Amanda Liles

Aqua Bodies: Water and Fiber for a Healthy Body

Lesson Background and Goals

Setting	Middle school science class
Length of Lesson	60 minutes (one class period)
Materials and Equipment	Whiteboard, Food items, packets of copies of pages from the book *Water and Fiber for a Healthy Body* p. 8-11
Goals	Students will be able to: -apply scientific content schemata and acquire and apply new vocabulary knowledge to reading. -build intensive reading skills and strategies for reading authentic science texts independently (Skim text to identify main ideas and scan text to find relevant information).
Lesson Objectives	Students will be able to: -Comprehend and use vocabulary related to water science, hydration and nutrition through the identification of water contents and quality water sources. -Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (CCSS.ELA-LITERACY.RST.6-8.7) -Identify and summarize main points and supporting details from a text. (CCSS.ELA-LITERACY.RST.6-8.2)

Lesson Outline

Time	Activity	Procedures/Actions
3-5 minutes Materials: whiteboard	Greeting/Announcements	-Share news and return homework. -Tell students that today they will be reading a text about water and water sources. -Go over the lesson sequence written on the board (Before reading activities: Continuum of foods by water percentage, Skimming the text, Water vocabulary-what we know/what we want to learn; During reading activities: Guide-o-rama; After reading activities: Update the continuum, Homework) -Tell students they will be completing two short activities to practice reading comprehension strategies and to identify new vocabulary in the text. Inform students that they will have a summary worksheet to complete for homework and that they should keep it in their Science notebook to turn in next class.
10-15 minutes Materials: foods, worksheet, whiteboard	Pre-reading/establishing a purpose for reading/scanning for information	-Write the following on the board: What's the difference between a grape and a raisin? Pose this question to the students as you hold a grape and a raisin in each hand. Call on a few students to give answers. Eventually tell the students the answer is "water" if no one provides this response. -Pull the various food items out of a bag and lay them on a desk/table at the front of the class to capture students' attention. -Ask students, "How much water do you think is in each item?" -Pass out the worksheet and tell students to look at Before You Read part A. -Call on one student to read the directions. -Model how to complete the activity by doing number one (tuna fish) with the whole class *Ex: I think a tuna fish is 92% water so I'm going to write 92% in the blank for number one.* -Have students complete the worksheet individually. *While students are doing this, draw a continuum on the board with all the percentages.* -Call on individual students to give answers for each number and to place the foods

		underneath the corresponding percentage on the continuum. -Pass out the packets of copies of pages 8-11 from *Water and Fiber for a Healthy Body* -Tell students we want to find out if our predictions about the percentage of water in the foods were correct. -Ask them to scan the text to check their answers. -Call on a student to share where they found the relevant information (answer: the chart in the bottom right corner of page 11) -Ask students, "Is our order correct?" If the answer is no, call on students to move the foods and make corrections. *Correct order: cucumber 96% raw carrot 92% orange 87% apple 86% raw peach 84% milk 94% boiled egg 75% tuna fish 75% baked beans 70% baked potato 63% chicken drumstick 62% grilled sausage 44% bread 39% cheddar cheese 36%*
15-20 minutes Materials: packet of pages from book p. 8-11, vocabulary logs	Pre-reading: establishing a purpose for reading, skimming the text, preteaching vocabulary	-Tell students that today we will be learning more about how much water these foods contain and what water itself contains. -Ask students to turn to page 8 of their book packets and to skim the text and to highlight any words they do not know or that are used in an unfamiliar way. -Have students list these words on the board. -Go through the list as a class asking students if they can define or provide a sentence for each word. If all of the students don't know a word, ask them to try to define the word based on how it is used in the text, then look up the dictionary definition and compare/match the dictionary definition with the text. -Have students write the new words and definitions in their vocabulary logs in their Science notebook (see Appendix C). *-Potential words students may not know(prepare these definitions in advance): nutrients, fiber, dehydrated, minerals, sediment, fluoride, evaporate*.
20-25 minutes Materials: book, Guide-o-rama	During reading: Guide-o-rama	-Tell students this time they will read the text more carefully in order to answer questions about main ideas and supporting details.

