

A Seahorse Life Cycle: Father Knows Best!



Topics

Seahorses, Life Cycle

Grades

K-5

Site

Indoors

Duration

45 minutes

Materials

- Chart paper or white board
- **Seahorse Life Cycle Rhyme** (1 copy)
- **Seahorse Life Cycle Photos or Illustrations** (1 set of 6 photos per group)
- **Seahorse Life Cycle Cartoon** (1 per student)
- Crayons, markers or colored pencils
- Scissors (1 per student)

Vocabulary

brood pouch, courtship, juvenile, life cycle

National Science Education Standards

Life Science (K-4)

Characteristics of organisms

Life cycle of organisms

Life Science (5-8)

Structure and function in living systems

Overview

What do you call a baby seahorse? Students find out and discover that the father seahorse, not the mother, has the babies in this unique animal's life cycle! Students use rhymes and illustrations to learn about the six stages of a seahorse life cycle.

Objectives

Students will be able to:

- Explain what a life cycle is.
- Describe and sequence the six stages of a seahorse's life cycle.

Background

A seahorse is a fish and classified as such because of its fins and gills. A seahorse is not only unique in physical appearance but in its **life cycle** as well. In a seahorse's life cycle, it's the male who gives birth. Like many animals, a seahorse's life cycle varies between individuals and species. But there are six general stages of development or steps that most seahorses pass through: adult, daily greeting, courtship, pregnancy, birth and a juvenile stage.

Adult

Adult seahorses spend most of their lives within a small home range, or a territory that may vary from the size of a ping pong table to that of a football field. Seahorses are mainly found in tropical and temperate coastal waters. Their habitats include coral reefs, mangrove forests and sea grass beds. Seahorses are weak swimmers and use their prehensile tails to grasp onto objects to ensure they don't drift away. Seahorses wait for ocean organisms, like plankton, to drift their way. Then they slurp the food up whole with their long straw-like snouts.

Daily Greeting

An adult female seahorse chooses a male to be her breeding partner, or mate. Every morning the female will find her mate in his home range to strengthen their ties, or bond to each other. These breeding pairs display elaborate daily greeting rituals once they are bonded. These daily greetings may include changing their colors, swimming with tails linked and swimming in circles around each other while holding on to the same holdfast. These greetings can last a few minutes or even hours and will end when one seahorse stops responding to the advances of its partner. Unlike many fishes, most seahorses stay with the same partner for an entire breeding season and perhaps even for future seasons.



VOCABULARY

Brood pouch: a pocket located on the front of a male seahorse where the eggs develop

Courtship: special animal behaviors for bonding with a mate or breeding partner

Juvenile: a young animal that has not yet reached sexual maturity

Life cycle: stages of growth and development that organisms go through as they mature

Courtship

When seahorses are ready to mate, their daily greetings change into **courtship** displays. Seahorse courtship may last from several hours to three days depending on the species of seahorse. The female's abdomen has grown rounder as she prepares the eggs inside her. The male shows off his **brood pouch**. He may inflate it with water by opening the hole at the top of his pouch and pumping his tail. Both seahorses might point their snouts at the surface and brighten their colors many times. Eventually both float upward with their abdomens lined up. The female inserts a special tube, called an ovipositor, into the male's pouch and quickly deposits her eggs. The male's pouch becomes swollen and full. He will now care for the eggs.

Pregnancy

The male slowly sinks to the ocean floor and sways gently back and forth to settle the eggs. Now that the male's pouch is sealed by contracting muscles, the eggs are fertilized and embryos begin to develop. Each pear-shaped egg has attached to the pouch wall and receives nourishment from the fluid within the pouch. The fluid, along with special blood vessels, ensures the eggs get enough oxygen and nutrients. Any waste is washed away. Over time, the fluid within the pouch becomes saltier and matches the surrounding environment ensuring a smooth transition out of the pouch. The female is not out of the picture. She visits her mate every morning.

Birth

Seahorse pregnancies may last from ten days to six weeks, depending on species and habitat conditions. When the young are ready to be born, the male relaxes his pouch muscle and pumps his tail back and forth. This movement "pumps" the small juveniles out. This birthing process usually takes a few hours. As soon as the male is done birthing he is able to accept more eggs from his partner!

