

# Observing an Aquarium

## TABLE OF CONTENTS

### ABOUT DELTA SCIENCE MODULES

<b>Program Introduction</b> .....	iii
Teacher's Guide .....	iv
Delta Science Readers .....	vi
Equipment and Materials Kit .....	vii
Scope and Sequence .....	viii
Assessment Features .....	ix
Process Skills .....	x
Communicating About Science .....	xi
Integrating the Curriculum .....	xii
Meeting the Standards .....	xiii
What We Believe .....	xiv

### OBSERVING AN AQUARIUM OVERVIEW

<b>About <i>Observing an Aquarium</i></b> .....	1
<b>Overview Charts</b>	
Hands-on Activities .....	2
Delta Science Reader .....	4
<b>Science Background</b> .....	5
<b>Materials List</b> .....	7

### HANDS-ON ACTIVITIES

<b>Activity Summary</b> .....	9
<b>Schedule</b> .....	10
<b>Preparing for the Activities</b>	
Classroom Management .....	11
Advance Preparation .....	11
Materials Management .....	13
<b>Activities</b>	
1. The Water Planet .....	15
2. Setting Up an Aquarium .....	23
3. Water Plants .....	31
4. Water Animals: Fish .....	39

5. Water Animals: Snails .....	47
6. The Tiniest Plants and Animals .....	57
7. Food Chains .....	69
8. Behavior of Fish .....	79
9. Behavior of Pond Snails .....	89
10. Birth and Growth .....	97
11. Water Pollution .....	109
12. Field Trip to a Pond .....	117

### Assessment

Activities 1–12 .....	127
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### Glossary

.....	133
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### DELTA SCIENCE READER

<b>Overview</b> .....	135
<b>Before Reading</b> .....	136
<b>Guide the Reading</b> .....	137
<b>After Reading</b> .....	141

### TEACHER RESOURCES

<b>References and Resources</b> .....	143
<b>Science Safety</b> .....	145
<b>Standards Correlations</b> .....	147

### COPYMASTERS

<b>Student Activity Sheets</b>	
<b>Assessment Activity Sheets</b>	
<b>Assessment Summary Chart</b>	
<b>School-Home Connection</b>	



# About **Observing an Aquarium**

**DeltaScienceModules**, THIRD EDITION

**S**tudents build and maintain aquariums that become, over several weeks, diverse underwater ecosystems. Students can observe food chains, how populations change, and how life cycles unfold. One by one, organisms are introduced into fresh water habitats: two types of aquatic plants, tropical fish, pond snails, algae, and tiny crustaceans called daphnia. Students examine each one to discover how it is suited to life under water. By the time they take an end-of-unit field trip to a local pond, students are experienced observers who will recognize meaningful similarities and differences between their classroom aquariums and the natural environment.

In the Delta Science Reader *Observing an Aquarium*, students read about the plants and animals that live in an aquarium. They learn about the life cycle of fish. They find out about the different body parts that make fish well adapted to living in water. They also read about the job of an aquarium scientist. Finally, students observe different types of water habitats.

