Getting Started: A Guide to Using the Curriculum

Clue into Climate resources have been created for grades 4-8. However, the curriculum unit is designed to be flexible and resources may be adapted for other grade levels.

OVERVIEW

Clue into Climate: A Digital Media-Based Curriculum Unit on Climate Change was created with input from San Francisco Bay Area teachers and advisors. The curriculum unit is comprised of four content strands, each of which includes 5-7 media resources related to the strand topic. Each strand also contains a strand guide and assessment, a background article and 4-5 lesson plans that provide information and activities to support the use of the media with students. Additionally, the curriculum unit provides a student workbook and a climate education resource guide. Clue into Climate resources are aligned with the California State Science Content Standards for grades 4–8 as well as the Essential Principles of Climate Literacy and other national science standards.

Clue into Climate’s website on kqed.org is organized around content strands:

- **Strand 1:** Increased Greenhouse Gases Contribute to Climate Change
- **Strand 2:** Climate Change Affects Ecosystems and the Distribution of Organisms
- **Strand 3:** Climate Change Affects the Water Cycle
- **Strand 4:** Climate Change Can be Mitigated by Using Renewable Energy Sources

One the webpage for each strand, you will find:
- An overview of the strand
- A link to the strand guide, strand background article and student workbook
- Links to lesson plans followed by associated media resource/s

FOR MORE INFORMATION

For additional ideas and tools, check out: www.kqed.org/education

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HOW TO USE THIS CURRICULUM UNIT

The Clue into Climate curriculum unit was designed to be used in multiple ways. Listed below are several ideas for integrating Clue into Climate resources into your teaching:

- Use the lesson plans to actively engage students in viewing the media and to reinforce the concepts through additional activities and discussion.
- Conduct an entire unit on the strand topic using a strand guide (for example, Strand 4 Educator Guide – Renewable Energy could be used to plan a 3-week-long unit on renewable energy).
- Use the Clue into Climate Student Workbook for student engagement and reflection in combination with any of the media resources or lesson plans.
- Read a strand background article to learn more about the subject area prior to teaching a lesson.
- Look in the strand guides or lesson plans for assessment ideas or climate change action items.
- Select Clue into Climate literacy connections to explore important literacy and real-world issues.
**ADDITONAL CURRICULAR RESOURCES**

**Background Articles**
Organized by topic, the background articles provide educators with the background information necessary to conduct the Clue into Climate lessons.

**Student Workbook**
The workbook contains activities and information about climate change and Clue into Climate’s literacy connections. The workbook can be used with any of the content strands as homework, as a place for reflection or as an assessment tool.

**STRAND GUIDES**

*Strand guides* provide information for teaching an entire content strand or multiple lessons. Strand guides include:
- a strand overview
- a unit plan
- subjects and content standards (selected grade levels)
- strand essential questions
- literacy connection information
- additional standards information
- multiple choice and short answer assessment with answer key
- project-based assessment
- interdisciplinary connections
- an “Explore Your Earth” section that includes outdoor activities
- a “What Can We Do At School?” section with ideas for taking action at school
- additional resources specific to the Bay Area

**LESSON PLANS**

*Clue into Climate lesson plans* offer questions, activities, assessment ideas, and additional resources to actively engage students in viewing the media and learning the concepts. Each lesson plan contains the following sections:
- an overview of the lesson topic
- subjects and content standards (selected grade levels)
- essential questions
- an overview of the associated media resource/s
- a vocabulary list
- two activities
- assessment ideas
- a “What Can We Do?” section
- a list of additional resources that includes related websites and lesson plans
- literacy connections (selected lessons)
- student worksheet (selected lessons)

**LITERACY CONNECTIONS**

In addition to teaching the science of climate change, this unit addresses the following important literacy and real-world issues:
- **Media Literacy**: The ability to use different types of media and to examine the purpose and source of media.
- **STEM Literacy**: The ability to think critically about science and math, to solve problems, and to ask meaningful questions (STEM stands for science, technology, engineering, and mathematics).
- **Climate Careers**: An understanding of the variety of jobs related to climate change.
- **Global Impact**: An understanding of how climate change may affect the different regions of the world.

Look for these important connections within the lesson plans.

