

Salt Creek- 2017

BACKGROUND INFORMATION: The Salt Creek Watershed Network (SCWN) has concerns about the overall environmental health of the area. They are also concerned that the dam in Salt Creek is having an adverse effect on the natural ecosystem in the creek. As in most problems in nature this one must be approached in a multidisciplinary fashion. To successfully solve the problem, knowledge about chemistry, biology, and earth science must be applied. (Sound hard?? It is, but these interrelationships are what make science challenging!)

PURPOSE: The purpose of this lab is to perform a complete environmental analysis of the Salt Creek Watershed and also to determine if the dam should remain or be removed. While determining the answer to this question, your company will:

- 1) Gain experience in collecting and interpreting field lab data.
- 2) Gain experience in researching and interpreting past data.
- 3) Gain experience in connecting past data to present data.
- 4) Gain experience in recognizing the connections and interrelationships among factors in an ecosystem.
- 5) Gain experience in working in a large, collaborative group while maintaining individual accountability.
- 6) Gain experience in researching and proposing reasonable, cost-effective measures to maintain or improve environmental factors.
- 7) Recognize the importance of human impact (both positive and negative) on a local ecosystem.
- 8) Gain experience in producing a variety of different projects to present data and corresponding analyses.

PROCEDURE:

1. Prior to going to Graue Mill/Salt Creek for the Field Based Lab

➤ Working with a Data Collection Team

- a. Become familiar with HOW to do all assigned data collection procedures.
- b. Research and write two papers on the importance of two of the assigned data collection procedures.

2. The day of the Field Based Lab at Graue Mill/Salt Creek

➤ Working with the same Data Collection Team

- c. Perform all of the assigned data collection procedures and accurately record all collected data.

3. Once the Field Based Lab Data Collection is complete

➤ Working as a Company

- d. Analyze and interpret ALL COMPANY data to determine overall environmental health of the area (using Data Collection Team papers and Senior papers for reference).
- e. Analyze and interpret data to determine if the Dam at Graue Mill is having an adverse affect to the area and decide if it should be removed or not. (Use Senior Papers as reference).
- f. Create a model of the Salt Creek area using the Water Table (found in room 10).
- g. Prepare 3 company projects that explain and display the overall environmental health of the area; the decision as to whether to keep the dam or not; proposal of ways to improve the area
- h. Host an Open House with invited guests to present projects.

PRIOR TO FIELD LAB:

Data Collection Teams

1. Your Data Collection Team must research and **type 2 papers** explaining the following for the assigned data collection procedures you will perform. The papers that you turn in will be a GROUP grade, not individual.
 - You need to address the following in the two team papers worth 15 pts each.
 - **4 points:**
 - Why is your assigned test important for determining the health of the ecosystem?
If the procedure requires collecting more than one piece of data (i.e. Soil Testing tests for P, N and K) you must address the importance of each of these separately.
 - **3 points:**
 - What are the acceptable levels/ranges for a healthy ecosystem? *(Give levels for ALL data that will be collected for the procedure). The EPA sets acceptable levels for many. SOME procedures do NOT have a safe/acceptable levels (Water Depth, pH, temperature, among others!)...see below** for what to write about.*
 - **3 points:**
 - State the negative environmental effect if the data does not fall within these levels (either high or low).
 - Give at least one reason why a level may fall out of range.
 - **For procedures that do not have standard acceptable levels, discuss the significance of varying values.**
 - **3 points:**
 - INTERRELATIONSHIPS! How does this procedure/results SPECIFICALLY relate to any other procedure/results that will be performed by the company.
 - **2 point:**
 - Include a bibliography
 - Do NOT include the procedure on how to do your test!
 - **Make two copies of each paper! One will be turned in to be graded. The other will be used by the company for reference.**
2. You will be given a **Data Collection Packet** containing Data Tables to record all data.
 - a. You must become familiar with how to perform ALL of your assigned procedures. Some procedures are in the Data Collection Packet. Test kits with instructions will be available in room 129.
 - b. Either read the paper or talk with the group that is writing the paper on other tests you will perform to find out about the purpose of the procedure and acceptable levels.

DAY OF FIELD LAB:

OPTIONAL, but encouraged, design and wear Team T-shirts/costumes to show your team spirit. Who knows, extra credit may come your way!

WORTH 10 POINTS

On your scheduled day meet in the cafeteria at 7:55 with all your materials.

- You **MUST** take the bus. You may **NOT** drive yourself.
- If you miss the bus, you do not go on the trip, therefore you will lose the 10 points for the trip.

