Animal Unit

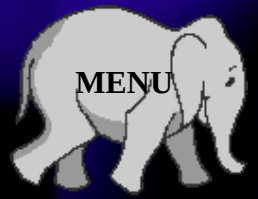
Menu

Common Characteristics

- 35 phyla of animals
- These phyla can be classified into two groups (vertebrates or invertebrates) based on external and internal physical characteristics.
- All animals share several common characteristics:

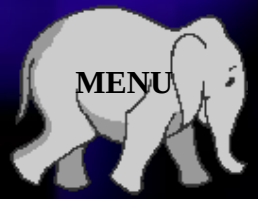
1. Their bodies are multi-cellular
2. They are heterotrophs
3. Their major functions are to obtain food and oxygen for energy, keep their internal conditions in balance, move, and reproduce.

Animal Diversity Web | Blue Planet Biomes



Vertebrates

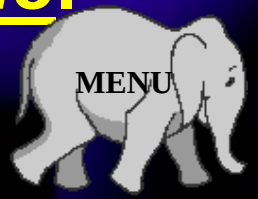
- Vertebrates comprise only one phylum of animals.
- Vertebrates share certain physical characteristics:
- They have backbones, an internal skeleton (*endoskeleton*), and muscles.
- They have blood that circulates through blood vessels and lungs (or gills) for breathing.
- They have a protective skin covering.
- Most have legs, wings, or fins for movement.
- They have a nervous system with a brain that processes information from their environment through sensory organs.



Vertebrates

- **Vertebrates differ in the way that they control their body temperature.**
- **In some (fishes, amphibians, and reptiles), their body temperature is close to that of their environment. They are considered *cold-blooded*, or *ectothermic*.**
- **In others (birds and mammals), their body temperature stays constant regardless of the temperature of the environment. They are called *warm-blooded*, or *endothermic*.**

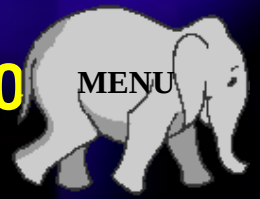
Warm Blooded vs Cold Blooded Link



Warm & Cold Blooded

***Warm-blooded* (endothermic) animals-**

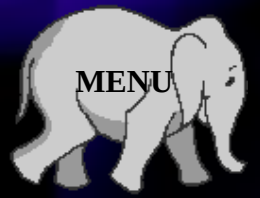
- **birds and mammals maintain a nearly constant internal temperature in any environment.**
- **When hot outside an endothermic animal can cool off by sweating, panting, changing position, or changing location.**
- **Sweating/panting generate heat loss through evaporating water.**
- **Endothermic animals eat more often than ectothermic animals since it takes energy to maintain a constant body temperature.**
- **Example: lions eat its weight in food every 7-10 days**



Warm & Cold Blooded

***Cold-blooded* (ectothermic) animals-**

- fish, amphibians, and reptiles have an internal body temperature that changes with environment.
- They must gain heat to perform activities like digestion.
- If it is cold outside, ectothermic animals move very slow. Some animals bask in the sun (lizards, snakes) or move to a warmer area (fish) before they can move about to hunt for food.
- If it is too hot outside, ectothermic animals will burrow in the ground to keep its body cool.
- Since cold blooded animals take on the temperature of their surroundings, they don't have to use food energy to keep warm. So, they don't have to eat as often.



Fish

Examples of vertebrates include:

Fish

- **Are cold-blooded (ectothermic); obtain dissolved oxygen in water through gills; most lay eggs; have scales; have fins; and live in water.**

MENU

Fish

Lamprey – Jawless Fish

Sea Ray - Chondrichthyes

Catfish - Osteichthyes

Whale Shark - Chondrichthyes

Amphibians

- Are cold-blooded (ectothermic); most can breathe in water with gills as young, and breathe on land with lungs as adults; go through metamorphosis; lay jelly-like eggs.
- The major groups of amphibians are frogs, toads, and salamanders.
- Frogs and salamanders have smooth, moist skin, through which they can breathe and live part of their life in water and part on land.
- Toads have thicker, bumpy skin and live on land.

