

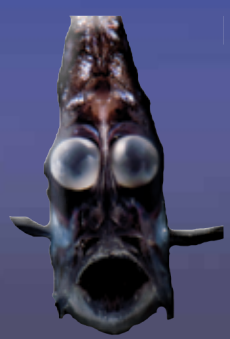


WhaleTimes

# Creep into the DEEPEND™

Taking Science Deeper™  
K-6th grade Classroom Activities

Book 2: Deep-Sea Animals



[dependconsortium.org](http://dependconsortium.org)



## WhaleTimes, Inc.

*Ocean Science in Action!*

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**WhaleTimes is a proud member of the  
DEEPEND: Deep Pelagic Nekton of the Gulf of Mexico Consortium**



### Mission Statement

The DEEPEND consortium will characterize the oceanic ecosystem of the northern Gulf of Mexico to infer baseline conditions in the water column. This information will establish a time-series with which natural and anthropogenic changes can be detected.

### Scope of Work Statement

In response to the Deep Water Horizon Oil Spill (DWHOS) and the highlighted absence of baseline data for the deep Gulf of Mexico (200-1500 m) water column, the DEEPEND consortium will conduct a three year sampling, sensing, modeling, and laboratory analysis program to assess ecosystem dynamics, identify drivers of variability, and investigate possible consequences of the spill on ecosystem attributes. Data obtained during the 2010-2011 and 2015-2017 periods will establish a time-series with which ecosystem shifts or responses can be detected.

Keep up on the latest DEEPEND research, visit:  
<http://deependconsortium.org/>



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




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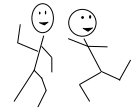
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# Creep into the DEEPEND™



For each activity, we have at-a-glance pictographs showing some of the skills students might use or discover when participating in the activity. We didn't include science, since that's a given!



Language Arts: Discussion, sharing stories, observations or questions



Language Arts: Writing



Visual Arts: Drawing, coloring, sharing discoveries through a visual medium



Visual Arts: creating a craft



Math: The activity introduces some form of math including measurements, graphs, estimates, and other math topics.



Observation



Role-play, dance, or some sort of physical activity



Music, singing, or rhythmic activity



Activity encourages further discovery about topic through various types of research as an addition to the project.

**GRADE LEVEL(S):** We have noted suggested grade levels, but find most activities can be adapted for younger or older students.



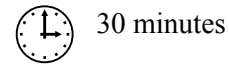
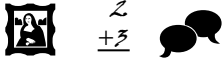
We have noted a general idea of how long the activity will take. However, this will vary depending on length of group discussions, student's age, and other factors. We strongly suggest that part of your prep includes testing the activities so you have a general idea of how long it will take for your students.

**MATERIALS:** We have endeavored to include everything you will need to complete the activity. All materials you use should be non-toxic child safe, of course. In some cases we have listed options such as markers or crayons. Choose the medium that works best for your classroom situation and students.

**TEACHER'S NOTE:** Though not required, with some activities, we suggest using cooperative learning groups with older students because it often encourages participation, brainstorming, and discussion.

ACTIVITY: Become a DEEPEND scientist to count shrimp and krill

GRADE LEVEL(S): K to 6th



OVERVIEW: Students create a mural to do their own population study

DISCIPLINES: Science, math, and visual arts

OBJECTIVES: Students will be able to:

- discuss why krill and shrimp are important to several ecosystems
- describe the size of a krill
- discuss vertical migration
- discuss challenges of studying and determining populations in the deep
- discuss challenges of deep-sea exploration
- describe where and how shrimp and krill fit within a food web

MATERIALS: Orange and Red Finger Paint

Butcher Paper

Paint brush or new kitchen sponge

Washable black marker (or black Sharpie for older kids)

REFERENCE: WhaleTimes' [10 Things You Should Know about Krill](#)



## WHAT TO DO:

Shrimp and krill are important deep-sea animals throughout the world. They are eaten by baleen whales, seabirds, fish, squid, and many other animals.

## NOTES:

- For younger students, rather than painting the finger over and over, we use the kitchen sponge to “ink” their finger. We find this makes it quicker, easier, and a bit neater. Re-ink (paint) as sponges when needed. We cut the sponge into 2 or 3 rectangles, dip it into the paint and place it near student groups.
- Have class create two murals to show (and later discuss vertical migration). To do this, when the kids paint the first, place it so the kids naturally and easily paint more of the animals higher on the mural. Then the second, place it so kids more naturally and easily paint lower.

## Preparation:

**Step 1:** Pre-cut butcher paper to the desired size.

**Step 2:** Draw two or four lines across the paper to represent different depths.

## Paint the mural(s):

**Step 1:** To paint the krill onto the paper, lightly \*paint a small amount of orange paint on the outside of the student’s pinky finger. Have the student press or gently stamp the painted finger onto the paper.

Repeat Step 1 as many times as desired.

**Step 2:** Allow paint to dry (which usually takes very little time). To make a larger shrimp, when the paint is dry, lightly \*paint a small amount of red paint on the side of the student's hand and pinky finger. Have the student press or gently stamp their hand onto the paper.

Repeat Step 2 as many times as desired.

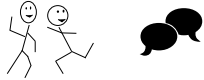
**Step 3:** When the paint is dry. Use the black marker to make the large eye by putting a dot on each krill and shrimp.

**Step 4:** This craft can be used to create a small picture or a large one depending on your curriculum. The ideas are endless, to become a DEEPEND scientist students can work as a class, in teams or individual to:

- Count the total number of krill and/or shrimp on the mural(s).
  - Choose a portion of the mural, count the number of shrimp and krill. Discuss how to take those numbers to figure out how many are on the entire mural.
  - Determine the number of krill and shrimp at each depth. Then students can
    - Compare and contrast
    - Determine percentage
    - Create a graph or graphs to represent data
  - Compare and contrast the number of shrimp and krill on each mural, their depth...etc.
  - Discuss the **vertical migration** pattern and try to determine what time of day it is on each mural based on location of most shrimp and krill.
  - Discuss the challenges for DEEPEND scientists in determining what kinds of animals and how many are at different depths.
- Discuss why it is important to understand how many and what kinds of animals are at different depths.
- Use the mural as the center of your discussion on the food web for the Gulf of Mexico. Find or draw pictures of other animals in the food web and add them to the mural.
  - Use the mural to represent the trophic level and/or to discuss how the energy moves throughout the food web.



ACTIVITY: Students sing and move like jellies.



GRADE LEVEL(S): K to 2nd

OVERVIEW: Students chant, role-play, and discover the graceful jelly.

