

HALL OF FISHES: PACIFIC NORTHWEST & CALIFORNIA COAST

The most important factor that determines where marine organisms live is water temperature.

Each organism has a temperature range that they can live in. Traveling through the Hall of Fishes is like swimming down the West Coast. See how the types of animals change from the Pacific Northwest to Southern California as the water warms.

**DRAW A LINE TO MATCH THE ANIMAL WITH THE HABITAT THEY LIVE IN.
SOME MAY LIVE IN MORE THAN ONE PLACE!**

| ANIMAL | HABITAT |
|---------------------------------------|--------------------------|
| Northwest Coast (Oregon & Washington) | Sunflower Star |
| | Giant Pacific Octopus |
| San Diego Bay | California Spiny Lobster |
| | Garibaldi |
| | California Moray Eel |
| Southern California: Rocky Reef | Bat Star |
| | Pacific Spiny Lumpsucker |

**WHAT DO YOU THINK WILL HAPPEN TO THE ANIMALS THAT
LIVE THERE AS OCEAN TEMPERATURES RISE DUE TO CLIMATE CHANGE**

See the chart below for the average water temperature in each location.

| | AVERAGE WATER TEMPERATURE | |
|---------------------|---------------------------|------|
| | January | July |
| Washington | 45°F | 54°F |
| Oregon | 49°F | 55°F |
| Northern California | 51°F | 56°F |
| Southern California | 57°F | 67°F |

KELP FOREST

The kelp forest is an important habitat in Southern California for many animals. At Birch Aquarium, our team of aquarists feed each animal exactly what they need. In the wild, they must depend on what is around them. Using the information about each animal, build a food web that shows how energy flows through this ecosystem.

Then, see if you can find any of these animals in the exhibit!

TIP:

Draw your food web arrows pointing towards the organisms getting the energy.



For example, this human gets energy from eating the hamburger, so the arrow points towards the human.

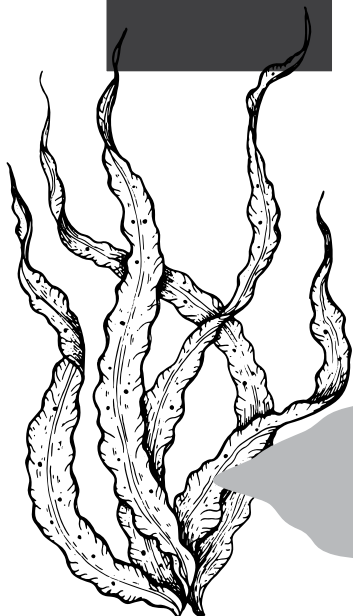
Remember, an animal might get energy from more than one thing!

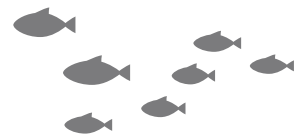
| PRODUCERS Create their own energy via photosynthesis | HERBIVORES Eat producers | OMNIVORES Eat both animals and producers | CARNIVORES Only eat other animals |
|----------------------------------------------------------------|------------------------------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Giant Kelp | Sea Urchin Opaleye Kelp Crab | Bat Star Eats kelp, sea urchins | Garibaldi Eats crabs, sea stars Sheephead Eats sea urchins, crabs Giant Sea Bass Eats sheephead |

DID YOU KNOW?

Decomposers like fungi, bacteria, and certain invertebrates are an important part of a food web as well. Decomposers break down organic matter from dead organisms into nutrients that producers need to make their energy.

Think about where you would add decomposers into your food web.





HALL OF FISHES: MEXICO & TROPICAL REEFS

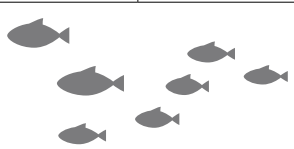
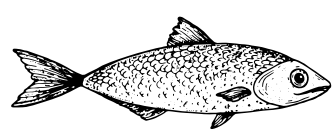
Your journey down the West Coast continues as you explore the wildlife found in Mexico and tropical reefs. Ethograms are a way to study an animal's behavior by collecting data on what they are doing. Use this ethogram to observe how the organisms are interacting with the other living and nonliving things in their environment.