Juveniles

The newborns are called **juveniles** and are tiny replicas of their parents. They may be as small as your smallest fingernail! Depending on the species, there may be as few as 12 juveniles or as many as 200. Once born, the juveniles are completely on their own and either drift away with currents or sink to the ocean floor. Often juveniles hold onto each other or their fathers for safety. Food is a top priority. Like adults, juveniles can eat thousands of tiny organisms each day. Those that find enough food and an object to cling to and escape predators will become adults. They'll find mates and the cycle will continue!

Protecting seahorses

Currently seahorses are facing many challenges. Each year, many are accidentally caught in fisher's nets. Millions more are intentionally caught and killed for tourist trade or traditional Asian medicine. Also, sometimes seahorse habitats are destroyed because of coastal development and runoff pollution from humans. Unfortunately, 33 species of seahorses are considered threatened by the International Union for Conservation of Nature (IUCN). People can make a difference by refusing to buy seahorse souvenirs, supporting marine protected areas and educating others about these issues.

Teacher Preparation

- 1.) Make copies of the **Seahorse Life Cycle Rhyme** and corresponding **Seahorse Life Cycle Photos**.
- 2.) For older students, copy one **Seahorse Life Cycle Cartoon** page for each student.
- 3.) Gather scissors, crayons, colored pencils and/or markers for each student.

Procedure

1. INTRODUCE AND REVIEW THE CONCEPT OF A LIFE CYCLE WITH STUDENTS.

Ask students the names of various animals in the "baby" stage of their life cycles. (*a baby dog is a puppy, a baby frog is a tadpole*) Then ask students to define "life cycle." (*A life cycle begins with the birth of a plant or animal and ends with that living thing growing older and producing more of the same kind of plant or animal before it dies. That is why it is a cycle.*) You may choose to review more by drawing a butterfly or frog life cycle on the board or chart paper.

2. PREDICT THE SIX STAGES OF A SEAHORSE'S LIFE CYCLE WITH STUDENTS.

Remind students that a seahorse is a type of fish (*It has fins and gills.*). Ask students what a baby seahorse is called (*a juvenile*) and where it comes from (*an egg*). Pass out a set of **Seahorse Life Cycle Photos** to each small group (or use one set as a class). Challenge students to place life cycle photos in what they think is the correct order. You may discuss what stage to begin with—"juvenile" or "adult."

3. READ THE SEAHORSE LIFE CYCLE RHYME TOGETHER AS A CLASS.

You may choose to read the **Seahorse Life Cycle Rhyme** aloud or have students take turns reading to the class. As you read, have students place the corresponding **Seahorse Life Cycle Photo** in the correct order and write the name of each stage by each photo. Before, during, or after reading, distinguish the "fact" from "fiction" in the rhyme. (*Seahorses don't speak, etc.*)

4. IDENTIFY THE SIX STAGES OF A SEAHORSE'S LIFE CYCLE.

List the six stages in order on the board or chart paper. Describe specific seahorse behaviors at each stage. Be as descriptive as possible—students will use the descriptions to illustrate each stage. Refer to the **Seahorse Life Cycle Rhyme** as needed.

- **Stage One: Adult**
Adult seahorses cling to objects like sea grass, roots or coral with their tails. They wait patiently for tiny food to float by.
- **Stage Two: Daily Greeting**
A male and female seahorse greet each other. Each morning they may swim together, change colors or grab each other's tail.
- **Stage Three: Courtship**
The female's belly is big with eggs. As the female and male swim, their bellies press together and the female extends a tube to put her eggs into the male's brood pouch.
- **Stage Four: Pregnancy**
The male seahorse's belly now gets bigger as the eggs inside begin to develop. Now the male takes care of the eggs on his own.



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Photo by Dave Woelzel



ELL TIPS

Try to use scientific vocabulary as much as possible when reviewing the stages of the life cycle. Use terms like "develop," "brood pouch," and "survive" in context and repetitiously to help reinforce new words.



STUDENT PAGE



**THE MISSION OF THE
MONTEREY BAY
AQUARIUM
IS TO INSPIRE
CONSERVATION OF THE
OCEANS.**

- **Stage Five: Birth**
The male seahorse begins to shake . A hole opens up on the top of his brood pouch. He pumps his tail and pushes out many tiny seahorses. Each baby seahorse may be about the size of a human's fingernail.
- **Stage Six: Juvenile**
A juvenile's head and eyes are almost bigger than its skinny body. To survive, it needs something to hold onto or hide in, like coral branches or sea grass. It also needs to find food and escape being eaten by bigger fish.

