Activity III.D. Lake Bonneville, In Depth

PURPOSE Identify some evidence of and causes for erosion
Reveal the ancestry of Great Salt Lake through a study of Lake Bonneville

FORMAT Classroom discussions, demonstrations, and group project

BACKGROUND *The Great Salt Lake Story,* text pg. 19; activity #6, "The Wave," pg. 23. (Utah Museum of Natural History, 1997)

Major Levels of Great Salt Lake and Lake Bonneville, by Curry, Atwood and Mabey. 1983. Map 73, Utah Geological Survey.

STAGES Students will . . .

1. Examine a map showing the size and range of Lake Bonneville;
2. Participate in a demonstration of Lake Bonneville filling;
3. Discuss causes for the filling, stabilization and subsequent disappearance of Lake Bonneville;
4. Participate in a demonstration of how Lake Bonneville caused the erosion of numerous shoreline terraces;
5. Work in groups to create a classroom story display of Lake Bonneville from 28,000 ago to the present;
6. Develop questions with which to quiz one another about what they have learned.

MATERIALS

- ✓ Classroom map of Lake Bonneville (such as published by Atlas Publishing Company, 801/627-1043. Alternately, you could create your own Bonneville map by tracing a projected transparency image of the student map onto a sheet of poster board.
- ✓ Copies of student maps of Lake Bonneville (Activity III.D.)
- ✓ Classroom maps of Utah and the US
- ✓ Student pencils and paper
- ✓ Student Great Salt Lake Scrapbooks

For the Lake Bonneville demonstrations:

- ✓ paint roller pan (non-rusting is best for long-term use)
- ✓ approximately 16 cups clean, relatively fine sand
- ✓ Large container of water
- ✓ wood or plastic "wave board," just less than pan width
- ✓ Large towel beneath demonstration for spills (optional)
- ✓ A siphon, or pre-drilled hole at deep end of pan with a stopper, for draining water level
- ✓ A large, flat tray to be placed beneath the pan (if you plan to drain the water through a hole in the pan).
- ✓ Various photographs of wave-cut terraces on area hillsides and/or Great Salt Lake islands

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For the classroom Bonneville Story project

- ✓ A wall or bulletin board with a prepared grid (described below)
- ✓ 5 Group Tasks Cards for distribution
- ✓ 5 copies of the Age & Elevation Handout for distribution
- ✓ 5 sets of pre-cut blank cards and black markers for labels
- ✓ 5 sets of crayons or color markers for decorating labels (optional)
- ✓ 5 sets of construction paper and scissors for cutouts
- ✓ Approximately 40 push pins for attaching cards and cutouts
- ✓ Blue yarn for marking the changing lake level
- ✓ Yellow yarn for matching each label to its display feature
- ✓ Blue marker or paint to represent water beneath the plotted water level line on the display (optional)

IN ADVANCE Prepare the Lake Bonneville demonstration:

Make a "beach" by moistening the sand and packing it smooth and flat in the paint roller pan so that it covers the sloping part to a depth of approximately one inch. (It is not necessary to have much in the deep part.)

Fill a container with approximately 2 quarts of water. If you choose to drain water from the pan instead of siphoning, pre-drill a hole near the farthest edge of the deep part of the pan so that it can be sealed and reopened with a rubber stopper.

Prepare an appropriate demonstration area.

If necessary, spray or sprinkle water to re-moisten the sand just prior to the demonstration.

Prepare the classroom display activity:

Using the sample shown below, or a projected overhead transparency of the grid, create (or have a competent team of students create) a large horizontal grid at least 36 x 60 inches on a classroom or hallway wall or bulletin board. At a minimum, include a title at the top and ensure that lines are drawn to accommodate the incremental years and elevations needed.

To provide students a convenient scale for their cutouts, mark off the y axis between 4100 and 4200 feet in 10 foot increments.

Complete the Age & Elevation Handout information pertaining to school elevation and approximate height.

Prepare at least 15 blank 4x5 inch cards for the various labels students will be making.