INSTRUCTIONS:

- Pick an animal to study in one of the Tropical Reef exhibits. Write its name on the line below.
- When you are ready to begin, count to ten. Then, place a checkmark next to the behavior the animal is doing at that moment. Then, count to ten again and repeat.
- Do this 12 times (for a total of 2 minutes) to fill out the whole chart. Total each behavior to see what they were doing the most.

ANIMAL: _____

| TIME | FEEDING | ACTIVE <small>Moving around, not interacting</small> | INACTIVE <small>Not moving around</small> | SOCIAL <small>Interacting with another animal</small> | NOT VISIBLE | OTHER |
|--------------|---------|-------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------------------|----------------|-------|
| 0:10 | | | | | | |
| 0:20 | | | | | | |
| 0:30 | | | | | | |
| 0:40 | | | | | | |
| 0:50 | | | | | | |
| 1:00 | | | | | | |
| 1:10 | | | | | | |
| 1:20 | | | | | | |
| 1:30 | | | | | | |
| 1:40 | | | | | | |
| 1:50 | | | | | | |
| 2:00 | | | | | | |
| TOTAL | | | | | | |

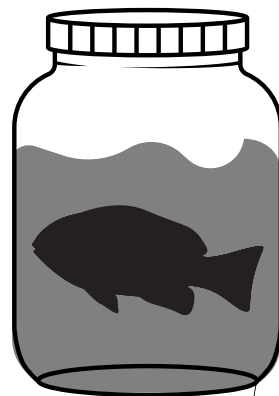


ODDITIES: HIDDEN HEROES OF THE SCRIPPS COLLECTION

All living things have adaptations to help them survive. These adaptations are like superpowers. Some are used for capturing prey (predation), protection from predators, or both!

EXPLORE THE COLLECTIONS AND FILL IN
THE USE OF THAT SUPERPOWER IN THE CHART

| ANIMAL | SUPERPOWER | USE (CIRCLE ONE) | | |
|--------|------------|------------------|------------|------|
| _____ | _____ | Predation | Protection | Both |
| _____ | _____ | Predation | Protection | Both |
| _____ | _____ | Predation | Protection | Both |
| _____ | _____ | Predation | Protection | Both |
| _____ | _____ | Predation | Protection | Both |
| _____ | _____ | Predation | Protection | Both |