5. DISCUSS AND REVIEW THE STAGES OF A SEAHORSE'S LIFE CYCLE.

Discuss a seahorse's life cycle with students. How does it compare to a human's life cycle? (*eat, sleep, bond with others, baby or "juvenile stage"*) How is it different? (*eggs, father gives birth, shorter life span, lives underwater*)

For younger students:: Write the name of each life cycle stage on the board or chart paper. Mix up the **Seahorse Life Cycle Photos or Illustrations**. As a class, sequence the photos in correct order. *You may choose to end the activity here.*

For older students: Pass out a **Seahorse Life Cycle Cartoon** page and drawing materials to each student. Direct students to draw one stage of a seahorse life cycle in each of the six boxes.

6. CUT OUT, TRADE AND SEQUENCE SEAHORSE LIFE CYCLE CARTOONS.

Pass out scissors and have students cut out the illustrations along the dotted lines. Each student will have six cards. Have students mix up these "cards" and swap with another student. Challenge them to sequence their partner's cards in the correct order. Remind them to use the descriptions on the board or chart paper if needed.

Extensions

- Use the **Seahorse Life Cycle Rhyme** as a Cloze activity. Choose key words to remove from the rhyme. Have students supply the missing words.
- Divide students into groups. Have them create a seahorse skit based on the stages of a seahorse's life cycle.
- Instruct students to write down and define new vocabulary in notebooks or journals. Students may also write a short story about a seahorse pair.
- Discuss with the class some current threats to seahorses. As a group, brainstorm ways to protect wild seahorses and their habitats.

Resources

Websites

Monterey Bay Aquarium. www.montereybayaquarium.org

Learn more about specific types of seahorses and some of the challenges they face in the wild on the Monterey Bay Aquarium's website.

Project Seahorse. <http://seahorse.fisheries.ubc.ca>

Find out more about *Project Seahorse*, an international organization dedicated to saving wild seahorses and communicating ocean conservation.

Activities

Shark Cartoons. Monterey Bay Aquarium. www.montereybayaquarium.org

For tips on cartooning or illustrating with your students, see this activity link on the Monterey Bay Aquarium's website.

References

Seahorses. George, Twig C. Millbrook Press. 2003.

Seahorses. James, Sylvia M. MONDO Publishing. 2002.

Sea Horses. Walker, Sally M. Carolrhoda Books, Inc. 1999.

Seahorse Reef: A Story of the South Pacific. Walker, Sally M. Trudy. Corporation and Smithsonian Institute. 2002.

Standards

Ocean Literacy Principles

Principle 5: The ocean supports a great diversity of life and ecosystems.

Principle 6: The ocean and humans are inextricably interconnected.

California State Science Standards

Kindergarten: 2a, b; 4e

Grade 1: 2a, b, c, d; 4a

Grade 2: 2a, c; 4d

Grade 3: 3a, b, d

Grade 4: 2b; 3b

Grade 5: 2a

California State Language Art Standards:

Reading

Listening and Speaking

Acknowledgements

Illustrations by Lindsay Parker



CONSERVATION TIPS

- Save resources. Use recycled paper and other school supplies.
- Reduce waste. Reuse or recycle paper scraps.
- Make sure trash ends up in the garbage and don't use toxic chemicals outside. This will prevent trash and pollutants from washing from the storm drains into the sea.

**WE OURSELVES FEEL
THAT WHAT WE ARE
DOING IS JUST A DROP
IN THE OCEAN. BUT THE
OCEAN WOULD BE LESS
BECAUSE OF THAT
MISSING DROP.**

MOTHER THERESA

Seahorse Life Cycle Rhyme

Part 1

Adult Seahorse



Stage One: Adult Male Seahorse

Seahorse lives alone in his home
 And doesn't like much to roam.
 With his monkey-like tail
 Seahorse holds on without fail
 To make sure he won't stray too far from home.

Seahorse spends lots of time every day
 Waiting patiently for tiny critters to float his way.
 With a SUCK and a SLURP
 His straw-like mouth does the work
 To swallow thousands of critters each day!

