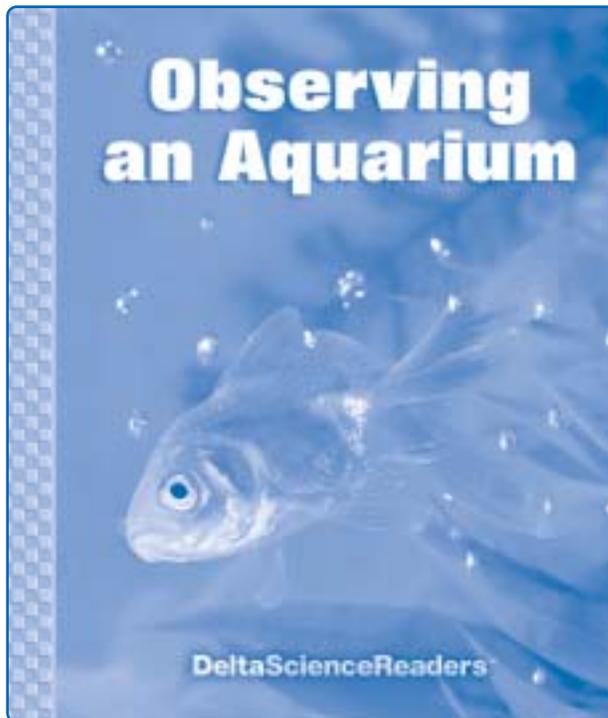


# Observing an Aquarium



*Delta Science Readers* are nonfiction student books that provide science background and support the experiences of hands-on activities. Every **Delta Science Reader** has three main sections: *Think About . . .*, *People in Science*, and *Did You Know?*

Be sure to preview the reader Overview Chart on page 4, the reader itself, and the teaching suggestions on the following pages. This information will help you determine how to plan your schedule for reader selections and activity sessions.

Reading for information is a key literacy skill. Use the following ideas as appropriate for your teaching style and the needs of your students. The After Reading section includes an assessment and writing links.

## OVERVIEW

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.

### Students will

- ▶ recognize the parts of an aquarium
- ▶ identify the different features of a fish
- ▶ discuss how features such as fins and gills help fish live in water
- ▶ identify the stages in the life cycle of fish
- ▶ compare and contrast what different fish eat; understand that living things are part of a food chain
- ▶ recognize different water habitats
- ▶ examine nonfiction text elements such as table of contents, headings, labels, and glossary
- ▶ interpret photographs and diagrams to answer questions

## READING IN THE CONTENT AREA SKILLS

- Compare and contrast
- Cause and effect
- Draw conclusions
- Main idea and supporting details
- Critical thinking
- Interpret graphic devices
- Summarize

## NONFICTION TEXT ELEMENTS

*Observing an Aquarium* includes a table of contents, headings, photographs, labels, boldfaced terms, a diagram, and a glossary.

## CONTENT VOCABULARY

The following terms are introduced in context and defined in the glossary: *animal, aquarium, egg, fins, fish, fry, gills, habitat, hatch, life cycle, oxygen, plant, scales, water.*

Optional vocabulary: *adaptation, food chain, living, nonliving*

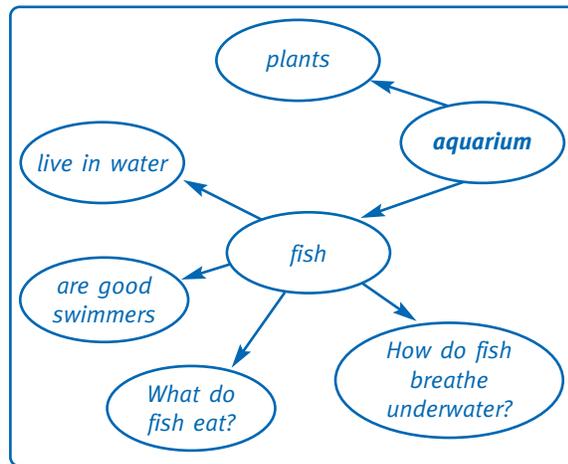
## BEFORE READING

### Build Background

Access students' prior knowledge of aquariums by displaying and discussing the cover. Read aloud the title. Explain that the word *observe* means to see or to study. Ask, *What do you see in this picture?* (fish or goldfish, water, bubbles, plants)

Invite students to share what they know about the topic from their personal experiences and hands-on explorations in science. To stimulate discussion, ask questions such as these: *Have you ever seen an aquarium? Where? What did it have in it? Do any of you have an aquarium at home? How do you take care of the plants and animals that live in it?*

Begin a concept web by asking students what they notice about the aquarium in the cover photograph. Write each word in a circle on the board and ask, *What do you know about this word? What would you like to know?* Record students' responses in connecting circles. Tell students that they will find the answers to many of their questions in the book they are about to read.



