Mapping Your Research Site

City planning departments have aerial photographs of their cities. You can get a copy of the aerial photograph from them. Some cities give them out for free for educational purposes, others charge a fee. You may need to go to the city offices to obtain a copy of the aerial photograph. The best size to use is the map scaled to 1 inch = 100 feet. Some cities have this resource on-line.

Blueprints of schools are usually located with the building maintenance section of your school district.

Making preliminary map of your schoolyard

From an aerial photograph:

Trace building, plants, parking lots and other features from aerial photographs. Make copies from this tracing. The scale of the aerial photographs is usually 1 inch=100 feet which you’ll need to convert to 1 cm = 12 m (scientists use the metric system but unfortunately, builders do not). Determine the size of all the important structures. You may want to enlarge this drawing (you can do this on a photocopier). Remember the scale will change when you enlarge the drawing.

From a blueprint:

Trace the buildings, parking lots and other features from a blueprint of your school. Make copies from this tracing.

By hand with the baseline and offset mapping technique:

Make an approximate drawing of your school grounds. Take this map and actually measure all the structures. Make a new drawing on graph paper that accurately reflects your measurements. In other words, make a scale drawing.

The size of the map depends upon how you are planning to use it. Some teachers prefer to have one large map for display, while others prefer something smaller. It may be useful to make the maps a size that is easily photocopied or easily scanned for use in a Web site.

A great reference book for mapping is “Mapmaking with Children” by David Sobel which explains various age-level appropriate mapping projects including baseline and offset mapping.
Grade Level

Middle school and high school students should be able to make accurate measurements of plant locations in their schoolyards. Teachers may want students to actually measure the structures as well, although this information can be taken directly from the aerial photos/blueprints.

Approximate locations of plants is adequate for elementary school students. One method of doing this is to divide a specific location to be mapped into quadrants and have groups of students map each quadrant. Students are supplied with stickers representing different types of vegetation (green for leaf trees, brown for pine trees, red for bushes, etc.) and the students place the stickers on their maps using their estimation skills. Then the quadrants can be put together for a larger map of one area.

Past and Present:

It is important for students to have some idea of the history of their research site. In the valley some schools actually rest on archaeological sites and so the history of human interactions with the environment at their school site can be quite long. Basic information about maintenance schedules and schoolyard use may be used in determining study sites or when to do collection (for example, if the school uses pesticides this may affect the arthropod sampling). This information may also be useful when students are developing hypotheses and experiments.

Grade Level:

Students at all levels can participate in conducting surveys and researching the site history
Mapping Your Research Site

Ecologists map research sites as a first step in documenting the living and non-living aspects of an ecosystem. The map also establishes the boundaries of the research site. You’ll use your map for a variety of projects: showing your data collection locations; comparing features of your schoolyard to other schoolyards; and comparing changes to the schoolyard over time.

Obtain a preliminary map from your teacher

If an aerial photograph of your school is available, compare it to your map.

Ground verification

Make sure your preliminary map contains the major structures (buildings, parking lots, etc.) and vegetation (trees, shrubs, etc.) at your school. You’ll need to go outside and verify that the structures and vegetation included on the preliminary map still exist and whether new ones have been added.

Try to include the following information on your map:

- Direction (usually north)
- Human-made structures (sidewalks, playing fields)
- Water sources
- Topography
- Traffic patterns of wildlife, people, and vehicles
- Path of sun and wind exposure
- Plant locations
- Scale

For a detailed map, carefully measure the distance from known locations to new objects and then plot the new objects on your map.
Your Research Site

Describe the past and the present condition of your research site

Why think about the past?
Ecologists study the history of a research site as they investigate why current ecological conditions exist. For example, knowing when the last fire occurred would explain certain vegetation patterns.

Urban ecologists also investigate the impact of past human decisions on current ecological conditions. For example, few mature saguaro cacti are found on ASU’s “A” mountain. Without considering past human influence, you might base your explanation on natural phenomena (like soil type or exposure). By ignoring human factors, you would overlook the main reason for the lack of mature saguaro cacti—they were removed by people.

Historic events you might document
- What was at your site before it became a school?
- Is there a written site history?
- When was your site transformed from native desert to some other use?
- When did it become a schoolyard?
- Who decided what vegetation to plant?
- Have parts of the schoolyard changed from the original design?

Next, think about the present
Why should you look at how your schoolyard is used and maintained? Your answers to these questions will be useful a you decide when to collect data. For example, you’ll want to schedule data collection at times when pesticides are not used. The answers to your question will also be useful when you start analyzing data.

When you describe your schoolyard, include both physical descriptions (most of these will be on your map) as well as how the schoolyard is used.
What should you know about the present?

- Who takes care of the schoolyard?
- Can you describe your school’s maintenance schedule?
- How often is the grass watered and mowed?
- How often are herbicides/pesticides used?
- Which teachers currently use the schoolyard for class projects?
- What areas are used by the students at recess and/or breaks?
- Which areas are used more during specific times of school year?
- How do the staff and faculty use part of the schoolyard during their breaks?
- What after-school activities use part of the schoolyard?
- How is the schoolyard used over the school vacations?