DURATION TBA

SEQUENCE

ENGAGE THE LAKE THAT CAME BEFORE

1. Ask the students if they are aware that the lake we now call Great Salt Lake is part of an amazing story that has been going on for thousands of years. Did they know that there had been a much, much larger lake here in the past?
2. If there are students aware of this history, find out if any know the name that has been given to this former lake. If necessary, inform them that this vast body of water that has come and gone has been given the name *Lake Bonneville.*
3. Display the classroom map of Lake Bonneville. To help the students begin to comprehend the scale of the lake, point out the location of today's Great Salt Lake, the present location of their school, current state boundaries, and other landmarks. (If available, distribute student copies of the Bonneville map. Have them place a colored dot or other marker on their maps to show the school location.)
4. Point out that Lake Bonneville was so huge that its water stretched all the way north into where Idaho is today. It spread west into what is now Nevada. And, it extended south toward the Arizona border to not far from what is now St. George. The lake was so deep that its shorelines rose up into mountains throughout our region.

   [A lake as deep as Bonneville today would completely submerge Utah's four largest cities as follows: Salt Lake City and Ogden by 850 feet, Provo by 650 feet, and Logan by 500 feet.]

EXPLORE A WHAT AND WHERE WAS LAKE BONNEVILLE

1. Set up the demonstration so that all students can observe the process. Inform the students that they are about to see part of what happened when Lake Bonneville rose to as big as it was more than fifteen thousand years ago. Have them imagine that they are looking down on a scene along a mountain or hillside near their school.
2. You or a student assistant should slowly pour water a few ounces at a time into the deep end of the pan. While doing so, provide a scenario of lake expansion and pause to ask the following series of questions. Accept various answers as you proceed. Stop adding water when the surface of the water reaches approximately halfway up the sloped "beach."
   a. When you begin to pour: Where was all the water coming from? (It might help to suggest them to recall where Great Salt Lake's water comes from.)
   b. As you continue pouring: Why did the lake keep growing larger and larger? (As with the previous question, it might help students to recall what they've learned about Great Salt Lake.)

c. When your pouring is complete: Why did the lake stop rising?

   Describe the lake as filling the Salt Lake Valley so deep that only the higher mountains stuck up above the water.

d. How long would it take for such a huge lake to get so full? (You might note that it took Great Salt Lake four years to rise twelve feet in the 1980's.)

3. Leave the demonstration in place for future use while you proceed to the following discussion.

EXPLAIN A TO MAKE A LAKE

1. Explain as necessary that the water that filled Lake Bonneville came from many of the same places Great Salt Lake now gets its water: from the higher mountains and valleys surrounding the lower valleys. The original source of that water then, as today, was from precipitation.
2. Discuss with the students how Lake Bonneville gradually increased its size in the same way that Great Salt Lake does: more water flowed in than evaporated out. The big difference is that instead of growing a few feet deeper over just a few years—as Great Salt Lake did in the 80's—Lake Bonneville continued to accumulate water faster than it could evaporate over a period that lasted thousands of years.
3. Ask the students to suggest how Lake Bonneville was able to receive so much water for so long and become so large. What might have been different between what happens to Great Salt Lake today and what conditions were like when Lake Bonneville was being formed?

   Explain as needed that Lake Bonneville was created at a time when the climate in this part of the world was both considerably cooler and wetter that today. Rather than a desert with dry foothills, our region had forests and green valleys full of many different plants and animals. There was much more rain and snow than now, with massive glaciers in many area mountains, including the Wasatch Range. A *wetter* climate meant a lot more rain and snowmelt flowing into the streams that fed the lake. A *cooler* climate meant there was less sun and heat to cause evaporation.
4. Point out to the students that Lake Bonneville *could* have stopped rising because the climate changed and inflow eventually became offset by evaporation. However, we have evidence that something else was responsible: An outlet to the north.

   On the classroom map of Lake Bonneville, direct a student to locate Red Rock Pass at the northeast part of the lake. For comparison, locate this Idaho site on the classroom maps of today's Utah and of the United States. Describe how Lake Bonneville gathered water from places far away, and it eventually rose high enough to reach Red Rock Pass. From there its water flowed out northward into the Snake River drainage and continued west to the Pacific Ocean.

5. Explain to the students that geologists believe the time it took to finally fill Lake Bonneville (10,000 years) was much longer than it ever actually stayed full (approximately 1,700 years). It would have been able to fill much faster if the climate stayed cool and wet, but it didn't. In fact, climate tends to fluctuate over time, so the early Lake Bonneville probably rose and fell, quickly and slowly, many times before it finally reached its greatest size and depth.