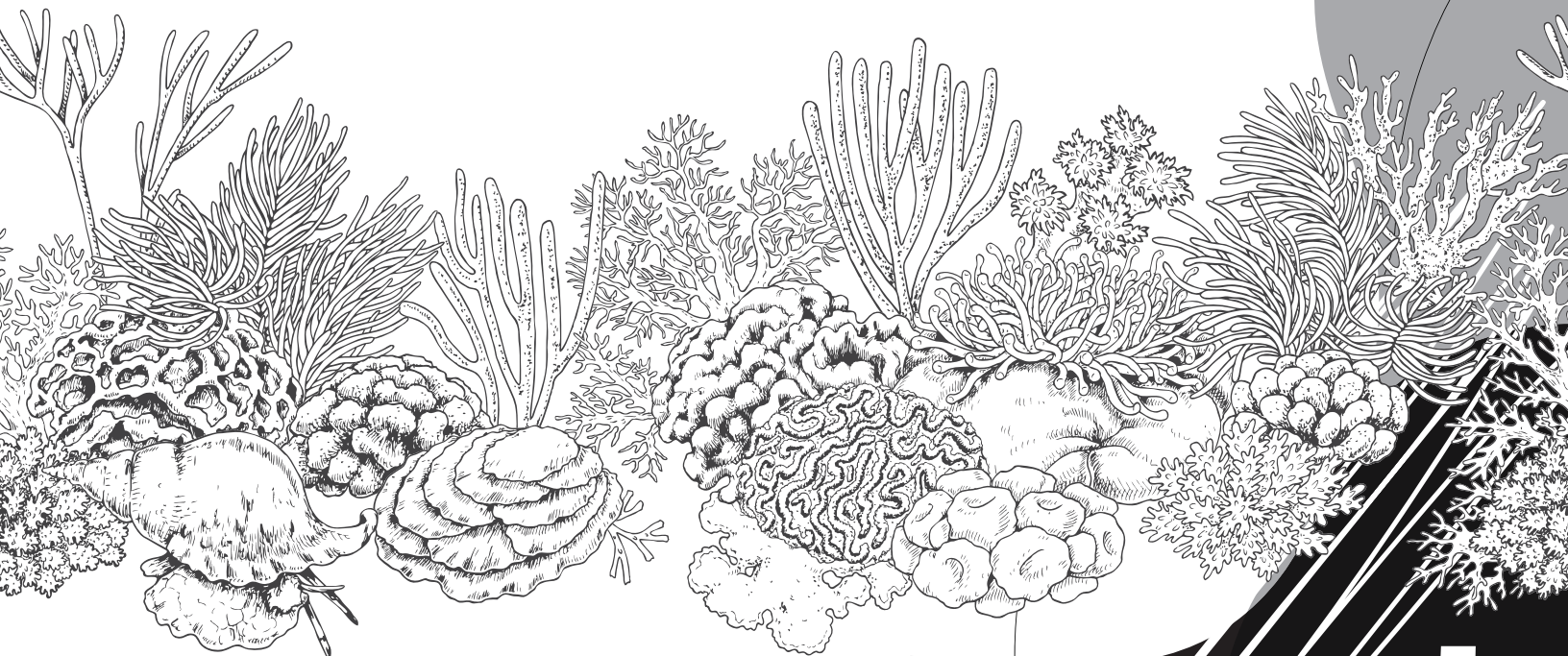




HEALTHY VS. BLEACHED REEFS

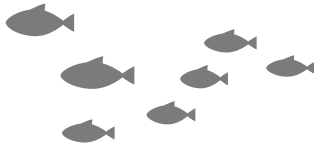
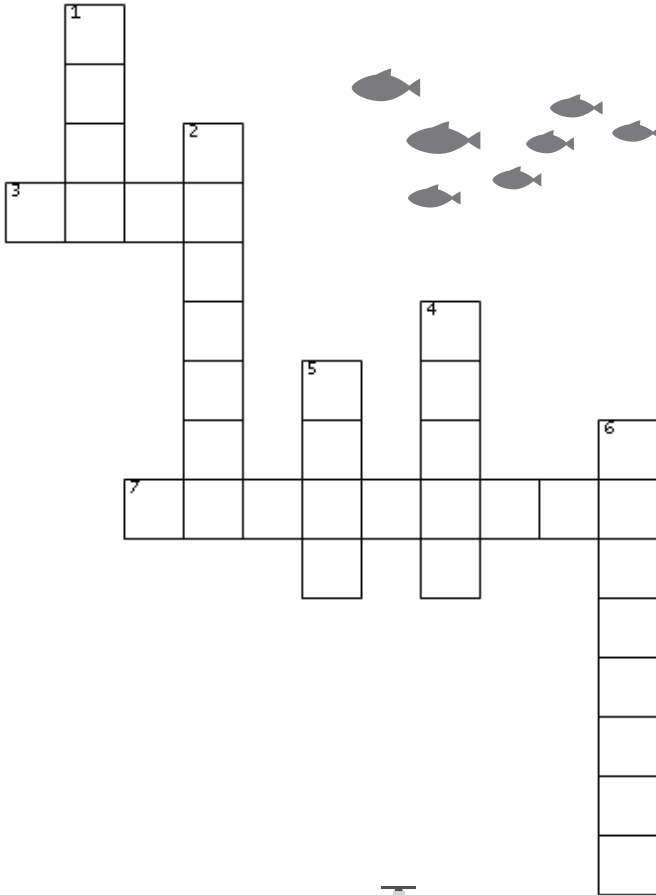
Look closely at the difference between the healthy and bleached reef. What do you notice? The healthy coral gets its vibrant colors from a type of algae called zooxanthellae. The algae and the coral have a mutualistic relationship: the coral provides the algae with protection and nutrients for photosynthesis, and the algae provide coral with food from photosynthesis. However, warming waters caused by climate change will cause the coral to expel the algae.

WHAT DO YOU THINK HAPPENED TO THE ALGAE IN THE BLEACHED REEF? WHAT DOES THAT MEAN FOR THE CORAL?



EXPEDITION AT SEA: R/V SALLY RIDE

FIND THE ANSWERS IN THE EXHIBIT TO COMPLETE THE
CROSSWORD PUZZLE AND LEARN ABOUT SCIENCE AT SEA!

