**\*\*Park Name**

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| --- |
| [Devils Postpile National Monument](http://www.nps.gov/depo/) |

**\*\*Lesson Plan Title (255 characters maximum)**

|  |
| --- |
| Exploring Climate Science: Climate Change |

**\*\*Essential Question and Quick Lesson Description**

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| --- |
| In “Exploring Climate Science (Climate Change),” students will explore causes of climate change and discuss impacts on the environment. Students will be able to:   1. List three causes of climate change 2. Describe at least two impacts to the environment caused by climate change |

**\*\*Lesson Grade Level: (Check One of the following)**

\_\_\_ Lower Elementary: Pre-Kindergarten through 2nd Grade

\_X\_ Upper Elementary: 3rd Grade Through Sixth Grade

\_\_\_ Middle School: Sixth Grade Through Eighth Grade

\_\_\_ High School: Ninth Grade through Twelfth Grade

\_\_\_ College Undergraduate Level

\_\_\_ Graduate Level (Masters, PhD)

\_\_\_ Adult Education

**\*\*Lesson Subject: (Check As Many as Apply)**

\_\_ Social Studies

\_\_\_ Math

\_x\_ Science

\_\_\_ Literacy and Language Arts

\_\_\_ Other: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Feature Image for Lesson**

**This will be shown next to your lesson on the Education Portal. Provide filename and location below.**

|  |
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| In folder |

**Alt Text for Feature Image**

**If the image does not display, what description do you want to appear in its place?**

|  |
| --- |
| Air quality monitoring equipment at Devils Postpile National Monument |

**\*\*Common Core Standards:**

**Want more information about Common Core? Go to [http://www.corestandards.org/](http:///h)**

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| --- |
| Grade Level: 3-5 Subject Area: Science  RI.5.7: Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.  RI.5.9: Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.  W.5.8:Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. |

**\*\*State Standards:**

|  |
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**Additional Standards(s) (255 characters maximum): Does this lesson meet additional standards?**

**e.g. Next Generation Science Standards, National Council for Social Studies Standards, Advanced Placement (AP) Courses, International Baccalaureate (IB) Courses, Next Generation Science Standards**

|  |
| --- |
| Next Generation Science Standards: 5-ESS3-1 |

**Thinking Skills (Check As Many as Apply)**

The thinking skills listed below are based on Bloom’s Taxonomy. Consider your lesson procedure and activities. Then check off the thinking skills that students will experience through your lesson.

X **Knowledge** – Recalling or recognizing information ideas, and principles

X **Comprehension** – Understand the main idea of material heard, viewed, or read. Interpret or summarize the ideas in own words.

\_\_\_ **Application** – Apply an abstract idea in a concrete situation to solve a problem or relate it to a prior experience.

\_\_\_ **Analysis** – Break down a concept or idea into parts and show the relationships among the parts.

\_\_\_ **Creation** – Bring together parts (elements, compounds) of knowledge to form a whole and build relationships for NEW situations.

\_\_\_ **Evaluation** – Make informed judgments about the value of ideas or materials. Use standards and criteria to support opinions and views.

**Complete Lesson File**

**Is there a downloadable file (or PDF) for this lesson plan? If yes, provide filename and location:**

**Be sure your PDF or other file meets universal accessibility requirements, most PDFs do not.**

|  |
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**Lesson Duration**

**Time to complete this lesson plan in minutes (25 characters maximum)**

|  |
| --- |
| 60 minutes |

**\*\*Background Information for Teacher**

**What important content, contextual, or practical information and background knowledge does the teacher need to successfully implement this lesson?**

|  |
| --- |
| Water is essential for life on Earth. Relative water availability is a major factor in designating habitats for different living organisms. In the United States, things like agriculture and water rights are hot topics. Current models predict that average global temperatures are going to continue to rise even if regional climate changes remain complex and varied. These changes will have an impact on all of Earth's systems.  Studies have shown that climate change is driven not only by natural effects but also by human activities. Knowledge of the factors that affect climate, coupled with responsible management of natural resources, are required for sustaining these Earth systems. Long-term change can be anticipated using science-based predictive models, making science and engineering essential to understanding global climate change and its possible impacts.  National Parks can serve as benchmarks for climate science trends and effects over time because they are protected areas void of human influence. Understanding current climate trends will help set students up to be successful in interpreting and engaging in discussions about climate change, which will lead to informed decision making. |