▲ Beginning of a concept web for **aquarium**.

## Preview the Book

Tell students that one way to find out what a book is about is to *preview* the book. Explain that they can preview a book they are about to read by looking at its cover, chapter titles, pictures, and other important parts.

To preview the book with students, flip through the pages and briefly discuss the photographs and diagrams. Ask questions such as, *What do you see in this picture? What do you think the words on this page tell about? Have any of these pictures made you think of other questions we could add to our web?*

Have students turn to the table of contents. Explain that the table of contents is a list that tells what is written in the book. Ask, *What do you notice about this page?* Read aloud the headings and point to the page numbers listed after each heading. Explain that each number tells the page on which they will find information about each heading.

Point to and read aloud the word *Glossary* at the bottom of the page. Tell students that a glossary is a list of words and their meanings. Explain that the words in the glossary are important words they will need to know in order to understand the information in the book. Ask, *What words do you think you might find in the glossary of this book?* Have students turn to the glossary at the back of the book. Tell them, *In the book, these words are printed in dark print. The dark print tells you that you can find out what the word means by looking in the glossary.* Choose one word and model how to find its definition in the glossary.

### Preview the Vocabulary

You may wish to preview some of the vocabulary words before reading rather than waiting to introduce them in the context of the book. Possibilities include creating a word wall, vocabulary cards, sentence strips, or a concept web.

For example, you might begin a class picture dictionary of aquarium words. Write each vocabulary word at the top of a large sheet of drawing paper. Read the word aloud and briefly discuss its meaning. Draw a simple illustration of the word and, if you wish, copy its definition from the glossary. Write *Aquarium Words* on a cover page and clip the pages together to make a book. Tell students that the dictionary will be available for them to use as they read their books.

### Set a Purpose

Discuss with students what they might expect to find out from the book, based on their preview. Encourage them to use the questions from the concept web to set an overall purpose for reading.

## GUIDE THE READING

Preview the book yourself to determine the amount of guidance you will need to give for each section. Depending on your schedule and the needs of your class, you may wish to consider the following options:

- **Whole Group Reading** Read the book aloud with a group or the whole class. Encourage students to ask questions and make comments. Pause as necessary to clarify and assess understanding.
- **Shared Reading** Have students work in pairs or small groups to read the book together. Ask students to pause after each text section. Clarify as needed and discuss any questions that arise or have been answered.
- **Independent Reading** Some students may be ready to read independently. Have them rejoin the class for discussion of the book. Check understanding by asking students to explain in their own words what they have read.

### Tips for Reading

- If you spread out the reading over several days, begin each session by reviewing the previous day's reading and previewing what will be read in the upcoming session.
- Begin each text section by reading or having a volunteer read aloud the heading. Have students examine any illustrations or graphics and read accompanying labels. Discuss what students expect to learn, based on the heading, illustrations, and labels.
- Help students locate context clues to the meanings of words in boldface type. Remind them that these words are defined in the glossary. Provide help with words that may be difficult to pronounce.
- As appropriate, model reading strategies students may find helpful for nonfiction: adjust reading rate, ask questions, paraphrase, reread, visualize.

### Think About . . . (pages 2–12)

#### Pages 2, 3 *What Is an Aquarium?*

- Point to the word *aquarium* in the heading. Ask, *Where have you seen this word before?* (on the cover of the book)

Encourage students to help you read the word. Then read the heading aloud.

- Briefly discuss the photograph on pages 2 and 3. Ask questions such as, *What do you think this is? Have you ever seen an aquarium like this one? What things are living? (fish, plants) What things are nonliving? (gravel, water)*
- Read aloud page 2. Have students summarize the information on the page by asking questions such as, *What is this page about? (aquariums) What did you learn about aquariums? (that aquariums have water, plants, and animals; that they are homes for living things).*
- Ask students to put their fingers on the *plants* in the picture of the aquarium. Then ask them to point to any *animals* they can find.
- Encourage students to track the print with their fingers as you reread the text. Point to the word *aquarium* and ask, *What do you notice about this word? (It is printed in dark print.)* Remind students that words printed in dark print are listed in the glossary. Have them turn to the glossary and find the word *aquarium* in the list of words. Read aloud the definition. Follow the same procedure to find the meanings of the words *water*, *plants*, and *animals*.

### Pages 4–7 *What Is a Fish?*

- Have students look at the photograph on pages 4 and 5. Remind students that they just learned that an aquarium is a home for living things. Ask, *What living things do you see in this picture? (plants, fish)*

(As appropriate, point out the pink coral reef. Explain that coral reefs form in warm, clear, shallow ocean water. Many kinds of fish live in coral reefs. Coral reefs also provide shelter to animals such as crabs, sponges, turtles, jellyfish, and sea stars.)

- Read aloud the heading on page 4. Briefly review the information about fish that students contributed to the concept web

on the board. Tell students that they will find out more about fish as they read the next few pages.

- Ask students to point to the word in dark print on page 4. Ask, *Do you see this word anywhere else on this page? What letter does the word begin with? (f) What sound does the letter f make? (/f/) What do you think this word says? (fish)*
- Read aloud the text on pages 4 and 5. Briefly discuss the different colors, shapes, and sizes of the fish shown in the photograph. Then ask, *What is a fish? (an animal that lives in water)* Confirm students' responses by reading the definition of the word in the glossary.

### Page 6

- Read the text on page 6. Direct students' attention to the photograph. Explain that the words on the photo are called *labels*. Tell students, *These labels tell about different parts of the fish's body.* As you point to and read aloud each label, have students trace the line from the label to the body part it names.
- Ask, *Do you have eyes? Point to your eyes. What do your eyes help you do? (see)* Tell students that fish have two eyes just as they do. Have students point to the fish's eye in the photograph on page 6. Ask, *What do you think a fish's eyes help it do? (see)* Have students point to their mouths. Ask, *What do you do with your mouth? (eat, speak)* Point to the fish's mouth in the picture. *Do you think a fish uses its mouth to eat? (yes) How about to speak? (no)*

(As appropriate, you may wish to point out that, like people, fish can see, hear, taste, smell, and feel. Explain that most fish have poor eyesight, but a very keen sense of smell, which helps them locate food in the water.)

- Have students point to the fish's scales. Ask, *Do you have scales? (no)* Explain that a fish's scales are small, thin plates

that overlap like the shingles on a roof. Ask, *How do you think scales help a fish?* (They help protect the fish's body.)

### Page 7

- Have students look at the picture on page 7. Ask, *Can you point to this fish's eye? its mouth? its scales?*
- Ask, *How many of you know how to swim? What parts of your body do you use to move through water?* (arms and legs) *Do fish have arms and legs?* (no) *How do you think fish move through water?* (Accept all answers.) Tell students that they will find out the answer as they read the next page.
- Read page 7. Ask, *What part of a fish's body helps it swim or move from place to place?* (its fins) Point to the labels on the photograph on page 7. Ask, *What do you think these labels say?* (fin) Have students point to the fins indicated by the labels.

(Different fins on a fish have different purposes. The tail fin helps push the fish through water. The pectoral fins on the side help the fish steer. The dorsal fin on top keeps the fish from rolling over in the water. Flexing their bodies in a wave motion also helps fish move through the water.)

### Pages 8, 9 *How Do Fish Breathe?*

- Ask, *Have you ever put your head underwater? Can you breathe underwater?* (no) *Can fish breathe underwater?* (yes) Tell students that the next pages will tell them how fish breathe underwater.
- Read aloud page 8. Read the label on the photograph and have students point to the fish's gills. Ask, *Do we use gills to breathe?* (no) *What do we use to breathe?* Remind students that people breathe with their *lungs*. If you wish, draw a simple diagram of a human body to show where the lungs are located.

- Read aloud page 9. Point out that both fish and people need oxygen to live. Explain that people get oxygen from the air they breathe. Ask, *Where do fish get their oxygen?* (from the water) *Can a fish live out of water?* (no) *Why not?* (It can't get oxygen from the air, only from the water.)

(As appropriate, explain that a fish sucks in water through its mouth and pushes it out through its gills. As water passes over the gills, the gills remove oxygen from the water, much as other animals' lungs remove oxygen from the air they breathe in.)

- Review the body features, or *adaptations*, of fish that help them survive in their environment: scales, fins, gills.
- Direct students' attention to the photograph on page 9. Ask, *What do you see in this picture?* (plants) *Where are the plants?* (under water) *Why is it important to have plants in an aquarium?* (because they make the oxygen that fish and other animals need to breathe)

(As appropriate, explain that plants make the oxygen that other animals, including people, breathe as well. Tell students that plants take in a gas in the air called *carbon dioxide* and give off *oxygen*. Animals like people and fish give off carbon dioxide and take in oxygen. In this way, plants and animals depend on each other for their survival.)

### Pages 10, 11 *How Do Fish Grow?*

- Read aloud the heading on page 10. Ask, *Do fish have babies? What makes you think so?* (Accept all answers.) Tell students to listen to find out if their ideas are right.
- Read the text on page 10. Ask, *Have you ever seen an egg? What kinds of animals lay eggs?* (birds, snakes, turtles, and so on) Point to the picture of fish eggs in the life cycle diagram. Ask, *What do you think these are?* (fish eggs) Read aloud the label to confirm students'

responses. Ask, *What do you think will hatch from these?* (baby fish).

- Read aloud the text on page 11 and have students look closely at the life cycle diagram. Ask students why they think there are arrows connecting the pictures. (Students may know that the arrows show the order in which things happen.)
- Have students put their fingers on the picture of the eggs and follow the direction of the arrow to the next picture. Ask, *What do you think this picture shows?* (baby fish; fry) Read aloud the label and, if necessary, remind students of the meaning of the word *fry*. Follow the same procedure for the picture of the adult fish.
- Ask, *How are the fry like the adult fish?* (Students may note that they have eyes, scales, and fins, and they are shaped like adult fish.) *How are they different?* (Students may say they are much smaller.) Point out that animal offspring such as fry are often similar but not identical to their parents. Some animals, such as butterflies, have stages that look very different from the adult.
- Tell students that the diagram shows the *life cycle* of a fish—the changes it goes through in its life. Ask students to put their fingers on the picture of the adult fish. Ask, *Where does the arrow go from here?* (back to the eggs) *Why do you think the arrow goes from the adult to the eggs?* (because adult fish lay eggs)

(As appropriate, review the life cycle of a fish as birth, developing into an adult, laying eggs, and eventually dying.)

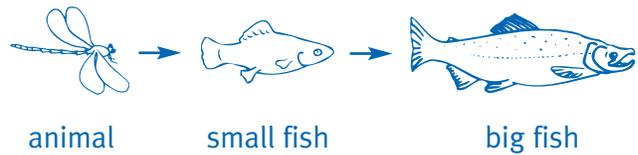
## Page 12 *Fish Need Food*

- Ask students, *What do you need to grow?* If necessary, point out that one thing students need to grow is food. Ask, *What kinds of foods do you like to eat?* Tell students that fish need food to grow, too. Ask, *What kinds of foods do you*

*think fish eat?* (Accept all answers at this time.) Tell students that you will read to find out if their answers are correct.

- Have students look at the top illustration as you read aloud the first sentence on page 12. Ask, *What do you think this fish is doing?* (eating the plant) Remind students that plants provide food and oxygen for fish. *Do people eat plants?* If necessary, point out that fruits and vegetables are parts of plants.
- Have students look at the second picture as you read aloud the second sentence. Explain that some fish eat insects and other tiny animals that live in water. Ask, *Do people eat animals?* Point out that meat, such as chicken and beef, comes from animals.
- Read aloud the third sentence and have students look at the picture. Ask, *What is the big fish doing?* (eating the little fish)

(Draw the following food chain on the board. Explain that living things are part of a food chain. Ask students to help you explain the chain.)



- Explain that, unlike fish that live in lakes or oceans, aquarium fish must depend on people to provide their food for them. Ask, *What kind of food do you think aquarium fish eat?* Tell students that commercial fish food usually contains dried plants and animals that fish like to eat.

## People in Science (page 13)

### *Aquarium Scientist*

- Ask students to look at the photograph on page 13. Ask, *What do you see in this photograph?* (a diver and a large, swimming animal) *Do you know what kind of animal this is?* (Some students

might recognize it as a ray.) *What is the diver wearing?* (scuba gear) *How does the scuba gear help the diver?* (It helps the diver breathe and move more easily under water.)

- Ask, *What do you think the diver is doing?* (Accept all answers.) Tell students to listen as you read to find out.
- Read aloud page 13. Ask, *Have any of you ever been to a big aquarium?* If necessary, explain that an aquarium is a building containing large tanks where fish, plants, and other aquatic life are displayed and studied. Ask, *Why do you think it is important to study water plants and animals?* Guide students to conclude that the more we know about the underwater world, the better able we are to protect the plants and animals that live there.
- Point out that aquarium scientists do lots of different jobs. Help students brainstorm a list of jobs an aquarium worker might do—for example, care for the animals, speak to visitors, teach school groups, plan exhibits, and so on.

### Did You Know? (pages 14–15)

#### About Water Habitats

- Have students look at the pictures on pages 14 and 15. Ask, *How are these pictures alike?* (They each show fish in water.) *How are they different?* (They show different kinds of fish and plants. They show different kinds of water. They show different kinds of places where fish can live.)
- Read aloud the heading on page 14. Point to the word *habitat* and ask, *Does anyone know what this word means?* Tell students to listen to see if they can figure out the meaning of the word.
- Read aloud pages 14 and 15. Ask, *What do you think the word habitat means?* (Students may suggest home or a place where plants or animals have what they

need to live.) Ask students to name the habitats of other animals they know about. For example, the habitat of deer is a forest, and the habitat of some monkeys is a jungle.

- Ask, *What kinds of things live in an aquarium?* (plants, fish, other animals) *What kinds of things live in a river? a pond? an ocean?* Help students infer that all four habitats are homes for the same kinds of living things.
- Ask, *What does a plant or animal need to stay alive?* (air, food, water, and shelter) *Does each of these habitats have all those things?* (yes)

(You may wish to discuss the word *ecosystem*. Write the word on the board. Tell students that aquariums, rivers, ponds, and oceans are all examples of underwater ecosystems. Explain that an ecosystem is a group of living things, the environment in which they live, and all their interactions. Point out, for example, that a desert and all the plants and animals that live in it make up a desert ecosystem.)

## AFTER READING

### Summarize

Read aloud any unanswered questions from the web on the board. Ask students to think about what they have read and answer the questions if they can. Record any ideas or words that students would like to add to the web and review the information as a way of summarizing what they have learned. Ask, *Has reading this book made you think of other questions?* Add the questions to the web and ask, *Where do you think we might find the answers to questions we still haven't answered?* (Students may suggest books, magazines, computers, or people who know about aquariums and aquatic life.)

Flip through the book one more time. Use the headings, photographs, and boldfaced terms to help students use the vocabulary and summarize their learning,

## Review/Assess

Use the questions that follow as the basis for a discussion of the book or for a written or oral assessment.

1. What is an aquarium? (an underwater home for living things) If you were to set up an aquarium, what would you put in it? (Students should include water, plants, and animals.)
2. What parts of a fish can you name? (Students should be able to name the mouth, eyes, fins, tail, scales, and gills.) Which body parts help fish swim? (the fins) Which body parts help fish breathe? (the gills)
3. What are baby fish called? (fry) Where do most fry come from? (They hatch from eggs.)
4. What do animals need to survive? (oxygen or air, food, water, and shelter)
5. How do plants help people, fish, and other animals? (Plants provide oxygen for animals to breathe.)
6. What is a habitat? (a home; a place where living things have what they need to live) Is an aquarium a habitat? (yes) An aquarium is a home for what living things? (plants and animals)

## Writing Links/Critical Thinking

Present the following as writing assignments. Provide help as needed.

1. Have students imagine that they are aquarium scientists. Have them dictate several sentences telling what they do in their jobs. Encourage students to draw pictures of themselves caring for the animals at the aquarium.
2. Show students how to make flipbooks showing the life cycle of a fish. Have them draw each stage on a separate index card and help them staple the cards together in the correct order. Students can flip through the cards to watch fry hatch and grow into adult fish.

3. Suggest that small groups or pairs of students make illustrated directions for setting up and maintaining an aquarium. Help students summarize important information such as what to put in the aquarium and how to take care of the living things in the aquarium.

**Science Journals:** You may wish to have students keep the writing activities related to the Delta Science Reader in their science journals.

## References and Resources

For trade book suggestions and Internet sites, see the References and Resources section of this teacher's guide.