



Who Eats Who?

Predators and Prey: Relationships and Functions



What are predators
and prey?

Predators eat other organisms. Prey are the organisms which the predator eats. Bear and fish, fox and rabbits are examples of predators and their prey "Predator" and "prey" are usually used for animals that eat animals, but you can apply same concept to plants: Bear and berry, rabbit and lettuce, grasshopper and leaf.



Predator and prey evolve together. The predators need the prey to eat to survive so they evolve with the adaptations they need such as speed, camouflage, a good sense of smell, sight, or hearing, the right kind of claws, teeth, mouth parts or digestive system, etc.



Predators are part of the prey's environment, and the prey dies if it is eaten, so it evolves what is necessary to avoid being eaten such as speed, a good sense of smell, sight, or hearing, a tough or spiny covering, unpleasant smell or taste, etc.



An example of evolution is that the fastest coyotes with the sharpest senses survive and reproduce; likewise, the fastest deer with the sharpest senses will survive and reproduce. They both get faster and sharper senses, so the relationship remains the same

Another example of predator-prey evolution is the Galapagos tortoise and the cactus it eats. On one of the islands, branches grow higher and there long-necked tortoises live. On a different island, branches are lower down and there short-necked tortoises live.



Functional traits in predator-prey relationships

Functional traits are any morphological (form), behavioral, or physiological trait of an organism associated with interactions that occur when organisms living in the same community directly or indirectly influence one another. Such traits include predator and prey size and personality, predator way of hunting, prey mobility, prey anti-predator behavior, and prey physiological stress.



Predator prey relationships are also impacted by environment and human intervention.

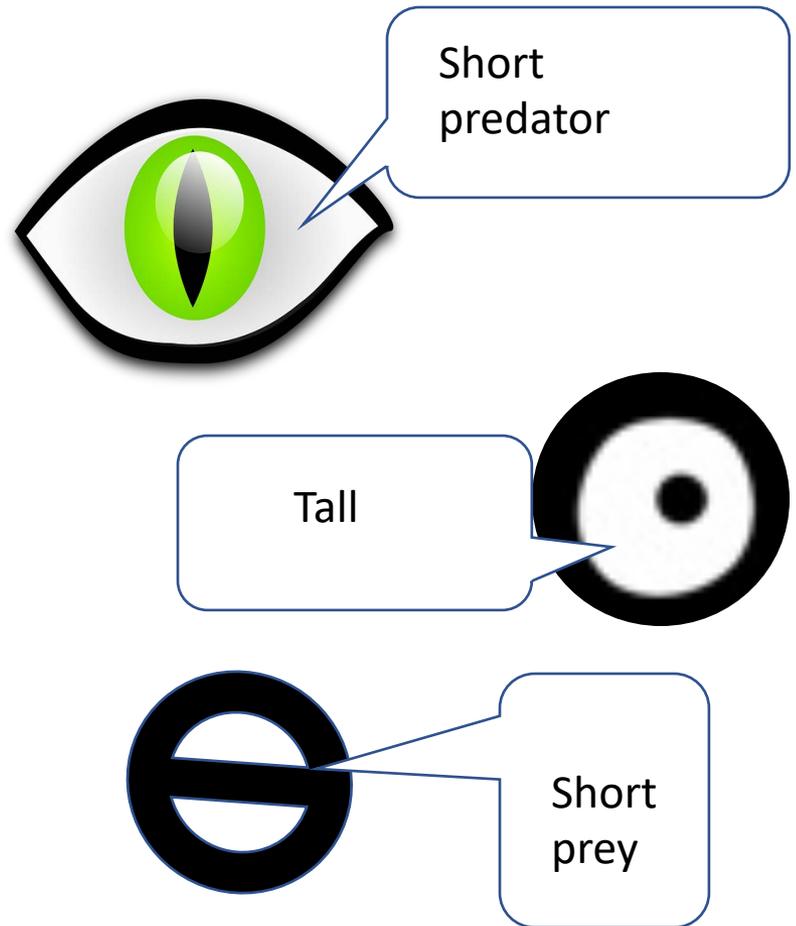
Predators and prey also compete for basic needs—space, shelter, water and food.

Human intervention and climate change can affect predator and prey relationships.

An example of human intervention affecting predator prey relationship is people putting out food and water for deer. The deer can become habituated (used to) humans and feel safe traveling in neighborhood streets, at risk for being hit by a car. Or the feeding may increase the herd size beyond the carrying capacity of the space, resulting in fewer births, or weaker fawns, as well as inadequate supplies of basic needs.

Animal Pupils

Pupil shape tends to relate to how animals find food and the time of day they are active. Vertically elongated pupils are likely to belong to ambush predators, active day and night, with eyes in front. Horizontally elongated pupils are likely to belong to prey with eyes on the sides. Vertically elongated pupils allow the predator to get sharp vision ahead, and to be able to estimate distance. Horizontally elongated pupils create a panoramic view, ahead, to the sides, and behind, to detect predators from different directions and on uneven terrain.



