 Energy in the Atmosphere | Energy and Matter | 4: Thermal Energy Conductivity | 82 |

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 4: Human Impact on the Environment | Human Impact on the Environment | 4: Impact on Climate | 79-101 |

Grade 7 Comprehensive provides focused coverage of climate change in the modules titled Natural Hazards, Matter and Energy in Ecosystems, and Biodiversity in Ecosystems. Text and digital assets in these modules describe topics such as modeling climate change and a California Environmental Connection on Droughts and El Nino.

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 2: The Changing Earth | Natural Hazards | 3: Severe Weather | 217A-217B |

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 4: Interactions Within Ecosystems | Matter and Energy in Ecosystems | 3: Cycling of Matter | 55 |

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 4: Interactions Within Ecosystems | Biodiversity in Ecosystems | 2: Maintaining Biodiversity | 173, 180 |

Grade 8 Comprehensive targets specific topics relevant to climate change across modules titled Earth and Human Activity and Natural Selection and Adaptations. California Environmental Connections provide opportunities for students to understand environmental challenges with influences from climate change.

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 1: Change Over Time | Natural Selection and Adaptations | 3: Artificial Selection | 109A-109B |

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 4: Humans and Their Place in the Universe | Earth and Human Activity | 2: People and the Environment | 37 |

### Grades 6-8 LEP

The following information includes direct references to climate change or launching points to the topic, as appropriate to the course standards.

Life Science covers a wide range of climate change topics across modules titled Matter and Energy in Ecosystems, Dynamic Ecosystems, and Biodiversity in Ecosystems. Text and digital assets in these modules describe topics such as modeling climate change and how populations are affected by climate change.

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 1: Interactions Within Ecosystems | Matter and Energy in Ecosystems | 1: Photosynthesis and Cellular Respiration | 16 |
| SE/TE | 1: Interactions Within Ecosystems | Matter and Energy in Ecosystems | 3: Cycling of Matter | 55 |

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 1: Interactions Within Ecosystems | Dynamic Ecosystems | 1: Resources in Ecosystems | 81 |

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 1: Interactions Within Ecosystems | Biodiversity in Ecosystems | 2: Maintaining Biodiversity | 173, 180 |

Earth and Space Science provides focused coverage of climate change in the modules titled Water Cycle, Natural Hazards, Weather and Climate, Earth and Human Activity, and Human Impact on the Environment. Each module’s assets contain several targeted learning opportunities on climate change and how humans both impact and are affected by climate change. Of interest is Lesson 4: Impact on Climate (Human Impact on the Environment), which provides a thorough discussion of climate change along with the contributing factors and supporting data.

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 2: Water and Climate | Water Cycle | 2: Water on Earth’s Surface | 29-30 |

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 2: Water and Climate | Weather and Climate | 1: Solar Energy on Earth | 67 |
| SE/TE | 2: Water and Climate | Weather and Climate | 4: Climates of Earth | 138, 146 |

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 3: Impacts on the Environment | Human Impact on the Environment | 4: Impact on Climate | 79-101 |

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 3: Impacts on the Environment | Earth and Human Activity | 2: People and the Environment | 147 |

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 4: The Changing Earth | Natural Hazards | 3: Severe Weather | 374a-347b |

Physical Science is primarily focused on the physical and chemical properties and forces in the world, and as such does not include significant coverage of climate change. However, the inquiry nature of the program provides opportunities for teachers to make connections from physical and chemical forces and properties to the origins and effects of climate change.

### Grades 9-12

The following information includes direct references to climate change or launching points to the topic, as appropriate to the course standards.

#### Biology

* + **Unit 1, Ecology,** covers a wide range of climate and climate change topics across modules titled Principles of Ecology; Communities, Biomes, and Ecosystems; Population Ecology; and Biodiversity and Conservation. Each module’s assets contain several targeted learning opportunities on climate change and how humans both impact and are affected by climate change, as well as other organisms and the environment. Of particular interest are targeted climate change discussions and assets in Communities, Biomes, and Ecosystems, and Biodiversity and Conservation, which provide contextual discussion of climate change along with contributing factors and supporting data.

