

## Waldorf Astoria

### Schedule and information

#### Shift Timing/Layout

- **HUSB Support Staff SCHEDULE:**
  - 11:00am-12:00pm: Arrive at OI, get supplies and prepare animals for transit, leave OI by 12:00pm
  - 12:00pm-12:30pm: Arrive at WA & setup animals in tank
  - 12:30pm-3:30pm: Run program at WA
  - 3:30pm-4:00pm: Cleanup tank & leave WA
  - 4:00pm-4:30pm: Arrive at OI & return animals, tank, and supplies
- **LEAD + INSTRUCTOR SCHEDULE:**
  - 11:30am-12:30pm: Arrive at WA, setup stations
  - 12:30pm-3:30pm: Run program at WA
  - 3:30pm-4:30pm: Cleanup stations and leave from WA

#### Program Setup:

- Echolocation
  - Tuning Forks
  - Dolphin skull model
- Tooth vs Baleen
  - Orca Tooth
  - Krill
  - baleen
- Whale Migration
  - Whale Migration Trifolds
  - Whale Poster
- Tidepool Exploration
  - Urchin/Kelp Tank
  - Tidepool ID Guides
  - Tidepool Hopscotch
  - Shark jaw
- Storytime/ Dissolved oxygen demonstration

## **Background Program Info**

- **Whales background**

Explain: ❖ Toothed whales and baleen whales have many distinct differences... o Teeth vs baleen

- They have different feeding strategies where toothed whales hunt, using their teeth to hunt their prey. • Toothed whales typically eat squid, fish, seals/sea lions, etc...

- Baleen whales use lunge feeding strategies where they entrap small prey in their mouth and filter the water out through their baleen.

- Gray whales eat amphipods from the mud, so they go down to the seafloor, take a big mouthful of mud and filter out the amphipods from the mud and water.

- Humpback whales sometimes use bubble netting where they work together to create a spiral of bubbles. As the bubbles float up they group fish together and push them up towards the surface where the whale can lunge for an easy target.

- Baleen whales typically eat krill, plankton, small crustaceans, small fish, etc...

o Number of blowholes

- Baleen whales have 2 blowholes while baleen whales have two, looking almost like a pair of nostrils.

- For baleen whales, using two blowholes to breathe allows them to more efficiently access the oxygen they need to support their massive bodies while underwater.

- Toothed whales have one blowhole. Over the course of evolution, the left nasal duct is now the breathing hole, and the right has subducted internally and is now used for echolocation (nasal sacs). o Sound frequencies/vocalizations

- High frequency clicks and whistles for close contact communication in toothed whales that live in pods. Toothed whales also use echolocation to sense the world around them and find prey. Baleen whales do not have echolocation.

- Low frequency vocalizations that travel far distances in baleen whales that tend to live more solitary lives.

## **Tidepools background**

Engage: • Ask guests if they have ever been tide pooling. Do they know what it means to go tide pooling?

Explore: • Ask them if they know of any animals that live in the intertidal zone. What is the intertidal zone? Show them the tidepool guides. Explain & Engage: Discuss the following with the public...

- Do they know what makes each zone different and why we care about the different zones?
- The high tide zone is the most exposed where it is dry during the low tide. The middle zone can be both wet and dry depending on the tide and the lower zone is usually wet all the time, even during low tide. The middle zone is where you're most likely to find "pools" where the water collects when the tide recedes.
- What are some of the noticeable characteristics of the animals in their zone?
- This is your chance to freely discuss various adaptations in intertidal organisms. Often, residents of the upper intertidal zone have adaptations for dealing with high amounts of sunlight and little water. The middle intertidal zone undergoes the most change, so you will have a plethora of adaptations to discuss. The lower intertidal zone is also very biodiverse.
- Why is the lower intertidal zone so biodiverse, i.e. has a great deal of species?
- Explain that biodiversity is related to the levels of disturbance or level of available niches/roles that environment offers. As a result, the middle intertidal zone is the greatest in diversity as the constantly evolving conditions hold many available niches. Meanwhile, the relatively dormant conditions of the lower and upper intertidal zones encourage less diversity – all it takes is several organisms to adapt to respective conditions and competition will rule out the rest.

## Guide for Artifacts – Waldorf Astoria Outreach

### **For Handling**

Similar to how we interact with animals in touch tanks. Someone must always attend/keep tabs on the artifacts while there are guests present.

Yours and guests' hands must be clean, washed with soap and water and thoroughly dried. Even if hands have been washed to touch kelp, they must be washed again to prevent any buildup of salt or kelp slime.

Guests use a gentle two finger touch on the artifacts. Preferably, artifacts will stay on the table or be handled by staff, if they are handled by guests, this must be monitored.

If a specimen is inside of plastic container with white lid, it is not to be removed. Those specimens are more delicate and can be observed from their container. Loose items are open to being touched and observed more closely.

If maintenance is required, (e.g. something breaks, is stained, cracks, etc.) please bring the entire box back to OI at the end of the session and leave on Sophia Carter Peters desk. Thank you!