EXPLORE B TERRACE FORMATION

1. Remind the students that so far we have been talking about *what* we know about Lake Bonneville, and not much about *how* we know. Invite suggestions from several students as to what *evidence* there might be that Lake Bonneville ever existed. Then, return to the pan for the second part of the demonstration.
2. Remind students to imagine they are looking at the full Lake Bonneville, more than one thousand feet deep. As you begin to paddle "waves" onto the "shore" in the pan, have the students visualize waves washing up on the Bonneville shores day after day, month after month, year after year, for a thousand years.

   Without splashing, gently and rhythmically use the board to thrust a series of waves up to a point approximately two-thirds across the "beach." The effect will be best if your paddle is the full width of the pan, your movements create gentle waves only on the upward swing of the paddle, and your waves consistently reach the same place upon the "beach." Wait briefly for each wave to return before making the next wave.
3. Ask the students to describe what they see happening. It should require just a minute or two for the sand to become sufficiently eroded to show a drop-off at the wave zone just beneath the water. Be careful not to jar the pan and disturb the underwater sand formation.
4. Once the terrace has been formed, stop to allow the water to settle and continue student observations. Why was the lake's edge carved in this way? Where might they have seen this kind of feature?
5. Next, continue the Bonneville story by explaining that after being filled for nearly two thousand years, something dramatic happened: The Bonneville Flood. The ground beneath the river flowing out of Red Rock Pass suddenly broke apart, hundreds of feet down and over a quarter mile across. In just a few short months, more water than today flows out of a river anywhere on earth rushed out of Lake Bonneville through Red Rock Pass. Geologists estimate that more than half of all water flowing on earth during the time was flowing from this single flood.
6. Demonstrate the lowering of Lake Bonneville after the flood. Using a siphon (or by temporarily removing the plug from a hole made at the deep end of the tray), lower the water in the tray to approximately

two-thirds the original depth. This process should expose the "Bonneville Shoreline" of sand created earlier in the demonstration.

Inform the students that after water eroded Red Rock Pass downward about 340 feet (or the height of a thirty story building), the outflow slowed to a small river again. Lake Bonneville then remained at the new level for approximately 800 years.

7. Ask the students to suggest what likely happened along this new lower shoreline that remained in place for 800 years.

EXPLAIN B THE LAKE BONNEVILLE SHORELINE TERRACES

1. Show photographs of various places where the evidence of shoreline erosion from Lake Bonneville remains today. Ask the students to recount in their own words what these terraces tell us.
2. Clarify to the students that while not enough deposition or time has passed to allow the creation of fossils, the waves that pounded for hundreds of years on the changing shores of giant Lake Bonneville etched a vast collection of "bathtub rings" that we can still see as evidence today throughout the region.

   [Even more fascinating evidence about the comings and goings of Lake Bonneville has been found by Carbon-14 dating of shoreline sediments: 27,000 year-old brine shrimp fecal pellets have been found in beaches at 4200 ft. elevation; 22,000 year old Lake Bonneville algae *(Chara)* have been found in beaches at 4400 ft.; 13,000 year old Lake Bonneville clam shells have been found in beaches at 4500 ft.; and 12,500 year old brine fly larvae have been found in beaches at 4200 ft.]
3. The students should understand that this process of rocks, sand and soils being altered and moved by wind or water is called *erosion.* When these materials are carried away, it is usually the result of wind or water *transportation.* Finally, when these particles later settle as *deposits* in new locations, it is through the process of *deposition.* The shoreline terraces we see throughout our region are deposits of material that had been eroded from someplace higher and transported by water movement.
4 The students should understand that these benches or terraces are evidence of how deep and how widespread Lake Bonneville was. The fact that such terraces are found at different heights further informs us that there were several periods in the lake's history when it remained long enough to "carve its name" into the hillsides.
5. By locating shoreline terraces around the state and measuring their elevations, geologists have found that Lake Bonneville reached 5,250 feet above sea level. Have the students calculate how much deeper Lake Bonneville was compared to Great Salt Lake by subtracting the elevation of the latter from that of the former.

[5,250 minus 4202 = 1048 feet. Combining Great Salt Lake's greatest depth of 30 + feet means that Lake Bonneville achieved a depth approaching 1,080 feet.]

