



Sea Lions – Swimming for Food

Meets 5th Grade Next Generation Science Standards

California Visual Art Standard 2.6 - Use perspective in an original work of art to create a real or imaginary scene.

Taking It Further - California Visual Art Standard 2.5 - Assemble...a mixed media two-dimensional composition that reflects unity and harmony and communicates a theme.

Animal to Draw for Art Contest – sea lion in the bay

Writing prompt for the sentence of the back of the student's drawing – Describe how plastic pollution affects a sea lion.

Objective - For students to observe how difficult it is for sea lions to fish in their natural habitat with the increase in plastic pollution. To learn that pollution is harmful to animals in their habitat and that sea lions rely on a food source based in the ocean. For students to think of solutions to reduce the amount of plastic pollution and understand how energy is transferred.

Time – 15-20mins

Background – California sea lions are found from Baja California to British Columbia in coastal waters. This includes bays, harbors, and river mouths and several islands far off shore with deeper waters. Sea lions are carnivores mainly preying on fish, squid, and occasionally clams. They are also the fastest of any sea lion reaching speeds of up to 25 mph. California sea lions are currently listed as least concern by the IUCN. This is mainly due to the passage of the Marine Mammal Protection Act of 1972. Today there are approximately 238,000 California sea lions, but they still are facing various threats.

One of the problems sea lions are facing is plastic pollution in the ocean. About 8 million metric tons of plastic enters the ocean every year. Plastic pollution in the ocean affects the health of wildlife like sea lions, sea birds, and fish. Often times the trash is mistaken as food or animals become entangled in it. The plastic can also attract pollutants from surrounding seawaters and can contaminate the species that eat it (trashfreeseasalliance.org). When an animal eats plastic, it can cause them to become ill and unable to produce enough energy to survive. Since sea lions rely on fish for food and the fish rely on the natural resources in the ocean for energy, plastic can be a serious threat to California coastal ecosystems.

Another effect of eating plastic is bioaccumulation. Bioaccumulation is when toxins build up in a food chain (BBC). Plastics, which contain toxins, are eaten by small fish, the small fish are then eaten by bigger fish, and sea lions eat the fish. The accumulation of toxins becomes greater as the consumer needs to eat greater amounts of food. The animals at the top of the food chain will have the highest concentration of toxins.

What are the solutions? There are different ways to address the plastic pollution problem. The first is to educate others about plastic consumption. If we reduce the amount of plastic, especially single-use

disposable products, we can reduce the amount of trash as a whole. We can do this by using reusable bags, reusable water bottles, creating zero-waste lunches, saying 'no' to plastic straws, and much more. This can be done on a larger scale by asking your city, state, and government to ban plastic bags, bottles, and straws. We can also participate in local beach clean-ups. Removing trash off of our coasts will reduce the amount moving into our oceans.

In this activity you will try hunting like a sea lion in an ocean with plastic pollution and try several ways to clean up plastic pollution.

Vocabulary –

Carnivore – an animal that eats other animals

Prey – an animal that is hunted

Pollution – introducing a substance into a habitat that could have harmful effects

Contaminate – to make something polluted by exposing it to a polluting substance

Food chain – an ordered series of organisms that are dependent on another as a source of food

Food web – a structure of collective food chains within a habitat

Energy – the potential to do work, as provided by fuel/food source

Materials -

- Large bowl or tub
- Small net
- Fork
- Small cup
- Blue pony beads
- Yellow pony beads “plastic”
- Red pony beads “fish”

Directions -

1. Fill the large bowl or tub with your Blue pony beads.
2. For every one red pony bead there should be three yellow pony beads (1 red bead: 3 yellow beads). Add the red pony beads to represent “fish” and your yellow pony beads to represent “plastic” to your large bowl or tub.
3. First use the fork to only scoop out the “fish” pieces. This represents how the sea lions must hunt around the plastic pollution.
4. Now using your different tools (small net, small cup) scoop out only the plastic pieces. The tools represent different ways to remove plastic from the ocean.
5. See if the class can come up with any other tools they would like to use to try and remove the plastic.

Note: it should be difficult to separate the “fish” from the plastic.

Questions for discussion –What method seemed to work the best at cleaning up the plastic? How could that work on an ocean in a natural habitat? What are ways we can reduce the amount of plastic going into the ocean? Sea lions use fish as a source of energy, but where do those fish get their energy source? How do plants in the ocean get their tools to grow? What does the sea lions entire food chain look like? What is the movement of matter (energy) for them?

Website/books/other resources –*Sulli Loves Sea Lions* by Cara P Fucci (a little young, but great art work)

San Francisco's Famous Sea Lions by Kat Shehata

California Sea Lion: Fast & Smart (Blink of an Eye: Superfast Animals) by Natalie Lunis

<http://www.sfzoo.org/animals/mammals/californiasealion.htm>

<http://www.marinemammalcenter.org/education/marine-mammal-information/pinnipeds/california-sea-lion/>

Taking it further – Because sea lions rely on their habitat to provide them with their food source, there are different ways we can help their habitat. As a class, you can set-up a beach clean-up day with local organizations. You can also have the class collect trash on school grounds or double-check to see if your trash sorting system is up to date.

You can also reduce plastic waste by students creating their own reusable bags out of old t-shirts.

<http://www.instructables.com/id/No-Sew-10-Minute-T-Shirt-Tote/>

Conservation Action – Because sea lions rely heavily on the ocean to provide them with food, there are choices we can make to improve the oceans current conditions. You can reduce the amount of plastic you use by bringing reusable shopping bags when you shop and carry a reusable water bottle instead of using plastic bottles. You can also **reduce** the amount of plastic you use, **reuse** items that you already own, and **recycle** everything you can by bringing them to proper recycling stations.

Sources –

<http://www.marinemammalcenter.org/Get-Involved/awareness-campaigns/your-ocean-footprint.html>

<http://www.sfzoo.org/animals/mammals/californiasealion.htm>

<http://www.trashfreeseasalliance.org/>

<http://www.oneworlddoneocean.com/initiatives/PlasticsBreakdown>

<https://www.nwf.org/Wildlife/Wildlife-Conservation/Food-Webs.aspx>

http://www.bbc.co.uk/schools/gcsebitesize/science/triple_ocr_21c/further_biology/ecosystems/revision/6/