Our mission is to promote understanding and responsible actions for the protection of the Treasure Coast's fragile ecosystems and their inhabitants, including the Florida manatee.
Adaptation is the evolutionary process by which a species becomes fitted to or specialized for its environment. All living organisms are adapted to their environments. Adaptations can be physical or behavioral and many help organisms either find food or avoid becoming food. Animals that eat other animals are called predators. Animals that are eaten by other animals are called prey. Let’s take a look at some of the very specialized ways that predator and prey animals are adapted to survive.

**Prey Adaptations**

Prey animals are constantly on the lookout for the predators that would eat them. In order to survive, they must find food for themselves while also avoiding becoming someone else’s dinner. Prey animals have developed a number of interesting adaptations that enable them to escape from or defend themselves against predators.

**You Can’t See Me**

Both prey and predator animals employ camouflage, the ability to blend into the surroundings, as a way to avoid being detected. Camouflage may include coloring, body shape, behavior or a combination of these to remain undetected by others.

**Color Resemblance**

Some animals are colored so that they can hide in plain site. Look at the photo to the right to see if you can find all four of the birds (*willow ptarmigan*) hiding in the snow. Insects win first prize in the color resemblance category. A quick search of the internet will reward you with photos of insects that resemble leaves, twigs, thorns, bark, flowers, lichens, and even bird poop!

**Disruptive Coloration**

Another method for hiding in the open uses bold patterns and markings to break up the outline of the animal’s form and lead the eye away into the background. Notice how the zebras’ stripes confuse your eye, making it difficult to tell one animal from another.
Prey Adaptations

Use Some Sense

Prey animals have very highly developed senses to help them detect predators.

Sight

Most prey animals are herbivores, they eat mainly plants. So they don’t need to watch food that is running away from them. Prey animals do need to keep track of movement in general. To do so effectively, they need a very wide field of vision. This is why the eyes of prey animals are set toward the side of the head.

Hearing

Look at the vision diagram above. Because prey animals have extreme peripheral vision, predators often approach from behind to avoid being seen. Prey animals have developed very large, mobile ears to make up for not having eyes in the backs of their heads. Notice how this deer is listening to different directions.

Escape or Avoid

Some prey animals have also developed specialized adaptations that allow them to escape predators that come too near or to avoid them all together.

Escape

Some prey animals are simply built for speed. Animals like deer, pronghorn, and rabbits have powerful hind limbs that are made for running. Pronghorn can reach top speeds of around 55mph. And, they can run at a steady pace of 30mph for more than 20 miles!! Jackrabbits can attain a speed of 40 mph and each running jump can be as much at 10 feet!

Avoid

Avoiding predators is really the safest bet for a prey animal. Prey animals have developed some very interesting ways to avoid being eaten by a predator. For example, mountain goats have cloven hooves that give them an advantage when climbing. In addition, only the outer edge is covered by hard material. The inner portion of the foot is soft and flexible allowing goats to grip the smallest ledge as they climb away from predators.
**Warning Signals**

Prey animals have developed a number of warning signals that can either scare predators away or warn others to the presence of a predator.

**Visual Signals**

Animals use visual signals to aid one another and to intimidate predators. For example, white-tailed deer raise their tails like a flag to warn other deer of a potential threat. The stripe of a skunk warns predators to keep away or be sprayed and most animals can raise their body hairs to look larger.

**Audible Signals**

Animals also use sound to ward off potential threats and to alert others. A beaver’s tail slap, the squirrel’s barking, and a deer’s sneezy snort are all effective ways to alert other animals to the presence of a predator. Raccoons growl viciously and skunks pop their teeth as ways to frighten predators.

**Bluffing**

Bluffing can be used to fool predators into thinking that prey is dangerous, already dead or injured. Many predators do not like to eat things that aren’t alive, so opossums and hognose snakes play dead. Birds like the killdeer pretend to be injured to lure predators away from their nests. And, many insects use mimicry to fool predators into thinking that they are a different poisonous creature or to advertise that they just don’t taste good.

**Predator Adaptations**

Prey animals have developed so many ways to avoid becoming a meal that predators really have to pull out all of the stops if they hope to catch something. Let’s take a look at some predator adaptations.

**Well, You Can’t See Me Either**

Predators also use color resemblance and disruptive coloring to hide. Can you find the predator in these examples?
Predator Adaptations

Predators Are Sense-able

Predators also have finely tuned senses and they tend to be curious about all that is happening in their surroundings.

Sight

It is more important for a predator to be able to track moving prey and accurately judge distances. So, predator eyes are situated on the front of their head which makes it much easier to judge far or close things are. Check in the Activities section for a fun way to test your binocular and peripheral vision.

