



## Relationships Among Organisms/ Life in Aquatic Systems (Freshwater)

High School Environmental Science | AP Module 1 | Lake Lotus Park

### NGSSS Big Idea: Standard 17—Interdependence

- A. The distribution and abundance of organisms is determined by the interactions between organisms, and between organisms and the non-living environment.
- B. Energy and nutrients move within and between biotic and abiotic components of ecosystems via physical, chemical and biological processes.
- C. Human activities and natural events can have profound effects on populations, biodiversity and ecosystem processes.

### Benchmark Code & Description:

**SC.912.L.17.2**—Describe changes in ecosystems resulting from seasonal variations, climate change and succession.

**SC.912.L.17.6**—Compare and contrast the relationships among organisms, including predations, parasitism, competition, commensalism and mutualism.



## LEARNING GOAL/OBJECTIVE

To understand how and why different organisms in the environment are interconnected and that something such as pollution, climate, etc., that affects an individual organism, can impact the whole ecosystem.



## PREREQUISITES

### **Review:**

- Vocabulary Words
- Applicable Textbook Sections



## VOCABULARY

---

- Habitat
- Niche
- Resource
- Predation
- Herbivory
- Symbiosis
- Mutualism
- Parasitism
- Commensalism
- Food web
- Food chain
- Food pyramid
- Trophic levels
- Primary producers
- Heterotroph
- Autotroph
- Heterotroph
- Consumer
- Omnivore
- Carnivore
- Herbivore
- Detritivore
- Scavenger
- Benthos
- Estuary
- Plankton
- Wetland



## HANDS-ON ACTIVITIES

---

### **Task(s):**

- Collect and identify samples from the lake and river.
- Use the Labquest meter and the appropriate probes to measure various conditions of the lake water. Document this data on a log sheet.
- Measure and document elements found in water samples .

### **Provided Materials:**

- Stream net
- Screen Filter Table
- Buckets and Baggies
- Gloves
- Log Sheet
- Clipboard & Pencil
- Labquest Meter
- Meter Probes: Nitrates, Phosphates, Turbidity, pH, Dissolved Oxygen, Chlorides

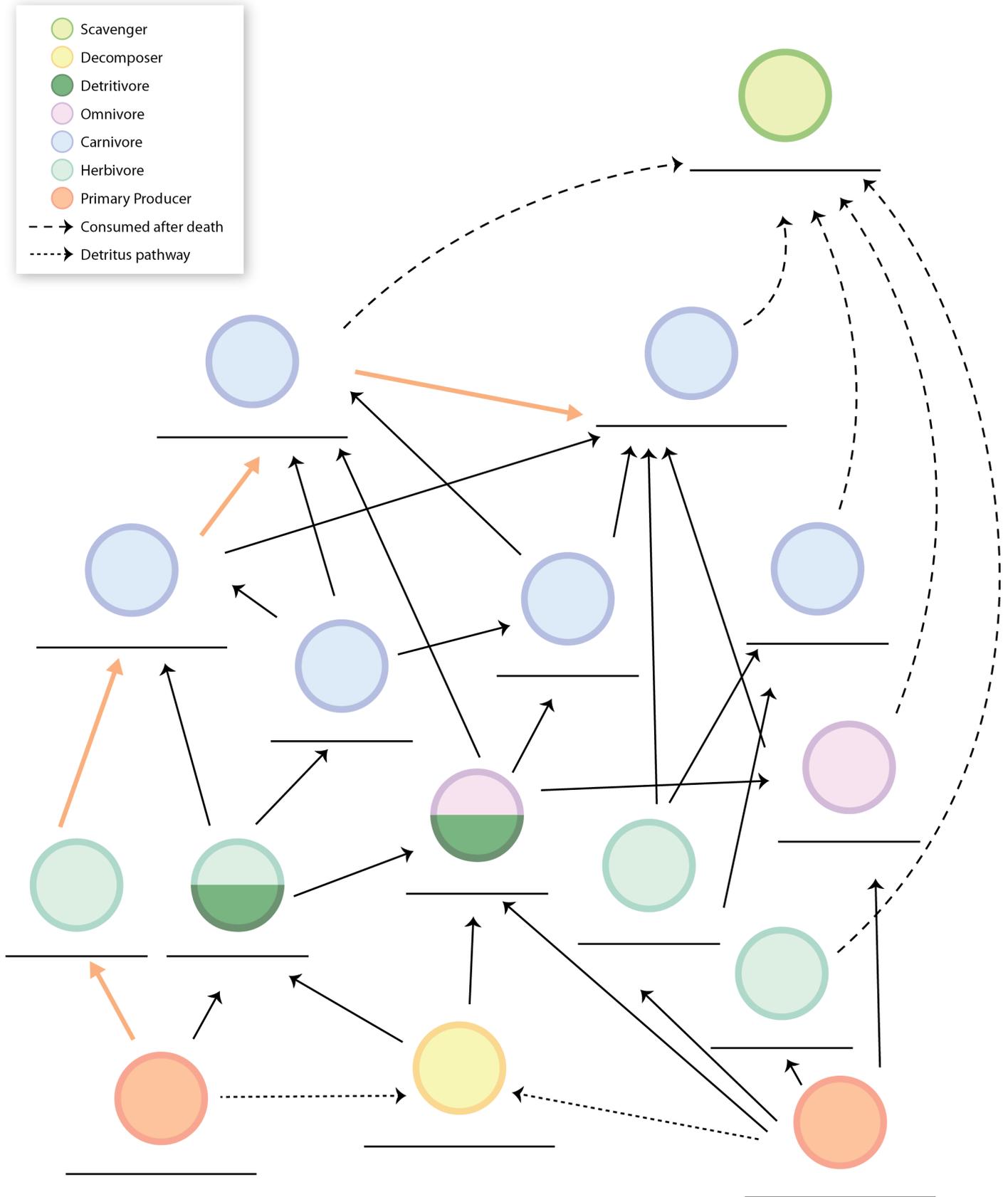
### **Career Options:** Freshwater Biologist, Water Quality Analyst

### **Lesson Steps:**

1. Students are further broken down to groups of 5.
2. Students will walk down towards the fishing pier. Students will collect and record on the data log, samples of various aquatic organisms and measure the water components at the river and at the lake.
3. Discussions will center around pollution tolerances, human impact and how organisms can be used to determine the condition of water systems.
4. Comparisons will be made between actual measurements of the water quality factors and the water quality indicated by the sample organisms collected.
5. Students will give examples of how water quality affects animal diversity and population densities in the natural environment.

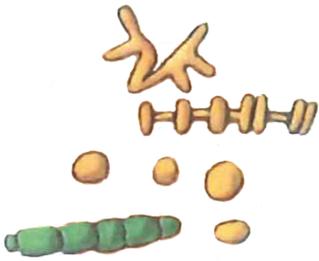
# Food Web in the Everglades

This food web shows some of the feeding relationships in the Florida Everglades. The orange-highlighted aquatic food chain is one of many that make up this food web. **Write the animal name under its corresponding circle on the food web. Think about what each animal eats and then use the key to decide where it should go.**

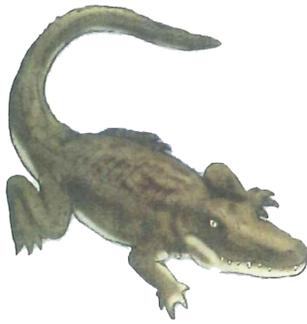


# Animals of the Everglades

Algae



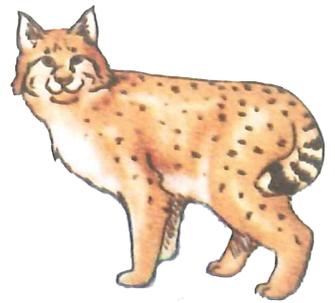
Alligator



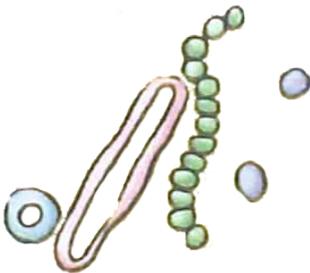
Anhinga



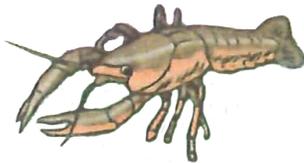
Bobcat



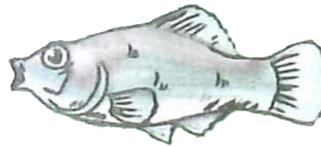
Detritus, bacteria and associated fungi



Everglades crayfish



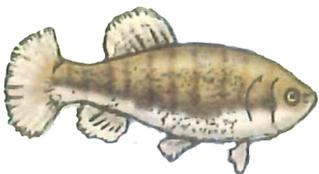
Flagfish



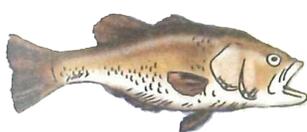
Glass shrimp and worms



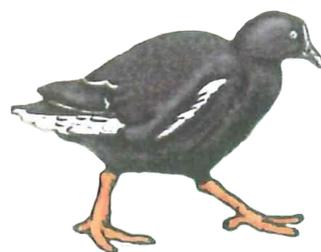
Killifish



Largemouth bass



Moorhen



Pig Frog



Plants, leaves, seeds and fruits



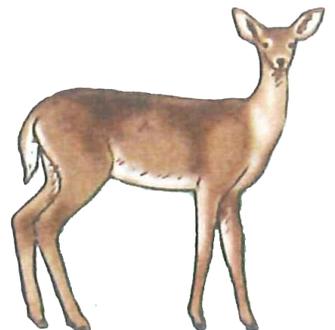
Raccoon



Vulture



White-tailed deer



## Pyramid of Biomass and Numbers

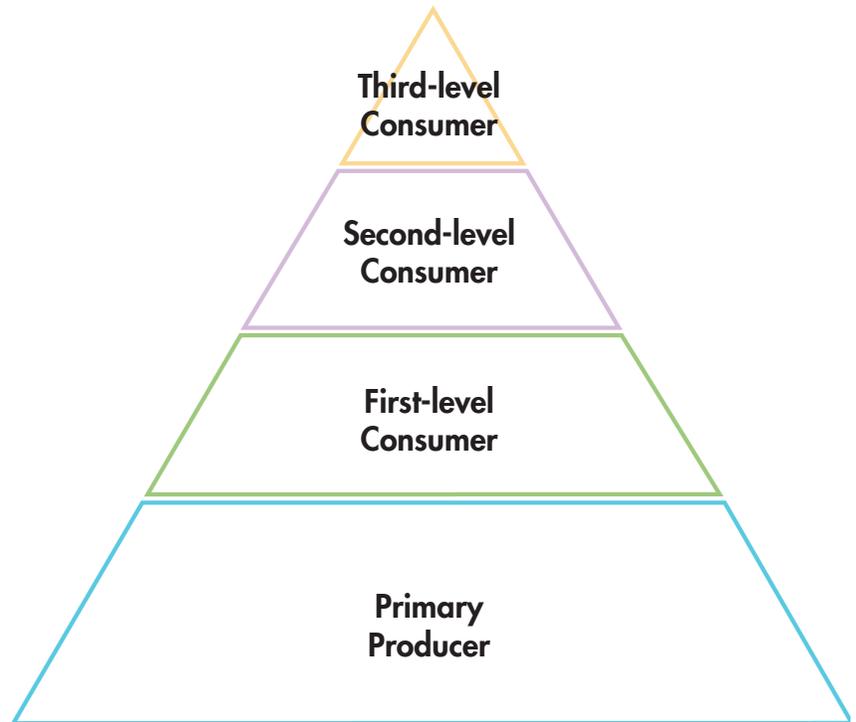
In most cases, pyramids of biomass and numbers follow the same general pattern. There are more individual primary producers than first-level consumers. And the primary producers collectively have more mass. With each step to a higher trophic level, biomass and numbers decrease. *Draw a line from the producers and consumers circles on the left to their corresponding group on the pyramid.*

Plants, leaves,  
seeds and fruits

Hawk

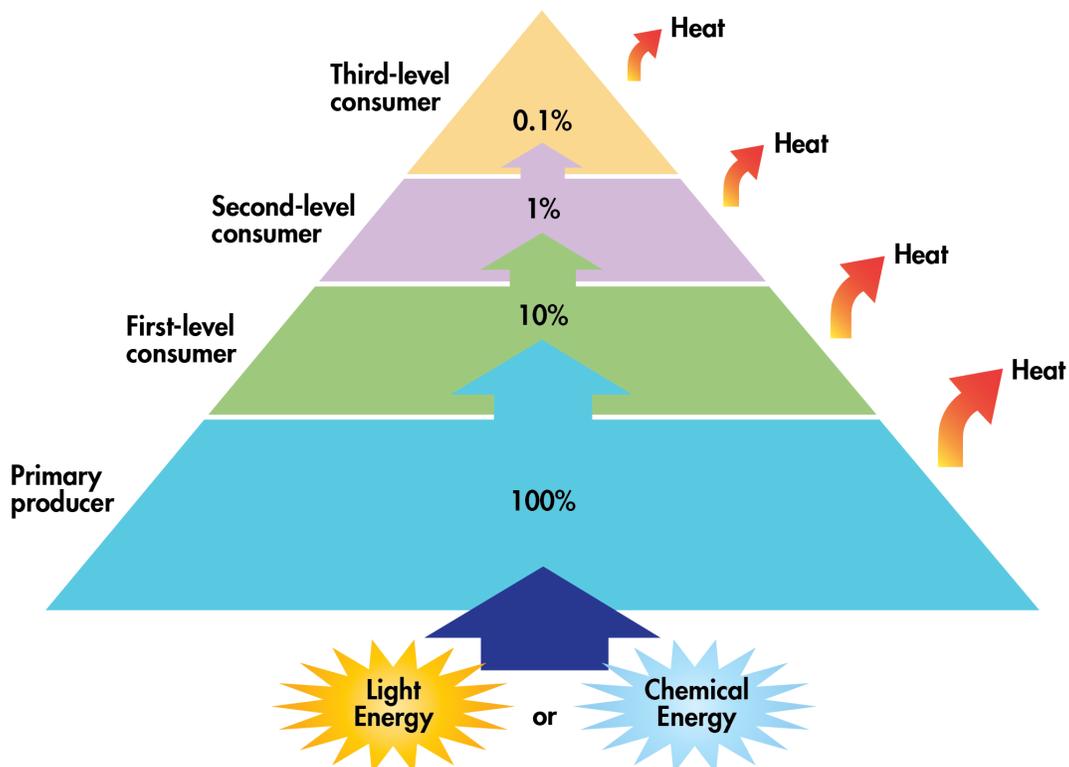
Rabbits, mice,  
grasshoppers

Snakes



## Pyramid of Energy

An ecosystem must have a constant supply of energy from photosynthesis or chemosynthetic producers.



## Organism & Fish Checklist

Check off the organisms and fish you found today.



Darnert Dragonfly Larva  
*Anax junius*



Damselfly Larva  
*Calopteryx maculata*



Diving Water Beetle  
*Dytiscus marginalis*



Southeastern Waterbug  
*Abedus immaculatus*



Freshwater Mussel  
*Elliptio buckleyi*



Gilled Snail  
*Viviparus georgianus*



Glass Shrimp  
*Palaemonetes kadiakensis*



Swamp Darter  
*Etheostoma fusiforme*



Banded Topminnow  
*Fundulus cingulatus*



Golden Topminnow  
*Fundulus chrysoths*



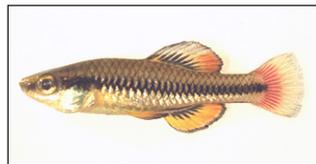
Seminole Killifish  
*Fundulus seminolis*



Flagfish  
*Jordanella floridae*



Rainwater Killifish  
*Lucania parva*



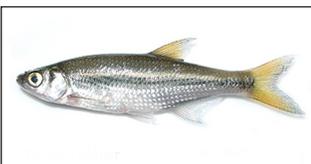
Bluefin Killifish  
*Lucania goodie*



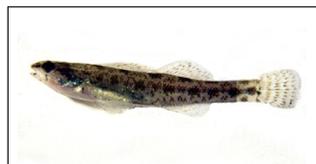
Costal Shiner  
*Notropis petersoni*



Ironcolor Shiner  
*Notropis chalybaeus*



Southeastern Golden Shiner  
*Notemigonus crysoleucas bosci*



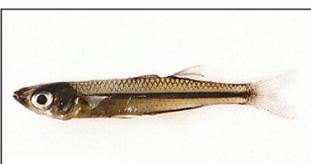
Blackbanded Darter  
*Percina nigrofasciatus*



Bluegill  
*Lepomis macrochirus purpurescens*



Redear Sunfish  
*Lepomis microlophus microlophus*



Inland Silversides  
*Menida beryllina atrimentis*



Least Killifish  
*Heterandria formosa*



Sailfin Molly  
*Poecilia latipinna*



Eastern Mosquitofish  
*Gambusia affinis holbrooki*