ELABORATE THE RISE & FALL OF LAKE BONNEVILLE: A CLASSROOM STORY

1. Describe to the students an idea for decorating the classroom with what they know about Lake Bonneville. The lake is long gone, so they cannot use photographs. But there is a way they can help create a group picture to tell Lake Bonneville's famous story.
2. Through a class discussion, gather a variety of student suggestions for the kinds of information that would be important to properly tell the Bonneville story. This activity is a good way to assess the breadth of student understanding to this point. All responses relative to the lake's size, age, climate, depth, shorelines, etc. are acceptable for now.
3. Draw student attention to the bulletin board set up for the activity. Point out lines drawn on both the x and y axes. Invite the students to think about ways a story could be told using that chart. Discuss what information might best be inserted in the x and y axes. What other kinds of information might help tell the story?

   [This outline continues below by describing a design that plots "Years Before Present" and "Elevation Above Sea Level" on the x and y axes, respectively. Other elements, such as shoreline labels, scale cutouts showing relative size of familiar objects, and climatic information, are suggested as well. You and your class might come up with an alternative approach or other embellishments.]
4. Describe the following procedure to the students:
   a. The class will be divided into five groups. Each group will work to prepare different materials for the display.
   b. Each group member will be assigned a particular job, but all members of the group should help one another do a good job.
   c. When all the group preparations are ready, one or more students from each group will be called upon to begin building the display.
5. Divide the class into five groups with the necessary tools and materials. Suggested tasks and further instructions for these groups are provided at the end of this section. You should ensure that tasks are divided evenly among the students and that the students work cooperatively. Students who finish their specific tasks should then politely assist other group members. Everyone should await further teacher instructions before attaching any materials to the display.
6. Assemble the display using the following procedure:
   a. Students representing Section 1 (Elevations)
      Call all Section 1 students from each group to the display area. These students worked on identifying the elevations for 13 lake levels. Direct these students, one at a time, to report their task and

show where on the display they believe a pin needs to be placed to mark an elevation. For each report seek consensus from the others and provide a push-pin to be inserted where appropriate.

After the students have been seated, create a line connecting the push-pins using yarn, a marker line, or other material. This shows the elevations of Lake Bonneville and Great Salt Lake from 29,000 years ago to the present.

b. Students representing Section 2 (Shoreline Cards).
Next, the Section 2 students should be called forward. These students have prepared the "Shoreline Cards," which will serve as labels for each important level reached. Direct these students, one at a time, to report their shoreline and show where on the display they believe their card needs to be placed. For each report, seek consensus from the others and provide a push pin to attach the card. You might wish to connect yarn or draw a marker line between each pair of pins.

c. Students representing Section 3 (Climate Cards).
Repeat the procedure used with students for Section 2.

d. Students representing Section 4 (Scale Cutouts).
Use the same procedure as above. Note that the cutouts of the Kennecott smokestack, city building and school are best located on the left (deeper) side of the graph and should be placed at the proper elevation. You might also find it most effective to place the sailboat "on the water" at the 4202 feet level on the right side. To best show past and present lake depths, position the human figure on the "bottom of the lake"—approximately 4170 feet elevation. (See the sample display and comments below.)

7. Review and Summarize the main points of the completed exhibit.

Once all sections have presented and attached their information to complete the display, summarize the overall exhibit with discussion questions, such as:

a. Which one worked more rapidly, global cooling to get Lake Bonneville going up, or global warming to wipe out Lake Bonneville?

[This asymmetrical slow cooling and rapid warming is the kind of evidence scientists also find in cores from deep sea sediments and from Greenland ice.]

How many years did it take Lake Bonneville to get to its maximum depth? [Approximately 10,000 years.]

How long did it take for Lake Bonneville to lower from its maximum depth to "where it started?" [About 4,400 years.]

b. How long has it been since Great Salt Lake, as we know it, has been around? [Approximately 14,600 years, which includes several fluctuations between elevations of 4,275 and 4,191 feet.]

c. Why has Great Salt Lake stayed nearly the same for as long as it has? [A relatively stable climate since the last "little ice age."]