DISCIPLINES: Science, music, dance

OBJECTIVES: Students will be able to:

- demonstrate how a jelly moves through the water
- recognize jellies as soft bodied invertebrates



10 minutes

MATERIALS: Copy (or copies) of the *Jelly Dance* lyrics

(OPTIONAL)

Streamers, ribbons, other fluttery material

Use ribbon or material to help mimic the flowing movement of a jelly's tentacles. Have kids mimic chant's movements with their jelly.

Background: What's a jelly? Though most people have heard of jellyfish, there are many kinds of jelly-like animals. Jellies are gelatinous animals that float through the sea. Deep-sea jellies can be transparent, red, or black. Many are bioluminescent. All of them are beautiful and graceful!

For more information: Jellyfish and Comb Jellies (Cnidaria & Ctenophora) Ocean Portal, Smithsonian Natural History ([ocean.si.edu/jellyfish-and-comb-jellies](http://ocean.si.edu/jellyfish-and-comb-jellies))

WHAT TO DO:

Teach the students the chant. Then, dance and chant and have fun!





# Creep into the Deep™

## *Jelly Dance*

Dance and chant and have fun!

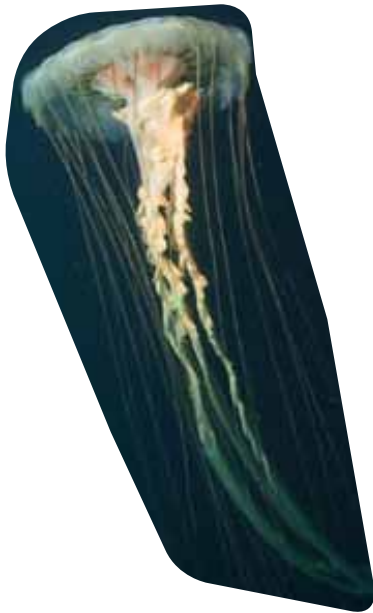
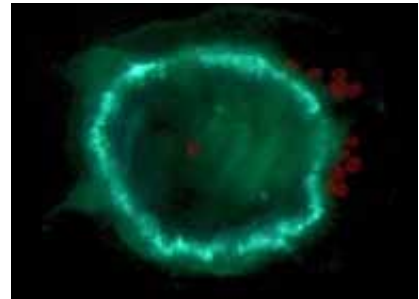
Do the jelly dance.  
Float like a jelly.  
Float like a jelly.  
Float and float and float.  
Do the jelly dance!

Do the jelly dance.  
Wiggle like a jelly.  
Wiggle like a jelly.  
Wiggle and wiggle and wiggle.  
Do the jelly dance!

Do the jelly dance.  
Glide like a jelly.  
Glide like a jelly.  
Glide and glide and glide.  
Do the jelly dance!

Do the jelly dance.  
Glow like a jelly.  
Glow like a jelly.  
Glow and glow and Glow.  
Do the jelly dance!

Do the jelly dance.  
Swirl like a jelly.  
Swirl like a jelly.  
Swirl and swirl and swirl.  
Do the jelly dance!



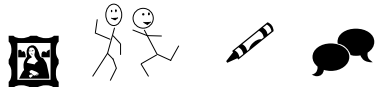
## Taking Science Deeper!

A WhaleTimes Publication ([www.whaletimes.org](http://www.whaletimes.org))

# Deep-sea Anglerfish Hat

ACTIVITY: Make a deep-sea angler fish role-play its behavior

GRADE LEVEL(S): K to 3rd



30-40 minutes

DISCIPLINES: Science, visual arts, role-playing

OBJECTIVES: Students will be able to:

- describe how a deep-sea anglerfish lures prey
- discuss why prey is attracted to the glowing lure
- discuss why it has large teeth
- explain how it is camouflaged
- name two adaptations of a deep-sea anglerfish



- MATERIALS:
- oval paper plates (one per student)
  - pipe cleaners, red, 13-inch long (one per student)
  - bead, blue, 1/2- to 3/4-inch diameter (one per student) (Or a pom pom, blue, 1/2- to 3/4-inch diameter)
  - red or black paint
  - construction paper, red
  - clean/new sponges for painting
  - 1/4-inch wide elastic bands or soft yarn to secure hat
  - packing tape (one role for leader)

Preparation:

- glue gun, stapler, staples



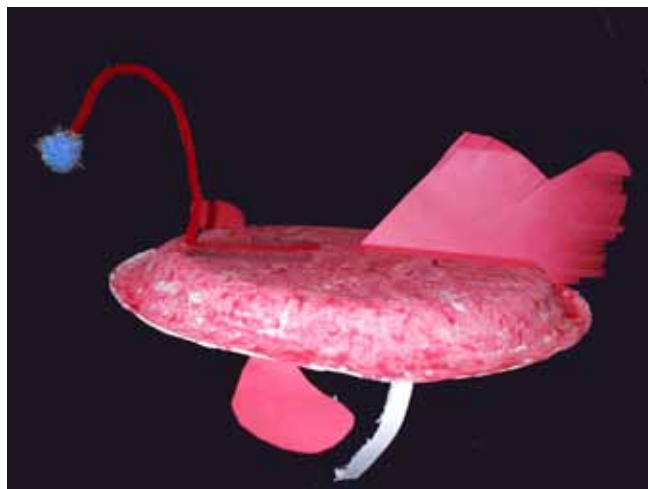
Something like the Creatology™ Sparkle Pom Poms (1/2 inch) can be found at a craft store.

WHAT TO DO:

## Preparation:

For each student, you'll need a set of hat parts:

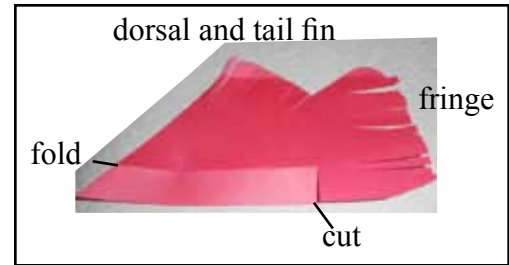
- 1 body (plate)
- 2 pectoral fins
- 1 tail/dorsal fin
- 1 lure (pipe cleaner with bead or pom pom)
- elastic strap



## Preparation:

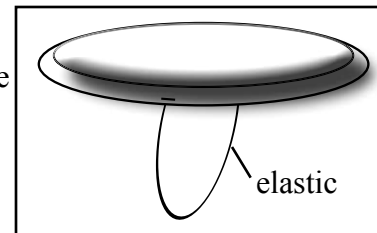
## Fins and Tail:

1. To make the patterns, print one copy of the attached pattern onto card stock and cut out. Or, print the pattern on to regular paper, cut out, then trace onto a file folder. Cut out.
2. Trace pectoral and dorsal/tail fins onto red construction paper. Cut out.
3. Add cut onto bottom and fold (see pattern)
4. OPTIONAL: To give the tail and dorsal fin a fluttery look, cut edges to create a fringe.



