LP 5 Consequences on Biological Systems & Adaptation

# of Days	3		
Prior Knowledge		California English-Language Arts Content Standards	Reading 2.0, 2.5 Listening and Speaking 1.3, 2.5
Lesson Objective	Students will analyze data to determine the consequences of climate change on environmental, biological, human, and social systems and identify adaptation strategies for these consequences.	Language Goals/Demands	Make sure students understand meaning of adaptation, system, biological, environmental, and social, density, displacement
Lesson Assessment	Students will generate and share adaptation strategies for dealing with the impact of climate change on biological systems	Changes for Next Time	
California State Science Standard	Biology 6.b, 6.g; Earth Science 6.b.; Investigation 1.a, 1.d, 1.m		
Materials Needed	LP 4 Quiz; Materials for sea level activity - clear containers, cubes of ice, clay, rulers; materials (data and graphs) for stations	What Worked Well	

Time	Learning Task or Activity	Method & Notes
Day 1		
3 min	BW: Make a list of positive and negative impacts of climate change	INDIVIDUAL SEAT WORK (5.1.1)
5 min	Discuss Bellwork - Ask students to share different consequences for humans or the environment - End by talking about sea level rise as an important consequence for coastal areas like the Bay Area. - Also remind students of ALBEDO: different materials/surfaces have different level of reflectivity.	LECTURE/DISCUSSION See 5.1.1 Consequences Slides
10 min	Begin Sea Level Activity - Students will set up Sea Level Activity (in small groups) and record initial observation of water level (outside if possible)	HANDS-ON ACTIVITY See 5.1.4 Sea Level Activity Instructions and Datasheet Students set up activity using task card.

15 min	Quiz over LP 4	INDIVIDUAL SEAT WORK Use 5.1.2 LP4 Quiz and Key Make second observation of ice after quiz
20 min	Sea Level Activity Continued - Have students make 2 more observations (at 20 and 30 min) -Teacher lead discussion (based on preliminary observations). What has occurred? What is different? What is the same between the two conditions? What are the scientific principles behind this phenomena? - Students make final observations (measure water level)	HANDS-ON ACTIVITY CONTINUED See 5.1.3 Ice Activity Instructions and Datasheet.doc Students check every 10 minutes, recording results on table. Have students work with groups to discuss and answer questions. Conclude with a whole group discussion.
HW	Homework What are some of the factors that contribute to sea level rise? What areas will be most affected?	
Day 2		
2 min	BW: We recently looked at graphs of sea level rise. If this pattern continues, what parts of the Bay Area will be affected?	INDIVIDUAL SEATWORK
5 min	Introduction to idea of Adaptation: We've looked at some of the impacts of climate change, one example is sea level rise. What are some things we can do to prevent more damage from climate change? The changes and adjustments we make are "adaptations".	DISCUSSION Review mitigation (introduced in earlier lessons). Introduce idea of adaptation. Create a KWL (what we KNOW, what we WANT to know, and what we LEARNED (this column is filled in later)) about adaptation.
10 min	We've talked about Physical systems (past lessons, now we're going to look at the IMPACT OF CLIMATE CHANGE ON BIOLOGICAL SYSTEMS) Station 1: Ecosystems Station 2: Agriculture Station 3: Fire on Wildlands Station 4: Global Health and Disease	GROUP WORK Students will rotate between 4 stations. Each station will have data, pictures, and graphs showing the consequences of climate change on each topic. Students have a list of questions about adaptations. Use 5.2.1 Sample Evidence Claim Use 5.2.2 Station Task Cards Use 5.2.3 Student Questions Use 5.2.4 Station Graphs Biological Systems
10 min	Station 2	GROUP WORK
10 min	Station 3	GROUP WORK
10 min	Station 4	GROUP WORK

4 min	Closure Question: What do you think will be the easiest consequence to deal with? What do you think will be the most difficult consequence to adapt to as an individual? As a society?	DISCUSSION
HW	Based on what we've learned so far, what are some ways that climate change might affect the community where you live?	
Day 3		
2 min	BW: List one way that climate change impacts a) agriculture b) ecosystems and c) weather and d) health and disease	INDIVIDUAL SEATWORK
10 min	Differences between mitigation and adapation - Review definition - Students discuss in pairs - Fill in KWL chart	GROUP DISCUSSION See 5.3.1 Adaptation Resources See 5.3.2 Mitigation and Adaptation Slides
15 min	The Great Discussion Prep: Students will work in groups, pulling together the various activities, data, and information they have learned over the course of the Climate Change Unit. Due to resources only ONE area of impact can be addressed. You will be assigned one of the four topics from the stations. Why should your topic be the one area addressed? Give examples and evidence to support your position. (including feasible and practical mitigations and adaptations)	GROUP WORK Teacher will assign each group an area of impact: ecosystem, agriculture, severe weather, or health.
25 min	The Great Discussion Presentations	STUDENT GROUP PRESENTATION Discussion format: teacher's choice