# Overview Chart for Hands-on Activities

Hands-on Activity	Student Objectives
<b>1 The Water Planet</b> <i>page 15</i>	<ul style="list-style-type: none"> <li>• examine a globe and conclude that much of the earth is covered with water</li> <li>• infer that, without water, there would be no life on earth</li> <li>• learn that some bodies of water are salty and others are fresh</li> <li>• conclude that some plants and animals live in salt water and others live in fresh water</li> </ul>
<b>2 Setting Up an Aquarium</b> <i>page 23</i>	<ul style="list-style-type: none"> <li>• brainstorm a list of living and nonliving things that may be found in a freshwater lake or pond</li> <li>• learn how an aquarium is like a miniature lake or pond ecosystem</li> <li>• discuss what plants and animals need to survive in an aquarium</li> <li>• discover the differences between tap water and spring water</li> <li>• add sand and spring water to their aquariums</li> </ul>
<b>3 Water Plants</b> <i>page 31</i>	<ul style="list-style-type: none"> <li>• name the parts of a plant</li> <li>• examine the anacharis and duckweed with a magnifier and discuss their features</li> <li>• compare and contrast water plants with land plants</li> <li>• introduce the anacharis and duckweed to the aquariums</li> <li>• discuss the role of water plants in an underwater ecosystem</li> </ul>
<b>4 Water Animals: Fish</b> <i>page 39</i>	<ul style="list-style-type: none"> <li>• name the parts of a fish</li> <li>• examine the platys with a magnifier</li> <li>• discover the importance of fins and gills to living underwater</li> <li>• introduce the platys to the aquariums</li> <li>• discuss the role of fish in an underwater ecosystem</li> </ul>
<b>5 Water Animals: Snails</b> <i>page 47</i>	<ul style="list-style-type: none"> <li>• name the parts of a snail</li> <li>• examine the pond snails with a magnifier and discuss their features</li> <li>• discuss the similarities and differences between pond snails and land snails</li> <li>• introduce the snails to the aquariums</li> <li>• discuss the role of pond snails in an underwater ecosystem</li> </ul>
<b>6 The Tiniest Plants and Animals</b> <i>page 57</i>	<ul style="list-style-type: none"> <li>• learn that most bodies of water contain plankton—plants and animals that are too small to see</li> <li>• examine samples of algae and daphnia with a Pocketscope and discuss their physical characteristics</li> <li>• compare and contrast algae with other types of plants</li> <li>• compare and contrast daphnia with other types of crustaceans</li> <li>• introduce algae and daphnia to the aquariums</li> <li>• discuss the role of plankton in an underwater ecosystem</li> </ul>
<b>7 Food Chains</b> <i>page 69</i>	<ul style="list-style-type: none"> <li>• observe the eating habits of the organisms in the aquariums</li> <li>• define these feeding relationships as a food chain</li> <li>• brainstorm a list of organisms that live in and around a lake or pond and discuss what they eat</li> <li>• assemble a food “chain”</li> </ul>
<b>8 Behavior of Fish</b> <i>page 79</i>	<ul style="list-style-type: none"> <li>• observe and describe the behavior of the platys undisturbed in their aquariums</li> <li>• observe and describe the platys’ response to smells, food, noise, movement, and other fish</li> <li>• infer the importance of maintaining a stress-free environment for the platys</li> <li>• learn to recognize some of the behaviors exhibited by sick fish</li> </ul>
<b>9 Behavior of Pond Snails</b> <i>page 89</i>	<ul style="list-style-type: none"> <li>• observe and describe the behavior of the snails undisturbed in their aquariums</li> <li>• observe and describe a snail’s response to motion, touch, and sound</li> <li>• learn how certain snail behaviors are an indication of unhealthy aquarium conditions</li> </ul>
<b>10 Birth and Growth</b> <i>page 97</i>	<ul style="list-style-type: none"> <li>• locate and examine a cluster of snail eggs</li> <li>• observe the development of the eggs over time</li> <li>• learn that some fish lay eggs while others give birth to fully developed young</li> <li>• observe the appearance and behavior of platy fry</li> <li>• compare their own birth and growth with that of snails and platys</li> </ul>
<b>11 Water Pollution</b> <i>page 109</i>	<ul style="list-style-type: none"> <li>• observe a healthy underwater ecosystem—a clean aquarium</li> <li>• isolate some water plants, algae, and daphnia in containers of spring water</li> <li>• add pollutants commonly found in oceans, lakes, and rivers</li> <li>• observe the effects of pollution on the living organisms</li> <li>• infer the effects of pollution on an underwater ecosystem</li> </ul>
<b>12 Field Trip to a Pond</b> <i>page 117</i>	<ul style="list-style-type: none"> <li>• prepare for the trip by listing the materials needed and safety precautions</li> <li>• observe and record the plants and animals that live near the edge of the pond or lake</li> <li>• observe and record the plants and animals that live in the shallow waters of the pond or lake</li> <li>• look for signs of pollution in and around the water</li> </ul>
<b>Assessment</b> <i>page 127</i>	<ul style="list-style-type: none"> <li>• See page 127.</li> </ul>

## Observing an Aquarium

Process Skills	Vocabulary	Delta Science Reader
observe, compare, classify, infer	aquarium, fresh water, salt water	pages 2–3, 14–15
make and use models, communicate, compare	ecosystem, habitat, living, nonliving, spring water, tap water	pages 2–3, 14–15
observe, compare	anacharis, carbon dioxide, duckweed, leaf, magnifier, oxygen, plant, root, stem	pages 2–3, 9
observe, hypothesize, communicate, compare	fins, fish, gills, platy, scales	pages 4–7, 8–9
observe, compare, communicate	foot, pond snail, shell, tentacles	
observe, compare, communicate	algae, daphnia, plankton, Pocketscope™	
observe, define based on observations, make and use models	food chain	page 12
observe, communicate, infer		pages 4–7
observe, use variables, experiment		
observe, predict, infer, compare	egg, fry, life cycle	pages 10–11
observe, use variables, experiment, infer	pollution	pages 14–15
observe; collect, record, display, or interpret data		pages 14–15

See the following page for the Delta Science Reader Overview Chart.

# Overview Chart for Delta Science Reader

## Observing an Aquarium

Selections	Vocabulary	Related Activity
<b>Think About...</b>		
<b>What Is an Aquarium?</b> <i>page 2</i>	animal, aquarium, plant, water <i>optional: living, nonliving</i>	Activities 1, 2, 3
<b>What Is a Fish?</b> <i>page 4</i>	fins, fish, scales	Activities 4, 8
<b>How Do Fish Breathe?</b> <i>page 8</i>	gills, oxygen <i>optional: adaptation</i>	Activity 4
<b>How Do Fish Grow?</b> <i>page 10</i>	egg, fry, hatch, life cycle	Activity 10
<b>Fish Need Food</b> <i>page 12</i>	<i>optional: food chain</i>	Activity 7
<b>People in Science</b>		
<ul style="list-style-type: none"> <li>• <b>Aquarium Scientist</b> <i>page 13</i></li> </ul>		
<b>Did You Know?</b>		
<ul style="list-style-type: none"> <li>• <b>About Water Habitats</b> <i>page 14</i></li> </ul>	habitat	Activities 1, 2, 11, 12

See pages 135–142 for teaching suggestions for the Delta Science Reader.