**\*\*Important Vocabulary and Terms with Definitions:**

**What terms and academic language will students have to know to participate in the lesson? Lessons typically include 5 to 15 terms and definitions.**

|  |
| --- |
| 1. Climate change – any significant change in the climate lasting for decades or longer. 2. Global warming— the rise in the average temperature of Earth's atmosphere and oceans since the late 19th century and its projected continuation. 3. Greenhouse effect – a process by which thermal radiation from a planetary surface is absorbed by atmospheric greenhouse gases, and is re-radiated in all directions. 4. Pollution— the introduction of contaminants into the natural environment that cause adverse change. |

**\*\*Lesson Preparation: What preparation does the teacher need to do before the lesson? What supplies or materials should be gathered?**

|  |
| --- |
| Make copies of [Reading Material](http://www.nps.gov/depo/forteachers/classrooms/loader.cfm?csModule=security/getfile&pageid=648971):Today's Climate Change, [Reading Material:](http://www.nps.gov/depo/forteachers/classrooms/loader.cfm?csModule=security/getfile&pageID=648962)Polar Bears in Peril, [Reading Material:](http://www.nps.gov/depo/forteachers/classrooms/loader.cfm?csModule=security/getfile&pageid=648970) The President's Climate Plan, [Reading Material:](http://www.nps.gov/depo/forteachers/classrooms/loader.cfm?csModule=security/getfile&pageID=648959) Going to Extremes and [Worksheet 1.1](http://www.nps.gov/depo/forteachers/classrooms/loader.cfm?csModule=security/getfile&pageID=648931). (See materials section) Gather and prepare the following supplies/materials:   1. Model of Earth (Provided in Snow Study Trunk or a globe could be used.) 2. White strips of paper, 1 per student, (teacher created) 3. 5 yellow strips of paper (teacher created) |

**\*\*Lesson Hook or Preview: What activity, video, song, or other experience could get the students excited about the lesson and thinking about the topic? Is there a way to make the lesson important to their lives or link the lesson content to what they already know?**

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| Brainstorm – have students share what they already know about climate change. |

**\*\*Procedure: List the instructions the teacher should follow as Step One, Step Two, Step Three, etc.**

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| STEP 1   1. Pass out white strips of paper to students. Ask students to write one type of air pollution on their strip of paper. Collect the strips and tape them together in a circle. 2. Have student volunteers hold up the model of the earth and the sun. Use the yellow strips of paper to demonstrate how the sun's rays reach the earth and then bounce back away from the earth. Have another volunteer hold up the circle of "pollution" around earth. Again demonstrate the yellow rays hitting the earth, but then show how they are trapped by the pollution, thus warming the earth.   STEP 2   1. Have students divide into pairs, read the text passages, and record their learning in worksheet 1.1. 2. Have each pair summarize and share 2-3 facts they learned about climate change from their reading. 3. Talk about how scientists respond to climate change by conducting scientific research (monitoring) and then taking action based on that research. Lessons will focus on this over the next two weeks. |

**\*\*Assessment: How can teachers tell that each individual student has met the objective? How will teachers see if each student knows the answer to the essential questions or has mastered the skills? Below, include below a brief description of how to use the assessment. Later in this template you are provided with the opportunity to upload a digital copy of the assessment for teachers to print and use.**

|  |
| --- |
| 1. Ask students how they think climate change or global warming is impacting the local community. 2. Discuss: How is climate change caused and what are some of its impacts? |

**Lesson Materials: Any worksheets, photos, primary source, scientific data, maps, graphic organizers, or PowerPoint ‘s should be described and attached using the template below. Please create additional materials boxes if necessary.**