Hearing

Predatory animals also have excellent hearing. Predators ears are more forward facing than those of prey animals. Can you figure out why?

Smell

Some predators rely more on their sense of smell to find prey than their eyes. Animals like the wolf, coyote and fox use scent to track down prey whereas animals like bobcats and panthers rely more on sight. Look at the photos on the right. Do you notice how much longer the coyote’s nose is than the panther? This gives them extra room for complex nasal passages full of chemically sensitive cells. Foxes are so sensitive to smells that they can find a mouse or vole two feet under the soil or snow!

Predators Have Weapons

Teeth & Claws

Predators have specialized teeth and sharp claws to help them capture and eat their prey. Predatory mammals have large teeth for grasping, tearing, shearing and cutting. Predatory birds have sharp talons to grab their prey and sharp, hooked beaks for tearing meat. Cat claws are unique because they are retractable – they can be tucked back into the paw so that cats can travel silently as they stalk their prey. In the photos to the right you can see the large grasping and cutting teeth of a wolf and the huge talons of a golden eagle.
Predator Adaptations

Predators Have Their Own Style

Predators have developed many different styles of tracking down and capturing their prey. Let’s take a look at some of these strategies.

Stalking

Predators that stalk their prey have developed a number of special features that allow them to sneak up on them. Most stalking predators rely heavily on camouflage to make it more difficult for prey to spot them. Cats also have those retractable soft fringed feathers to keep their movements quieter. Animals that stalk also need to have very quick reflexes.

Ambush – Hide and Pounce

The hide and pounce style of hunting requires very little energy, but a lot of patience. Animals that hide and pounce also rely on camouflage so that prey won’t see them in their hiding spots. The great blue heron is an amazing ambush predator. Its long legs resemble reeds in the water, so fish aren’t frightened away. The bird will stand motionless for hours waiting for a fish or frog to swim near enough to be speared by that long bill.

Working Together

Some predators work together in groups to hunt, taking advantage of their numbers to catch animals much larger than themselves. Wolves are an excellent example of cooperative hunting. Each wolf has a job in this highly organized method of hunting.

<table>
<thead>
<tr>
<th>Prey</th>
<th>Predator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyes on sides of head</td>
<td>Eyes face forward</td>
</tr>
<tr>
<td>Peripheral vision</td>
<td>Binocular vision</td>
</tr>
<tr>
<td>Wide field of vision</td>
<td>Narrow view</td>
</tr>
<tr>
<td>Broad teeth for grinding</td>
<td>Sharp teeth for tearing</td>
</tr>
<tr>
<td>Jaw moves side to side</td>
<td>Jaw moves up and down</td>
</tr>
<tr>
<td>Smaller brain</td>
<td>Larger brain</td>
</tr>
</tbody>
</table>
Adaptations-Predator or Prey
All animals are specialized to survive in their environments. Join us for a look at the ways that predators and prey animals are adapted to survive in the natural world.

**LIVE from the Lagoon**

Adaptations-Predator or Prey
Wednesday, May 20
12:00 pm

Adaptations-Ocean Predators
Predators are some of the most highly adapted species on earth. Join us to take a look at some of the crazy ways the ocean’s top predators, sharks, are adapted to find and capture prey.

**LIVE from the Lagoon**

Adaptations-Ocean Predators
Saturday, May 23
12:00 pm
Test Your Vision

Peripheral Vision
Prey animals have extreme peripheral vision. That means they can see way off to the side when they are looking straight ahead. Try testing your own peripheral vision.

1. Stand in the center of a room. Choose a point on a wall straight in front of you to look at. Don’t allow your eyes to leave that point.
2. Stretch your arms out to your sides and point your index finger in the air.
3. Reach your arms backwards as far as you can while keeping them at shoulder height.
4. Now, slowly bring your arms forward until you can just see your fingers out of the corner of your eye. Remember, keep looking at your place on the wall in front of you.
5. Are your arms in exactly the same place? Some people have better peripheral vision on one side.
6. How does your peripheral vision compare to other members of your family?
7. Refer to the diagram at the beginning of the Prey section of this packet. Can you imagine being able to see to the sides as well as a prey animal?

Binocular Vision
Predators need to have excellent binocular vision to judge distances. That means that both eyes see an object at the same time, then the brain puts the images together to show how close or far away the object is. Try these two tests to see how binocular vision works.

The Thumb Trick
1. Stretch your arm straight out in front of you and give yourself a thumbs up.
2. Now close one eye, then quickly switch to the other eye. Repeat this several times.
3. Your thumb seems to move around the background, doesn’t it?