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 1: Ecology | 2: Principles of Ecology | STEM AT WORK: How can computers model an ecosystem’s future? | 45 |
| SE/TE | 1: Ecology | 3: Communities, Biomes, and Ecosystems | 1: Community Ecology | 51 |
| SE/TE | 1: Ecology | 3: Communities, Biomes, and Ecosystems | 2: Terrestrial Biomes | 60 (Cross-Cutting Concept) |
| SE/TE | 1: Ecology | 3: Communities, Biomes, and Ecosystems | 3: Aquatic Ecosystem | 63 |
| SE/TE | 1: Ecology | 3: Communities, Biomes, and Ecosystems | Science & Society: Out on a Limb | 72 |
| SE/TE | 1: Ecology | 5: Biodiversity and Conservation | 2: Threats to Biodiversity | 105-110 |
| Digital | 1: Ecology | n/a | n/a | STEM Unit Project: Rooftop Garden |
| Digital | 1: Ecology | n/a | n/a | Smithsonian: Ecosystems on the Edge—Forests and Climate Change (Part 1) |
| Digital | 1: Ecology | n/a | n/a | Smithsonian: Ecosystems on the Edge—Forests and Climate Change (Part 2) |
| Digital | 1: Ecology | 3: Communities, Biomes, and Ecosystems | n/a | STEM Connection: The Art of Modeling Climate Change |
| Digital | 1: Ecology | 3: Communities, Biomes, and Ecosystems | 2: Terrestrial Biomes | Quick Investigation: Formulate a Climate Model |
| Digital | 1: Ecology | 5: Biodiversity and Conservation | Learning Resources | Smithsonian: Climate Change |

* + **Unit 4, History of Biological Diversity,** provides broad coverage of historic climate change in the module titled The History of Life. Text and digital assets in these modules describe topics such as fossil evidence for change and the origin of life.

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 4: History of Biological Diversity | 15: Primate Evolution | 1: Primates | 404 |
| SE/TE | 4: History of Biological Diversity | 15: Primate Evolution | 2: Hominoids to Hominins | 407, 412 |
| Digital | 4: History of Biological Diversity | n/a | n/a | Smithsonian: Arctic Cetaceans – Indicators of Climate Change |
| Digital | 4: History of Biological Diversity | 15: Primate Evolution | 3: Human Ancestry | Applying Practices: Influence of Natural Resources, Hazards, and Changes in Climate |
| SE/TE | 5: The Diversity of Life | 18: Protists and Fungi | Science & Society: Blooms of Death: Proactive Pollution Prevention | 499 |

* + The **Earth Science Digital Module** is provided in *California Inspire Biology* as a supplement for integrating Earth Science into high school courses. This digital module, titled Relationships Between Humans and Earth, targets specific topics relevant to climate change, including the causes of climate change, long-term and short-term variations in climate, and natural causes.

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| Digital | 1: Ecology | Earth and Space Science: Relationships Between Humans and Earth | 2: Human and Earth Interaction | Explore and Explain: Annual Averages and VariationsExplore and Explain: Causes of ClimateExplore and Explain: MicroclimatesExplore and Explain: Long-term Climatic ChangesExplore and Explain: Short-Term Climatic PatternsExplore and Explain: Natural Causes of Climate ChangesExplore and Explain: Global Climate Change |
| Digital | 1: Ecology | Earth and Space Science: Relationships Between Humans and Earth | 2: Human and Earth Interaction | Applying Practices: Human Activity, Natural Resources, Hazards, and Climate ChangeApplying Practices: Forecasting Climate ChangeApplying Practices: Climate Change and Human Activity |
| Digital | 4: History of Biological Diversity | Earth and Space Science: Earth’s Early History | 2: Earth’s Formation and Early History | Applying Practices: The Coevolution of Living Things and the Atmosphere |

##### California Environmental Principles and Concepts (Biology)

| **Principle** | **Component** | **Page(s)** |
| --- | --- | --- |
| Principle 1 | Digital | STEM Unit Project 4 |
| Principle 1 | SE | 72, 77-85, 91-92, 499 |
| Principle 2 | Digital | STEM Unit Project 1 and 4 |
| Principle 2 | SE | 72, 91-92, 98-120 |
| Principle 3 | Digital | STEM Unit Project 4 |
| Principle 3 | SE | 39-44, 72 |
| Principle 4 | Digital | STEM Unit Project 1, 2, and 4 |
| Principle 4 | SE | 104-112, 499 |
| Principle 5 | Digital | STEM Unit Project 1 and 4 |
| Principle 5 | SE | 45 |

#### Chemistry

* **Unit 4, Organic and Nuclear Chemistry,** provides students with a focus on California climate change strategy related to energy production, as well as a Smithsonian Museum perspective on global climate change.