A little more info about the artifacts being presented:

### **Abalone**

- Larger specimen: species: flat abalone (8 open holes, brick red with white mottling, purplish pink interior). Opportunity to talk about biofouling and notice the barnacles on the external shell.
- Mid-sized specimen: species: black abalone (6 open holes, dark blue, pearly white interior)

- Small specimen: species: pink abalone (4 open holes, light with pink, pink interior with prominent muscle scar). Opportunity to discuss muscle scar and how abalone is a type of snail.
- All abalone are a type of gastropod (snail) and these animals primarily eat algae (kelp, etc.).

### **Chestnut Cowrie Snail Shell**

- These are the shells of the sea snails we have in our touch tanks. Cowries are scavengers and carnivores; in the wild, they'll eat anemones, tunicates, eggs, and dead organisms.

### **Horn Shark Egg and Unknown Shark Egg**

- Shark eggs are made of collagen and are flexible when wet and often wedged in between rocks to keep them safe. Mother sharks do not stay with or take care of their young. The horn shark has a distinctive spiral shape, but many species have roundish rectangular eggs with the horns protruding from the top and bottom. They are commonly called 'mermaids' purses '.

### **Sea Lion Skull (Model)**

- This is a small model

### **Orca Tooth**

- Orcas belongs to the order Odontoceti, within the infraorder Cetacea. Orcas are the largest species of dolphin, identifiable by the conical nature of their teeth. They are apex predators, well known for hunting smaller dolphins (bottlenose, common, etc.). They are not commonly seen in this area, but they do pass through.

### **Humpback Whale Baleen**

- Humpback whales belong to the order Mysticeti, within the infraorder Cetacea. This fragment of baleen is a small piece of the huge plates that line the jaw of the whale (picture included in box for visualization). They use their baleen like a huge sieve, taking in big mouthfuls of water and filtering out small animals, like anchovies and krill to eat.

### **Krill Vial**

- **NOTE: THE KRILL IS PRESERVED IN ETHANOL – DO NOT LET GUESTS OPEN VIAL.** Krill is a small, planktonic crustacean, and a common food source of many whales.

There is a great opportunity to show the krill when discussing what whales eat and how baleen whales feed.

### **Wavy Turban Snail and Operculum**

- Like the ones we have in the C shape touch tank on campus. The operculum, (the smaller, rounder piece of shell accompanying the main shell) acts as a door to the opening of the shell that stays tucked away behind the foot until the snail is threatened. The operculum will cover the opening in the shell and protect the snail's soft, vulnerable body from harm. Their diet consists of kelp and algae.

### **Purple Urchin Test, Teeth, and Spines**

- Purple urchins are a type of echinoderm native to this region. They eat algae, kelp, and decaying plant and animal matter.
- Test: the test is like the skeleton of the urchin. It is interesting to point out the pentaradial symmetry, and it can be compared to an orange. The animal is divided into five slices, that we can see in the test.
- Teeth: the teeth of the urchins are 5 plates (pentaradial) called Aristotle's Lantern, because Aristotle compared it to a lantern in his scientific observations.
- Spines: urchin spines are important for protection and spearing floating pieces of algae as it moves past them. They are situated in a ball and socket joint (like that of your shoulder) and can move independently.

### **Sand Dollar Test**

- An echinoderm, like sea stars and urchins, sand dollars live burrowed under the sand. Their test shows the pentaradial symmetry very well with the star shape in the middle. The mouth is on the bottom of the animal, and they have teeth like an urchin. Sand dollars are opportunistic filter feeders and will take any small plankton they can get.

### **Hermit Crab Molt**

- Hermit crabs are unique because their exoskeleton is not as thick as those of other crustaceans, so they use the shells of other animals to keep themselves safe. In this molt, you can see the details of the hermit crab. There's an opportunity to compare the thickness to the lobster tail molt and explain what a molt is. Hermit crabs are scavengers and eat whatever plant and dead animal material they can find.

### **Lobster Tail Molt**

- A partial molt of a spiny lobster found nearby OI. It would be interesting to compare to the hermit crab molt and discuss molting patterns (increased in summer, decreased in winter). Adult spiny lobsters primarily eat snails, clams, and crabs.

### **UnID Clam Shell**

- A bivalve clam, good tactile for the little ones if more worried about the fragile artifacts.

### **UnID Spiral Shell**

- Unidentified snail shell, good to mention how hermit crabs can repurpose these

### **Room Setup:**

- **Red arrows**- Setup locations
- **Gold stars**- Storage!  
Includes:
  - Black and yellow bin for echolocation storage, Artifact storage, tidepool toys
  - Whale Poster storage
  - Chalkboard sign
  - Tidepool Hopscotch foam mats
- **Moon**- Storytime/ titration space
- **Tidepool Hopscotch**- outside either within the little or just outside it with the gate open
- **Chalkboard**-outside the front doors



Urchin Setup

Echolocation