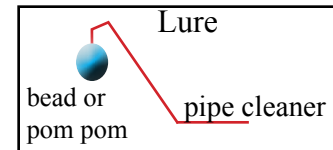
## Hat:

1. Add an elastic (or yarn) strap to hold hat onto the student's hand. Determine the length of strap needed based on average size/age of students in class. Cut the elastic or yarn straps. Note: You need two pieces of yarn for hat, so it can be tied under student's chin.
2. Staple the strap to each side of the paper plate.



## Lure:

If using a bead, depending on the age of students, either an adult can prepare the lure in advance or let students put on bead themselves. If using pom pom, an adult will need to prepare in advance.



## Bead lure:

1. Feed bead through one end of pipe cleaner. Once through, gently, but tightly twist pipe cleaner to secure bead.

## Pom pom Lure:

1. Using a glue gun, secure a pom pom to the end of each pipe cleaner.
2. Carefully poke a hole into the pom pom.
3. Fill the small hole with hot glue.
4. Quickly push the end of the pipe cleaner into the hole.
5. Add more hot glue to fill in space.
6. Allow to cool.

(Be sure and follow safety guidelines set out by glue gun manufacturer.)

Make the craft:

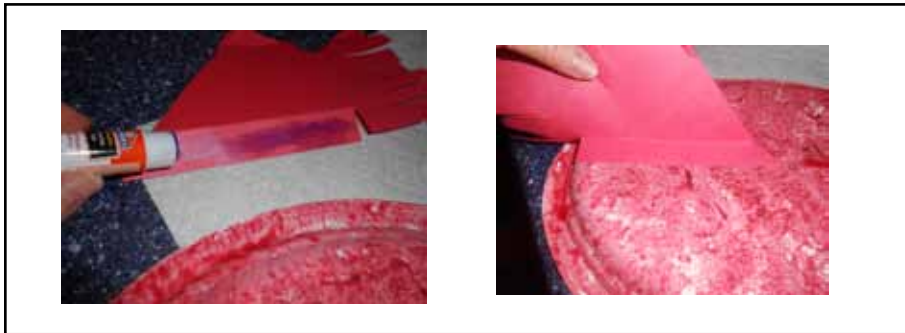
STEP 1: Sponge paint top of hat (bottom of plate). Allow to dry



STEP 2: Glue a pectoral fin on to bottom edge of each side of the hat near the head



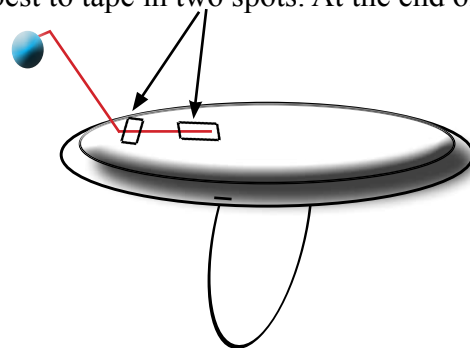
STEP 3: Glue dorsal/tail fin on to back of hat.



OPTIONAL: If not prepared in advance

STEP 4: Add lure by threading one end of the pipe cleaner through the bead. Bend the tip of the pipe cleaner around the bead, then give the pipe cleaner and gentle but tight twist.

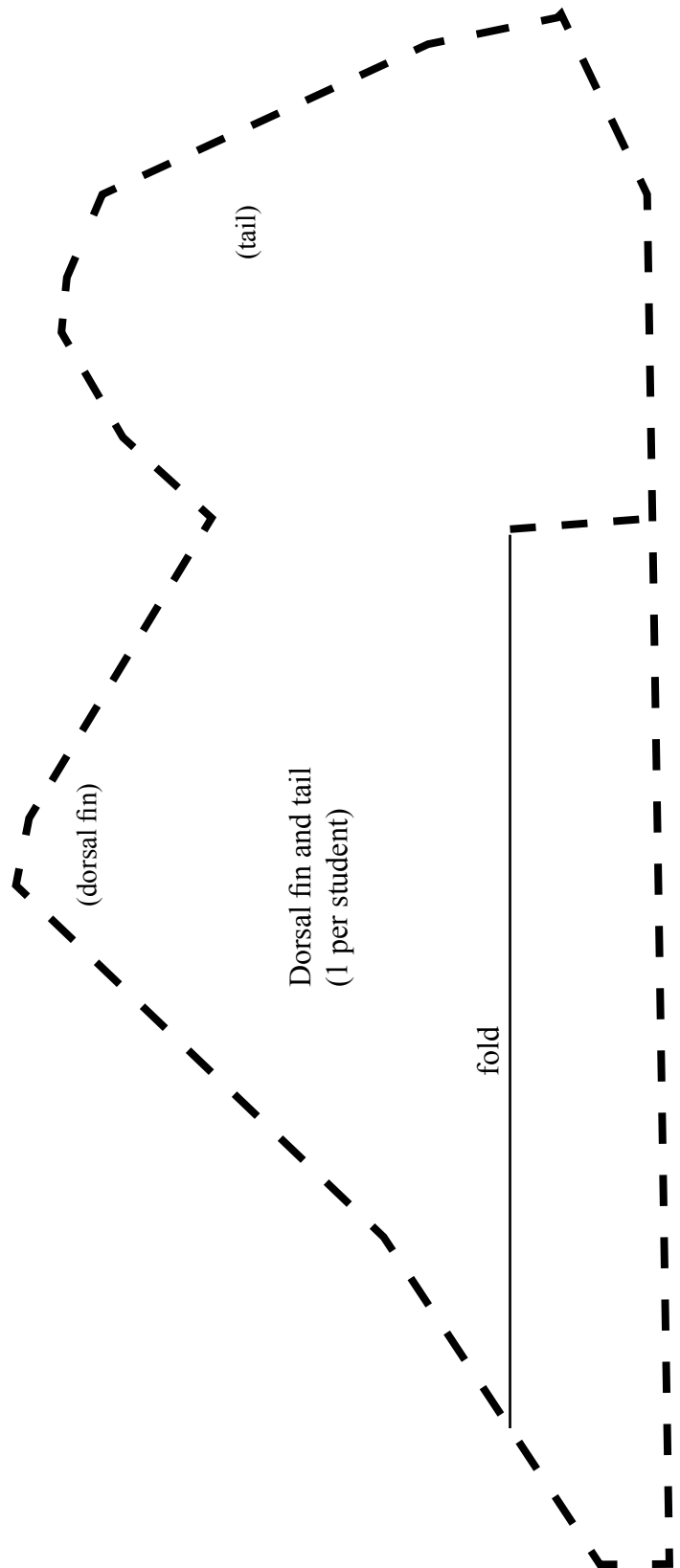
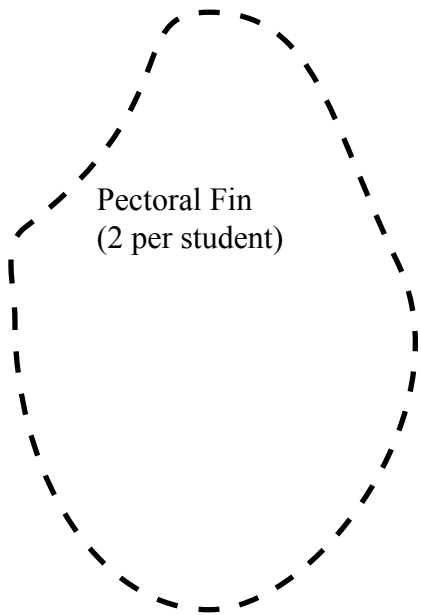
STEP 5: Have an adult tape the lure onto the hat. It is best to tape in two spots. At the end of the pipe cleaner and near the bend at the front to the hat.