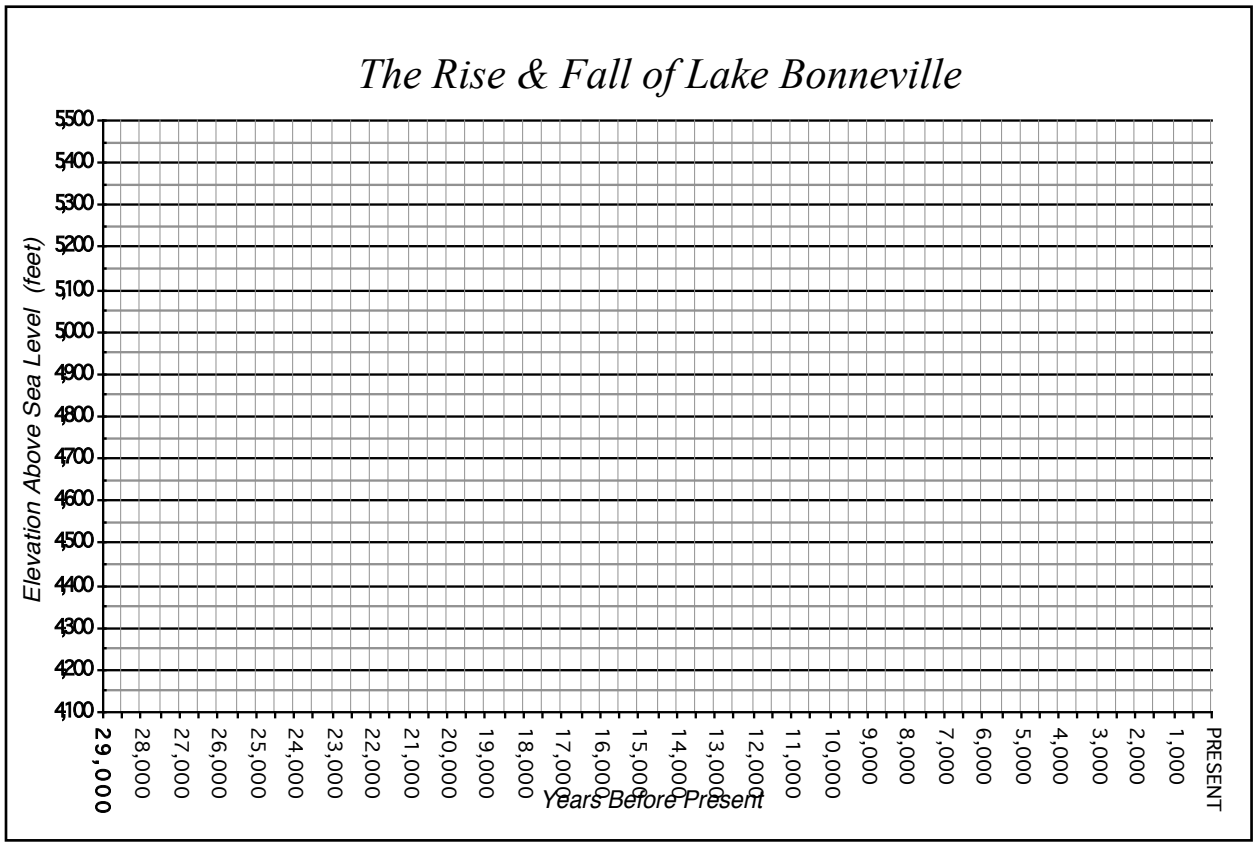
d. What about the future? What could cause Great Salt Lake to change again? [We do not know the answer, since it depends on both our climate and changes we choose to cause through water use and diversions.]

Invite and discuss further questions or observations.

