Lesson planning for the Campus Needs Assessment

LESSON 1: Classification

Science Standards-based LO: Students will know the natural origin of materials used to make common objects.

Science Standards-based LO: Students will know how to classify natural material resources as renewable and nonrenewable.

Context-based LO: Students will develop group membership skills.

Context-based LO: Students will classify material resources as parts of a system.

Instructional materials/resources: Assortment of objects, seven identical sets

Summary Description:

Introduction: The same items can be sorted in several ways according to the purpose of the activity. It would take several lifetimes to study every animal or electric invention or galaxy. Scientists group like objects together to study them more efficiently. The method of forming groups depends on the purpose of the investigation. A tomato and a rock could be grouped together (or not) depending on the purpose of the investigation.

Activity 1: Have selected students model the process of sorting a set of objects twice, each time with a different purpose in mind.

Activity 2: Assign teams to sort a set of items in a way that will be hard to guess. Challenge students to think beyond the obvious characteristics of color, shape. Afterwards permit teams to guess the challengers categories.

Activity 3:Brainstorm the sorting and classification that is done according to social criteria, scientific criteria, government criteria, merchandising criteria.

Responsible Individual: Science Teacher

Timeline: 1 class period

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LESSON 2: Natural Resources

Standards-based LO: Students will know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests.

Context-based LO: Students will identify natural resources as the materials upon which they depend in both local and global natural contexts.

Instructional materials/resources: selection of large (calendar) photos,
poster size sheets of paper
tape

Summary Description:

Inquire what the term "resource" means in different contexts.

Assign each cooperative team one of the following to brainstorm:

information resources
recreation resources
financial resources
personal emotional resources
emergency resources in the community

After teams report their examples, move the discussion to natural resources. What would natural resources mean? When we refer to *natural resources* we mean that these *are the parts of nature that we depend on regularly.*

Have each team select one or more photos to display as a poster illustrating some of their ideas about what are our natural resources.

After the posters are displayed, guide the class to identify the 7 accepted categories of natural resources.

Brainstorm ways of classifying natural resources.

Guide the discussion toward these criteria:

Accessibility Fragility Renewability

Responsible Individual: Science teacher

Timeline: 2 class periods

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LESSON 3: Conservation

Standards-based LO: Students will know how to classify natural resources as renewable or nonrenewable.

Standards-based LO: Students will recognize whether evidence is consistent with a proposed explanation.

Standards-based LO: Students will identify changes in natural phenomena over time.

Context-based LO: Students will become empowered to take control of some aspects of conservation of natural resources in their local school community.

Instructional materials/resources: KIDS TALK TRASH video

Summary Description:

PART A: What can be (should be, has been) done to minimize the impact of an individual person, an individual school, an individual city on the depletion of natural resources?

Elicit from students their reflections on discussions held in social studies class about conservation in ancient civilizations.

Is the use, misuse, waste, disposal, conservation of natural resources a "modern" problem or has it always been an issue for human settlements?

Have each team generate a list of the similarities and differences between ancient consumption and conservation compared to modern consumption and conservation.

Discuss & record: programs, habits, organizations, etc. of which the students are aware that work toward conservation of resources. *These are examples that the students themselves generate from personal observation and experience.* Display the lists that have been brainstormed.

Show video: *Kids Talk Trash. Have students record questions and reflections after viewing the video.*

PART B:

If we are to embark on a conservation program here at Ralston, we must:

Identify what categories of natural resources are used all over the school.

Identify what natural resources can be

REDUCED REUSED RECYCLED ROTTED

Activity: Getting to Know Your Trash

1. Collect a sample of trash from a variety of sources at the school.
2. Sort the sample heap of trash.
3. Based on this sample sort, identify what types of trash we generate.
4. Classify it by source, contents, and disposal methods.
   What can be reduced, reused, recycled, or rotted?
   (Are their some items about which we are uncertain? What resources in the community can help us determine what to do about these?)
5. Discuss how we will be able to know ***and measure*** the difference we can make in the conservation of natural resources at Ralston.
6. After brainstorming ways to meaure success, explain to the class that in science and other technical fields, it is desirable to measure the effects of a program, a change, an initiative. We can quantify our success at Ralston by measuring the weight of garbage before our program begins. We will weigh garbage again to understand the results of our efforts over time.