MENU

Amphibians

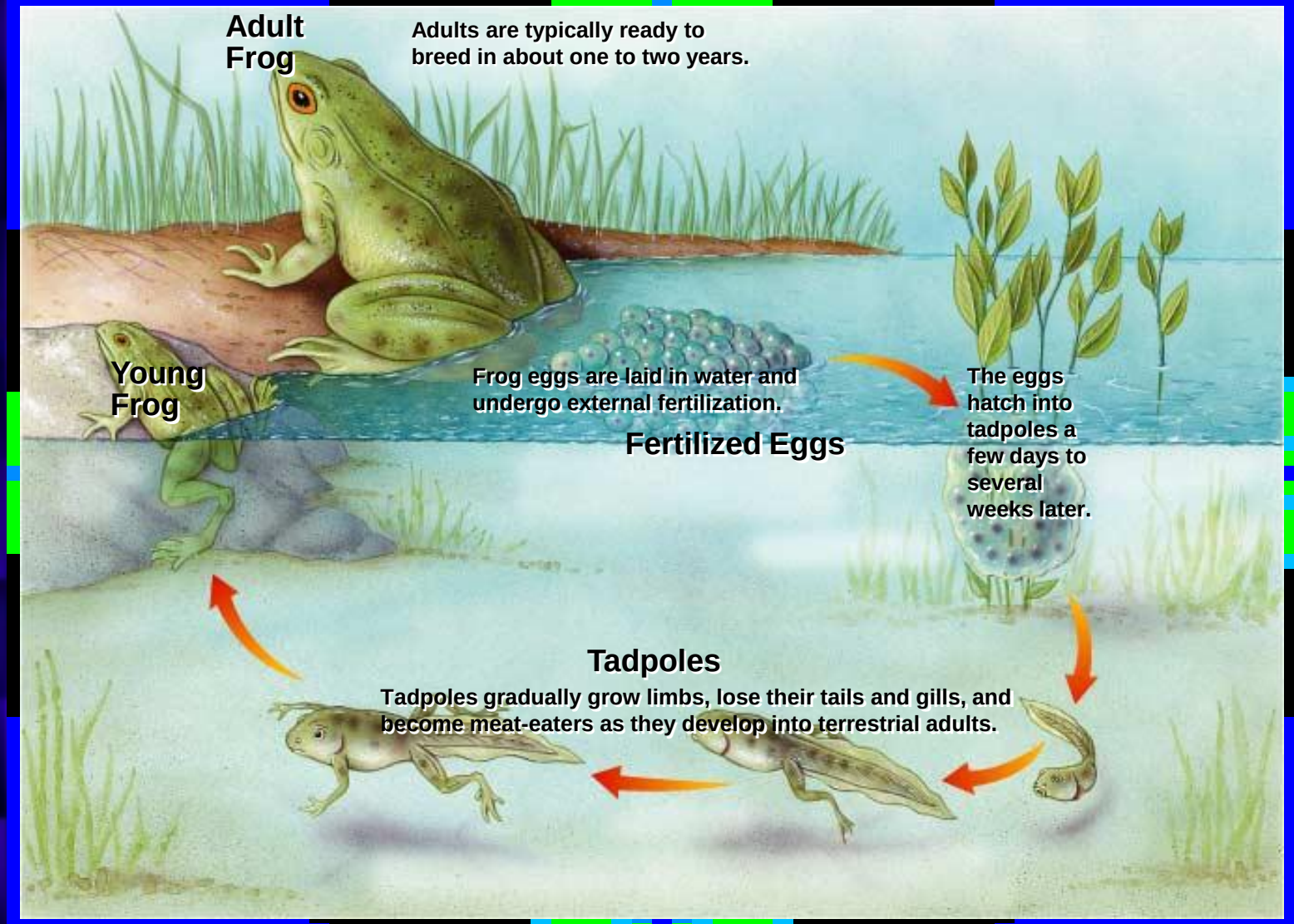
Spotted Salamander

Poison Dart Frog

Fire Bellied Toad

Caecilian

The Life Cycle of a Frog



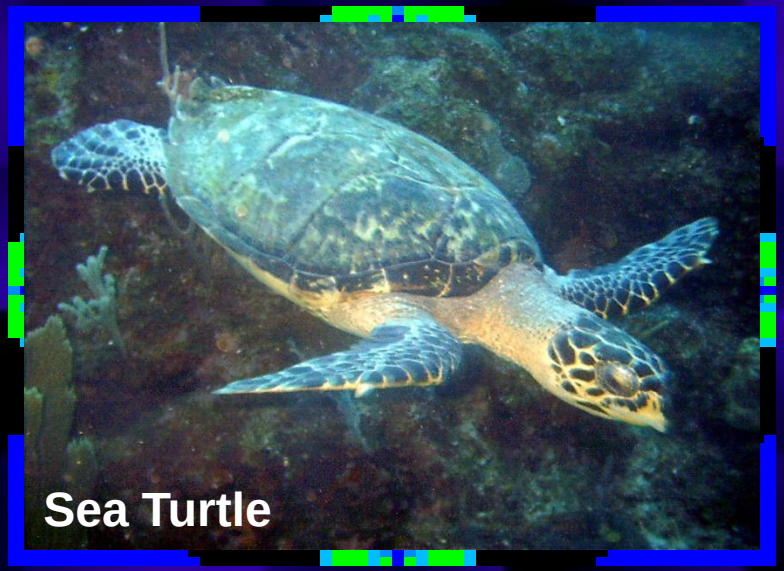
Reptiles

- Are cold-blooded (ectothermic); breathe with lungs; most lay eggs, although in some the eggs hatch inside the female; and have scales or plates.

MENU

Reptiles


Coral Snake


Sea Turtle


Galapagos Tortoise


Tuatara

Birds

- Are warm-blooded (endothermic); breathe with lungs; lay eggs; have feathers; and have a beak, two wings, and two feet.

MENU

Birds

Mammals

- Are warm-blooded (endothermic); breathe with lungs; most have babies that are born live; have fur or hair; and produce milk to feed their young.

MENU

Invertebrates

Vertebrates vs Invertebrates Link

- **They do not have backbones or internal skeletons.**
- **Some have external skeletons, called *exoskeletons*.**

Examples of invertebrates include:

Sponges

Segmented Worms

Echinoderms

Mollusks

Arthropods

MENU

SPONGES

