Day 4: Inquiry and field investigation

-- Exploring and investigating organisms land habitats at Alvarado Park, Richmond CA.

Focus Question:

What lives here and how does it interact with its environment, and with other organisms that live here?
What is a testable question?

Welcome and warm-up (Betsy) – ■ Welcome and lunch instructions ■ Form groups (4 groups, each led by a graduate student) ■ Warm-up teambuilder: Tableau ■ Introduce the day: schedule, logistics and the FQ: what lives here and how does it interact with its environment and the other organisms that live here? ■ Gather materials ■ (bathroom) ■ Head out	40 min 9:00-9:40
Journal activities – 1) Move to first location 2) First impressions – in the science journal, record your first impressions of place, using sight, smell, sound, feel – (10 min) (some potential prompts are: I observe/I notice _____(using all senses except taste) It reminds me of_____ because_____; I am curious about____ or I wonder what would happen if _____or it surprises me that ____ 3) Share (5 min) 4) Observe more closely - one square foot/small quadrat – describe (biotic and abiotic elements?) plus I notice _____ or I wonder _____ 5) Pick one item in your square foot – draw: begin with outside contour/overall shape, then add details, focus on one part at a time, add a title, add labels OPTIONAL: you can also start out with an activity on biotic and abiotic factors – introduce the concept by asking everyone to find an abiotic factor, find a biotic one, and then discuss. Then do a journal of first impressions followed by closer, more detailed observations as described above. Optional: Do Beetles I Notice I wonder It Reminds Me Of (INIWIRMO) activity – as intro or during exploration	20 min 9:40-10:00
Hike and explore • Move through the park to a second spot where you will stop. As you go observe habitats, landscape changes, and organisms -- look for patterns, notice change/differences, what are you curious about? • As you go jot down questions. Do INWIRMO at some point if you have time • Possible themes to bring out during walk- Introduce/use different tools to used for finding and observing organisms Observe and discuss leaf variation Invasive species Different habitats and how they vary in terms of biotic & abiotic factors Variation in diversity among plants, habitats Variation in growth form Collect insects, observe variation in diversity and abundance Gradients – your walk can be a model of a transect Do a quick, informal quadrat study to compare two habitats • At second spot, repeat initial observations and journaling	55 min 10:00-10:55

Nineteen questions • A bit of quiet reflection time during which each teacher is to write 19 questions that relate to their field experience. All questions are recorded in their field notebooks. You can use crosscutting concepts to help generate questions! (10-15 min) • Once all questions have been written, teachers share their questions with others in the group. This may be done as a whole group share or as a pair-share in which each pair selects 3 questions to share with the rest of the group (this can save time) (5-10 min) • Discussion focuses on: which questions are testable; which questions are testable in this context (i.e. given current constraints of equipment, time, etc.); which questions contribute to our overarching/focus questions: "What lives here, how do they interact with one another and their environments?" (20-30 min) • Select question for further study, design study (20 min) • Timing: Write questions – 10-15 minutes Pair-share (or group share) - 5-10 min Discuss questions as a group – 20-30 min Select question, design study – 20 min	65 min 10:55-12:00
LUNCH in the field	40 min 12:00-12:40
Gather Data	60 min 12:40-1:45
Return to meeting area	10 min 1:45-2:00
Analyze data and create poster To include on poster: ➢ Question ➢ Hypothesis – what do you think you will find, why? ➢ Methods - how did you investigate the question, what will you measure, what are your variables ➢ Results – present your data in a graph and/or table ➢ Statement of your findings – what did you learn/find out? ➢ Follow-up question – how would you continue this research, what new questions come to mind?	45 min 2:00-2:45
Present posters and findings Each group gets 5 mins to present 2-3 mins for audience questions	30 min 2:45-3:15
Closing circle Share one word describing the day's experience	15 min 3:15-3:30

<u>Learning goals</u>:

- Anyone can do an investigation to learn about natural phenomena/ask and answer a question about nature using the practices of science and their own observational skills
- Understand and use the practices of science
- Observe biotic and abiotic factors in ecosystems
- Address Focus Question: What lives here, how does it interact with its environment and with the other organisms that live here?
- What is a testable question?

<u>NGSS Practices of science:</u>

1. Asking questions - yes
2. Developing and using models - not really
3. Planning and carrying out investigations - yes
4. Analyzing and interpreting data -yes
5. Using mathematics & computational thinking - yes
6. Constructing explanations (for science) -yes
7. Engaging in argument from evidence -yes
8. Obtaining, evaluating & communicating info - yes