The Pen Trick
1. Close your eyes and have someone hold a pen in front of you, just a little less than your arm’s length away.
2. Now, open one eye and try to grab the pen. Switch eyes and try again.
3. Now open both eyes and grab the pen.
4. What happened when you only used one eye? Were you reaching too far or too close to touch it? How did that change with both eyes?
Hearing Like a Prey Animal

Remember that not only do prey animals have excellent hearing, but their ears are on swivels. They can turn them to the front, or side, or rear. They can turn them both the same way, or turn only one. Try this test to see how moving ears helps prey animals find potential predators.
This activity works best with at least two people. Choose one person to start off as the predator.
1. The Prey animal stands in the center of the room with eyes closed...no cheating!
2. The predator chooses a place in the room at least six feet away from the prey. The predator whispers the prey’s name quietly.
3. The prey animal tries to determine where the predator is in the room.
4. Was it difficult to decide where the predator was hiding?
5. Now, start over only this time the prey animal gets to make larger swivel ears by cupping her/his hands behind the ears. Listen for the predator whisper.
6. Is it still a bit difficult to tell? Try cupping your hands in front of your ears but facing backwards.
7. Now, try cupping one behind and one in front. How does the sound change?
8. You can use this trick anytime you want to hear something more clearly or when you need to figure out from where a sound is coming.

Smelling Like a Predator

What You Need: several small jars or containers, facial tissues (unscented), rubber bands, assorted food items like herbs, spices, fruit, etc...

What To Do:
This activity works best if the sniffer is not the same person who puts the jars together.
1. Tape a piece of paper to the outside of any transparent containers so that the object inside cannot be seen.
2. Place a few pinches or small pieces of an assortment of different food items in each jar.
3. Cover each jar with a tissue and secure with a rubber band
4. Allow jars to sit for about 30 minutes
5. Sniff the jars and try to guess what is inside.
6. Turn this into a fun family game by numbering the jars and setting them around a table. Have each family member sniff the jars and write down their guess. Compare answers to each other and to the contents of the jars.
7. How hard was it to guess the contents? Did some things smell alike? What might make it easier to guess?
Create these adorable prey and predator puppets. The great thing about puppet play is that predators and prey can be the best of friends!

**Finger Puppet Mouse**

What You Need: A *sheet of white paper will make 4 mice*, A *plate appx 6-7” diameter for tracing*, Scissors, Glue stick, Markers

What To Do:
1. Trace the plate and cut a out circle. Keep the scraps for mouse details.
2. Fold the circle in half and in half again – so you have folded lines to mark out the pie shaped quarters.
3. Cut out the quarters – each one will make one mouse.
4. Add glue to one long edge of the quarter, roll up and secure. This is the mouse body.
5. Cut two tear drops for ears, one long thing piece of paper for the tail (curl with scissors) and two shorter thin strips of paper for whiskers.
6. Glue the tail to the bottom inside of the cone.
7. Color in the tear drop ears for the mouse, add glue about half way along the cone.
8. Cross the two short strips of paper, add glue and secure underneath the tip of the cone.
9. Draw two small black eyes and a little nose to match the ear color.

**Owl Puppet**

What You Need: *TP Tube, Markers, Crayons, Glue*

What To Do:
1. Fold the ends of the tube down to create ear tufts.
2. Now Just Get Creative!
   a. Glue on eyes and wings
   b. Draw on eyes and wings
   c. Create feathers with paper, pipe cleaners, foam shapes, confetti, what ever you have
   d. Draw on feet, glue on construction paper feet, make wire feet...
Down:
1. Bold stripes or patterns that draw the eye into the background is ____________ coloration.
2. When a predator hides and pounces on prey.
3. When predators work together to catch prey.
4. Prey use this to fool predators into thinking they are dangerous, already dead or injured.
5. Retractable ones help cats travel quietly.
6. When a predator sneaks up on prey.
7. This sense help prey animals avoid being attacked from behind.

Across:
3. The ability to blend into the surroundings.
6. Color ____________ refers to an animal’s ability to hide in plain sight by blending into the surroundings.
8. The evolutionary process by which a species becomes fitted to its environment.
9. Seeing to the sides.
11. Ability to judge distances.
12. Prey animals use this to let others know a predator is near.
13. Predators have these for grasping, tearing, shearing and cutting.

Word Bank
Adaptation
Camouflage
Hearing
Teeth
Ambush
Binocular
Claws
Cooperative
Peripheral
Resemblance
Disruptive
Signal
Help the rabbit escape the fox!!