**5E** [**CondorKids**](https://www.youtube.com/watch?v=PyzKqUm-97M) **Middle School Unit**

By USFWS Hopper Mountain National Wildlife Refuge Complex, Teachers from Fillmore Unified School District and Santa Paula Unified School District: Laurie Merrill and Cynthia Martin, and support from Oxnard School District Science Instructional Specialist Sarah Raskin (template adapted from Annie Ransom)

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| **Standards** | |
| **MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.** [Clarification Statement: Emphasis is on describing the conservation of matter and flow of energy into and out of various ecosystems, and on defining the boundaries of the system.] [Assessment Boundary: Assessment does not include the use of chemical reactions to describe the processes.]  **MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.** [Clarification Statement: Emphasis is on recognizing patterns in data and making warranted inferences about changes in populations, and on evaluating empirical evidence supporting arguments about changes to ecosystems.]  **Partially addressed:**  **MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.\*** [Clarification Statement: Examples of ecosystem services could include water purification, nutrient recycling, and prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and social considerations.]  **MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem**.[Clarification Statement: Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.]  **SEP: Asking Questions, Developing and Using Models, Analyzing and Interpreting Data, Using Mathematics and Computational Thinking, Constructing Explanations, Engaging in Argument from Evidence, and Obtaining, Evaluating, and Communicating Information** | |
| **Environmental Principles & Concepts** | |
| ~~Principle 1 - People Depend on Natural Systems~~  Principle 2 - People Influence Natural Systems  ~~Principle 3 - Natural Systems Change in Ways that People Benefit From & Can Influence~~ | Principle 4 - There are no Permanent or Impermeable Boundaries that Prevent Matter from Flowing Between Systems  Principle 5 - Decisions Affecting Resources and Natural Systems are Complex and Involve Many Factors |
| [EP&Cs Flyer](https://www.californiaeei.org/media/1422/epandcs-flyer.pdf) [EP&Cs Infographic](https://www.californiaeei.org/media/1407/infographic_californias-environmental-principles.png) | |
| **Essential Question** | |
| **What role does the California condor play in the California ecosystem, and how do changes in the ecosystem impact condors over time?** | |
| **Engage – Anchor Phenomenon and Preliminary Model**  **1 Day: 45 minutes** | |
| **Lesson 1 – Intro and Preliminary Model**   * Engage: **Condor Feeding Frenzy Videos** [**Condors feeding on deer carcass**](https://www.youtube.com/watch?v=245wa0_rjc4) * Optional videos: [**Condor Eats Deer Heart**](https://www.youtube.com/watch?v=TuGpuxlb0dw), [**Condors Eating a Pig**](https://www.youtube.com/watch?v=9BE1JP284_Y), [Condors Supplemental Feeding Central Cal](https://www.youtube.com/watch?v=GgXo8gQURAU)ifornia**,** [**Condor vs Eagle**](https://www.youtube.com/watch?v=IYRYc30XUgk) * **Create a** [**preliminary model**](https://amarshall477.wixsite.com/condorkids/lesson-aides) **of how the condor interacts with its environment** * **Gallery Walk** * **Revise Models** | |
| **Explore/Explain #1 – GIS Tutorial and Week 1 GIS Lab**  **2 days: 60/45 minutes** | |
| **Lesson 2: GIS Tutorial and Activity 1**  **Day 1:**   * **Warm-Up** * **GIS Activity Tutorial**   **Day 2:**   * **Warm-Up** * **Intro and assign groups a condor to monitor** * **GIS Data Sheet – Week 1 (Habitat)** * **Class Discussion** | |
| **Explore/ Explain #2 – Week 2 GIS Lab & Hopper Mountain Food Web**  **2 days: 45/50 minutes** | |
| **Lesson Plan 3 – GIS Activity 2**   * **Warm-Up** * **Re-watch Anchor Video** * **GIS Data Sheet – Week 2**   **Lesson Plan 4 – Developing the Hopper Mountain Food Web Model**   * **Warm-Up** * **Gather Information/ Research** * **Building a Hopper Mountain Food Web Model** * **Class Discussion** * **Revising the Food Web Model** * **Revise Preliminary Model** | |
| **Explore/ Explain #3 – Week 3 GIS Lab and Scavenger Success**  **2 Days: 45/40 minutes** | |
| **Lesson Plan 5 – GIS Week 3**   * **Warm-Up** * **Class Discussion** * **GIS Activity Week 3**   **Lesson Plan 6 – Scavenger Success**   * **Deer Decomposition Video** * **Close Reading of article** * **Re-watch Anchor Video and Discussion** * **Revise Model** * **Reflection** * **Optional Homework** | |
| **Explore/ Explain #4 –GIS Lab Week 4 and Graphing Human Impacts**  **2 Days: 45/45 minutes** | |
| **Lesson Plan 7 – GIS Week 4**   * **Warm-Up** * **GIS Activity Week 4** * **Reflection**   **Lesson 8: The Life and Death of California Condors – Graphing Human Impacts**   * **Warm-Up** * **Jigsaw Activity** * **Making Graphs** * **Sharing the Data** * **Claim-Evidence-Reasoning** | |
| **Explore/ Explain #5 – The Condor’s Shadow and Do the Math!**  **1 Day: 60 minutes** | |
| **Lesson 10: The Condor’s Shadow and Do the Math!**   * **Watch Condor’s Shadow video** * **Do the Math Activity**   **Lesson 11:**   * **Warm-Up** * **Question Formulation Technique** *\*Guest speaker is not guaranteed. Video or written question responses can be substituted.* | |
| **Explore/ Explain #6 – Expert Answers and Microtrash Madness**  **1 Day: 45 minutes** | |
| **Lesson 12: Microtrash Game** | |
| **Elaborate – Public Service Announcements**  **2 Days: 30/30 minutes** | |
| * Create a PSA/ Billboard/ Sign/ Video/ Poster encouraging people how to prevent microtrash or lead from entering the condor’s environment. * Share with FWS Park Ranger for possible showcase on Facebook or Websites   [**Funny video example**](https://www.youtube.com/watch?v=vSCALpmxnLE)[**Serious video example**](https://www.youtube.com/watch?v=E8d_JvMpoY4&list=PL5WqtuU6JrnXjsGO4WUpJuSVmlDcEgEYb&index=2)[**Kid made signage**](https://ca.audubon.org/downloadable-beach-signs) | |
| **Evaluate – Claims, Evidence, and Reasoning**  **1 Day: 30-45 minutes** | |
| * **[CER](https://drive.google.com/open?id=1OqWXVmYAl2_bXxVcnDx3_6w73FBWiP43)** * **[Rubric](https://drive.google.com/file/d/17n0nUYJcKH8S8WcElDBA6FEm5A4lOf__/view?usp=sharing)** | |

*Estimated time to complete: lesson plans 30-60 minutes; 15 lesson days (50-minute periods)*