Daily Greetings



Stage Two: Daily Greetings

Every now and then Seahorse gets lonely
 And has to search for his one and only.
 A lady seahorse swims his way
 And he nods to say, "Hey!"
 Now neither one needs to be lonely.

Every morning she'll swim to greet Seahorse
 As if pulled by a magical force.
 They dance and they play
 Grasping tails along the way
 Changing colors as part of their bonding course!

Courtship



Stage Three: Courtship

One morning lady seahorse's belly
 Looks rounder and a little more heavy.
 She's ripe with her eggs.
 "Let me take them!" Seahorse begs,
 "For I have a perfect pouch on my belly!"

Seahorse and his lady dance with each other
 For now they will not breed with another.
 They float to the top of the ocean
 Bellies pressed together in motion
 Now in his pouch Seahorse holds eggs from the mother!

Seahorse Life Cycle Rhyme

Part 2

Stage Four: Pregnancy

Safe in his pouch the eggs grow
 And develop into baby seahorses you know!
 Seahorse's pouch keeps getting bigger
 As he waits for that natural trigger
 That tells him it's time for those babies to go!

Stage Five: Birth

One morning Seahorse's pouch is aching
 "It's time" thinks Seahorse, as his body starts shaking.
 Then a hole in Seahorse's pouch appears.
 "They're coming!" he thinks as he cheers,
 For into the world the baby seahorses are waking!

One by one a hundred babies emerge,
 Swimming out with a natural urge!
 Baby seahorses are ever so tiny
 Unlike human babies, they're not very whiny
 Even when they float away with the surge!

Stage Six: Juveniles

Now the juveniles have to live on their own
 And find their own homes where they'll roam.
 While they're ever so small,
 They still give it their all.
 It takes hard work to survive all alone!

To get bigger the juveniles need to eat
 And are always looking out for some treats.
 As they eat they grow strong,
 Find a home, and before long
 They make babies, and the life cycle repeats!

