Biome Boxes
Create Biome Boxes to Summarize and present information on biomes for 6LTER sites

Engagement:
• In order to establish an understanding of the concepts of change over time (extent) and over different scales (grain), the teacher may (as an option) obtain short excerpts from movies that visually exemplify them. For example, the movie “The Time Machine” both the 1960 and 2002 versions contain segments that show vast landscape changes in accelerated time lapse format (changes in extent). The movie “Honey I Shrunk the Kids” (1989) contains ample examples of seeing the world from the viewpoint of an ant. (10 mins.) Use Worksheet A: Changes

• As a short introductory exercise ask each student to write a paragraph from a first person viewpoint about the changes evident in the environment as either a) a time traveler observing how the world changes from his vantage point as an observer in his own backyard over one hundred thousand years. (Too short for major geological change such as canyons or continental drift). Or b) a scientist testing a “shrink ray” in his back yard. (10 mins.) The results can then be shared. (10 mins.)

• Resources:
  – Worksheet A

Exploration
• Students will be assigned to groups of four to perform the assignment. They will be informed that there are six distinct areas that the class is studying (Biomes). They will be shown a short powerpoint (Agricultural Landscapes in Transition) that surveys briefly these sites and describes the biome concept. A link is provided to allow students to locate each LTER Site in its particular biome. Tell them that each site has a unique diversity of species and a particular history of human interaction. Their task will be to produce a “Biome Box” that displays the results of their research to fully explain the nature of that site in terms of the typical characteristics of its biome, its location, the flora, fauna, and climate, the impact of human activities at the site (agriculture, logging, urban infiltration etc). Each group will choose one of the six LTER sites. Using the supplied resources they will research the climate, flora, fauna and history of human activities at the site. Each aspect will be studied by one student. Students will collaborate and take responsibility for further research beyond class time and gathering of construction materials for the biome box. (10 mins)

• Resources
  – Agricultural Landscapes in Transition Power Point Presentation
    http://ces.asu.edu/AGTRANS/education.htm
  – LTER site Flora Power Point Presentation
    http://ces.asu.edu/AGTRANS/education.htm
  – Worksheet B: Biome in a Box
  – Biome Box Scoring Rubric
Evaluation

• Each group will present their biome box to the class. Students will make their own notes on each site as presented by their peers using the supplied worksheet (Worksheet C Biome Boxes: Presentation Notes). A short period after the presentations to view each display will allow them to fill in missing information or elaborate their notes (30 mins.)

• Class Discussion: Have the students reflect on the similarities and differences among the six sites as presented. Is there a pattern to be discerned? Are there differences in wildlife or vegetation related to annual rainfall or temperatures? Do the activities of man have similar or differing effects among the sites? Are some regions more or less vulnerable to the impact of human activity? Why? (20 mins)

• Resources
  – Worksheet C
Worksheet A: Changes.  
Change over time and change over different scales

If you could sit in a special time-free field, shielded from getting older, and you could sit in this time machine as time accelerated around you for 100,000 years...what kind of changes would you observe around you? Write down your ideas in a short paragraph.

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Ok, but the time machine is not the only gizmo you have. Imagine taking a shrink ray out into your backyard and zapping yourself down to the size of an ant. What would that feel like? What kind of dangers might you face? Are there any benefits to being that small?
Worksheet B: Biome-in-a-box

Your group has been assigned an environment to research. Write down the name of this site here.

You have been supplied a page of links to visit and research this site. You need to know all about the plants (flora), the animals, insects, birds, (fauna) and the environmental conditions (rainfall, amount of sun, temperatures, special features of the soil or rocks, height above sea level, population, human activities such as tourism, farming, logging, etc)

You will be working in a group of four students.

Write down here exactly who is responsible for researching these topics:
1
2
3
4

Follow the supplied links (or find your own), and find out all about this site so that you can build a “Biome Box” to communicate your ideas to your class.

Materials:
A cardboard box (about 1 foot long, example: shoebox)
Colored paper
Tape, glue, scissors
Clay or collage materials
Perhaps real plant materials, model animals.

Create a box that displays your findings as on the diagram.

Idea!! Why not open the box and make a 3D model of this environment?
Be sure to note your references/sources.
# Rubric for Biome Box

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>0</th>
<th>1-2</th>
<th>3-4</th>
<th>5</th>
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<tbody>
<tr>
<td>Student Participation</td>
<td>none</td>
<td>minimal</td>
<td>adequate</td>
<td>excellent</td>
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<tr>
<td>Content</td>
<td>None-scant</td>
<td>Barely covers requirements</td>
<td>Covers required material</td>
<td>Goes beyond required material, up to date and pertinent</td>
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<tr>
<td>creativity</td>
<td>none</td>
<td>minimal</td>
<td>Covers the material but goes no further</td>
<td>Very creative, exciting and involving</td>
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<tr>
<td>Data Analysis</td>
<td>None</td>
<td>Minimal</td>
<td>Climate data expressed in graphical form</td>
<td>Graphs discussed and related to other aspects of biome</td>
</tr>
<tr>
<td>Presentation</td>
<td>poor</td>
<td>Some members not contributing</td>
<td>All members contribute but uninspiring</td>
<td>All contribute to a clear and concise, exciting presentation</td>
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</tbody>
</table>

Total


Worksheet C: Biome Boxes: Presentation Notes
As you listen to your classmates presentations, write down your ideas and information here

<table>
<thead>
<tr>
<th>LTER Site/Biome</th>
<th>Climate</th>
<th>Flora</th>
<th>Fauna</th>
<th>Human Influences</th>
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Questions: Do you see any patterns in these data? Are there similarities or differences that seem related to temperature or rainfall? Are some sites more or less affected by human activities?

Write your reflections on these questions

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Think!
Is there an organism that might live in each environment? Name your candidate here and say why you think it might be present in every site...

__________________________________________________________________________________________
__________________________________________________________________________________________

Draw your organism at life size in its local environment