worksheet		-Call on a student to read the first paragraph aloud. -Model how to answer the first question (on part C of the worksheet) with the whole class. -Tell students to continue reading silently and to answer the remainder of the guide-o-rama (part C on the worksheet) questions individually while they are reading.
5-10 minutes Materials: worksheet, continuum on board	Post-reading: connect items mentioned in the reading to the continuum from the pre-reading activity	-Review the answers to the guide-o-rama as a class. -Refer to the continuum drawn on the board during the pre-reading activity and the foods arranged on the desk and ask students to add relevant items to the continuum based on their answers to the guide-o-rama questions (Ex: A possible answer to question four is "leafy vegetables such as lettuce and cabbage." A student would write lettuce and cabbage under the appropriate spot on continuum.)
2-5 minutes Materials: worksheet	Post- reading: Homework assignment and wrap-up	-Tell students to complete the summary worksheet (parts D & E) for homework. -Go over the instructions and answer any questions students have about the assignment. End class.

*Lesson materials can be found in the attached appendices

Appendix A

Reading Text (from *Water and Fiber for a healthy body* By Angela Royston)

What is Water?

Water is made from two elements-hydrogen and oxygen-combined together. Both of these elements are normally gases, but when they combine together they form a liquid. Many substances dissolve easily in water, so water usually contains other chemicals, too. Some of these chemicals are minerals that your body can use. In polluted water, there are harmful bacteria that could harm your body.

Calcium in Water

Some water contains a lot of calcium. Calcium is a mineral that makes your bones and teeth strong. Calcium makes the water "hard," and leaves a hard, chalky-white deposit on faucets and in pipes. It takes more soap to work up a lather in hard water.

Bacteria in water

Bacteria, like all forms of life, need water to live and breed. Typhoid, cholera, and dysentery are three serious illnesses that are caused by bacteria that live in water. These diseases are not common in the United States, but they kill thousands of people every year in parts of the world that do not have a clean supply of drinking water. The water you drink is treated to kill bacteria, which makes it safe to drink.

Tap water

The water from your faucet has been treated. The sediment is removed from the water. Then, chlorine is added to kill bacteria. In some places the mineral fluoride is added, too. Fluoride can help protect your teeth from tooth decay. It is added to most toothpastes.

Water filters

Some people do not like the taste of tap water. Tap water is tested to make sure that it does not contain too many chemicals. Even so, many families use water filters. Some people think that water filters make tap water taste better.

Bottled water

Some companies bottle water that has been collected from underground springs. Many people think that bottled water tastes better than tap water. It does not contain chlorine or other chemicals that are added to tap water. But bottled water is expensive, and many people consider it an unnecessary luxury.

Water in Food

Even solid foods contain a lot of water. This is because all food comes from plants, fungi, or animals. Like all living things, they consist mainly of water. Some foods contain more water than others. Leafy vegetables, such as lettuce and spinach, have the most. They are more than 90 percent water.

Plants

Plants take in water from the soil through their roots. Dissolved in the water are nutrients that the plants need to stay healthy. The water and nutrients travel through narrow tubes up the stem to the leaves. Here, some of the water combines with carbon dioxide from the air to make food, using the energy of sunlight. The food is carried to all other parts of the plant-the flowers, fruit, stem, leaves and roots.

Fruit juice

Fruit contains seeds that can grow into new plants. Some plants surround the seeds with sweet, juicy flesh. This kind of fruit contains a lot of water and is often made into fruit juice. The fruit of apples, oranges, grapefruits, pineapples, and grapes, for example, are squashed and the juice is collected and sold in bottles or cartons.

Other food from plants

Nuts, grains, peas, and beans are seeds, too. They contain water, but not as much as juicy fruits. Most vegetables come from other parts of the plant and they are all rich in water. Broccoli and cauliflower are flowers, while celery and asparagus are stems. Some plants store food in their roots. Potatoes and onions are two examples of root vegetables. Some vegetables, such as carrots, are juiced and sold as drinks.

Food from animals

Meat and fish are more than half water, but meat contains much less water than fruits and vegetables. Female cows, sheep, and goats make milk that we can drink or make into cheese or yogurt. Milk is about 90 percent water, so when you have a glass of milk, you are drinking mainly water. The other ten percent consists of fat, sugar, protein, vitamins and minerals.

Dried food

Sometimes food is dried to preserve it. Raisins are dried grapes. Even so, these foods still contain some water. Dried dates, for example, are fifteen percent water.

Text as it appears in the book:

What Is Water?