- **Very simple animals that have many *pores* (holes) through which water flows.**
- **Water moves into a central cavity and out through a hole in the top.**
- **Sponges obtain their food and eliminate wastes through this passage of water.**
- **They have specialized cells for obtaining food and oxygen from the water.**

MENU

SEGMENTED WORMS

- Have long tube-like bodies that are divided into segments.
- They are the simplest organisms with a true nervous system and blood contained in vessels.

- A long digestive tube runs down the length of the worm's inner body.
- Worms take in dissolved oxygen from the water through their skin.
- Examples of segmented worms may be earthworms and leeches.

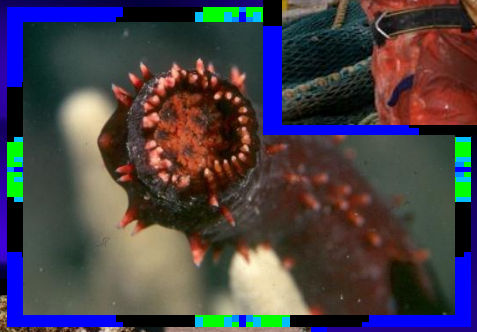
Worm Website

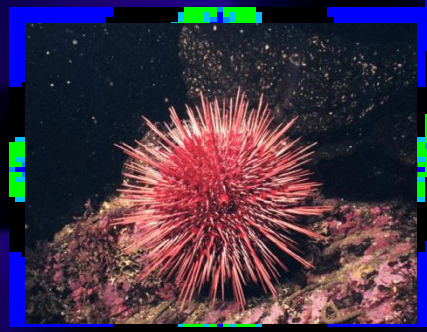
MENU

Invertebrates

ECHINODERMS

- Have *arms* that extend from the middle body outwards.
- They have tube feet that take in oxygen from the water and spines.
- Examples may be sea stars, brittle stars, sea cucumbers, or sea urchins.





