

LP 4

Impacts of Climate Change on Physical Systems

# of Days	2		
Prior Knowledge	Depending on students' backgrounds they may or may not be able to identify dependent and independent variables. If students struggle with reading easy graphs, they may need more scaffolding prior to the Stations activity.	California English-Language Arts Content Standards	Reading 2.5 Writing 2.3.b, c Listening and Speaking 1.1, 2.0.b, c
Lesson Objective	Students will analyze the sources for climate data and will analyze this data to identify the impact of climate change on physical systems.	Language Goals/Demands	Students will be able to describe the impacts of climate change on the physical system and justify claims with evidence.
Lesson Assessment	Quiz over using data to make conclusions & mitigation strategies	Changes for Next Time	
California State Science Standard	Earth Science 1.c, 4.a, 4.b, 4.c, 6.a, 6.c, 6.d, 8.b; Investigation 1.a, 1.d, 1.m		
Materials Needed	Graphs and Questions for each station; Graphs for Causes; Powerpoint slides for Ice Core Explanations, Mitigation Powerpoint	What Worked Well	
Time	Learning Task or Activity	Method & Notes	
Day 1			
3 min	BW: Some scientists collect data from tens of thousands of years ago. How do you think scientists can know what happened so far in the past? Discuss your ideas with a partner	Pair Work	
20 min	Data Collection Instrumentation - Show students slide #2 pointing out that the data goes back 100,000 years. - Ask for student input about how data is collected especially from periods long ago. (Talk about thermometers, satellites, etc. and introduce ice cores if students don't suggest this) - Pass out Student Guide for use during this segment	WHOLE CLASS DISCUSSION/ANALYSIS See Slides 4.1.1 for Ice Core Slides See 4.1.1 for Ice Core Slides and Notes See 4.1.2 for Ice Core Guiding Questions If you have access to streaming video, you may replace the slide show and data analysis with the KQED video (20 minutes) on ice cores found at: http://www.kqed.org/quest/television/web-extra-at-the-core-of-climate-change	

7 min	<p>Mitigation Introduction</p> <ul style="list-style-type: none"> - We have talked about the presence of GHG's and how we detect them, how do you think we can limit them? We will be talking about this at different points over the next few lessons. - Have the chalkboard divided into four parts. Assign student pairs to one sector and have them discuss for four or five minutes how we might be able to decrease or "mitigate" GHG emission in these sectors. Have students write ideas on the board under the proper heading <p>Possible Sectors: Transportation, Heating & Cooling Buildings, Industry emissions, Electricity Use</p>	<p>PAIR WORK</p> <p>See Slides 4.1.3, # 1-3 to introduce the activity</p>
12 min	<p>Mitigation Presentation</p> <ul style="list-style-type: none"> - Present slides on four or five of the wedge strategies that students will use for the summative assessment 	<p>LECTURE/SLIDES</p> <p>See Slides 4.1.3 for Mitigation Strategies</p> <p>See Teacher Guide 4.1.3 for copies of mitigation strategies and notes</p>
HW	<p>Concept Maps - Add the following terms and relationships to your Concept Map:</p> <p>Sea Level Rise, Glacial Cover, Ice Cores</p>	<p>HOMEWORK SLIDE</p> <p>See 4.1.3 #8 for homework slide</p>
Day 2		
3 min	<p>BW: What parts of Earth's systems do you think are changing due to increased greenhouse gases? Try and think of two or three possibilities.</p>	<p>INDIVIDUAL SEAT WORK</p>
5 min	<p>Introduction to Stations</p> <ul style="list-style-type: none"> - Humans are responsible for significant increased carbon emissions that have an impact on physical and biological systems. Today we are going to look at evidence to make claims about the impact of increased emissions on the <u>physical world</u>. You will be divided into groups and rotate through four stations. Each station has the instructions and task cards. You will record your answers on the student handout. - Divide up students into four groups 	<p>TEACHER-LED INSTRUCTIONS</p> <p>See 4.2.1 for Station Resource Cards</p> <p>See 4.2.2 for Station Task Cards</p> <p>See 4.2.3 for Student Prompts for the Station Activity</p>

8 min	Station 1: Long-term Temperature Graphs Station 2: Long-term Sea Level Rise Graphs Station 3: Long-term Snow Cover Graphs Station 4: Severe Weather Frequency Graphs	GROUP WORK
8 min	Station 2:	GROUP WORK
8 min	Station 3:	GROUP WORK
8 min	Station 4:	GROUP WORK
10 min	Group Processing/Station Debrief - What claims can be made about climate change? - What is the evidence that climate is changing? What is the impact on physical systems? (Remind students to support their statements with data from the previous day's stations). - Is this evidence convincing?	TEACHER-LED DISCUSSION See 4.2.4 for Discussion Slides
HW	Write a paragraph summarizing the impact of climate change on the physical system. You should mention how confident you feel in the data that supports these claims.	