On the day of your lab, you ***MUST***:

- Wear long pants (not heavy, just long)
- Wear closed-toe shoes (This is because the area is covered with poison ivy and poison oak).
- Someone in the group should have a watch/phone since we are on a time schedule.
- Bring small snacks and water for when you return to the Mill and wait for your next test. Lunch is not until 1 pm and there is no scheduled time for a break. Small coolers are allowed, and you can share with friends. Please use hand sanitizer before eating.
- Bring lots of water since you will be working extremely hard.
- Bring Data Collection packet and a writing utensil. Also bring a large ziploc bag for your packets if it starts to rain.
- Bring rain gear in case it rains!
- We may not be able to leave things on the bus, so make sure you can carry around all that you bring.
- The only bathroom facilities are the outhouses near the parking lot. You **MAY NOT** use the bathroom in the Graue Mill historic center.
- Bring \$\$\$ for lunch or a sack lunch!!
- At 1 pm, **EVERYONE** will be responsible for loading up the buses before being allowed to go to McDonald's.
- Once we return to school, Mr. Ludovice will direct some students to unload the equipment back to room 129. Depending on when we get back and how muddy we are, the rest of the company will either stay in the cafeteria OR go back to 10th period.

At Salt Creek:

- You will complete the test and not goof around. Everyone must participate. The field trip is worth 10 points for effort and cooperation. Chaperones will be reporting back to your teacher and negative comments or observations by any adult on the trip will lower your grade.
- Once you have completed your test, return all materials to the Mill area. Team captain must check-in with Mr. Paige.
- Report to your Company Managers to give them your data.
- If there is time before your next scheduled test, you may use the restroom, but **BE ON TIME** for the next test! If your group is not ready to go for the next test your group will lose points.

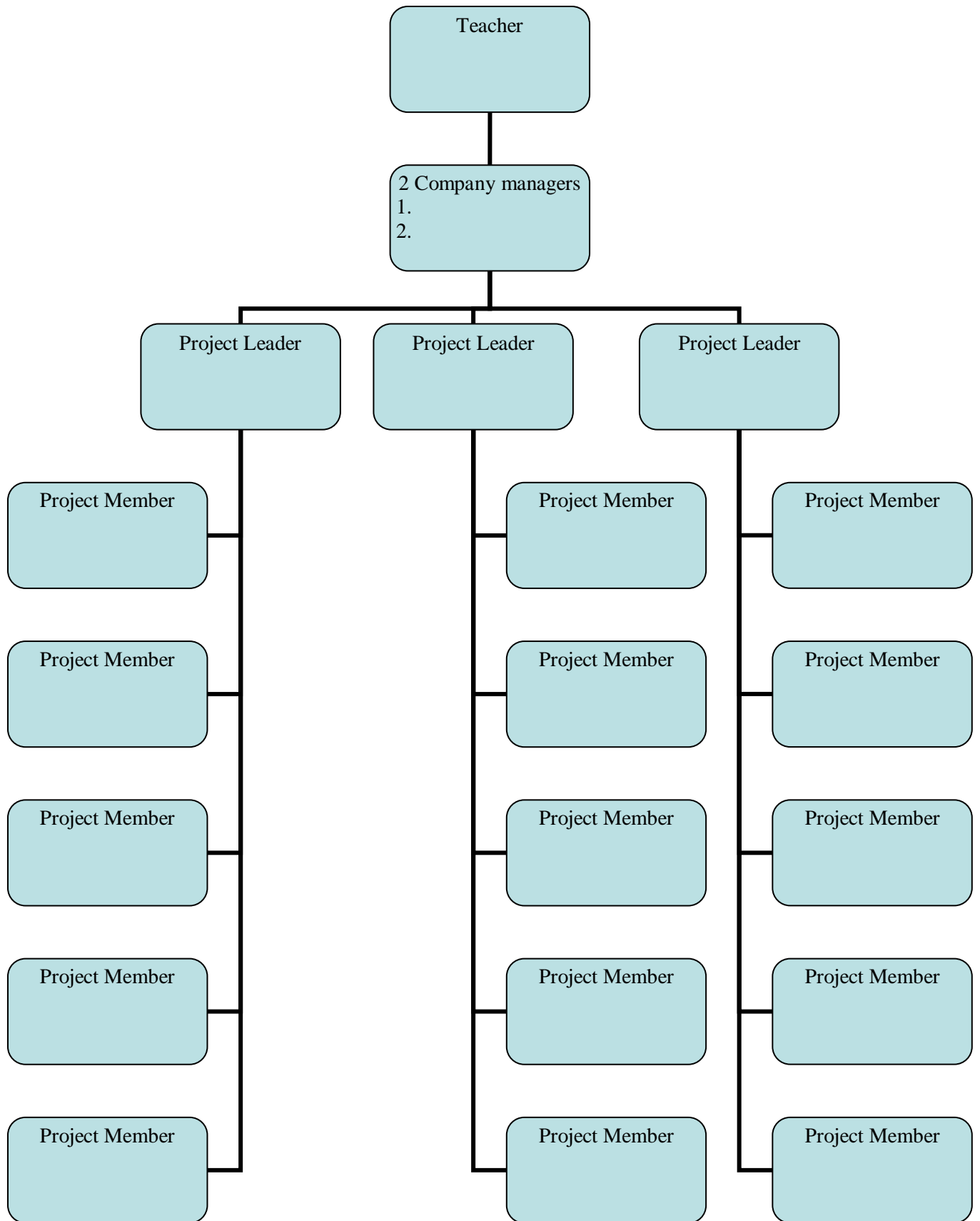
You will be working the entire time at Salt Creek. Be prepared to do so. There is no complaining, whining, slacking or goofing off allowed. All of these can result in a lowered grade.

AFTER FIELD LAB:

All of the following must be included somewhere within any one (or more) of the three DIFFERENT company projects. (e.g. powerpoint, tri-fold poster, brochure, magazine, Photostory, video, other...)

1. **ALL DATA (except General Observations)**, including the following explanations:
 - WHY...
 1. What is the importance of performing each test?
 - RESULTS...
 2. Report the data.
 3. How does data compare to standard?
(charts may be used)
 - A PROBLEM?,...
 4. If data shows that it is a problem, give a reason WHY (ie...how did it get bad, **AND** what problems does this cause?)
 5. Must have a water quality rating/Q value for both above and below the dam. Be sure to include an explanation
 6. Must have a water quality rating from the invertebrate study for both above and below the dam. Be sure to include an explanation
2. **Data representation with Q Values is worth 30 pts.**
2. **INTERCONNECTIONS!** You will find that some problems at the creek cause other problems, as in the Riverwood Fishkill. Include a detailed explanation of how problems found in the area interconnect. Refer to data! **Worth 15 pts.**
3. Address whether or not the Dam should be removed with a complete explanation of why or why not. The company **must** create a model of the Salt Creek dam. The company must then video recorded simulation that shows the result of your suggestion(s). In order to run an accurate simulation accurate measurements, depths, etc. of the Salt Creek dam must be taken, then scaled for the Water Table use. Refer to specific data, history, costs and anything else to address this. **Worth 25 pts.**
4. You will find that there are problems at the creek.
 - a. Research and present ideas as to what can be done to improve all problem areas
 - b. Research and present the general costs involved.
 - c. **Prepare a timeline** for when improvements will be made. It is important to note that some improvements take time to be completed before others should be started.
Worth 10 pts.
5. What can the public do?
 - a. List at least 3 things that people visiting the area can do to improve the creek while they are visiting. Give specific reasons why this will improve the area.
 - b. List at least 3 lifestyle changes that residents/businesses near the area can make to improve the creek. Give specific reasons why this will improve the area. Think interrelationships! **Worth 5 pts.**
6. Give an overall assessment of the overall environmental health of the area. Compare it to historical information (from senior papers and other information looked up). Use data to support your assessment. Is it better, worse, the same? **Worth 10 pts.**
7. Include at least 10 photos....at least 3 showing positive aspects of the area, at least 3 showing negative aspects of the area. **Worth 5 pts.**
8. Have at least five adult guests present at the Open House. One point of extra credit (up to 5 maximum) for each additional guest. Each guest will rate the company on the professionalism of the Open House as well as the clarity of content presented. **The average of the guests ratings will be worth 10 pts toward project grade.**

What is your role?



What is your role after the field trip?

SENIORS WILL NOT BE PROJECT MEMBERS! THEY HAVE THEIR OWN RELATED PROJECT!!!

Each person in the company must be specifically designated to be a contributing member to at LEAST one of the final projects. The members of the Data Collection Teams do NOT need to be assigned to the same project.

Company Managers: This role has the potential for earning 5 extra credit points!