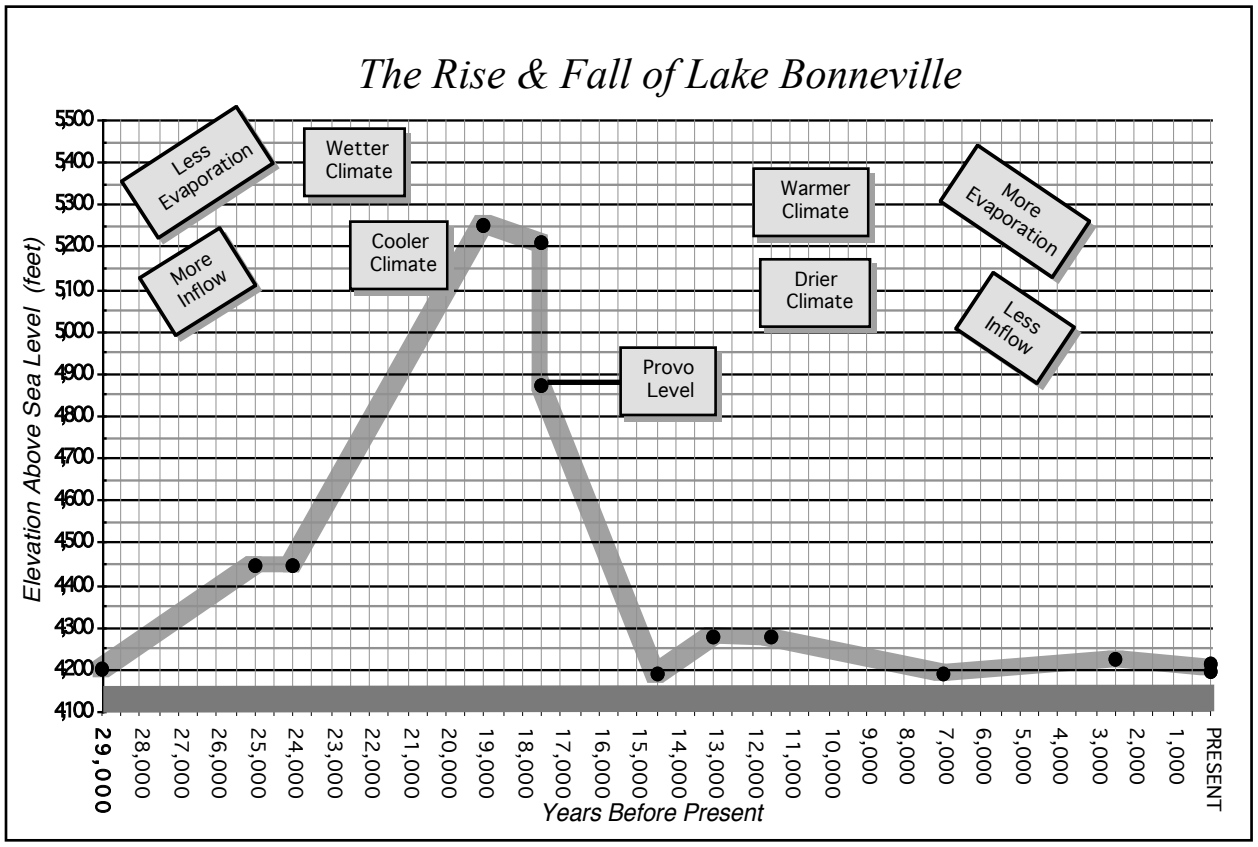
EVALUATE DESIGN-A-QUIZ

1. Facilitate a class discussion inviting students to review what they have learned about Lake Bonneville. However, instead of using statements instruct the students to respond in the form of questions, such as could be included on a quiz. Discuss with the students what goes into making up a interesting and creative question.
2. Instruct the students to individually compose three questions about Lake Bonneville that could be on a quiz.
3. Assemble students in groups to share their questions with one another. Ask them to come up with 5 different ones, rephrasing or combining as they wish. They should be sure to rewrite each question neatly and legibly.
4. Photocopy each set of questions and redistribute them so that each group takes another group's quiz.

Display projection template for Activity III.D.
(Copy this template onto transparency material and project an image from which you can trace a classroom display grid.)



Sample partially completed display for Activity III.D.



This illustration suggests the partially completed appearance of the classroom display. Shown is the titled graph with the two axes filled in and labeled, the data points fixed and connected, and some climate cards and one shoreline card attached. Also shown is the shading to represent the lake bottom at approximately 4170 feet elevation.

Not shown in place are other climate cards, shoreline cards and the various cutout objects to illustrate scale, such the human figure, the sailboat, the Kennecott chimney, etc.

To further accentuate Bonneville depths, the entire space below the changing Bonneville elevation line could be colored blue down to the lake floor.

Group Tasks and Task Cards

The student tasks below accompany the classroom display project for Activity III.D. This activity has been structured using both *groups* and *sections* so as to enable each student to have an active and individualized role in assembling the display. The role of the five groups (A through E, on the following pages) is to prepare a variety of display materials. Because there is a total of 32 tasks, it may be necessary to assign a few students to more than one task.