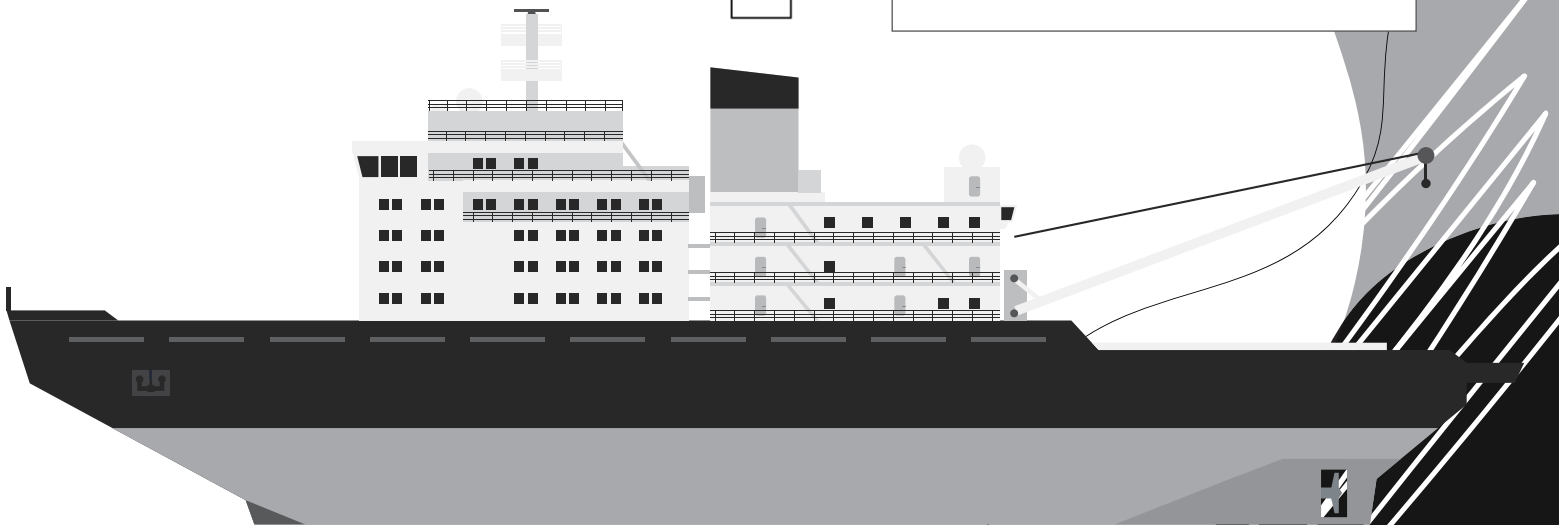


ACROSS

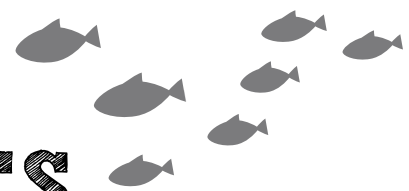
- Number of research vessels and platforms in the Scripps fleet.
- First American woman in space; namesake of the newest research vessel.

DOWN

- This crab, named for a mythical creature, has a bacteria food source right on its claws.
- The area of the ocean explored by Remotely Operated Vehicles.
- Safety device that transmits a "May Day" message on contact with water.
- An eight (8) on the Beaufort Scale.
- The scale that relates wind speed to open ocean conditions.



SHARK SHORES



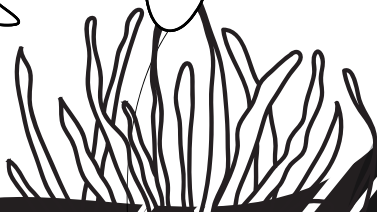
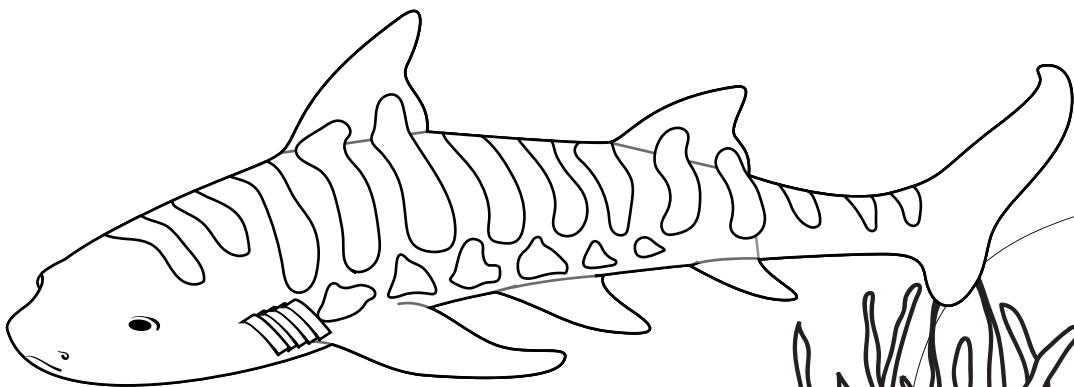
What emotions do you feel when you see these sharks?

