**Answer Key – Guiding Questions –
What Makes a Quality Lake? DVD Presentation**

Name: _____Class Period: _____ Date:_____

1. The rapid growth in Florida's population has affected many lakes. List three changes that have occurred in Florida lakes due to rapid population growth.

   1. **less wildlife**

   2. **changes in water quality from increased nutrients**

   3. **increased sediments in lakes**

2. Lakes have many different uses in Florida. List several examples of these uses.

Recreational fishing, commercial fishing, boating, skiing, swimming, bird watching

3. List key concept ideas for the following words:

   A. Algae – **naturally occurring microscopic plants that depend on water, nutrients and sunlight to grow**

   B. Eutrophication – **nutrient enrichment**

   C. Nitrogen – **a naturally occurring nutrient that promotes plant growth**

   D. Nutrient enrichment -- **an increase in nutrients**

   E. Phosphorous – **a naturally occurring nutrient that promotes plant growth; it is also mined from soils in parts of Florida**

4. There are four trophic state categories used to describe lakes. Define each of them briefly.

   A. Oligotrophic: **lowest level of biological productivity; clear water; few plants and fish and not much wildlife**

   B. Mesotrophic: **moderately clear water and moderate amount of plants**

   C. Eutrotrophic: **high level of biological productivity; lots of aquatic plants and clear water or few aquatic plants and less clear water (lots of algae); potential to support lots of fish**

   D. Hypertrophic: **highest level of biological productivity; cloudy water; very productive in terms algae, aquatic plants, fish and other wildlife**

5. Explain the effects of nitrogen and phosphorous on a lake's water quality:

Nitrogen and phosphorous are nutrients that enable plants to grow, including algae. When these two nutrients are increased, water clarity usually decreases due to a greater abundance of algae. More nutrients also means there might be a greater abundance of large plants (macrophytes).

6. Describe how water flush rates affect the nutrient levels in a lake.

A fast flush rate doe not allow the nutrients to be used by the plants, whereas a slow flush rate allows more nutrients to be taken up by algae and large plants (macrophytes).

7. Several different factors can affect the sedimentation rates in a lake. Please discuss how the following two factors might influence sedimentation.

   1. Increased nutrients: **Increased nutrients from lawn fertilizers, agriculture, and other sources contribute to increased nutrients in the lakes via runoff. The increase in nutrients promotes more plant growth. As plants grow and then degrade, the rotting materials settle to the bottom of the lake, increasing muck layers (sediments).**

   2. Flushing rate: **A fast flushing rate in a lake decreases the nutrients available for plant growth, therefore there are not as many plants or algae. With fewer plants, degradation of materials is not as great and there is less sedimentation.**

8. Humans can have a direct impact on lakes. Examples include housing development, recreational boating activities, industry, agriculture and aquaculture. What are some of the changes that occur in lakes due to human impact?

Nutrient levels may increase from more lawns being fertilized and algae blooms will reduce water clarity; sediments may increase from nearby construction sites or land-clearing activities, reducing water clarity; wildlife habitats are altered when plants and trees are removed for development; wildlife often leave the area for lack of habitat or food; or in some instances, a lake may actually become more productive from the nutrients and wildlife may be increased.

9. Water clarity in a lake can be affected by various factors. Explain how the following two factors can change water clarity.

   1. An increase in the abundance of algae – **will decrease water clarity.**

   2. Increased nutrient levels – **can result in an abundance of aquatic plants. An increase in plants can make water more clear because the nutrients are "taken up" by plant tissues and are not available for the algal growth.**

10. Fill in the blanks:

   The presence of aquatic plants will generally not improve water quality unless at least **50 %** of the bottom is covered with submersed plants.

   A eutrophic lake is not a **dead** lake. Instead it is a **productive** lake.

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Common Core State Standards

9th – 10th Grade

Common Core Code	FL Common Core Code	Common Core Standard
RI.9-10.1	LAFS.910.RI.1.1	Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
RI.9-10.4	LAFS.910.RI.2.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).
RI.9-10.10	LAFS.910.RI.4.10	By the end of grade 9, read and comprehend literary nonfiction in the grades 9–10 text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 10, read and comprehend literary nonfiction at the high end of the grades 9–10 text complexity band independently and proficiently.
W.9-10.2d	LAFS.910.W.1.2d	Use precise language and domain-specific vocabulary to manage the complexity of topic.
W.9-10.9	LAFS.910.W.3.9	Draw evidence from literary or informational texts to support analysis, reflection, and research.
W.9-10.9b	LAFS.910.W.3.9b	Apply grades 9–10 Reading standards to literary nonfiction (e.g., "Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning").
SL.9-10.1	LAFS.910.SL.1.1	Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
L.9-10.4	LAFS.910.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies.
L.9-10.4a	LAFS.910.L.3.4a	Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.
L.9-10.6	LAFS.910.L.3.6	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression
RST.9-10.1	LAFS.910.RST.1.1	Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
RST.9-10.4	LAFS.910.RST.2.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
RST.9-10.10	LAFS.910.RST.4.10	By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently
WHST.9-10.2d	LAFS.910.WHST.1.2d	Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.
WHST.9-10.4	LAFS.910.WHST.2.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
WHST.9-10.9	LAFS.910.WHST.3.9	Draw evidence from informational texts to support analysis, reflection, and research.

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11th – 12th Grade

RI.11-12.1	LAFS.1112.RI.1.1	Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
RI.11-12.4	LAFS.1112.RI.2.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines faction in Federalist No. 10).
RI.11-12.10	LAFS.1112.RI.4.10	By the end of grade 11, read and comprehend literary nonfiction in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 12, read and comprehend literary nonfiction at the high end of the grades 11–CCR text complexity band independently and proficiently.
W.11-12.2d	LAFS.1112.W.1.2d	Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic.
SL.11-12.1	LAFS.1112.SL.1.1	Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11–12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
L.11-12.4	LAFS.1112.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies.
L.11-12.4a	LAFS.1112.L.3.4a	Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase.
L.11-12.6	LAFS.1112.L.3.6	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
RST.11-12.1	LAFS.1112.RST.1.1	Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
RST.11-12.4	LAFS.1112.RST.2.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
RST.11-12.10	LAFS.1112.RST.4.10	By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently.
WHST.11-12.2d	LAFS.1112.WHST.1.2d	Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.
WHST.11-12.4	LAFS.1112.WHST.2.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
WHST.11-12.9	LAFS.1112.WHST.3.9	Draw evidence from informational texts to support analysis, reflection, and research.