After all tasks are completed and materials have been prepared, students are reorganized by sections (numbered below) so that the display can be assembled in a logical and organized sequence. The numbered sections and their descriptions are:

1. Lake Elevations Section (7 tasks)
   Up to 7 students who determine the proper location for pins to designate various lake levels. Lake elevations are found in the chart following this section.
2. Shoreline Cards Section (8 tasks)
   Up to 8 students who create and add cards to label the important lake elevations. Shorelines with elevations are found in the chart following this section.
3. Climate Cards Section (10 tasks)
   Up to 10 students who create and add cards describing climate features over time.
4. Cutouts Section (7 tasks)
   Up to 7 students who create and add cutouts to provide scale and other information. The height measurements for scale cutouts can be found in the chart following this section.

OPTIONAL TASKS AND ENHANCEMENTS

- To assist students with scale for their cutouts, mark off the elevations between 4100 and 4200 feet in ten foot increments, or provide some other scaling tool.
- Cutouts of fish and brine shrimp can be made and placed in the Lake Bonneville and Great Salt Lake locations, respectively.
- You might wish to have some students assist with the labeling for both axes, showing years in 500 year increments and elevations in 100 foot increments. (See sample illustration, above.)
- Using a tan or brown marker or construction paper, the lake bottom can be simulated by filling in the space between 4100 and approximately 4170 feet. (See sample illustration, above.)
- Before adding the cutouts, the space between the surface line and the lake bottom could be colored blue to further enhance the variable lake depth.

Activity III.D. Group Task Cards for photocopying

GROUP A TASKS BY SECTION NUMBER

1. The place for a pin to show Lake Bonneville's elevation 29,000 years ago.
   The place for a pin to show Lake Bonneville's elevation 14,600 years ago.
2. A shoreline card that reads "Bonneville Shoreline" to be pinned to the story.
3. A climate card that reads "Cooler Climate" to be pinned to the story.
   A climate card that reads "Warmer Climate" to be pinned to the story.
   A climate card that reads "More Clouds–Less Sun" to be pinned to the story.
4. Scale cutout of the Kennecott smokestack to be placed at the proper elevation. (The stack is 1,235 feet tall, standing at an elevation of 4,320 feet.)

GROUP B TASKS BY SECTION NUMBER

1. The place for a pin to show Lake Bonneville's elevation 25,000 years ago.
   The place for a pin to show Lake Bonneville's elevation 24,000 years ago.
2. A shoreline card that reads "Provo Level Shoreline" to be pinned to the story.
3. A climate card that reads "Wetter Climate" to be pinned to the story.
   A climate card that reads "Dryer Climate" to be pinned to the story.
   A climate card that reads "More Sun–Fewer Clouds" to be pinned to the story.
4. Scale cutout showing the height of a six foot tall person.

GROUP C TASKS BY SECTION NUMBER

1. The place for a pin to show Lake Bonneville's elevation 19,000 years ago.
   The place for a pin to show Lake Bonneville's elevation just before it suddenly became much lower.
   The place for a pin to show Lake Bonneville's elevation at the end of the Provo Level.
2. A shoreline card that reads "Stansbury Shoreline" to be pinned to the story.
   A shoreline card that reads "Gilbert Shoreline" to be pinned to the story.
3. A climate card that reads "More Water Flowing In" to be pinned to the story.
4. Scale cutout of the silhouette of the tallest building in Salt Lake City.
   Cutout of an arrow with the words "Rising Salinity" to be pinned to the story.

Activity III.D. Group Task Cards for Photocopying (continued)

GROUP D TASKS BY SECTION NUMBER

1. The place for a pin showing Lake Bonneville's elevation 2,600 years ago.
   The places for two pins to show the Gilbert Shoreline when it was eroded.
   The place for a pin to show Lake Bonneville's elevation just after it suddenly became much lower.
2. A shoreline card that reads "Great Salt Lake Average: 4,202 ft." to be pinned to the story.
   A shoreline card that reads "Great Salt Lake Record Low: 4,191 ft." to be pinned to the story.
3. A climate card that reads "Less Water Flowing In" to be pinned to the story.
4. Colorful scale cutout of a sailboat with a 25 foot tall mast.
   Cutout of an arrow with the words "Lowering Salinity" to be pinned to the story.