People often feel nervous around sharks because they are often portrayed as scary or dangerous in movies or media. In reality, shark attacks are incredibly rare, and sharks are actually very important to the ocean! They keep the ocean food web balanced and their health indicates the overall health of the ecosystem.

Imagine that white sharks were removed from the ocean food web.

WHAT WOULD HAPPEN TO THEIR PREY (SEALS AND SEA LIONS)?

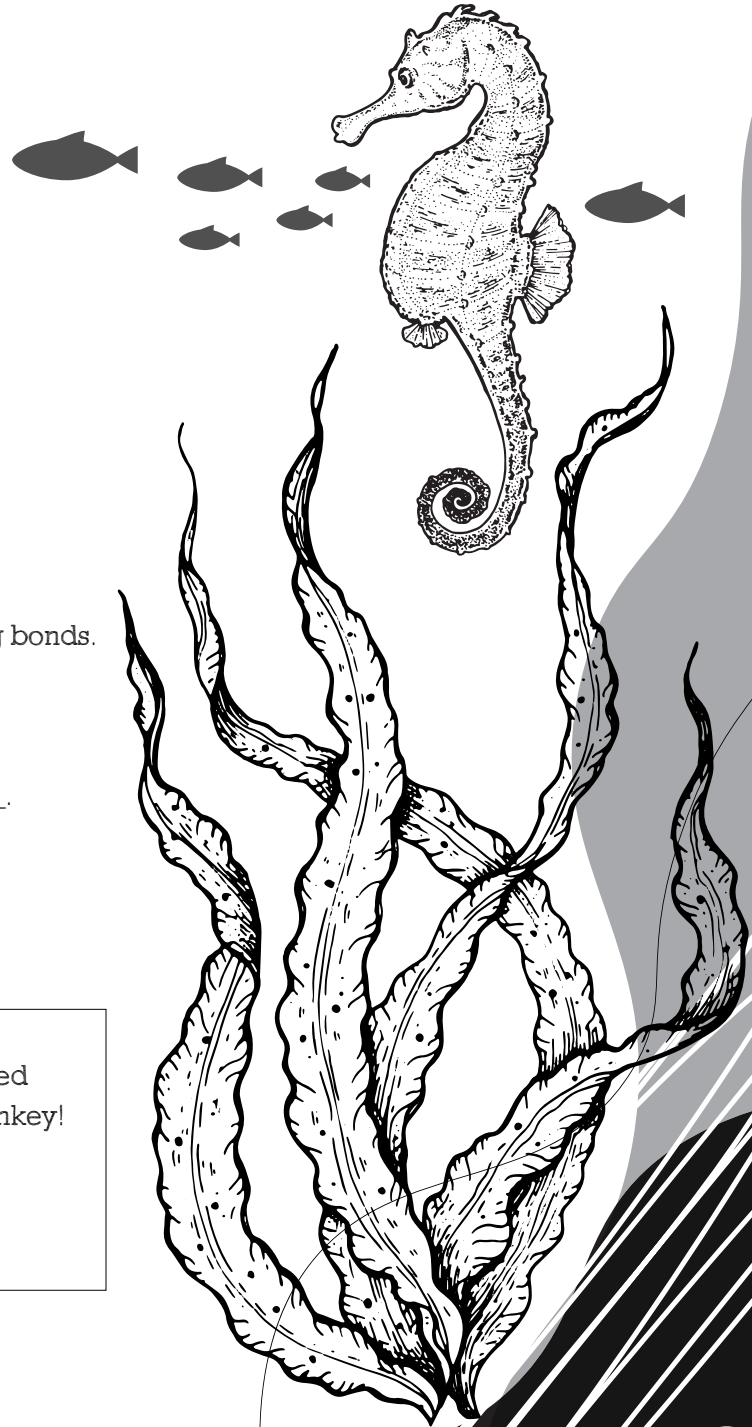
WHAT WOULD THEN HAPPEN TO THE FISH THAT SEALS AND SEA LIONS EAT?