STEP 6: Have students put on hat. Their eyes and mouth are the anglerfish's. Have students role-play an anglerfish fishing for its dinner.

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DEEP-SEA ANGLERFISH HAT PATTERNS



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ACTIVITY: Compare and contrast animal adaptations to a human's or other animal through a funny throw down song and role-playing.



GRADE LEVEL(S): K to 6th



20 minutes

OVERVIEW: DISCIPLINES: Science, oceanography, art, music, and dance

DISCIPLINES: Science, music

OBJECTIVES: Students will be able to:

- define an adaptation as a behavior or body part that helps an animal survive
- recognize that animals have different adaptations
- name an adaptation for three different animals
- describe or role-play an adaptation for three different animals

## WHAT TO DO:

### Activity

Step 1: Divide class into two smaller groups.

Step 2: Have each group choose an ocean animal or human. (Groups choose different animal for each round.)

Step 3: Have the first group choose an adaptation (flipper vs hand; tail vs feet; scales vs hair...etc.).

Step 5: That group sings song to the second group filling in adaptations.

Step 6: The second group reverses the adaptations and sings back.

Step 7: Have groups choose new animals and repeat Steps 2-6.

### **My Adaptation is Better than Your Adaptation**

(to the tune of "My Dog's Better than Your Dog")

My (adaptation)'s better than your (adaptation)  
My (adaptation)'s better than yours  
My (adaptation)'s better because I'm a (animal),  
My (adaptation)'s better than yours


(Example)

My flipper's better than your hand.  
My flipper's better than yours.  
My flipper's better because I'm a sea turtle,  
My flipper's better than yours.

ACTIVITY: Draw two life size deep-sea animals, a sperm whale and giant squid



GRADE LEVEL(S): K-12th

 varies (45-60+ minutes average)

OVERVIEW: Life-size drawings help students discover size, practice measuring skills, compare and contrast sizes, and, determine location of body parts based on fractions or measuring.

DISCIPLINES: Science, math, visual arts

OBJECTIVES: Students will be able to:

- draw a life-size sperm whale and giant squid
- compare and contrast sizes
- practice measuring skills using standard and/or metric measurements
- use math or hands-on techniques to convert traditional or nontraditional measurements
- create their own measuring tool to determine lengths and location of adaptations
- identify and discuss whale and giant squid adaptations and behaviors
- recognize that sperm whales are an important part of the Gulf of Mexico food web
- explain that sperm whales eat giant squid

LOCATION: Location: large sidewalk, playground, black top area, or large indoor space

MATERIALS: • Measuring tool(s) of your choice: measuring tape, rulers (other kids, paper clips...etc.)  
• Sidewalk chalk or \*painter's tape if indoors  
(Optional) pencil, paper, graph paper, calculators

(\*Check with custodian to be sure tape won't damage flooring.)

## WHAT TO DO:

It's easy to say a giant squid is huge and a sperm whale enormous, but having them in your park, playground or cafeteria helps kids see just how large!

### Preparation:

With some classes, it might be easier to pre-draw the animals. This can be done freehand with concern mostly of the body length and basic body parts. With older students, you might prefer to have them help measure and draw the whale.

**How do you draw a whale or squid?** First, determine where the head will be located. Mark that spot. Then with a tape measure (or pre-measured rope) measure out the length of the animal from head to tail (or top of mantle to tip of feeding tentacles). Mark that spot. Then fill in the rest either freehand or based on measurements provided in the "Measurement Keys."

**How to use your life size whale and squid:** There are many ways to use or expand on this activity. Kids can practice estimation, measuring skills, fractions, even graphing. Below are just a few ways to use your life-size ocean animals.

**Who is longer?** Of course comparing and contrasting the whale to the squid is an obvious beginning. Then you can compare sizes of students and the whale and squid. Have students carefully lie down head to feet and count how many kid it takes to equal one whale.

**How many steps?** Have students walk from head to tail counting the number of steps it takes.

**Measure the whale or squid.** Depending on the age, students can suggest size based on standard and/or metric units of length. Write down estimates. Then as a class, learning groups, or individuals, have students measure the whale's length. Discuss discoveries.

**Measure the whale using nontraditional measuring tools.** Have students compare and contrast a whale's length to everyday objects or even to the students. In addition to length, students can also compare body arm size to flipper, eyes to eye, feet to tail...etc.

For example, you might ask, *How many shoes long is a sperm whale?* Write down all students' guesses. Then as a class find out the answer.

Expand this activity by having student groups (or as individuals) use nontraditional measuring tools.

1. Have student groups choose a nontraditional measuring tool (paper clip, book, toy car...etc.)
2. Have each group estimate how many of that tool it would take to equal the length of a sperm whale and/or giant squid. Be sure and have them write down their guesstimates.
3. Have students measure the whale with their chosen nontraditional item. Depending on the age of the students, they can do this by physically moving the object and/or mathematically.
4. Have students share discoveries with the rest of the class.