# MATERIALS LIST

## Observing an Aquarium

Quantity	Description	Quantity	Description
10	aquariums	<b>TEACHER-PROVIDED ITEMS</b>	
1	bulb, 75-watt	1	bag, garbage, plastic (optional)
2	coverslips, p/12	2	basters
1	depression slides, p/40	2	bouillon cubes, beef*
8	dip nets	4	bowls, mixing, medium-size
24	dishes, plastic	-	containers, collecting
8	droppers	-	containers, 1-qt
1	fish food*	-	crayons
10	lids, for aquariums	-	detergent, liquid
1	light, aquarium	-	field guides to pond life
1	light bulb	1	first-aid kit
16	magnifiers	1	globe, topographical
1	<i>OBIS Pond Guide</i>	32	gloves, protective (optional)
1	pencil, grease	-	insect repellent
4	Pocketscopes™	1	map of local area (optional)
10	sand, 2 lb*	1	microscope (optional)
16	spoons, plastic	1	mug
1	tape, masking*	-	oil, vegetable
1	thermometer	-	paper towels*
1	toothpicks, p/750*	-	paper, white, 11 in. × 17 in.*
1	<b>Teacher's Guide</b>	-	paste*
8	<b>Delta Science Readers</b>	2	photographs of student (optional)
1	<b>Delta Science Reader Big Book</b>	-	pictures, baby and adult animals (optional)
1	Living Material Card* Shipment includes	-	pictures, crustaceans
	16 oz algae	-	pictures, eggs
	10 anacharis	-	pictures, water pollution
	200 daphnia	-	salt, table*
	2 oz duckweed	32	scissors
	25 platys	-	shells, assorted
	32 snails	1	spoon, wooden
		-	water, spring*
		-	water, tap*

\* = consumable item

† = in separate box

# ACTIVITY SUMMARY

**In this Delta Science Module, students learn about aquatic life as they build and maintain their own fresh water aquariums.**

**ACTIVITY 1** Students examine a globe and discover that much of the Earth’s surface is covered with water. They learn that all living things need water to survive and that, without water, there would be no life on Earth.

**ACTIVITY 2** Students prepare their aquariums for the addition of plants and animals. They discuss how an aquarium is like a miniature lake or pond ecosystem. Then they discuss what plants and animals need in order to survive in an aquarium.

**ACTIVITY 3** Students add two types of water plants—anacharis and duckweed—to their aquariums. They name the parts of a plant and examine the water plants with a magnifier. They compare water plants with land plants, and discuss the role of water plants in an underwater ecosystem.

**ACTIVITY 4** Students add platys—small, freshwater tropical fish—to their aquariums. They name the parts of a fish and identify them on the platys. Then they learn about the features that make fish well suited to living in water and discuss the role of fish in an underwater ecosystem.

**ACTIVITY 5** Students add pond snails to their aquariums. They name the parts of pond snails and examine them with a magnifier. Students compare pond snails with land snails, and discuss the role of snails in an underwater ecosystem.

**ACTIVITY 6** Students learn about plankton—the tiniest plants and animals on Earth. They examine samples of algae, discuss the characteristics of these microscopic “plants,” and compare algae plants with other types of plants. Then they examine daphnia, discuss

their features, and compare them with other types of crustaceans. Finally, students discuss the role of plankton in an underwater ecosystem.

**ACTIVITY 7** Students learn more about the habits and behavior of the animals in their aquariums. In this activity, students learn about food chains—the feeding relationships between organisms in an ecosystem. Students observe the eating habits of the platys, snails, and daphnia. Then they assemble food “chains” of the plants and animals that live in and around a lake or pond.

**ACTIVITIES 8 and 9** Students observe the behavior of the platys and snails, both undisturbed in their aquariums and in response to stimuli. They learn that animals respond in observable ways to changes in their environment. They also learn that certain behaviors indicate illness or an unhealthy environment. These activities emphasize the importance of maintaining a clean, stress-free environment for the animals.

**ACTIVITY 10** Students learn about the birth and growth of snails and platys. They observe the development of snail eggs over time and learn that platys give birth to fully developed young. Then they share their baby pictures with classmates and compare their own birth and growth with that of the organisms in their aquariums.

**ACTIVITY 11** Students add detergent and oil to dishes of plants and daphnia and observe the effects of pollution on the organisms. From this, they infer the effects of pollution on an underwater ecosystem like an ocean, a lake, or a pond.

**ACTIVITY 12** Students take a field trip to a local pond to observe plants and animals in their natural environment.