

**Field Study – SF Bay Unit**  
**Integrated Science 1**  
**Redwood High School**

8/10

Name: \_\_\_\_\_ Period: \_\_\_\_\_

■ **Background**

Fieldwork is an essential component of environmental studies. Environmental scientists routinely perform part of their research outdoors among the plants and animals that make up their area of study. This assignment involves conducting a detailed field study on a local ecosystem. You will begin by choosing a study site and conducting several initial observations. You will then conduct a detailed study of the biotic and abiotic factors affecting your study area. You will also construct a map, a food web, a description of adaptation, and a vision for future studies at your site. Although the ecosystem you study must meet certain requirements, you will have the opportunity of locating and selecting your study area. In this capacity you will be acting as the primary Field Investigator responsible for a preliminary study of a particular ecosystem of your choice.

We will be conducting a variety of class activities to help you develop the skills essential to successfully completing this project.

■ **Suggested Materials List**

- Thermometer      • Compass      • Clipboard      • Camera      • Watch (w/ second hand or digital)
- Color Pencils      • Plant and Animal Field Guides

■ **Benchmark Due Dates**

*\*When submitting assignments, CLEARLY LABEL ALL SECTIONS WITH THE APPROPRIATE HEADING*

Benchmark	Description	Due Date
1	<ul style="list-style-type: none"> <li>• Site Overview</li> <li>• Journal Entry #1</li> </ul>	Tuesday 9/28
2	Published Maps w/Study Area Boundaries Indicated	Tuesday 10/5
3	Detailed Site Description	Friday 10/8
4	<ul style="list-style-type: none"> <li>• Data Tables: A (1<sup>st</sup> entry) and B1</li> <li>• Journal Entry #2</li> </ul>	Tuesday 10/12
5	Personal Map ( <i>Draft</i> ) [Peer Review Session]	Tuesday 10/19
6	<ul style="list-style-type: none"> <li>• Data Tables: A (2<sup>nd</sup> entry) and B2</li> <li>• Journal Entry #3</li> <li>• Personal Map (<i>Final Version</i>)</li> </ul>	Tuesday 10/26
7 and 8	<p><b>Written Report</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Cover Page: <i>name, date, teacher, period, RHS, study site name, and a color photo of yourself in or next to your site</i></li> <li><input type="checkbox"/> Site Overview</li> <li><input type="checkbox"/> Photo Collage</li> <li><input type="checkbox"/> Observation Journal</li> <li><input type="checkbox"/> Published Maps</li> <li><input type="checkbox"/> Personal Map (<i>Final</i>)</li> <li><input type="checkbox"/> Detailed Site Description</li> <li><input type="checkbox"/> Data Tables A, B1, B2 [<i>Original Handwritten - Not Re-Typed</i>]</li> <li><input type="checkbox"/> Adaptations</li> <li><input type="checkbox"/> Food Web</li> <li><input type="checkbox"/> Conclusion</li> <li><input type="checkbox"/> Further Study</li> <li><input type="checkbox"/> Bibliography</li> <li><input type="checkbox"/> Extra Credit Extensions [<i>optional and not due until BM 8</i>]</li> </ul>	<p>BM 7: First Draft (Entire Project) <b>Double Spaced Typed</b> Friday 11/12</p> <hr/> <p>BM 8: Final Draft <b>Double Spaced Typed</b> Tuesday 11/16</p>

## ■ Study Area Selection and Requirements

- Size: No less than 200m<sup>2</sup> (recall that 1 meter = 3.28 feet)
- Your study area must be a legally accessible natural setting where biotic and abiotic factors are plentiful.
- An aquatic environment must be adjacent to or included within your study area.

## ■ Procedure

### Site Overview [Benchmark #1] DUE: \_\_\_\_\_

Your site overview should be produced after an initial 30-minute visit to your study area. Use the following requirements to organize your site overview. **Type 1 paragraph for each bullet – in the following order:**

- Describe the exact location, size, and shape of your study area. Include linear dimensions and area (m<sup>2</sup>)
- Write three questions about the ecology of your study area that an extended study could seek to answer.
- Give a detailed description of your study area. Include a thorough description of the plants, animals, water, topography and climate. Include enough specifics so that a person reading your description would not be surprised or confused if they visited your study area after reading your description. Paint a picture with words!
- Driving directions to your study area from Redwood High School.

EXTRA CREDIT EXTENSION: [Benchmark #7] DUE: \_\_\_\_\_

*A 3-5 paragraph essay describing the 100-year history of your study area. Sources must be cited. Bibliography required.*

### Observation Journal [Benchmarks #1, 4, and 6,] DUE: #1: \_\_\_\_\_ #4: \_\_\_\_\_ #6: \_\_\_\_\_

Create 3 observation journal entries using the guidelines below. Turn each entry in with the appropriate benchmark. Each journal entry should be handwritten and recorded on binder paper. Your goal is to observe as much as possible. Consequently, complete sentences are not required.

- Sit quietly in one spot of your study area for ten minutes. *Change locations each time you make an entry.*
- Format your journal entries into three columns: what you **SEE**, **HEAR**, and **FEEL**.
  - **HEADER:** date, time of day, the temperature, and climatic conditions occurring on that day.
  - Excellent entries reflect interactions between biotic and abiotic factors.
  - If applicable, complete the appropriate drawings and descriptions in your Data Tables.