**Don't forget the language skills** aspect of the activity. Encourage students to talk about measurements, size, think of multiple words for "large" or "long." Have students create and share a story about this whale and squid.

#### Recommended Videos:

"How the Colossal Squid Feeds" Museum of New Zealand Te Papa Tongarewa

In this animated video, watch a colossal squid hunt, move through the sea, and avoid being eaten by a sperm whale. (The colossal and giant squid feed in a similar fashion, so this will work for the activity.)

<http://squid.tepapa.govt.nz/anatomy/article/how-the-colossal-squid-feeds>

"(The perils of being a) Giant Squid Expert" Smithsonian National Museum of Natural History

In this short funny animated video Clyde Roper answers the question "What do giant squid like to eat?" Excellent for kids!

[http://invertebrates.si.edu/giant\\_squid/page3.html](http://invertebrates.si.edu/giant_squid/page3.html)

"How We Found the Giant Squid" Ted Talks: Edith Widder

Dr. Widder discusses and shows the footage) of how she and a science team captured the first ever footage of a free-swimming giant squid. (**NOTE: One minor expletive** within first minute or so. For kids, start video after that -- the talk and footage are well worth it.)

[www.ted.com/talks/edith\\_widder\\_how\\_we\\_found\\_the\\_giant\\_squid?language=en](http://www.ted.com/talks/edith_widder_how_we_found_the_giant_squid?language=en)

"Rare Sperm Whale Encounter with ROV"

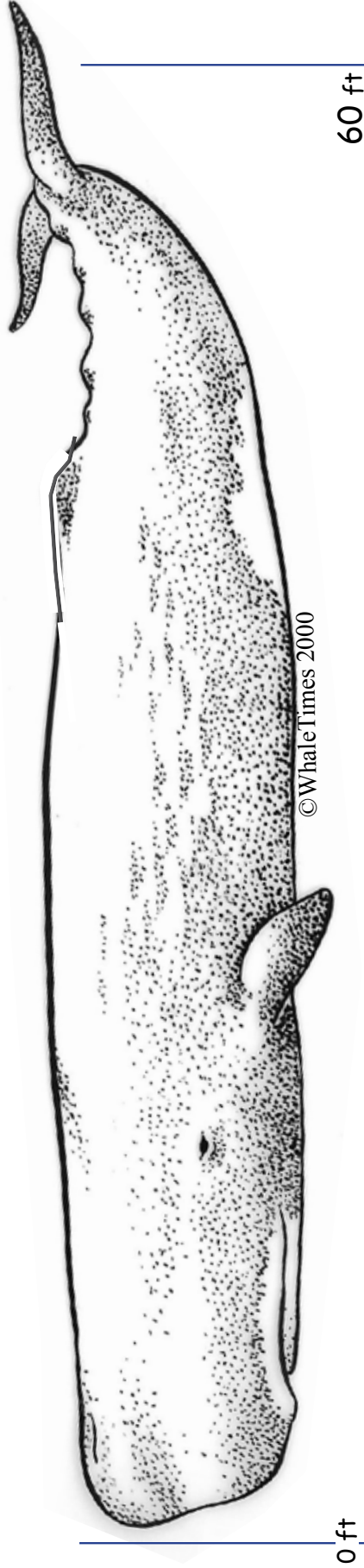
A sperm whale checks out ROV in the Gulf of Mexico. Incredible footage!

<http://nautiluslive.org/video/2015/04/15/rare-sperm-whale-encounter-rov>



## Chalk it Up to Deep-Sea Giants: Sperm Whales

### Sperm Whale Measurement Key



Draw a life-sized sperm whale. Just as people vary in sizes, so do whales. This is a fun general guide to help you create a sidewalk chalk whale. We've used the "tip of mouth" ("0 ft") as the starter point to find location of adaptations.

Size	Males reach lengths up to 52 to 60 feet (16 to 18 m). Females reach lengths up to 36 (11 m). Females weigh up to 33,000 pounds (15,000 kg); males weigh up to 100,000 to 125,000 pounds (45,000 - 57,000 kg)
Head	A sperm whale's head is 25- to 30-percent of its entire length
Eyes	Eyes located on either side of head. The eye is an ellipsoid shape (sort of a flattened sphere). The dimensions are about 2.8 in. x 2.8 in. x 1.1 in. (7 cm x 7 cm x 3 cm). Each eye weighs about 1/3 of a pound (170 g)
Blowhole	Like all toothed whales, a sperm whale has one blowhole. Unlike most whales, the blowhole is off-center (to the left) and close to front tip of the whale's head. It is shaped like an the letter "S."
Flippers	Like all whales, it has two pectoral flippers. On an adult, the flipper is about 6 feet (1.8 m) long and about 3 feet (1 m) wide.
Dorsal hump	It has dorsal humps which start about two-thirds of the way back on the body (or 1/3 of the length from the tail).
Tail	13 to 16 feet (4 to 4.9 m) wide from tip to tip. Each fluke (side of the tail) is broad and flat. Some describe the fluke shape as similar to a gingko-leaf.
<b>OTHER ADAPTATIONS</b>	
Blow	The blow (the "steamy" visible breath when the whale exhales air) shoots 16 feet (5 m) into the air. Since the blowhole is off-center, the blow isn't straight in the air, but off to an angle.
Teeth	18 to 26 pairs of teeth in the lower jaw. The teeth are 8 inches (20 cm) long, 4 inches (10 cm) in diameter