Responsible Individual: Science teacher coordinating with custodial staff, faculty, and administration.

Timeline: 2 class periods

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LESSON 4: Mapping the Ralston Campus Solid Waste Stream

Standards-based LO: Students will construct and interpret a simple scale map.

Standards-based LO: Students will use appropriate tools and technology to collect and display data.

Context-based LO: Students have the opportunity to apply skills and knowledge in local surroundings.

Instructional materials/resources: variety of measuring devices as selected by teams, paper, clipboards

Summary Description: **Mapping the Ralston Campus Solid Waste Stream**

Introductory Discussion:

Elicit the definition of "stream" from the class. Explain that in some technical fields the word is used to show how something passes through a system, much like a stream passes through a forest. All the waste generated at Ralston starts out as natural resources elsewhere before passing through our campus. Solid waste leaves Ralston after materials pass through campus for a variety of purposes.

Challenge:

We need to map the campus showing where natural resources enter and where waste leaves. We break into teams and map the waste stream for all the rooms, all the buildings, and all the outdoor areas.

(Students have had enough background experience to know the basic characteristics of maps.)

Planning:

1. What decisions about making our maps are needed before we head out?
2. Do we need to use common symbols in our keys?
3. Do we need to agree on a common scale?
4. How do we indicate the following on the maps:
   entry points for natural resources?
   points where they are "used, processed, eaten, discarded, etc."?
   exit points for the waste?
5. What rules do we take with us when we conduct an investigation outside the classroom?

Responsible Individual: Science teacher and parent volunteers to accompany student teams to various locations on campus.

Timeline: 2 class periods

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LESSON 5 Campus Waste Audit

Standards-based LO: Students will develop a hypothesis.

Standards-based LO: Students will select and use the appropriate tools and technology to perform tests and collect data.

Context-based LO: Students will, with support, undertake service-learning projects.

Instructional materials/resources: School Campus Waste Audit (2003 Draft provided by the Acorn Group and SEER) including the required materials for collecting, storing, weighing trash and garbage.

Summary Description: Students sort one day's worth of Ralston Middle School trash.
Logistics: TRASH & GARBAGE will be collected, labeled, and stored by afternoon classes on one day. TRASH & GARBAGE will be weighed and sorted by the morning classes the following day.
Details: Waste Audit Procedures, pp. 9-12 Acorn & SEER draft.

Responsible Individual: Science teacher in communication with and the support of the staff of Ralston, BFI, parent volunteers.

Timeline: 2 class periods (one for prep and one for the audit)

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LESSON 6 Report and Plan of Action

Standards-based LO: Students will select and use appropriate tools and technology to display data.

Standards-based LO: Students will construct appropriate graphs from the data and develop qualitative statements about the relationships between variables.

Standards-based LO: Students will communicate the steps and results from an investigation in written reports and verbal presentations.

Standards-based LO: Students will recognize whether evidence is consistent with a proposed explanation.

Context-based LO: Students will carry out service-learning projects that contribute to their community.

Context-based LO: Students will construct their own understandings and define specific action goals.

Instructional materials/resources: Access to computers to develop reports and presentations of findings

Summary Description:

Part A: Students determine how best to report their project. How will the data be presented?

What types of graphs should be made?

What analysis is needed?

Do we have recommendations?

Will there be an action plan?

Will there be advertising?

Will we start an organization?

To whom should we present our findings and our plan?

Part B: Students carry out the project or engage others to do so.

Responsible Individual: Science teacher with other supporting members of the school, the district and the local community

Timeline: 2 class periods and additional independent time outside of class