MENU

MOLLUSKS

- Have soft bodies; most have a thick muscular foot for movement or to open and close their shells.
- They have more developed body systems than sponges or worms.
- They take in oxygen through gills or lungs, and some have shells.
- Examples may be slugs, snails, clams, and octopuses.

MENU

Invertebrates

ARTHROPODS

- Have jointed legs, segmented bodies, and some have wings.
- They have hard outer coverings called *exoskeletons.*
- They obtain oxygen from the air through gills or air tubes.
- Examples may be insects, arachnids, and crustaceans.

MENU

Defense

- Animals can hide from a predator or warn a predator by camouflage or patterns (mimicry)
- Animals can make a direct attack painful: horns, claws, quills, stingers, or venom
- Animals can change size to prevent a direct attack: shells, emitting smells or body fluids (ink),
- Animals can flee/hide from predators: body design, sensory organs, legs (speed or for jumping), wings, or light-weight skeletons (flight)

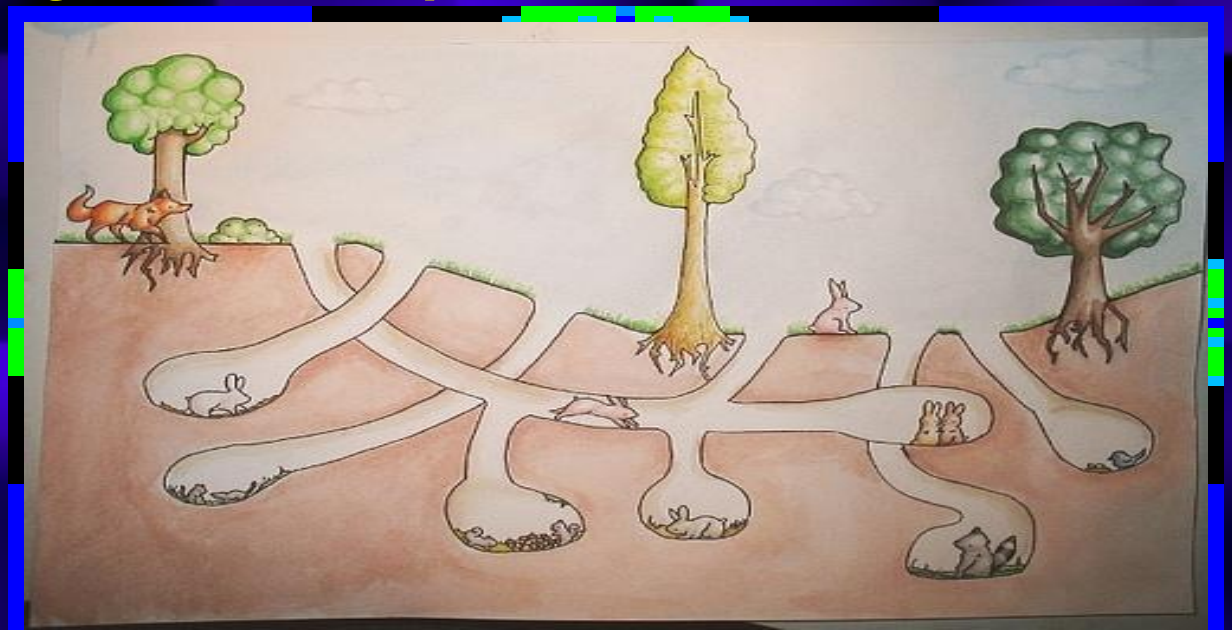
MENU

Defense

- Animals can construct holes/tunnels to run into and hide or to climb: paws or toenails

Structures for movement

- Allow animals to move to fulfill their needs such as finding food and escaping predators (for
- example legs, feet and arms, tails, fins, wings, body design, skeleton)