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<th>Strand</th>
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<td>Lesson 1a: Carbon Dioxide and Climate Change</td>
<td>Graph (PDF): Atmospheric Carbon Dioxide Levels</td>
<td>Answer graph interpretation questions about increasing carbon dioxide levels</td>
<td>Design a hypothesis poster about the effects of increasing carbon dioxide levels</td>
<td>Media Literacy: Discuss credible sources and types of media</td>
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<td>Lesson 1b: The Greenhouse Effect and Climate Change</td>
<td>Diagram (PDF): The Greenhouse Effect and Greenhouse Gases Video: “At the Core of Climate Change”</td>
<td>Interpret the greenhouse effect diagram</td>
<td>Complete video viewing questions about how scientists gather data from ice cores</td>
<td>Climate Careers: Write an “ask a climate scientist” interview</td>
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<td>Lesson 1c: Methane and Our Changing Climate</td>
<td>Audio feature: “Methane - The Other Greenhouse Gas”</td>
<td>Draw a diagram of methane’s path</td>
<td>Design pamphlets about sources of methane</td>
<td>STEM Literacy: Explore different views on climate change</td>
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<td>Lesson 1d: Greenhouse Gases and the Amazon</td>
<td>Video: “Regulating Greenhouse Gases”</td>
<td>Conduct a fishbowl discussion about climate change and the Amazon</td>
<td>Map and discuss deforestation in the Amazon</td>
<td>Global Impact: Research and discuss how governments are addressing climate change</td>
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<td>Lesson 1e: Climate Modeling</td>
<td>Video: “Climate Models” Video slideshow: “Forecasting Suitable Habitat for Redwoods from the Present to 2100” Diagram (PDF): Forecasting Suitable Habitat for North America’s Wolverines From the Present to 2090</td>
<td>Answer video viewing questions and discuss how climate models work</td>
<td>1. Experiment with a mini-climate model 2. Develop a conservation plan in response to climate change</td>
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<td>Lesson 2a: The Changing Arctic Ecosystem</td>
<td>Video: “A Warmer World for Arctic Animals”</td>
<td>Fill out a video viewing chart about how climate change is affecting Arctic predators</td>
<td>Create ecosystem profiles and diagrams</td>
<td>Global Impact: Discuss how climate change is affecting the Arctic</td>
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<td>Lesson 2b: Adapting to Climate Change</td>
<td>Video slideshow: &quot;Forecasting Suitable Habitat for Redwoods from the Present to 2100&quot; Diagram (PDF): Forecasting Suitable Habitat for North America’s Wolverines From the Present to 2090</td>
<td>Interpret and discuss the diagram and video slideshow about changing suitable habitats for redwoods and wolverines</td>
<td>Discuss and invent animal adaptations</td>
<td>STEM Literacy: Discuss the science behind, and difficulties with, predicting future suitable habitats</td>
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<td>Lesson 2c: Animals on the Move</td>
<td>Video: &quot;Resurveying California’s Wildlife&quot; Video: &quot;The Intertidal Zone and Sea Level Rise&quot;</td>
<td>Fill out a viewing chart and write a journal entry about how animal distributions have changed</td>
<td>Complete Venn diagrams and future wheels about the effects of climate change on the distribution of organisms</td>
<td>Media Literacy: Discuss different views on climate change and how these opinions are expressed</td>
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<td>Lesson 2d: Plants in Peril</td>
<td>Video slideshow: &quot;Disappearing Plants&quot;</td>
<td>Discuss and debate how plants will be affected by climate changes</td>
<td>Set-up an experiment to test the effects of temperature on plants</td>
<td>Climate Careers: Discuss how scientists make decisions and the technologies they use</td>
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<td>Lesson 3a: The Water Cycle</td>
<td>Interactive animation: &quot;Climate Change and the Water Cycle&quot;</td>
<td>Take notes and draw diagrams about the water cycle</td>
<td>Design digital stories about the water cycle</td>
<td>Global Impact: Research water issues around the world</td>
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<td>Lesson 3b: Climate Change and the Water Cycle</td>
<td>Video: &quot;Following Raindrops&quot; Interactive animation: &quot;Climate Change and the Water Cycle&quot;</td>
<td>Answer and discuss video viewing questions and create a prediction poster about the importance of understanding how water moves through the water cycle</td>
<td>Play a prediction game about how climate change affects the water cycle</td>
<td>Climate Careers: Investigate different types of science careers</td>
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<td>Lesson 3c: A Global Glacier Melt</td>
<td>Video slideshow: &quot;Visiting Dana Glacier&quot;</td>
<td>Draw and discuss pre- and post-viewing ideas about glaciers</td>
<td>Draw a glacier comic strip illustrating how glaciers have changed and might change in the future</td>
<td>Media Literacy: Discuss media sources and whether all glaciers are melting</td>
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<td>Lesson 3d: The Impact of Climate Change on the Ocean</td>
<td>Video: “The Intertidal Zone and Sea Level Rise”</td>
<td>Answer viewing questions and create concept maps about how climate change is affecting the intertidal zone</td>
<td>Create a PowerPoint presentation about sea level rise</td>
<td>STEM Literacy: Explore graphs and the range of uncertainty</td>
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<td>Lesson 3e: How Climate Change Affects Our Water Supply</td>
<td>Video: “Snowpack” Map: Decreasing California Snowpack</td>
<td>Complete a viewing chart about how decreased snowpack affects urban areas, agriculture and ecosystems</td>
<td>Research and present a report on important reservoirs</td>
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<td>Lesson 4a: Comparing Renewable Energy Sources</td>
<td>Animation: “Energy Sources” Diagram (PDF): Energy Sources</td>
<td>Complete graphs about how much electricity comes from renewable sources</td>
<td>Research and compare renewable energy sources</td>
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<td>Lesson 4b: New Breakthroughs in Solar Power</td>
<td>Video: “Solar Power”</td>
<td>Complete a chart and Venn diagram comparing conventional solar and nanosolar technologies</td>
<td>Write and record a news story about new solar technologies</td>
<td>Media Literacy: Research and discuss sources of media</td>
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<td>Lesson 4c: Turning Waste Into Energy</td>
<td>Video: “Turning Waste into Energy”</td>
<td>Complete a KWLQ viewing chart about methane</td>
<td>Measure food waste from a day’s lunch</td>
<td>Climate Careers: Discuss careers in bioenergy production</td>
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<td>Lesson 4d: Geothermal Energy: Harnessing the Power of the Earth</td>
<td>Video: “Geothermal Energy”</td>
<td>Complete video viewing questions and a pro/con chart about geothermal energy</td>
<td>Write a persuasive essay for or against geothermal energy</td>
<td>Global Impact: Research countries that are investing in geothermal energy</td>
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