Water is made from two **elements**—**hydrogen** and **oxygen**—combined together. Both of these elements are normally gases, but when they combine together they form a liquid. Many substances **dissolve** easily in water, so water usually contains other chemicals, too. Some of these chemicals are **minerals** that your body can use. In polluted water, there are harmful **bacteria** that could harm your body.

Calcium in water

Some water contains a lot of calcium. Calcium is a mineral that makes your bones and teeth strong. Calcium makes the water "hard," and leaves a hard, chalky-white deposit on faucets and in pipes. It takes more soap to work up a lather in hard water.

Bacteria in water

Bacteria, like all forms of life, need water to live and breed. Typhoid, cholera, and dysentery are three serious illnesses that are caused by bacteria that live in water. These diseases are not common in the United States, but they kill thousands of people every year in parts of the world that do not have a clean supply of drinking water. The water you drink is treated to kill bacteria, which makes it safe to drink.

Tap water

The water from your faucet has been treated. The **sediment** is removed from the water. Then, chlorine is added to kill bacteria. In some places the mineral fluoride is added, too. Fluoride can help protect your teeth from tooth decay. It is added to most toothpastes.

Water is treated to make it safe to drink before it is piped to your home.

Water filters

Some people do not like the taste of tap water. Tap water is tested to make sure that it does not contain too many chemicals. Even so, many families use water filters. Some people think that water filters make tap water taste better.

Bottled water

Some companies bottle water that has been collected from underground springs. Many people think that bottled water tastes better than tap water. It does not contain chlorine or other chemicals that are added to tap water. But bottled water is expensive, and many people consider it an unnecessary luxury.

This pitcher contains a water filter. It is used to filter tap water of chemicals that can harm your body.

Water Fact

The water you drink is the same water that the dinosaurs drank! The earth's water is constantly recycled. It evaporates from the oceans and falls as rain. Some of the rain runs into lakes, wells, and underground springs. The rest flows into rivers and back to the oceans.

Water in Food

Even solid foods contain a lot of water. This is because all food comes from plants, **fungi**, or animals. Like all living things, they consist mainly of water. Some foods contain more water than others. Leafy vegetables, such as lettuce and spinach, have the most. They are more than 90 percent water.

Plants

Plants take in water from the soil through their roots. **Dissolved** in the water are **nutrients** that the plants need to stay healthy. The water and nutrients travel through narrow tubes up the stem to the leaves. Here, some of the water combines with **carbon dioxide** from the air to make food, using the **energy** of sunlight. The food is carried to all other parts of the plant—the flowers, fruit, stem, leaves, and roots.

Fruit juice

Fruit contains seeds that can grow into new plants. Some plants surround the seeds with sweet, juicy flesh. This kind of fruit contains a lot of water and is often made into fruit juice. The fruit of apples, oranges, grapefruits, pineapples, and grapes, for example, are squashed and the juice is collected and sold in bottles or cartons.

Vegetable or Fruit?

Although we think of cucumbers, eggplants, peppers, and tomatoes as vegetables, they are really fruits. Like other fruits, they have seeds inside them.

You can squeeze oranges to make orange juice. When the squeezing has finished, the only solids left will be the skin, the membranes, and the seeds.

Other food from plants

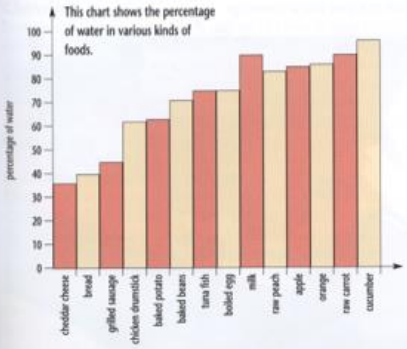
Nuts, grains, peas, and beans are seeds, too. They contain water, but not as much as juicy fruits. Most vegetables come from other parts of the plant and they are all rich in water. Cabbage and lettuce are leaves and contain the most water. Broccoli and cauliflower are flowers, while celery and asparagus are stems. Some plants store food in their roots. Potatoes and onions are two examples of root vegetables. Some vegetables, such as carrots, are juiced and sold as drinks.

Food from animals

Meat and fish are more than half water, but meat contains much less water than fruits and vegetables. Female cows, sheep, and goats make milk that we can drink or make into cheese or yogurt. Milk is about 90 percent water, so when you have a glass of milk, you are drinking mainly water. The other ten percent consists of **fat**, sugar, **protein**, **vitamins**, and **minerals**.