## Maps

**Two Published Maps:** [Benchmark #2] DUE: \_\_\_\_\_

partial list of map sources  
Google Earth  
<http://terraserver.microsoft.com> (has link to USGS)

Required: One aerial photo, and one topographical map. For each published map you obtain and turn in, indicate the boundaries of your study area on the map using a colored marker. Label the source used directly on the published map and cite it in the bibliography section. *No topo map published for your area? Alternates are nautical or road maps*

**Personal Map: [Draft-Benchmark #5]** DUE: \_\_\_\_\_ **[Final Version-Benchmark #6]** DUE: \_\_\_\_\_

Using graph paper and a pencil, create a hand drawn map of your study area. The map will be challenging. As a result, you will be required to produce a draft before producing a final version. The following are required:

- Title
- Scale – *Example: 1 box = 1 m<sup>2</sup>*
- Note the compass direction N (north)
- Indicate the Latitude and Longitude of one point within your study area
- Symbols: use colored symbols which may include patterns like you saw on the topographical maps that are used to define things like grassy areas, marshes, groves of trees, mud, etc.
- Key: define the colors, patterns, and symbols used in your map
- Elevation: the highest and lowest point in your study area must be labeled with elevation in feet AND meters (3.28 feet = 1 meter) \* Elevation data are available from topographical maps. In some cases you may need to estimate elevations.
- Labels/Names: for things like roads, trails, buildings, creeks, bodies of water, etc.
- Indicate major landmarks nearby, and their distances, so that someone could find your site using only this map.

**EXTRA CREDIT EXTENSION: [Benchmark #7]** DUE: \_\_\_\_\_

*Find the surface area (m<sup>2</sup>) of your study area using the weight ratio method as described in the “Surface Area of the SF Bay” activity. SHOW ALL YOUR WORK*

**Detailed Site Description [Benchmark #3]** DUE: \_\_\_\_\_

In paragraph form, describe your study area in detail, focusing on the interactions of the biotic and abiotic factors, as described below. **Type 1 paragraph for each bullet – in the following order:**

- Estimate the percent of your study area that is covered by each of the following components: trees, bushes, grasses, water, bare ground, man made structures, etc. (*Note: these should add up to 100%*)
- Describe any signs that indicate regular use by wild animals.
- Describe soil types present in your study area. *Example: sandy, muddy, rocky, etc.* Discuss how the varying soil types influence the biotic factors living there.
- Discuss the influence of the associated body of water on your study area. How does the body of water affect the plants, animals, climate, soil types etc.?
- Discuss how the topography of your site influences the biotic factors living there. If your study area is not flat, describe the “faces”. *Example: southern exposure, etc.*
- Discuss how the climate and microclimates present in your site influence the biotic factors living there.

### Data Tables

Data Table A: Abiotic Factors **[Benchmarks 4 and 6]** DUE: **#4** \_\_\_\_\_ **#6** \_\_\_\_\_

Data Table B1: Biotic Factors **[Benchmark 4]** DUE: \_\_\_\_\_

Data Table B2: Biotic Factors **[Benchmark 6]** DUE: \_\_\_\_\_

**Photo Collage** [Benchmark #7] DUE: \_\_\_\_\_

A two-page photo collage is required. Your collage should thoroughly reflect your field study site. Your collage should be printed in color. Minimally, your collage must have the following pictures:

- your entire field study site
- (3) close up pictures of biotic factors
- your body of water
- a picture of yourself in, or next to, your study site

**Adaptations** [Benchmark #7] DUE: \_\_\_\_\_

Select one of the native organisms identified at your study site. In paragraph form, identify and describe at least three specific adaptations that make this organism well suited to survive in its environment. Cite the source(s) of information you use.

EXTRA CREDIT EXTENSION: [Benchmark #7] DUE: \_\_\_\_\_

*In paragraph form, identify any endangered or threatened species that may be present in your study area. Include information regarding reasons for decline and any efforts to restore the population. Cite the source(s) of information you use.*

**Food Web** [Benchmark #7] DUE: \_\_\_\_\_

Construct a food web of organisms that inhabit your study area. Next to each organism indicate its trophic level (producer, primary consumer, secondary consumer, top consumer, decomposer). Connect the organisms using arrows to indicate the direction that energy is flowing. Organisms can be represented by either their name or by a picture. You may create this by hand or using a computer.

**Conclusion** [Benchmark #7] DUE: \_\_\_\_\_ **Type one paragraph for each bullet**

- Summarize your experience and your observations. Include an explanation for how and why you chose your study area.
- Offer suggestions to improve the selection of your study area and data collection procedures you used.
- Discuss what you have learned about the connections between the abiotic and biotic factors within your site.
- Discuss the impact humans have made, or are making, in your study area. What are the potential ecological consequences of this impact and in what ways could the impact be minimized?

**Further Study** [Benchmark #7] DUE: \_\_\_\_\_

- Refer to the questions you wrote in the Site Overview section of the field study. Using these questions as a guide, formulate a question that could be used as the basis of a specific experiment, which if carried out would increase your understanding of the ecology of your study area.

\* NOTE: *you are not required to actually conduct this experiment*

- Complete an **Experimental Design Outline** for your proposed experiment.
- Construct a blank data table that could be used to gather data for your proposed further study. Use proper format.

**Bibliography** [Benchmark #7] DUE: \_\_\_\_\_

Cite all the references used in this project. This should include maps, field guides, web sites, etc. Use the (*Author, date*) format to cite information in the body of the text that came from published sources. Refer to the bibliographic format handout for guidelines.