

Water Quality Lab: Instructions

Due: _____

Name: _____

PREPARATION:

1. Complete Background Questions using the Water Monitoring Kit booklet provided.
2. Make a hypothesis for the water quality based on your knowledge of the Panther Creek High School area, retention ponds, and the information learned from the Background Questions.

Hypothesis: The overall health of the water is expected to be (good, fair, poor) because _____

DATA COLLECTION:

1. You must WEAR GOGGLES for the entire time.
2. Follow teacher instructions/Water Monitoring Kit booklet as appropriate to collect each piece of data ("results").
3. CLEAN UP according to teacher instructions.
4. Rank the results using the table in the Water Monitoring Kit booklet.

LAB REPORT:

1. Type your report and analyze your results using the template provided. Delete the italicized words as you write. Be sure to answer all questions noted in the template!
 - a. Top right corner: **name, date, class, and period.**
 - b. **Title**—completed
 - c. **Statement of Problem**—completed
 - d. **Background/Research**—the three paragraphs should contain all information collected on the Background Questions page. Be sure to write complete sentences that are related to one another; do not just list facts.
 - e. **Hypothesis**—complete with what you recorded above.
 - f. **Materials**—completed
 - g. **Procedure**—completed
 - h. **Data**—fill in the data table with the results and rankings collected during the testing portion of the lab. Be sure to include units for the results!
 - i. **Analysis/Conclusion**—analyze the results/rankings and determine the overall health of the retention pond. Explain how one overall health was determined from multiple, varied rankings. Then, explain what each individual test result means in terms of the Background/Research information.
 - j. **Sources of Error**—Describe several ways that the tests were limited or otherwise could have produced inaccurate data. These are NOT human errors (improperly measuring the water, using the wrong tablet, etc.). These are things beyond your control (for example, color is subjective and could cause the data to show ____ when really it could be ____).
2. Submit your final report at TurnItIn.com.

SCORING:

| | | | |
|---------------------|---------|---------------------|---------|
| Title | ____/5 | Materials | ____/5 |
| Problem | ____/5 | Procedure | ____/5 |
| Background Research | ____/25 | Data | ____/10 |
| Hypothesis | ____/10 | Analysis/Conclusion | ____/25 |
| | | Sources of Error | ____/10 |

Water Quality Lab: Data Collection Sheet

Name: _____

As you work together keep in mind:

- Directions must be followed carefully
- Protective eyewear must be worn at all times during the lab
- Reacted test samples must be poured into a waste container or down the drain with running water

Tips for working through the directions:

- Follow the verbal directions for completing the **Temperature**, **Turbidity**, and **Other Life** tests.
- Using the yellow booklet, begin with the **Dissolved Oxygen Procedure**, and continue with the tests as written.
- Choose one group member to read the directions aloud, two to complete the test, and one to record data.
- Switch roles as you work, giving each group member a chance to experience all roles.
- Skip the booklet instructions for **Biological Oxygen Demand (BOD)**; this is not a test we will complete.
- I will provide you with the **Coliform Bacteria** data during class. Do not perform this test.

When your group has completed all tests:

- Rinse, clean, and dry all equipment,
- Return all equipment and papers to the container and replace the lid.
- Return the lab container and goggles to your teacher.
- Check to make sure that all group members have a completed data table **including units and rankings**.

DATA:

| Physical Tests | Result (Include Units) | Ranking (Number AND Value) |
|----------------|------------------------|----------------------------|
| Temperature | | |
| Turbidity | | |

| Chemical Tests | Result | Ranking |
|--|--------|---------|
| Dissolved Oxygen (DO) | | |
| Percent Saturation of Dissolved Oxygen | | |
| Nitrate | | |
| pH | | |
| Phosphate | | |

| Biological Tests | Result | Ranking |
|-------------------|--------|---------|
| Coliform Bacteria | | |
| Other Life | | |

Water Quality Lab: Background Questions

Name: _____

Answer all of the questions below to prepare for the background section of your formal lab report. Be sure to paraphrase the information!

PHYSICAL FACTORS:

Temperature:

- 1) What are three (3) reasons that temperature is important to water quality?

Turbidity:

- 2) What does turbidity measure?
- 3) What types of suspended material produce turbidity?
- 4) What are three (3) causes of turbidity?

CHEMICAL FACTORS:

Phosphate:

- 5) Why is phosphate important for aquatic life?
- 6) Excessively high levels of this nutrient can lead to what?
- 7) What are three (3) sources of phosphates that can enter the aquatic system and cause problems?

pH:

- 8) What is the normal range of pH for aquatic systems?
- 9) What happens to aquatic organisms if the pH is outside of this range?
- 10) What are three (3) ways that humans can inadvertently change the pH of a stream?

Water Quality Lab: Background Questions

Name: _____

CHEMICAL FACTORS (CONTINUED):

Nitrate:

- 11) Why is nitrate important for aquatic life?

- 12) How does nitrate enter the aquatic system?

- 13) An excess of nitrate can lead to what?

- 14) What are three (3) sources of manmade nitrates that enter the aquatic system and cause problems?

Dissolved Oxygen:

- 15) Why is dissolved oxygen important to the health of aquatic ecosystems?

- 16) Which can hold more dissolved oxygen: cold or warm water?

- 17) Why do you think thermal pollution (hot water released from factories and nuclear reactors) can be detrimental to aquatic life?

- 18) A) How can high levels of bacteria from sewage pollution affect dissolved oxygen?

B) How does this affect aquatic life?

BIOLOGICAL FACTORS:

Coliform Bacteria:

- 19) Where is coliform bacteria normally found?

- 20) What does the presence of coliform bacteria suggest?

- 21) Since coliform bacteria themselves are not dangerous to our health, why do we test for them?