<u>**Freshwater unit --**</u>

Enduring Understanding: *The student will understand that* **humans impact the environment.**

Essential Questions:
What is a watershed and How is it determined? (DOK 1)
How do humans affect the environment and how can we quantify the pollutants given off by them? (DOK 2)
How can living organisms be helpful in determining water quality? (DOK 2)
How can knowing a body of water's trophic state help determine water quality? (DOK 2)
Why is it important to collect data from multiple sources to analyze water quality ? (DOK 3)
How can chemical data, biodiversity and trophic state be used to determine overall water quality and how the water quality can be improved? (DOK 3)

Learning Goal: *I will safely perform and understand the results of chemical and biological testing I will be performing, determine what is considered healthy or not and why, and give sound advice on how to improve poor water quality.*

The goal of this unit is to determining the water quality of **Big Island Pond**. To get there we will be practicing on *Beaver Lake'*s water and muck.

To determine water quality, the following must be done. Again, we will practice the below on Beaver Lake before making our field trip to Big Island Pond.

1. test the water chemically and determine health and trophic state
2. test the water biologically and get a biotic index value
3. analyze the class data, get rid of outliers
4. conclude the water quality

THEN
5. determine where the water quality deficits are coming from using a watershed map and make a plan to improve the quality which explains how humans impact the environment

For your competency, you will be making a presentation for the "Friends of Big Island Pond", complete with #1-5 above. The presentation can be of any style (poster, prezi, etc) but must include 1-5 above. These folks are not water quality specialists, so be sure to walk them through the process of how you came to your conclusion.

Rough agenda….
Week 1 = learn the chemical info for water quality testing on Beaver Lake
Week 2 = learn the biological info for water quality testing on Beaver Lake
Week 3 = analyze the data and make a conclusion for Beaver Lakes Water Quality
Week 4 = field trip and begin analyzing data for Big Island Pond
Week 5 = finish analysis and conclusion for BIP and learn how to "read" a watershed map
Week 6 = Make an improvement plan for Big Island Pond

PA Learner Responsibility Rubric

Assess each of the three categories with a score of 4 to 1. Use the bulleted lists in each category to provide guidance in scoring.

Level 4	Level 3	Level 2	Level 1
Consistently Meets Criteria	Meets Criteria with **Few Exceptions**	**Inconsistently** Meets Criteria	**Rarely** or Makes no Attempt to Meet Criteria

Rubric for Graded Assessments

Score	Criteria
0	**No attempt or response is off topic**
1	**The response, although on topic, is an unsatisfactory answer to the question.** *It may fail to address the question, or it may address the question in a very limited way. *There may be evidence of serious misconceptions regarding the science content/skills. *There may be little relevant scientific vocabulary used
2	**The response is a marginal answer to the question.** *While it may contain some elements of a proficient response, it is inaccurate, incomplete and/or inappropriate. *There may be evidence of significant misconceptions with the science content/skills. *Some relevant scientific vocabulary is used, but other vocabulary could have been included.
3	**The response is a proficient answer to the question.** *The answer is generally correct, complete, and appropriate. *Minor inaccuracies in content may appear. *Examples are used to illustrate the point. *The scientific vocabulary used is appropriate & accurate, but may be incomplete.
4	**The response is an excellent answer to the question.** *The answer is correct, complete, and appropriate. *It contains relevant examples to illustrate the point. *There is no evidence of misconceptions regarding the science content. *The scientific vocabulary used is appropriate, accurate and complete *The student's answer relates the topic to prior knowledge and makes applications beyond was what directly taught.