#### OTHER ADAPTATIONS

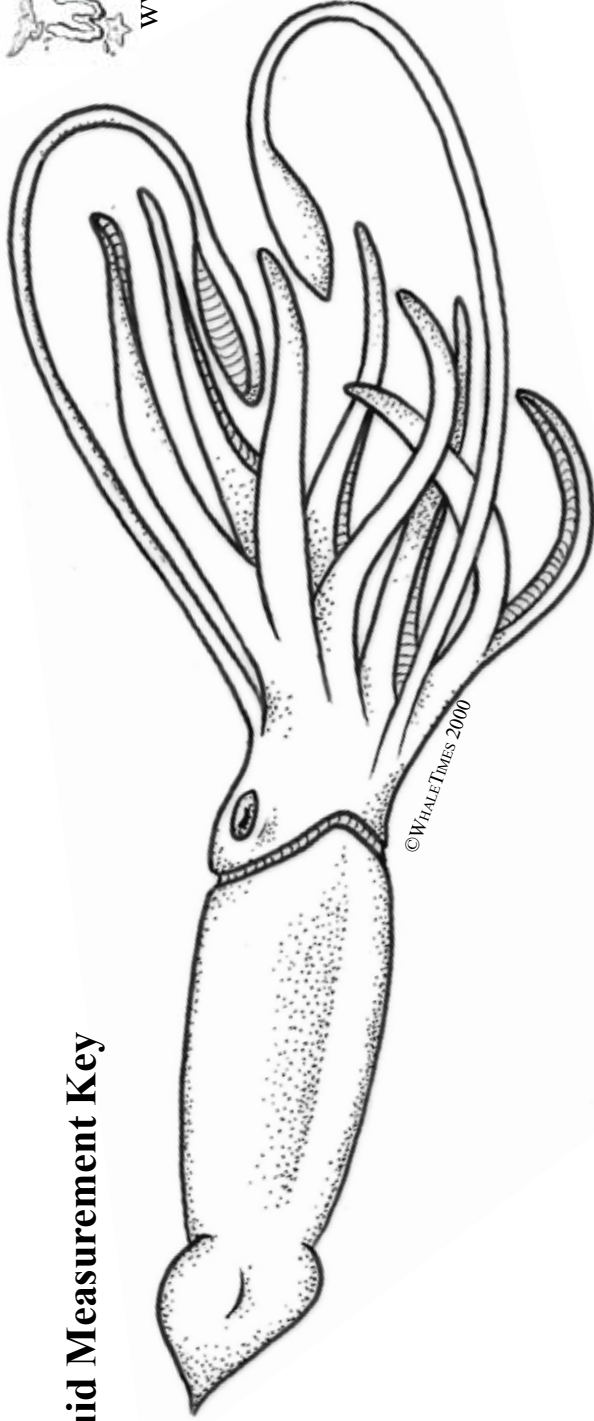
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## Chalk it Up to Deep-Sea Giants: Squid

### Giant Squid Measurement Key



Draw a life-sized giant squid. Just as people vary in sizes, so do giant squid. There seems to be many unconfirmed “fish tales” when it comes to the size of giant squid. Only a few hundred giant squid have been found since 1873! Another reason length is disputed is because of the “stretchy” nature of the feeding tentacles, which adds a challenge to measuring the animal. The feeding tentacles can double the length of the squid. This is a fun general guide to help you create a sidewalk chalk squid.

Size	The longest squid measured was 43 feet (13 meters) in total length, mantle and feeding tentacles. Many scientists seem to indicate this is an extreme size and most giant squid are smaller -- maybe about 30 feet long. More research will reveal the true length and natural history of this fascinating squid.
Arms	A squid has 8 arms, as long as 9.8 feet (3 m)
Tentacles	A squid has 2 feeding tentacles reaching 33 to 40 feet (10-12 m) long
Suckers	A giant squid has hundreds of suckers on its arms and feeding tentacles. They range in size from 0.79-1.97 inches (2-5 cm) in diameter.
Eyes	A giant squid's eye can be 1 foot (30 cm) in diameter. That's as big as a basketball. It uses its giant eyes to see movement, bioluminescent prey, and maybe bioluminescence churned up by predators or prey moving through the water bumping into tiny plankton and critters causing them to flicker or glow.

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# Creep into the DEEPEND

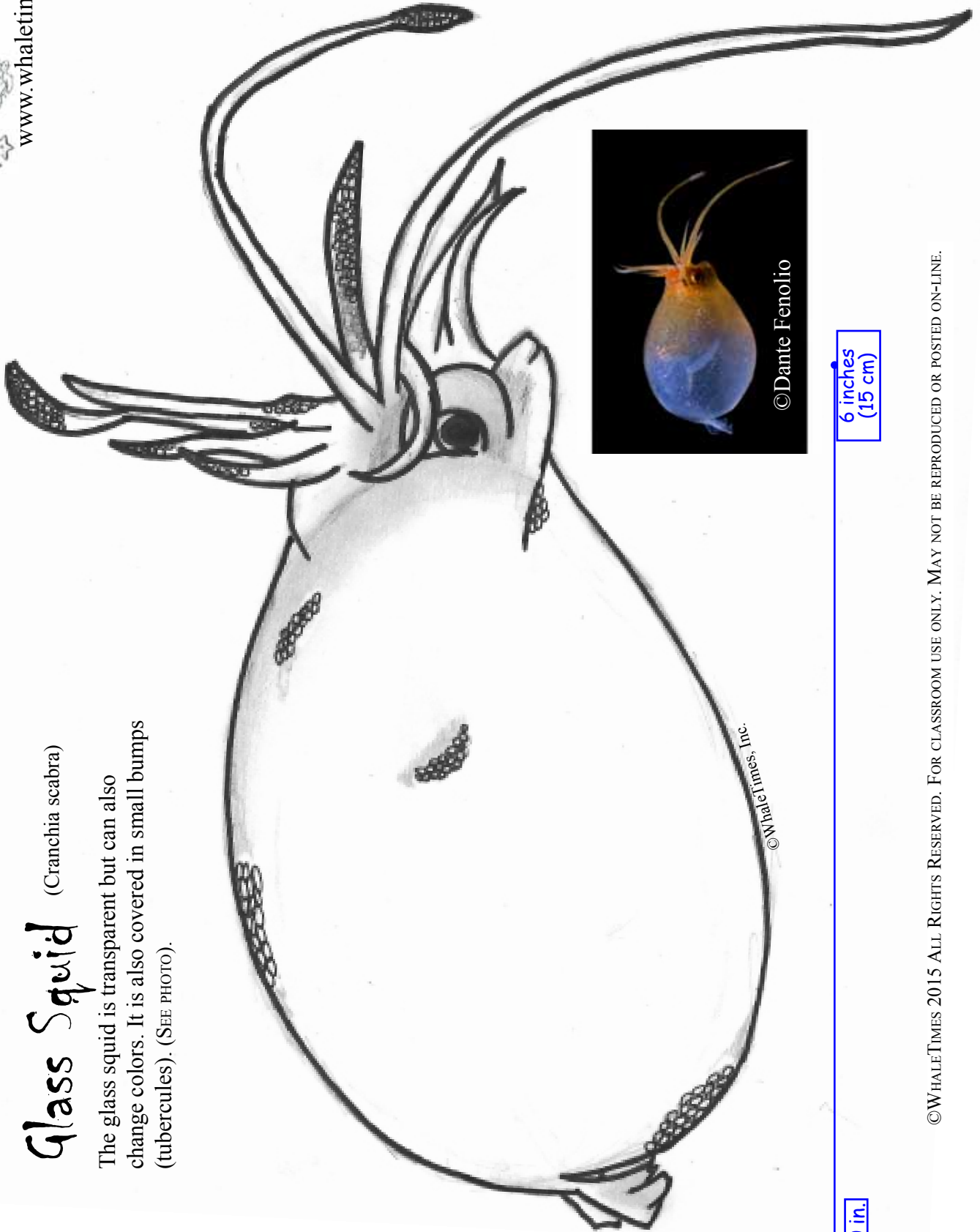
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## Glass Squid (Cranchia scabra)

The glass squid is transparent but can also change colors. It is also covered in small bumps (tubercles). (SEE PHOTO).



