Scientific Sketching

Description

Within the lake itself and surrounding chaparral, oak, and riparian habitats, the Clear Lake region is home to incredible biodiversity. This biodiversity includes native and non-native species that interact and impact the health of the Clear Lake watershed. This activity allows students to explore these species. It focuses on skill building, asking questions, and making observations using the tool of scientific sketching. As students learn more through observation and using species lists, they begin to develop expertise and environmental science agency.

Objectives

Student Objectives	Students will develop observation skills through sketching.	YCCS Core Activity: Develop Expertise
	Students will practice asking questions.	YCCS Core Activity: Develop Expertise
Educator Objectives	Educators can set protocols for student generated questions, dialogue protocols/ways to facilitate.	YCCS Key Educator Practice: attend to the unexpected

Key Vocabulary

Observation, invasive species

Instructions

Time

1 hour

Materials

- Clipboards and pencils
- iPad, camera, or smartphone to take photos

- Print the Lake County Office of Education's Lake County Strong nature journal, enough copies for every student. Blank sheets of paper or custom-made versions can also be options.
- A bag of acorns, the bag must not be see through. Note: if there are no acorns at your site, you can use the acorns from off-site or substitute with leaves or other small, natural items that are seasonally available at your site.

Getting Ready

- Scout a small area for examples of key native and/or non-native plants, some ideas for what to look for can be found from the Lake County Strong lesson.
- Choose an area with few hazards, set and identify boundaries, and thoroughly warn students about any local hazards. For safety reasons, avoid poison oak, tall grass, down logs if possible. Prep your students in the environment for exploration using the BEETLES Project Ecosystem Literacies and Exploration Guide.
- Review examples of nature journals from John Muir Laws, Robin Carlson, and others. Review student samples of scientific sketches from the UC Davis Center for Community and Citizen Science.
- Use the species list to identify a key species of management concern at or near your site to use in the post-activity. You can bring students directly to these plants or bring the plants inside, enough for every 3 or so students to observe.

Facilitation

Part One

Walk around to each student with the bag of acorns/natural objects. Have students use their sense of touch to feel inside the bag to guess what is inside. Make sure you tell students to keep their answer a secret until every student has a chance to feel inside the bag. As you are going around to the different students, discuss with the group:

- What are the different senses that help us make observations? Answer: Smell, touch, seeing, hearing, tasting

Once you have gone around to every student, have the group turn to someone next to them and talk about what they think is inside the bag and why. When students all have their guesses, reveal the contents of the bag. For the students that accurately guess the insides of the bag, ask them what specific things they felt that helped them figure out it was an acorn. Students will use different senses to help them make observations about nature around them.

Part Two

Students will go into a designated area at the site to find an acorn, or a leaf if acorns are not available, of their own. Once they find an acorn/leaf, students will spend 15 minutes drawing and writing as many details as they can using the Lake County Office of Education's Lake County Strong nature journal. Their goal is to provide enough of a description through a combination of words and illustration for someone else to be able to identify the exact acorn/leaf they picked. Give students 30 seconds to find an acorn/leaf before they must be seated and ready to make observations with their acorn/leaf.

Reflection

After the 15 minutes, have everyone return to the group and share with a partner one observation they recorded while nature journaling. Ask the group if they observed something new about their acorn/leaf that they never noticed before. Tell students that this activity is intended to help them hone their observation skills. This skill is important for scientists to be able to notice patterns, differences, similarities, and more about the world around them.

Do a gallery walk where students share their illustrations and see what other things their classmates observed. Split students into small groups and have them discuss what details of their drawings helped them identify the specific acorn/leaf. Have students reclaim the acorn/leaf they used for their drawing. Test their observation skills by asking them to return the acorn/leaf to where they first found it. When they return it, their job is to make arguments from evidence about what kind of tree their acorn/leaf came from. They can use some of the observations from their drawings to help them with the identification. If you get stuck on the identification, you can use the species list and/or preview the Youth Engagement with iNaturalist activity as a tool that can help.

Optional Post-Activity

Use an invasive species of management concern from the species list. Introduce an invasive species. Tell students that there are some key characteristics that can be observed through scientific sketching that make invasive species so successful in their new environments.

- Structure: Invasive species can produce a lot of seeds. This means we might be able to find a lot of flowers.
- Habitat: Invasive species can live in lots of different habitats, often in disturbed soils. This means we need to make notes about where we find this species.
- How much is around: Invasive species will often spread a lot over a large area. This means we need to make note of if we are seeing many nearby.
- Predators: Invasive species don't have predators. This means we need to take note of any signs that it's being eaten.

Have students make sketches of your invasive species with these key observations noted.

Additional Uses and Modifications

While the students are drawing, send a teacher or chaperone to take photos of all of the organisms that students are using for their nature journaling. You may also instruct students to do this themselves after they complete their journal activity. These photos will be uploaded to iNaturalist either on-site or at a location with internet connection in the Youth Engagement with iNaturalist activity.