Each company should have 1 or 2 managers that will oversee the entire process. They will not be assigned to a specific Final Project as they will over see ALL projects! Being a manager does NOT mean that they will do most of the work, they help coordinate and guide. Managers' responsibilities will include:

- Participating in one of the Pre-Planning meetings for all Company Managers and preparing an initial management plan.
- During company time the Data Collection Teams will be writing their Group Papers. You will be helping teams with their paper. This will be done by making sure each group has all of the required information in their paper. Also, you will need to help groups find information (such as EPA standards) when needed. **Poor Group Papers will negatively impact your grade.**
- On the day of the Field Lab, collecting all data from the Data Collection Teams. The Company Managers will fill out TWO Data Analysis Packets and turn ONE in to their teacher at the end of the field trip. Further, they will have the data available to the company the next day for analysis.
- Getting approval from teacher for project types and content
- Have the authority to assign homework to Project Leaders
- Making sure all required parts of assignment are represented in at least one of the projects in a high quality manner:
- Keeping company members on task
- Organize the open house in an orderly, professional fashion
- Decide when and if there needs to be a rearrangement of personnel working on the projects
- Report to the teacher periodically regarding progress of company

Project Leaders: Each of the 3 projects must have a leader to guide all other members. Project leaders coordinate all efforts towards the project and have the authority to delegate assigned homework to project members. They will report back to the Company Managers regarding progress of project as well as participation of members. If problems arise while working on the project, they will work with company managers to make decisions as to how to best alleviate the issues.

Project Members: Everyone else in the company will be a member of a specific project. As a member of a project, they will work closely together under the guidance of the Project Leader to produce a high quality product. In order to produce an informative Open House, ALL members must be familiar with ALL projects produced by the company, not just the project worked on.

ALL company members will also have a role as a Data Collector on the day of the lab.

Point Breakdown of the Entire Salt Creek Project

Individual Grade Breakdown

- You will be evaluated on your participation on the field trip for a total of 10 pts.
- Each company will need to be highly organized to be successful in this project. To this end, each company must organize themselves into specific roles. This will include an evaluation of your participation in the Open House. You will be evaluated by your teacher for a total of 10 pts on this role.
- Your peers will evaluate you on your participation throughout the duration of the project for a total of 10 pts.

Group Grade

- You will be graded on your 2 assigned data collection test research papers. Each paper is worth 15 points for a total of 30 points.

Company Grade

- The content contained in the projects is worth a total of 110 pts.

Individual Grades	points
Participate in field trip	10
Teacher's evaluation of individual	
ROLE	10
Peer Evaluation	10
INDIVIDUAL TOTAL	30
Data Collection Team Grade***	
paper #1 with bibliography	15
paper #2 with bibliography	<u>15</u>
GROUP TOTAL	30
Whole Company Grade	
Explanation of Data with Q values	30
Interrelationships among data	15
Dam stay/remove? Use data to support	25
Cost to improve creek with timeline	10
How can visitors and the community help improve area?	5
Overall health of area.past vs present	10
Photos	5
5 adult guests present at Open House	<u>10</u>
COMPANY TOTAL	110
TOTAL PROJECT GRADE	170

*****Company Managers will NOT be a part of Data Collection teams.**

Instead, they will earn their 30 points as follows:

8 points for reflective pre planning paper

7 points for helping/checking Data Collection Team papers

15 points for completing the Data Analysis Packet in its entirety and turning it into their teacher the day of the field trip, as well as having the data available for the company the next day

SENIOR PROJECT

Seniors will participate in a Data Collection Team. However...

Seniors will not participate as a project member in the Open House. Instead they will complete an individual assignment. The information obtained in this assignment will be incorporated into one or more of the three projects.

Senior Assignment (NOTE: Individual teachers may assign one or two papers depending on the number of seniors in an individual company. If a senior is assigned two papers, each paper will be worth 10 points. If a senior is assigned one paper, the single paper will be worth 20 points.):

Each individual senior must write and research ONE of the following papers

- A paper on the History of the Salt Creek/Graue Mill/Fullersburg Woods area. Include:
 - Basic History of the Area **3 or 6 points**
 - Historical Environmental Health of the Area **3 or 6 points**
 - Data supporting historical environmental health **3 or 6 points**
 - Bibliography **1 or 2 points**

- Researching and Writing a paper on the pros and cons of dams in areas similar to Graue Mill. Include:
 - Pros and cons of having a dam in an area similar to Salt Creek. **2 or 4 points**
 - A case study where a dam has been removed in an area similar to Salt Creek.
 - Where is this dam located? **1 or 2 points**
 - WHEN and WHY was this dam removed? **2 or 4 points**
 - Discuss the cost of this dam removal. **2 or 4 points**
 - Positive and/or negative effects of this particular dam removal. **2 or 4 points**
 - Bibliography **1 or 2 points**

Senior Points:

History of Salt Creek Paper	10 or 20 pts
Pros/Cons of Dam Paper	10 or 20 pts
<u>TOTAL</u>	<u>20 PTS</u>

Resources to start with....

To understand some of the tests you will be performing, EPA standards, and general background information about Salt Creek, everyone in the company should check the following resources early on in the project.

<http://www.saltcreekwatershed.org/>

<http://illinois.sierraclub.org/rpg/>