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| SE/TE | 4: Organic and Nuclear Chemistry | Unit level | Unit 4 opener | 596–597 |
| Digital | 4: Organic and Nuclear Chemistry | Unit Planning and Presentation Resources | Learning Resources | STEM Unit Project: Analyze Energy Investments |
| Digital | 4: Organic and Nuclear Chemistry | Unit Planning and Presentation Resources | Learning Resources | California Connection: Climate Change |
| Digital | 4: Organic and Nuclear Chemistry | Unit Planning and Presentation Resources | Learning Resources | Further Connection: Renewable Energy |
| Digital | 4: Organic and Nuclear Chemistry | Unit Planning and Presentation Resources | Learning Resources | Smithsonian: India’s New Green Machine; Global Climate Change in Perspective; The Strange, Controversial Way Plants Trap CO2; and Sea Level Rise |

* **Earth Science Digital Modules** are provided in *California Inspire Chemistry* as a supplement for integrating Earth Science into high school courses. The module titled Ocean Acidification targets specific topics relevant to climate change and the increasing acidification of global oceans. The module titled Climate Change covers the human causes of climate change, short- and long-term variations in climate, and short- and long-term effects of climate change.

| **Component** | **Unit** | **Module** | **Lesson** | **Page(s)** |
| --- | --- | --- | --- | --- |
| Digital | 3: Matter, Energy, and Equilibrium | Earth and Space Science: Ocean Acidification | Cycles of Matter | Explore and Explain: The Effects of Air Pollution (card 2 of 6) |
| Digital | 3: Matter, Energy, and Equilibrium | Earth and Space Science: Ocean Acidification | Cycles of Matter | Applying Practices Projects: Analyze Geoscience Data—Ocean Acidification; Carbon Cycling Through the Earth’s Spheres—Ocean Acidification |
| Digital | 4: Organic and Nuclear Chemistry | Earth and Space Science: Climate Change | Climatic Changes and Patters | Explore and Explain: Natural Causes of Climate Change |
| Digital | 4: Organic and Nuclear Chemistry | Earth and Space Science: Climate Change | Climatic Changes and Patters | Applying Practices Projects: Analyze Geoscience Data—Climate Data |
| Digital | 4: Organic and Nuclear Chemistry | Earth and Space Science: Climate Change | Impact of Human Activities | Explore and Explain: Our Influence on the Atmosphere |
| Digital | 4: Organic and Nuclear Chemistry | Earth and Space Science: Climate Change | Impact of Human Activities | Explore and Explain: Global Climate Change |
| Digital | 4: Organic and Nuclear Chemistry | Earth and Space Science: Climate Change | Impact of Human Activities | Explore and Explain: The Effects of Air Pollution (card 2 of 6; note this is a second use of the same Explore and Explain cited in the Cycles of Matter lesson above) |
| Digital | 4: Organic and Nuclear Chemistry | Earth and Space Science: Climate Change | Impact of Human Activities | Applying Practices Projects: Carbon Cycling Through the Earth’s Spheres—Climate Change; Climate Change and Human Activity; Forecasting Climate Change |

##### California Environmental Principles and Concepts (Chemistry)

| **Principle** | **Component** | **Page(s)** |
| --- | --- | --- |
| Principle 1 | Digital | STEM Unit Project 3 and 4 |
| Principle 1 | SE | 191 |
| Principle 2 | Digital | STEM Unit Project 3 and 4 |
| Principle 2 | SE | 73, 191, 232, CA340-341, CA596-597 |
| Principle 3 | Digital | STEM Unit Project 3 and 4 |
| Principle 3 | SE | 232, CA340-341 |
| Principle 4 | Digital | STEM Unit Project 3 and 4 |
| Principle 4 | SE | 232, 517, 634, CA340-341 |
| Principle 5 | Digital | STEM Unit Project 3 and 4 |
| Principle 5 | SE | 73, 405, 674 |

#### Physics

Due to the nature of the content in Physics and the related Earth Science integrated content, climate change is not covered in this program.

Posted on behalf of McGraw Hill by the California Department of Education, February 2025