Pregnancy



Birth



Juveniles



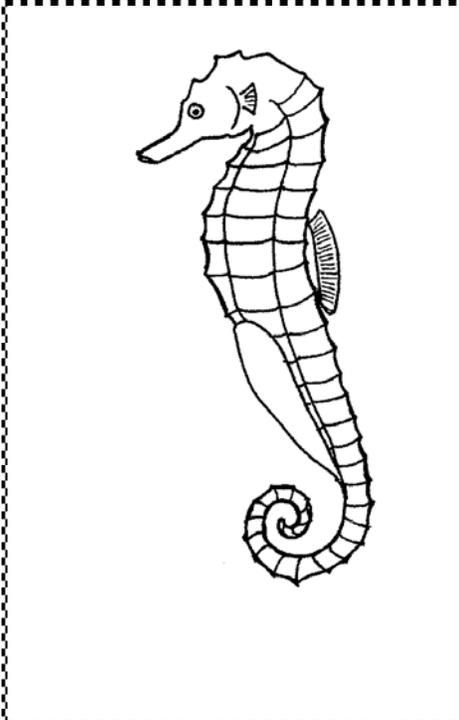
Seahorse Life Cycle Photos



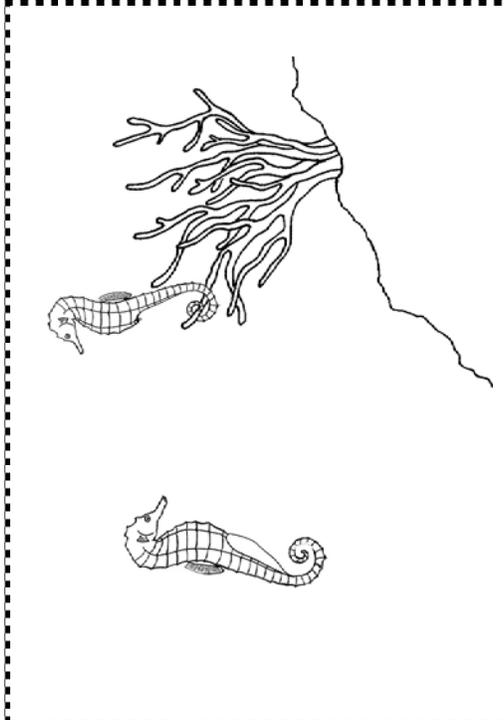
Seahorse Life Cycle Illustrations



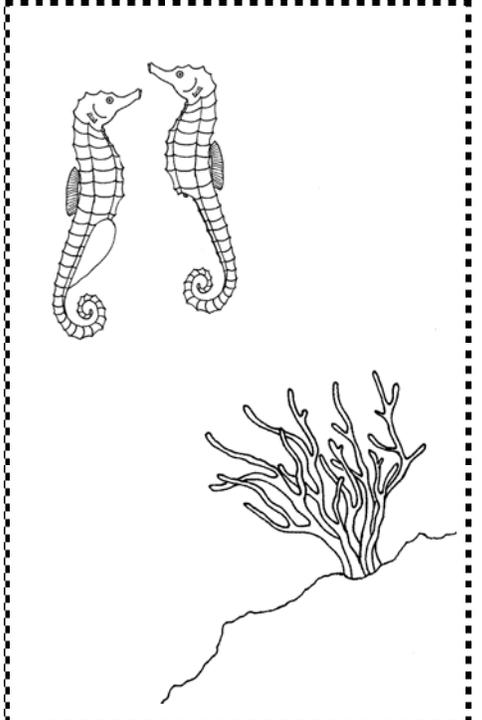