Predator adaptations



Predators need to obtain food without taxing available energy. They will hunt sick, old or very young prey which makes the prey population stronger. Predator adaptations include:

Big eyes in front with a narrow field and binocular vision

Long snout or Jacobson's mouth organ for sharp sense of smell

Ears that can swivel forward

Hunting strategies including stalking, sitting and waiting, and group hunting

Sharp claws and teeth for cutting, shearing and tearing, with strong jaws that move up and down

Superior strength and speed

Special features such as long tongues, webbed feet and oily fur

Larger brains with superior intelligence

Prey adaptations



Prey animals need to be able to forage (gather food) without being eaten so they develop adaptations to escape predators:

Camouflage--color resembling the environment, counter shading of two blended colors to hide contours, or distraction coloration like spots and stripes

Peripheral wide field vision, sharp hearing and sense of smell

Warning, visual and alarm signals like white tailed deer lifting their tails

Special defensive and chemical weapons like porcupine quills and skunk musk

Speed

Behavioral adaptations like playing dead or bluffing pretending to be dangerous, living in groups, or hiding in a burrow or tunnel

And population control by producing multiple offspring.

Prey typically have grinding teeth which move side to side, and a small brain.

You can be predator or prey!

I'm a hunter with sharp claws, (curling fingers)

Seeing straight ahead, strong jaws.
(pointing straight ahead with fingers at eye level)

I'm the hunted with my tools, (swiping hand down chest)

Warning colors and camouflage fools!
(swiping hand down chest)



You can sing the song to *Oh My Darling Clementine!*

I'm a predator

Hunting nightly.

I am strong and I have speed.

Stalking prey with stealthy movements

To obtain the food I need.

I'm a prey and have strategies

To the predator evade.

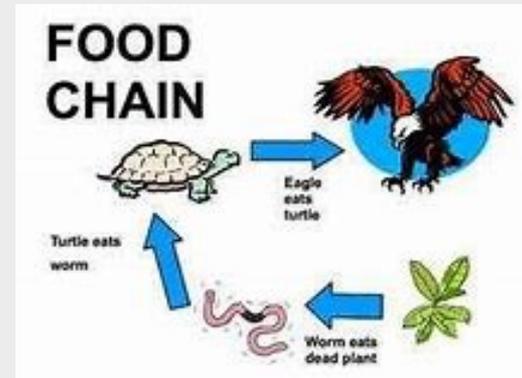
I can use my dappled colors

Hiding deep beneath the shade.



What's on the Menu?

All animals need to eat to get energy and stay healthy. Some animals eat plants and their fruit. Some animals eat other animals. Both are necessary for a healthy ecosystem.





I'm a
hunter
with sharp
claws,



See
straight
ahead, and
strong
jaws.



I'm the
hunted
stinky
smell



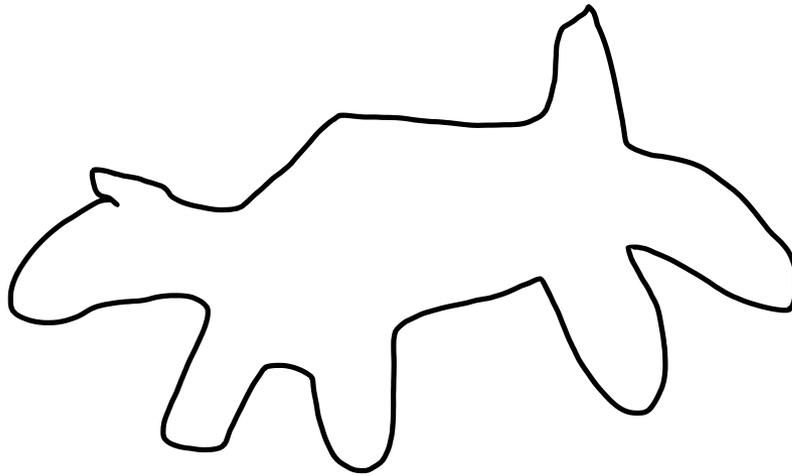
Hard and
scaly
protecting
shell!



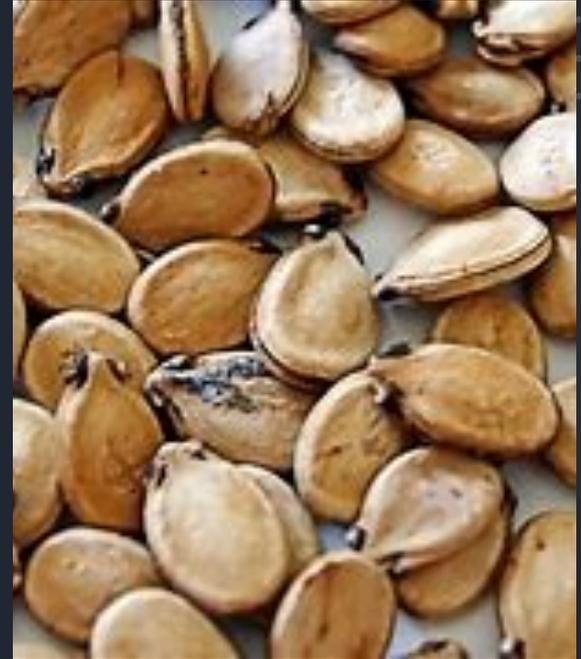
You can be a stalking predator
looking for places prey might hide!

What are some places around your neighborhood that prey could use to evade predators?

You can design a prey animal? What adaptations will you give it to evade predators?



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What's on the menu?

We can make a snack using foods to represent predator adaptations!

What foods might look like claws? Pretzel twists? Can you think of any others?

How about teeth? Pumpkin or sunflower seeds? What else?

You can make a mini-book!

1. Fold the paper in half
2. Then in half again.