Dried food

Sometimes food is dried to preserve it. Raisins are dried grapes. Even so, these foods still contain some water. Dried dates, for example, are fifteen percent water.



Appendix B: Student Worksheet

Name: _____

Water and Fiber for a Healthy Body (Pgs 8-11) Worksheet

Before You Read

A. Look at the information below. Each item is made up of a certain percentage of water. Write a percentage (from the box) in each blank to predict much water you think is in each item.

36%	39%	44%	62%	63%	70%	75%	75%	84%	86%	87%	92%	94%	96%

1. tuna fish ___

2. boiled egg ____

3. milk ____

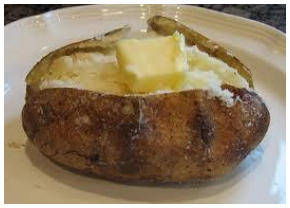
4. bread _____

5. cucumber _____

6. baked beans ____

7. raw carrot ____

8. orange _____



9. baked potato ____

10. apple _____

11. peach _____

12. cheese _____

13. chicken _____

14. grilled sausage ____

B. Skim the text and highlight any unknown words. Make sure you write these words with their definitions and your own original sentences in your vocabulary log.

During Reading

C. Guide-o-rama. Read each paragraph(s) then answer the question(s) that follows.

1) Paragraphs one and two: What can be found in water? How does calcium affect water and those who use or drink water?

_____
_____
_____
_____

2) Paragraphs three and four: What must be done to tap water to make it safe to drink?

_____
_____
_____
_____

3) Paragraphs five and six: Why do some people not drink tap water? What are the alternatives are there to drinking tap water?

_____
_____
_____
_____

4) Paragraphs seven and eight: How is water recycled? Where is it found? What types of vegetables contain the most water?

_____
_____
_____
_____

5) Paragraphs nine and ten: What is in the water in plants? Which types of fruit contain a lot of water?

_____
_____
_____
_____

6) Paragraphs eleven and twelve: What are some fruits that we traditionally think are vegetables and why are they considered to be fruits? What parts of a plant contain the most water?

_____
_____
_____
_____

7) Paragraphs thirteen and fourteen: What animal products contain the most water? Why do we dry out food?

_____
_____
_____
_____

After Reading Summary Practice (Homework)

D. Instructions: Read the sentences below. Write an "M" next to sentences that express main ideas. Write a "D" next to sentences that express a supporting detail.

_____ Tap water must be treated before it is safe to drink.

_____ Chlorine is added to kill bacteria.

_____ Water contains minerals that your body can use, but it can also contain chemicals that could harm your body.

_____ Typhoid, cholera, and dysentery are three serious illnesses that are caused by bacteria that live in water.

_____ Some foods contain more water than others.

_____ Cabbage and lettuce are leaves and contain the most water.

E. Now write a brief summary using your own words to answer the questions below. Please write your summary as a complete paragraph.