Adult



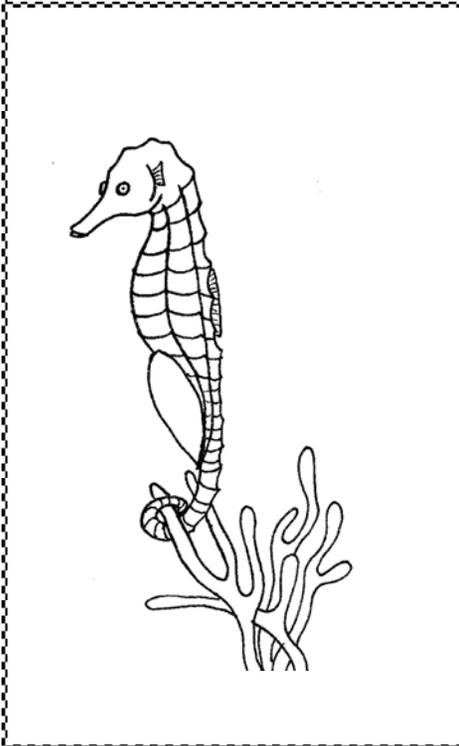
Daily Greetings



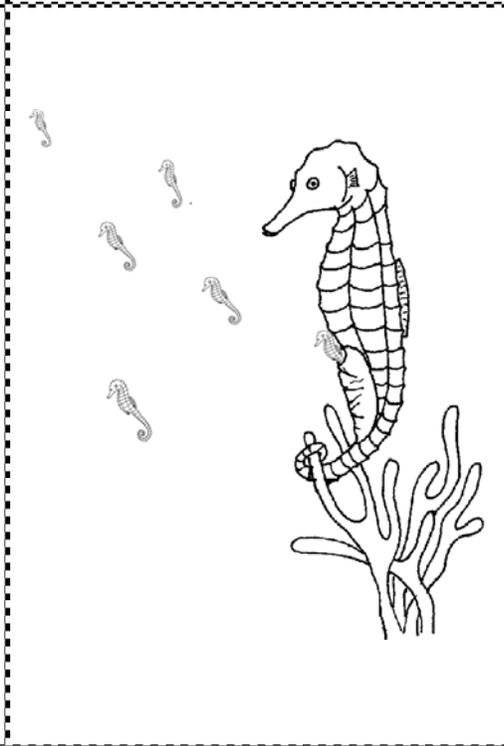
Courtship



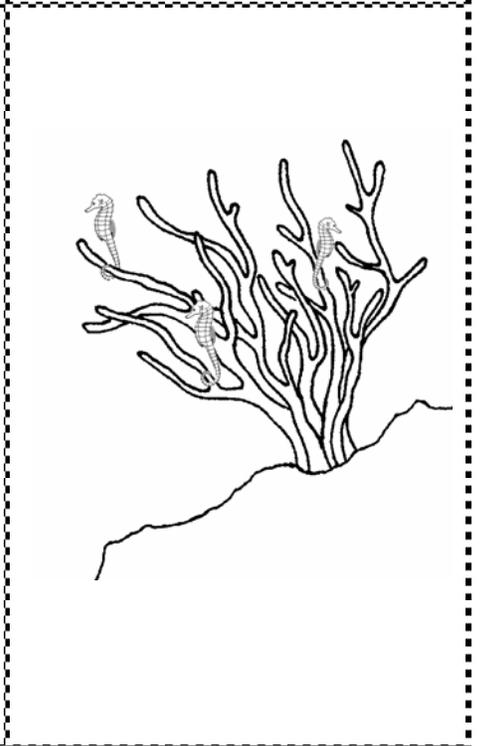
Pregnancy



Birth



Juveniles