0 in.

6 inches  
(15 cm)

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Deep Red Medusa  
(*Crossota* sp)



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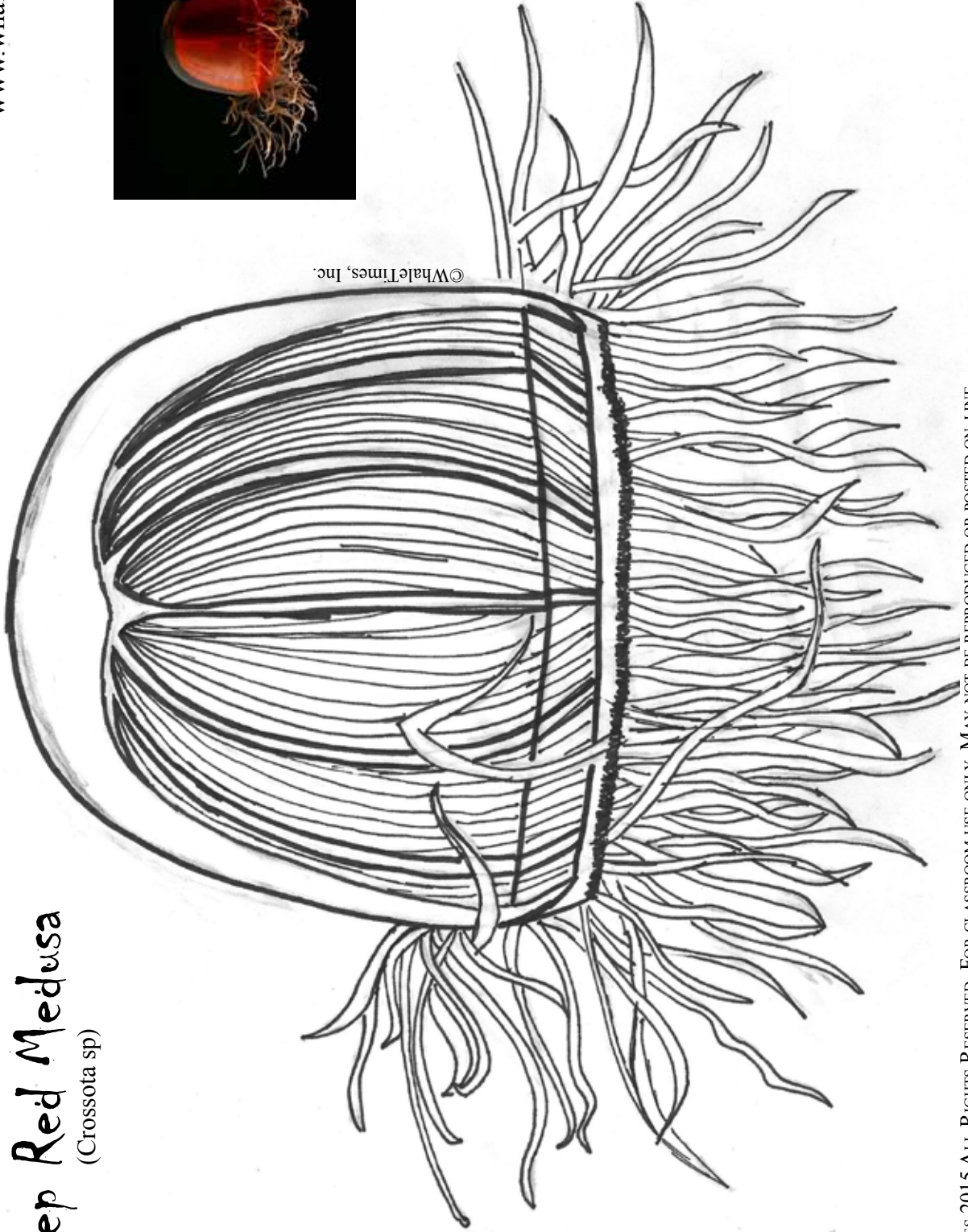
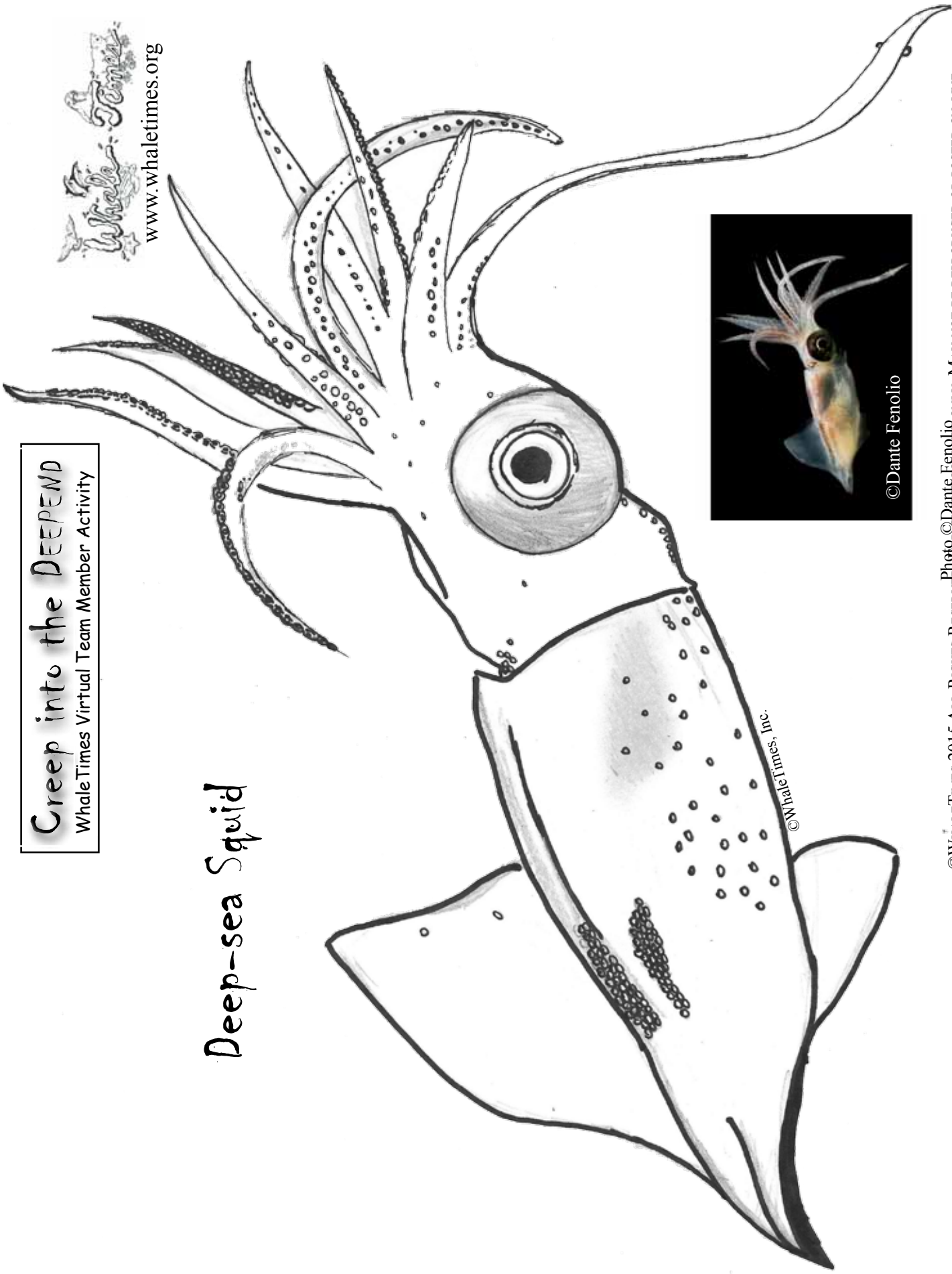