1. What is the author's main idea is the *What is Water?* section (pages 8-9)? State it in one or two sentences.

2. In one or two follow-up sentences, briefly state other key points the author mentioned in this section.

3. What is the author's main idea in the *Water in Food?* section (pages 10-11)? State it in one or two sentences.

4. In one or two follow-up sentences, briefly state other key points the author mentioned in this section.

Appendix C

Vocabulary Log

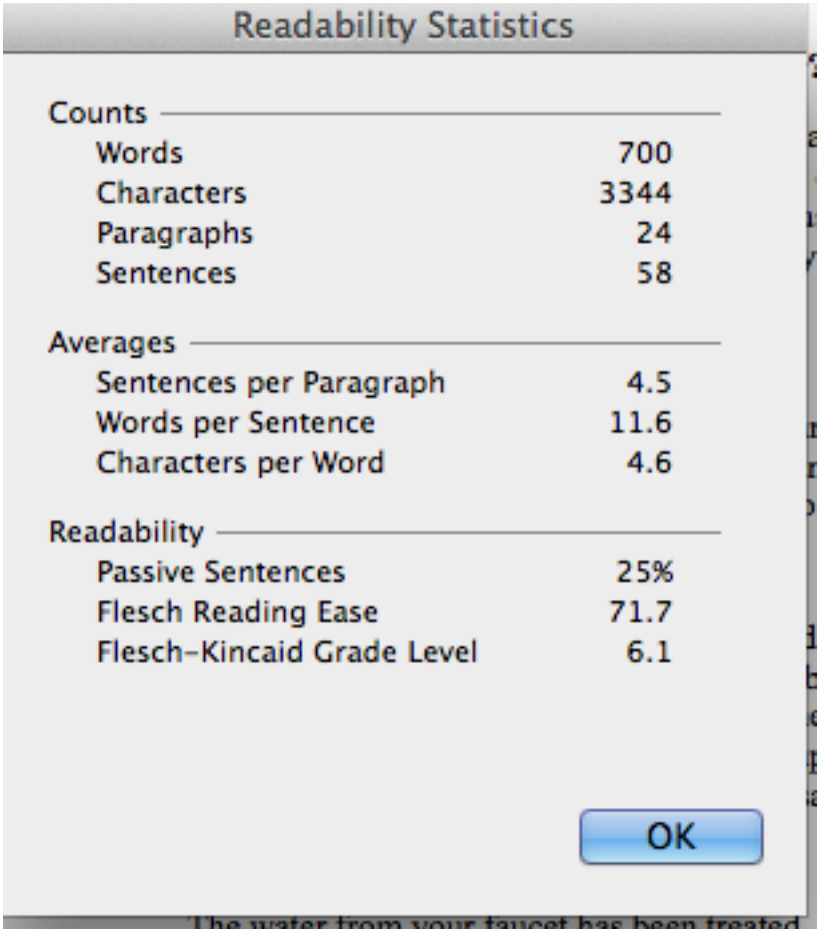
fluoride: a chemical that is sometimes added to drinking water and toothpaste to help keep teeth healthy

Source sentence: Fluoride can help protect your teeth from tooth decay. (P. 8 Water and Fiber for a healthy body)

Original sentence: The fluoride in my Crest toothpaste helps keep my teeth clean, white and strong.

Appendix D

Readability Statistics and VocabProfiler Analysis



	Families	Types	Tokens	Percent
K1 Words (1-1000):	136	160	538	76.42%
Function:	...	...	(287)	(40.77%)
Content:	...	...	(251)	(35.65%)
> Anglo-Sax =Not Greco-Lat/Fr Cog:	...	...	(154)	(21.88%)
K2 Words (1001-2000):	43	55	85	12.07%
> Anglo-Sax:	...	...	(47)	(6.68%)
1k+2k		...	...	(88.49%)
AWL Words (academic):	7	8	15	2.13%
> Anglo-Sax:	...	...	(1)	(0.14%)
Off-List Words:	?	48	66	9.38%
	186+?	271	704	100%

Freq. Level	Families (%)	Types (%)	Tokens (%)	Cumul. token %
K-1 Words :	129 (58.90)	145 (59.92)	541 (76.85)	76.85
K-2 Words :	38 (17.35)	42 (17.36)	82 (11.65)	88.50
K-3 Words :	16 (7.31)	18 (7.44)	30 (4.26)	92.76
K-4 Words :	10 (4.57)	11 (4.55)	14 (1.99)	94.75
K-5 Words :	7 (3.20)	7 (2.89)	9 (1.28)	96.03
K-6 Words :	2 (0.91)	2 (0.83)	5 (0.71)	96.74
K-7 Words :	6 (2.74)	6 (2.48)	7 (0.99)	97.73
K-8 Words :	3 (1.37)	3 (1.24)	3 (0.43)	98.16
K-9 Words :	2 (0.91)	2 (0.83)	2 (0.28)	98.44
K-10 Words :	2 (0.91)	2 (0.83)	3 (0.43)	98.87
K-11 Words :	1 (0.46)	1 (0.41)	1 (0.14)	99.01
K-12 Words :	1 (0.46)	1 (0.41)	1 (0.14)	99.15
K-13 Words :	2 (0.91)	2 (0.83)	3 (0.43)	99.58
K-14 Words :				
K-15 Words :				
K-16 Words :				
K-17 Words :				
K-18 Words :				
K-19 Words :				
K-20 Words :				
K-21 Words :				
K-22 Words :				
K-23 Words :				
K-24 Words :				
K-25 Words :				
Off-List:	??	3 (1.24)	3 (0.43)	100.00
Total (unrounded)	219+?	242 (100)	704 (100)	100.00