**Material #1**

**Title (255 characters maximum):**

|  |
| --- |
| Reading Material: Today’s Climate Change |

**Summary (how does the material function in the lesson?):**

|  |
| --- |
| Provides background information on Climate Change |

**Downloadable file of this material in original format if possible, such as Microsoft word or PowerPoint (Provide filename and location)**

|  |
| --- |
| In folder |

**Material #2**

**Title (255 characters maximum):**

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| --- |
| Reading Material: Polar Bears in Peril |

**Summary (how does the material function in the lesson?):**

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| --- |
| Provides background information on Climate Change |

**Downloadable file of this material in original format if possible, such as Microsoft word or PowerPoint (Provide filename and location)**

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**Material #3**

**Title (255 characters maximum):**

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| --- |
| Reading Material: The President’s Climate Plan |

**Summary (how does the material function in the lesson?):**

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| --- |
| Provides background information on Climate Change |

**Downloadable file of this material in original format if possible, such as Microsoft word or PowerPoint (Provide filename and location)**

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**Material #4**

**Title (255 characters maximum):**

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| Reading Material: Going to Extremes |

**Summary (how does the material function in the lesson?):**

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| --- |
| Provides background information on Climate Change |

**Downloadable file of this material in original format if possible, such as Microsoft word or PowerPoint (Provide filename and location)**

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**Material #5**

**Title (255 characters maximum):**

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| Worksheet 1.1: Introduction to Climate Change |

**Summary (how does the material function in the lesson?):**

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| --- |
| Students answer questions that provide background information on Climate Change |

**Downloadable file of this material in original format if possible, such as Microsoft word or PowerPoint (Provide filename and location)**

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**Assessment Materials**

**How can teachers tell that each individual student has met the objective? How will teachers see if each student knows the answer to the essential questions or has mastered the skills? Attach below the assessment and, if applicable, a rubric or answer key.**

**Assessment**

**Title (255 characters maximum):**

|  |
| --- |
| Pre-Assessment for Unit |

**Summary (how does the material function in the lesson?):**

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| --- |
| This is the pre-assessment for the entire 8-day unit. |

**Downloadable file of this material in original format if possible, such as Microsoft word or PowerPoint (Provide filename and location)**

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**Assessment Rubric or Answer Key**

**Title (255 characters maximum):**

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| --- |
| N/A |

**Summary (how does the material function in the lesson?):**

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**Downloadable file of this material in original format if possible, such as Microsoft word or PowerPoint (Provide filename and location)**

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**Supports for Struggling Learners**

**If a learner is struggling to understand the objective, essential question, or skills presented in the lesson, what can be done to help this learner? Is there a lower reading level version of text? Is there a more image heavy or simplified version of content? Can supportive devices be provided such as calculators?**

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| --- |
| N/A |

**Extensions for Excelling Learners**

**If a learner is really excelling at the objective and skills presented in the lesson, what can be done to continue to challenge this learner? Can the student create a product or learn more in depth about the content?**

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| --- |
| N/A |

**Additional Resources**

**Please list websites, references, or other materials for further research by interested students that is not already provided within the lesson.**

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|  |

**Related Lessons or Educational Materials**

**Is this lesson connected to other lessons within a unit? Is this lesson related to a field trip guide or activity? If so, list the website address or titled of these other materials below.**

|  |
| --- |
| Day 1- [Earth as a System](http://www.nps.gov/depo/forteachers/classrooms/earth-as-a-system.htm)  Day 2- [Weather vs Climate](http://www.nps.gov/depo/forteachers/classrooms/weather-vs-climate.htm)  Day 3- [Watershed](http://www.nps.gov/depo/forteachers/classrooms/watersheds.htm)  Day 4- [Climate Science Data and Tools](http://www.nps.gov/depo/forteachers/classrooms/climate-science-data-and-tools.htm)  Day 5- [Field Trip](http://www.nps.gov/depo/forteachers/classrooms/field-trip.htm)  Day 6- [NPS Connections](http://www.nps.gov/depo/forteachers/classrooms/nps-connect.htm)  Day 7- [Project Preparation](http://www.nps.gov/depo/forteachers/classrooms/project-preparation.htm)  Day 8- [Evaluations](http://www.nps.gov/depo/forteachers/classrooms/presentations.htm) |