Photo courtesy of Kevin Raskoff, California State University, Monterey Bay/NOAA

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# Deep-sea Squid



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## Benthic Octopus (Macrotritopus)

This young octopus is actually much smaller than the illustration! That's because it is still in its "paralarval" stage. After hatching, it spends the first part of its life as plankton, drifting through the sea. When it grows up, it'll settle on the ocean floor. It will grow many times larger before it is an adult.

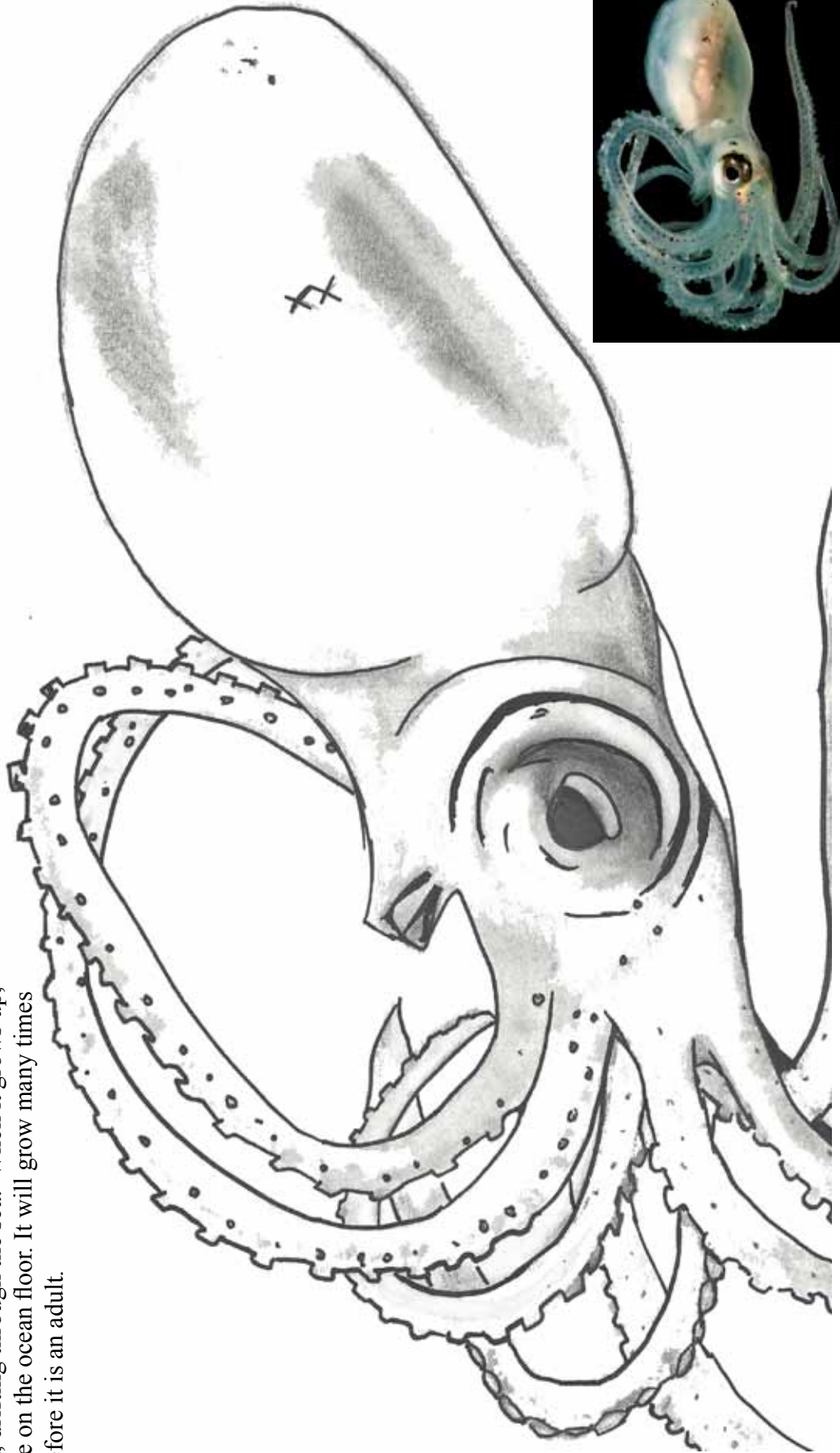


Photo ©Dante Fenolio

# Siphonophore



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# Anglerfish



Photo © Tamara Frank

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