GROUP E TASKS BY SECTION NUMBER

1. The place for a pin to show Lake Bonneville's elevation 6,800 years ago.
   The place for a pin to show the lowest elevation recorded for Great Salt Lake.
   The place for a pin to show the highest elevation recorded for Great Salt Lake.
2. A shoreline card that reads "Great Salt Lake Record High: 4,212 ft." to be pinned to the story.
   A shoreline card that reads "Outlet Erodes 300 feet – Huge Flood to Pacific Ocean" to be pinned to the story.
3. A climate card reading "More Evaporation" to be pinned to the story.
   A climate card reading "Less Evaporation" to be pinned to the story.
4. A scale cutout of the school to be placed at the proper elevation.

Age & Elevation Handout for Activity III.D.

Generalized History of Lake Bonneville and Great Salt Lake

Lake Stage	Elevation *	Calendar Years †	C-14 Dating †
Start of Lake Bonneville	4200 feet	29,000	24,000 years
Stansbury Shoreline	4445 feet	25,000–24,000	20,800–20,200 years
Bonneville Shoreline	5250 feet	19,000–17,300	16,000–14,500 years
Start of Bonneville Flood	5210 feet	17,300	14,500 years
End of Bonneville Flood	4870 feet	17,300	14,500 years
The Provo Shoreline	4870 feet	17,300–16,500	14,500–13,800 years
End of Lake Bonneville	< 4200 feet	14,600	12,500 years
The Gilbert Shoreline	4275 feet	12,900–11,600	11,000–10,000 years
Post-Gilbert lowstand	< 4200 feet	6,800	6,000 years
Post-Gilbert highstand	4221 feet	2,600	2,500 years

* Approximate elevation at Antelope Island location

† NOTES: The shorelines and lake levels selected for this activity represent the better-known and most dramatic changes. There is evidence that additional intermediate fluctuations occurred at Lake Bonneville. It is also possible that Great Salt Lake completely or nearly completely dried up during the past 15,000 years. Geologists use Carbon-14 (C-14) analysis to age sediments through measurements of radioactive decay for materials up to 30,000 years old. From these dates a further series of calculations can provide us with approximate calendar years.

(Data from a draft table constructed by Don Currey, University of Utah November 2000)

Heights and Elevation Chart for Lake Bonneville Display

KENNECOTT SMOKESTACK:	Height: 1,235 feet Base el.: 4,320 ft. Top el.: 5,555 ft.	TALLEST SALT LAKE CITY BUILDING:	LDS Office Building Height: 366 feet Elevation: 4,320 ft.
SCHOOL ELEVATION:		SCHOOL HEIGHT:	

Supplemental Information

Lake Bonneville Compared to the World's Largest Present-day Lakes

Rank (area)	Lake	Location	Area (sq. mi.)	Depth (feet)	Volume (cu. mi.)
1	Caspian Sea	Azerbaijan-Russia-Kazakhstan-Turkmenistan-Iran	152,239	3,104	18,852
2	Lake Superior	U.S.A.	31,800	1,180	2,935
3	Lake Victoria	Tanzania-Uganda	26,828	270	660
4	Lake Huron	U.S.A.	23,010	750	850
5	Lake Michigan	U.S.A.	22,400	870	1,180
—	Lake Bonneville	—	19,750	1,230	2,200
6	Aral	Kazakhstan-Uzbekistan	12,915	111	130
7	Tanganyika	Tanzania-Zaire	12,700	4,708	4,270
8	Baikal	Russia	12,162	5,712	5,517
9	Great Bear	Canada	12,000	270	537
10	Nyasa	Malawi-Mozambique-Tanzania	11,600	2,216	2,015
11	Great Slave	Canada	11,170	2,015	500
12	Chad	Chad-Niger-Nigeria	9,946	23	17
13	Lake Erie	U.S.A.	9,940	210	116
14	Winnipeg	Canada	9,094	204	68
15	Lake Ontario	U.S.A.	7,540	738	393

NOTES: Lake Bonneville would rank 6th in area, 7th in depth and 5th in volume, relative to today's lakes.

40% of global freshwater is held in Lake Baikal and the Great Lakes.

The Caspian and Aral Seas contain water of approximately 1% salinity. All other lakes listed contain fresh water.