Student Checklist: Ecological Restoration

Challenging Question: How can we use science, policy, and nature-based engineering practices for ecological restoration in California?

Add due dates to the following tasks and phases as instructed by your teacher.

Phase 1: Invitation to Engage, Explore Challenging Question, & Organize

Ask significant questions and define problems as you launch your project.

* Read “Invitation to Engage: Restoring our Land and Water.” Review rubrics.
* After you are assigned to a group, you will adopt a role as a principal investigator, scientist, engineer, or policy analyst and develop a brief job description for the role. These roles may be adopted for the length of the project, or rotated within your group. Accept or modify the Challenging Question with your group and teacher.
* Investigate an existing restoration project via online reports and news articles, documenting what you learn in your science notebook. Discuss within your group ethical, political, cultural, financial, and ecological factors influencing the decisions that were made in the process of completing the project.
* With your teacher’s guidance, work as a team to identify a project site for which your team will create a restoration plan.
* Through your research, get familiar with what constitutes a restoration plan. There will be a range of options and solutions for any given site. Create an initial need-to-know list of relevant questions to launch your site investigation.
* Research and begin to make contact with a local organization or government agency to arrange for your local volunteer field experience. Read “Guide to Volunteer Restoration Field Work.”

Phase 2: Explore Questions, Existing Models, and Knowledge

During the second phase of the project you will work in your group to explore, analyze, and interpret qualitative and quantitative data related to your need-to-know questions.

* Individually, perform a self-assessment of Phase 1 and write a brief plan of improvement to turn in to your teacher.
* Read “Asking the Right Questions.” Working with your group, use the Question Formulation Technique to refine your need-to-know list of relevant questions developed in Phase 1.
* With your group, meet with your teacher to review and gain approval for the plan for your project.
* Use your need-to-know questions to launch your investigations, assigning specific questions to group members by role, skills, or individual preference. If your plan includes interviews, be sure to contact the subjects well in advance to set up appointments. Once you have completed the investigations, work as a group to synthesize and record the results. (Your teacher may ask you to turn these in or share them with your class.) Discuss how you will use these results to develop a restoration plan for your selected site. Do you have all the information you need? If not, assign and collect the missing information. Review existing ecological restoration principles or philosophies. Participate in local volunteer restoration work as arranged.

Phase 3: Explain and Evaluate Claims, Argue from Evidence, and Reason

Take time now to compare and contrast claims within your group. Each claim is a response to either the challenging question or a related, need-to-know question. In this phase, you will complete planning for the presentation of your ecological restoration plan.

* Read the “Claims, Evidence, and Reasoning Guide.” Based on the results of your investigations, develop several alternative approaches to a restoration solution for your site. Group members can devise individual solutions or you can work as a group to come up with several alternatives. Review and compare these approaches. Record all the claims you can make regarding each approach, and the evidence to support each claim. Evaluate the strengths and weaknesses in restoration principles or philosophies as you consider your own proposed restoration approaches. Evaluate the quality and credibility of your sources.
* Select your best restoration plan elements. Share them as directed by your teacher, and revise based on feedback.
* Read “Communicating Science and Policy to Public Audiences.”
* Complete your restoration plan and create visual presentation materials. Practice and review your presentation with the Presentation Rubric.
* Individually, perform self-assessment and write a plan of improvement to turn in to your teacher. Submit project notebook to teacher for review. Confirm arrangements for any off-site presentations if applicable.
* Participate in local volunteer restoration work as arranged.

Phase 4: Extend into Action: Communicate your Restoration Plan

Your primary academic role towards the end of the project is to communicate your science, engineering and policy solutions using visual tools, models, media presentations, or written products.

* Perform technology checks on any equipment that will be needed for final presentations and follow up with invited guests to confirm attendance at least 24 hours in advance of the scheduled presentation. Present your proposed restoration plan to your audience.
* Complete local volunteer restoration work as arranged.
* Perform self-assessment and peer reviews.
* Submit individual project notebook to teacher for review.

Phase 5: Reflecting, Evaluating, and Celebrating

Ask yourself how you could improve while your successes and failures are still fresh in your mind.

* Organize a group debrief with teacher. Have any new questions emerged?
* Write thank you notes to any adult mentors and partners.
* Perform a final self-evaluation, write a plan of improvement, and submit
to teacher.
* Celebrate with your hard working team!