SEADRAGONS & SEAHORSES

Seadragons and seahorses have unique characteristics that help them reproduce
Find the answers to the questions below around the exhibit to reveal a fun fact.

- The ___ seahorses get pregnant, which differs from most of the animal kingdom.
 P. Male Q. Female
- Female seahorses transfer their eggs to the male's ___ after an elaborate mating ritual.
 D. Tail E. Pouch
 F. Fins G. Gills
- Female seadragons transfer their eggs to the male's ___ after an elaborate mating ritual.
 E. Tail F. Pouch
 G. Fins H. Gills
- ___ greetings help seahorses form long-lasting bonds.
 P. Weekly Q. Monthly
 R. Yearly S. Daily
- Male seahorses remain pregnant for up to _____.
 L. 4 Weeks M. 2 Weeks
 N. 10 Weeks O. 4 Days



Seahorses have this kind of tail, which is adapted to grasp and hold onto objects, similar to a monkey!

___ R ___ H ___ N ___ I ___ E
 1 2 3 4 5 6 7 8 9 10

BEYSTER FAMILY LITTLE BLUE PENGUINS

Look at the life cycle chart to the right to see how penguins tend to spend their time over the course of a year. Then, observe the penguins for a few minutes.

WHAT BEHAVIORS DO YOU OBSERVE? (Circle all that apply)

SOCIALIZING:

Penguins spend their time swimming and feeding together.

MOLTING:

Once a year, penguins molt all of their feathers and grow back new ones.

EGGS:

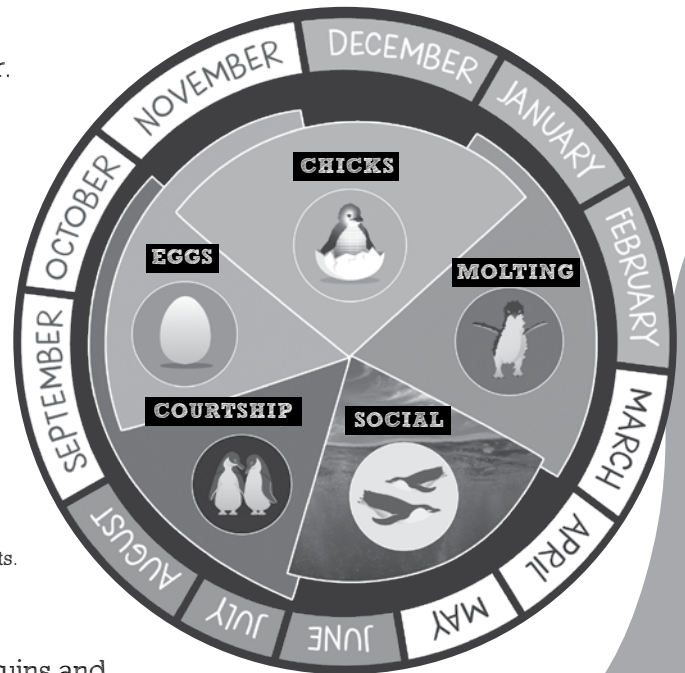
Eggs are laid, both penguins take turns sitting on the eggs to incubate them.

CHICKS:

Parents will care for and feed their young chick.

COURTSHIP:

Male penguins will do courtship displays to attract females and start building nests.



The effects of climate change can negatively impact the penguins and their habitat. Use exhibit signage to answer the following questions.

WHAT WAYS DOES OUR WARMING PLANET AFFECT PENGUINS?

1. _____
2. _____
3. _____

Read how the community came together in New Zealand to protect penguins from the effects of climate change, like flooding. What effects of climate change have you felt in your own community?

CIRCLE ANY OF THE EFFECTS BELOW THAT YOU HAVE NOTICED:

Extreme temperatures

Flooding

Drought

Increased fires

Warming oceans

Sea level rise

Extreme weather

Other: _____

What climate action can you take to help your community? Choose an action from the exhibit or come up with your own!

I CAN HELP MY COMMUNITY FIGHT CLIMATE CHANGE BY:

