ADVENTURE aquarium | CENTER for AQUATIC SCIENCES at Adventure Aquarium

Exhibit COMPANION

Exhibit Companion

Grades Pre K-K

Topic: The Buddy System

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About this Guide:

Thank you for booking a trip to Adventure Aquarium! This Exhibit Companion contains information and activities to enhance your visit, adding more educational value to an already exciting experience for you and your students. This companion was created to reinforce topics you are already studying in your classroom and stimulate conversations before, during and after your trip to the Aquarium. It is recommended that you read over the packet in its entirety, and distribute the "**At the Aquarium**" section to your chaperones. This section contains discussion questions to be asked at various exhibits throughout the Aquarium, as well as "Not to Miss" exhibits and shows.

For many of your students, this is their first visit to Adventure Aquarium and they may be interacting with animals that they have never seen before. With the help of you and your chaperones, their visit will be filled with fun and learning, and will be an experience they will never forget.

Adventure Aquarium is divided up into four areas, called Zones, to help you easily find your way around the building. This Exhibit Companion is also set up by Zone. The sections of the guide refer to exhibits found in each Zone and how they relate to the topic of this Companion. You may find other exhibits that also relate to the topic while touring the Aquarium. Please have your students and chaperones stop at each one to discuss the animals and their exhibit. Your students will gain more from your trip by taking the time to look, listen, and experience each exhibit, rather than racing through the building!

Adventure Aquarium is constantly updating and adding to our exhibits and collections. Please refer back to these documents prior to each visit, as they will also be updated to reflect changes at Adventure Aquarium.

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This Guide Includes:

- Activities to prepare your students for their visit and to reinforce topics addressed after they have visited.
- Descriptions of the exhibits that will be the focus of this Exhibit Companion and the animals they contain. Please note: while we make every effort to keep the animal list up to date, we are always adding to and adjusting our collections. Please ask an Adventure Aquarium cast member if you are unsure about the identity of a particular animal. We are always happy to help.
- Discussion questions about the animals and their relationships to each other.

Objectives:

After the visit, students will be able to:

- Recognize several types of animal relationships.
- Understand the various ways animals communicate with each other.
- Identify the senses that animals use to communicate.

Standards:

NGSS:	K-LS1-1, K-ESS2-2, K-ESS3-1
New Jersey	5.1A, 5.1C, 5.1D
Pennsylvania	3.1.PK.A1, 3.1.K.A5, 3.2.PK.A1
Delaware	SS6, SS7

Background Information – Relationships

Many animals must work together for survival. These relationships are important for protection, food, and the health of the animal. When two animals have a relationship like this, we call it symbiotic. There are different types of symbiosis. When both animals benefit from the relationship, it is called a **mutualistic** relationship. When one animal benefits from the relationship, and the other one is neither harmed nor benefits, it is called a **commensalistic** relationship. A **parasitic** relationship is one where one member benefits, while the other is harmed by the relationship. It is not necessary that your students be able to name these different relationships, but just know that they exist.

An example of a mutalistic relationship is a bee and a flower. The bee gets nectar from the flower, and the flower uses the bee to spread pollen to other flowers.

An example of a commensalistic relationship is a whale and a barnacle. Barnacles do not have a way to move around, so by attaching themselves to a whale, they are able to relocate but do not harm the whale.

A cowbird displays a form of parasitism. They do not build nests of their own, but instead lay their eggs in the nests of other birds and leave, leaving their egg to be raised by the other bird.

Animals often communicate with each other in ways that are different from how humans communicate. Some use odors, some use touch, and others use body language. Because animals do not speak like we do, they rely on all of their senses for communication.

Some animals, like lightning bugs, will use bioluminescence to communicate, flashing at each other to relay messages. Some animals, like cats, will use urine to communicate, leaving a scent marker that tells other cats their territorial boundaries.

Preparing for Your Visit:

In addition to using this guide, you can enhance your visit with a specially themed educational program. Ask about scheduling a classroom program such as ***Animal Wrappers*** *or* ***Fabulous Fish****.*

A little preparation before the day of your field trip can set expectations and prepare your students to make the most of the visit. Visit www.adventureaquarium.com and view our interactive map. Familiarize yourself with the layout of the Aquarium, and advise your chaperones to do the same. It is easier to find the exhibits you will be focusing on if you know where you will be going and what shows and classes you will be attending. A handout of the daily show schedule is available at check-in and the Information Desk.

Discuss with your students the importance of having friends. What do your friends do for you, and what do you do for your friends? Friends help us with our school work. Sometimes friends even have their own special language that only the two of them understand.

Talk to your students about their senses. Have them name them (smell, touch, hearing, taste and sight) and discuss how they use their senses.

Create a sense test. Get several easily recognizable objects and have students use senses other than sight to figure out what they are. Some items could include crayons, apples, peppermints, wooden blocks, drinking straws, etc. Have students close their eyes, and use their other senses to try to figure out what they are. They can smell the crayon, taste the apple, and feel the blocks with their hands (or try smelling the block…just don't eat the crayons!).

At the Aquarium:

While at the Aquarium, your students will be examining the different animals and discussing how they work together and communicate with each other. Below are various exhibits containing animals of interest that you will find at the Aquarium and questions (indicated by a "light bulb") that you can ask your students while looking at the exhibits. The exhibits are broken down by Zone. While walking through the Aquarium, have your students complete the "Buddy Match" worksheet, located on page 9 of this Exhibit Companion.

Zone A – Shipwrecked and Ocean Realm

Migration March – Every year, spiny lobsters migrate from shallow waters to deeper ones. In order to find their way, they must work together. Using their long antennae, the lobsters will touch the lobster in front of them, forming a long line. They use their sense of touch to communicate with each other. Sometimes these lines of lobsters number in the thousands.

- Can you think of other animals that migrate by "following the leader"?
  - *When you look up in the sky in the fall, you will often see groups of geese in a "V" pattern. These birds are migrating together, and often will switch leaders in mid-flight.*

School Zone – Many fish travel in schools. The menhaden in the School Zone exhibit swim together for protection from predators and to make it easier to find food. These fish use their lateral line, a sensory organ located on either side of the fish, to feel the fish next to them. This prevents the fish from bumping into each other when they school.

- What other animals travel in large groups like this?
  - *Lions travel in prides, Zebras travel in herds, and many bird species travel in flocks.*

Ocean Realm – In the Ocean Realm, you will see many examples of smaller fish swimming with larger fish. Blue runners can be found swimming above the large roughtail ray. Often, the smaller fish swim with the larger fish for protection. Or, they gain extra scraps of food every time the bigger fish eats. Sometimes they save energy by coasting along in the wake produced by the bigger fish.

- Are there other examples of relationships that you see in this exhibit?
  - *Schooling (Lookdown)*
- Find the stingray's buddy on your "Buddy Match" worksheet.

Zone B – Penguin Island

African Penguins exhibit many behaviors that benefit each other. Penguins will often preen each other, using their beaks to clean their feathers. Not only does this help keep them clean by reaching spots it may be hard for the penguin to reach itself, it also is a way for penguins to communicate.

Penguins are also very vocal communicators. They will use calls to recognize each other and help find each other in the colony. This is especially true when baby penguins are trying to find their parents.

- Why do you think it is difficult for a baby penguin to recognize its mother by looking at her?
  - *All penguins in the colony look very similar. Our penguins wear bands on their wings so that we can tell them apart. In the wild, baby penguins recognize their parents by a special song that they create together so they will know each other when they are reunited.*
- Find the penguin's buddy on your "Buddy Match" worksheet.

Zone C – KidZone

Clownfish and Anemones – The clownfish and anemone relationship is one of the best examples of symbiosis. Clownfish are slow swimmers, and depend upon the anemone for protection from predators. The anemone, in return, gets cleaned of parasites, increased water circulation (by the clownfish swimming in and out of it), and food – sometimes other fish are lured into the anemone by the clownfish's presence, other times the clownfish will actually bring food to the anemone and feed it.

The clownfish is protected from the anemone's stinging cells by a mucus coating on their skin. They must acclimate to the anemone by rubbing their bodies against the anemone's tentacles until they become immune to the stinging.

- What would happen to a clownfish if it was unable to find an anemone in which to live?
  - *Because the clownfish needs the anemone for protection, it would probably become food for another predator if it could not find an anemone.*
- Find the clownfish's buddy on your "Buddy Match" worksheet.

Coral – Coral is an animal that has a special relationship with a plant called *zooxanthellae*. This plant is an algae and is what gives the coral its color. The *zooxanthellae* also produce food through photosynthesis, which gives the coral added nutrients. In return, the coral provides protection for the *zooxanthellae*.

- Why do you think coral needs to live in shallow water?
  - *The zooxanthellae need sunlight to produce food. If the coral lived in deeper water, the algae would not have enough sunlight to survive.*

Gill's Grotto – Cleaner Shrimp – Living in the reef, sometimes animals pick up bits of debris or parasites on their skin, or bits of food get stuck in their teeth. If this happens, fish can go to a "cleaning station", where cleaner shrimp will pick off the debris and clean their teeth. The fish get these annoying parasites removed from their skin, and the shrimp have their food brought to them.

- Did the cleaner shrimp crawl over your hands? What do you think they were doing?
  - *Cleaner shrimp will also clean off dead skin. If you are patient, the cleaner shrimp may crawl on your fingers and pick off bits of dead skin.*
- Find the cleaner shrimp's buddy on your "Buddy Match" worksheet.

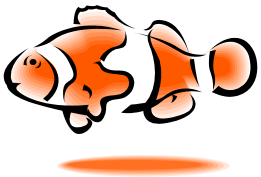
Zone D – Hippo Haven

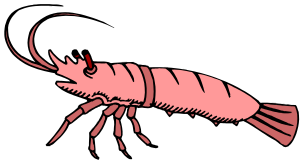
Hippos and Cichlids – In the hippo's lower viewing area, there are many brightly colored fish, called African cichlids. These fish help keep the water clean by eating the hippo's waste, and keep the hippo's skin clean by eating parasites from it. They will also swim inside of the hippo's mouth to clean her teeth. Because hippos are herbivores (eat only plants) the fish do not have to worry about getting eaten. In return, they get food and nutrients.

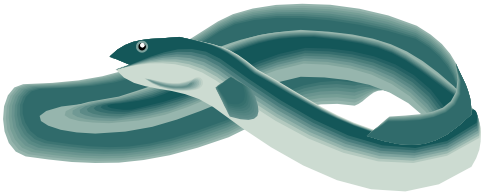
- Why do you think there are so many cichlids in the exhibit?
  - *Hippos produce a lot of poop! A hippo can eat up to 100 pounds of vegetation every day. What goes in, must go out!*
- Find the hippo's buddy on your "Buddy Match" worksheet.

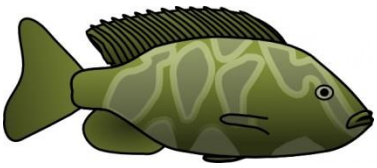
Buddy Match

Match each animal in the left column with its Buddy in the right column.









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Don't Miss:

Touch Exhibits

- Please Note: Touch exhibits close for 15 minutes every hour to give our animals a well-deserved break. If the exhibit is closed upon your arrival, please check with a cast member at the exhibit to see when it will be re-opened.
- Review with your students prior to arrival the best way to touch our animals. For all exhibits, we encourage a "two-finger" touch, gently on the animal's back. Listen for more tips from cast members at the exhibit.

Touch-A-Shark – Your students will be thrilled to actually touch beautiful indo Pacific Brown-banded and White-Spotted Bamboo Sharks in the TOUCH-A-SHARK exhibit. And all they have to do is stick their hand in the water — if they dare.

Stingray Beach Club – Touchable stingrays glide past this multi-level exhibit, with touch areas for both tall and small visitors.

Shows and Feedings **–** *please check your show schedule for times and locations*

Hippo Feed and Talk – Watch as our biologists provide a Q & A and toss treats to Nile Hippos, Button and Genny.

Meet the Divers! – Meet members of Adventure Aquarium's dive team and find out what keeps them moving through the water.

Penguin Feeding & Talk – Penguins eat 20 percent of their body weight in one sitting! Watch it happen live during one of our daily feeds and hear our biologists talk about these fascinating creatures.

After Your Visit – Questions to Ask and Things to Do:

1. Review the "Buddy Match" worksheet. Discuss how the different animals work together for their survival.

2. Have your students create two imaginary animals. Have them decide what each of them eats, how they communicate, and how the two animals work together for survival.