Illustrations by Lindsay Parker

Seahorse Life Cycle Cartoon

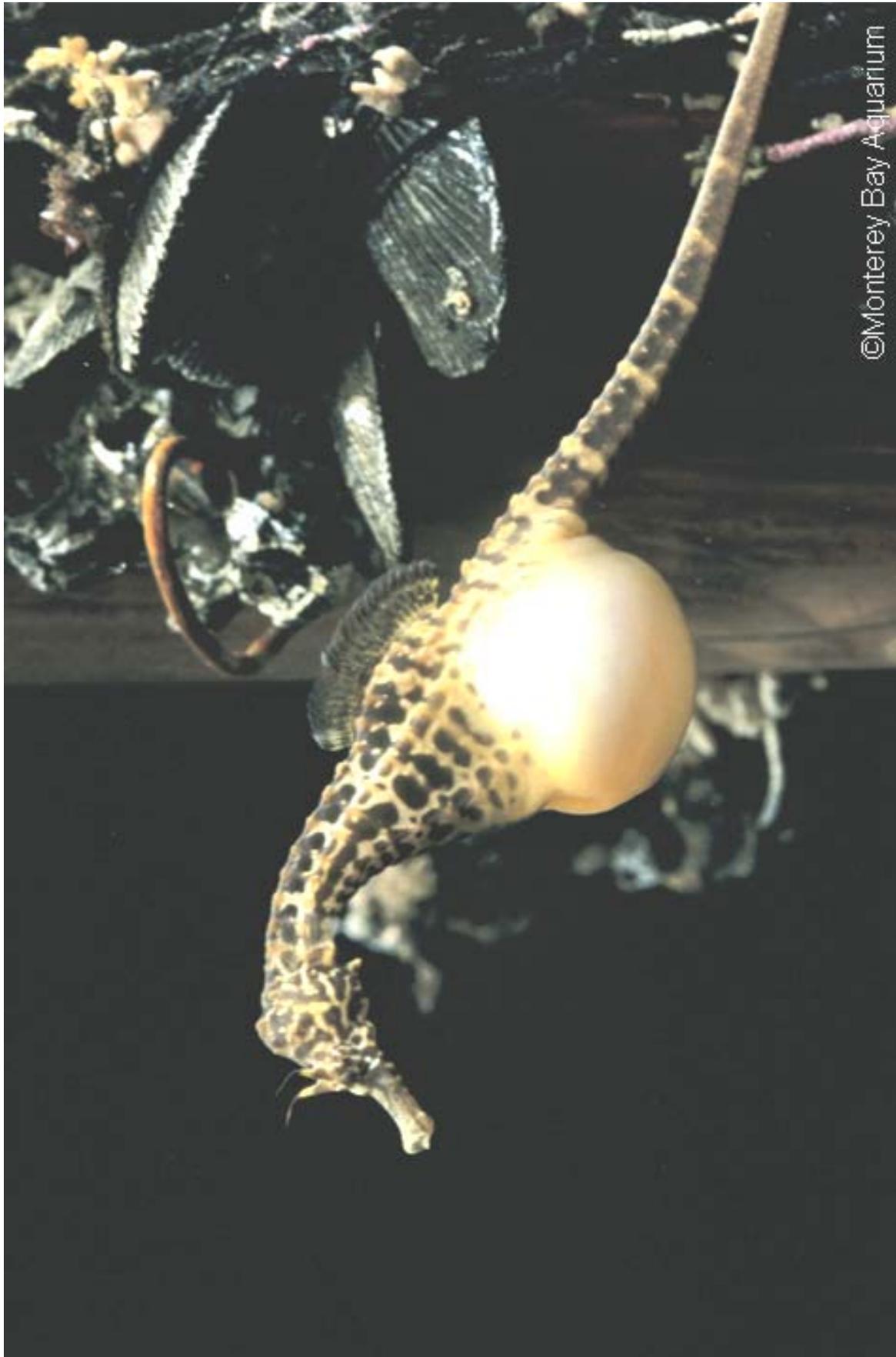




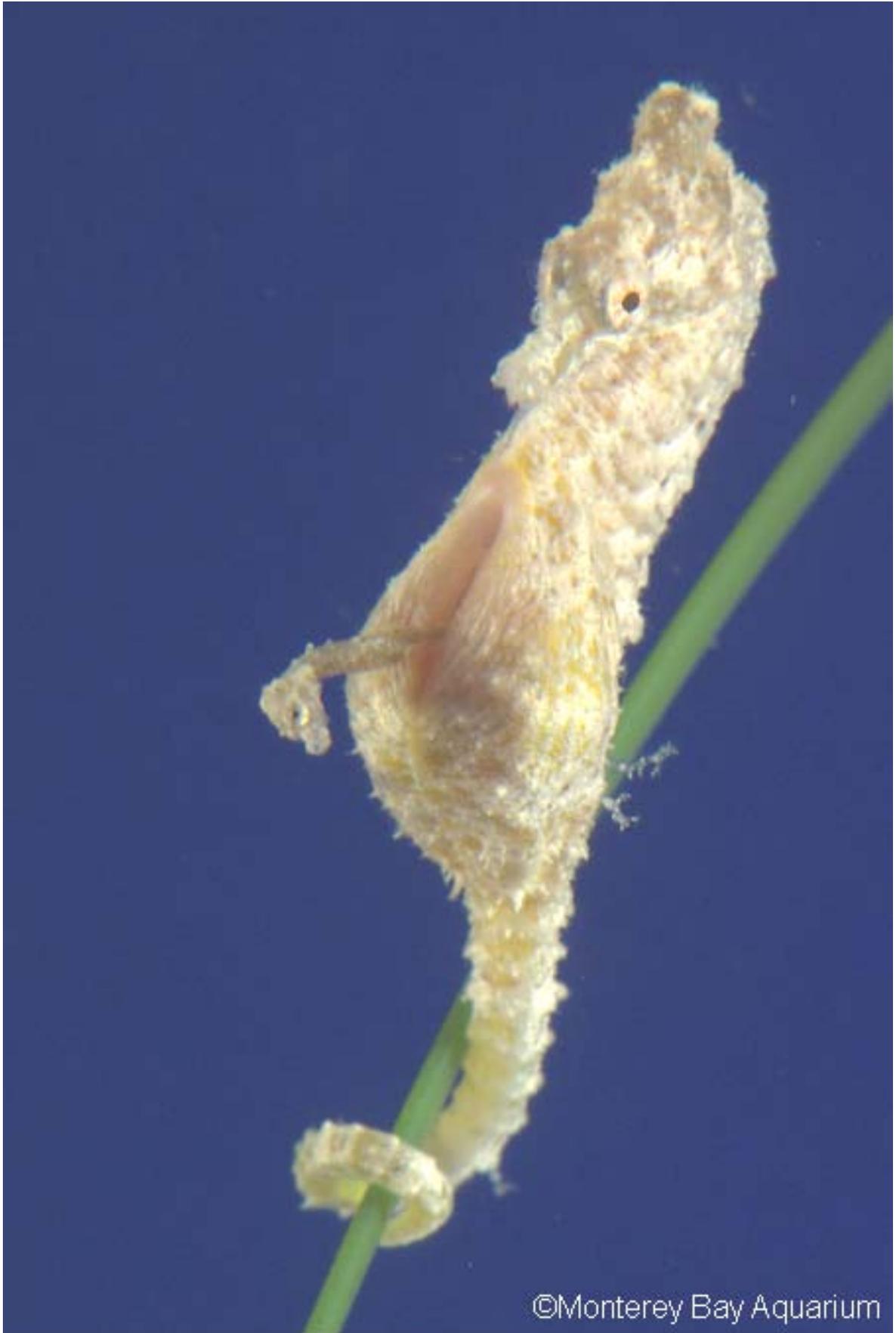
Courtesy of Carl Clifford







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