MENU

Resources

- Allow an animal to chew, tear, and eat its food or drink (for example mouth parts including beaks, teeth, flexible jaws, tongues, tube-shaped)
- Allow an animal to grab and hold its food (for example tentacles, pincers, claws, fangs)
- Allow an animal to consume food found in the water (for example filtering structures for filter feeders in sponges or clams)

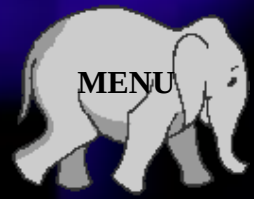
MENU

Resources

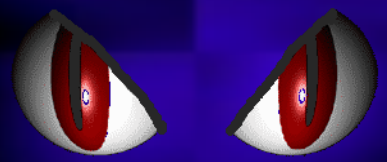
- **Animal responses to temperature changes needed to maintain internal temperature include:**

- ***Shedding*- animals may form thick coats of fur/feathers to insulate from cold weather; in hot weather animals will shed**

- ***Sweating*- *evaporating moisture is a* major way of getting rid of excess body heat.**
- ***Panting*- evaporation from the animal's mouth and lungs cools the animal**
- ***Shivering*- *involuntary response to* increase heat production**

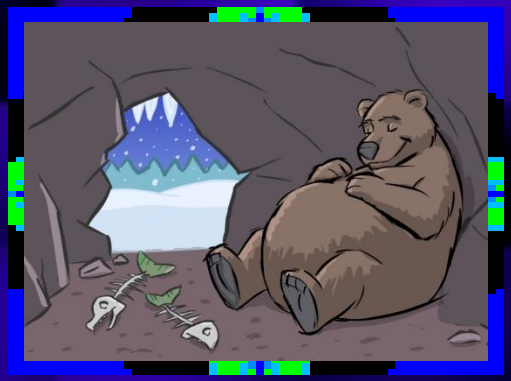


Stimuli



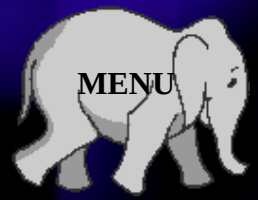
Responses to environmental stimuli include:

Blinking- an automatic response that helps to protect the eye from drying out, infection, foreign objects



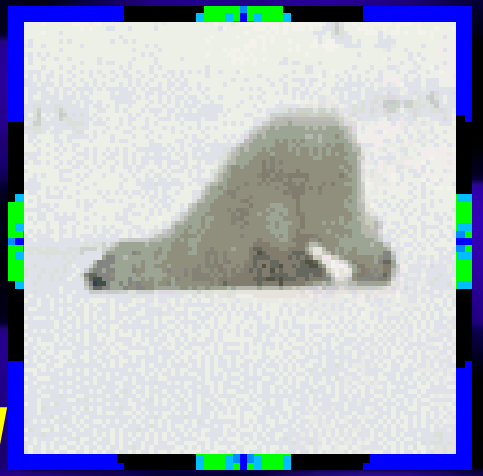
Food gathering- store food for the winter

- ***Examples: squirrels, mice, and beavers***
- ***Storing nutrition in the form of fat***
- ***Many animals will overeat and reduce their physical activity to conserve energy during cold weather or drought.***
- ***Examples: bears, penguins, walruses, chipmunks, or ants.***



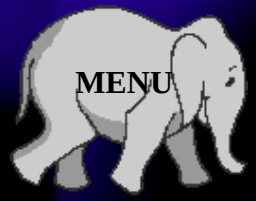
Stimuli

A behavior is a *set of responses to stimuli, how animals cope in the environment*



Hibernation

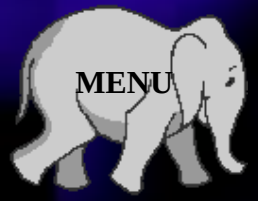
- ***winter weather (stimulus) causes some animals to hibernate.***
- ***Hibernation is a state of greatly reduced body activity, used to conserve food stored in the body.***
- ***body temperature drops, heartbeat and breathing slow down, and the animal uses little energy.***
- ***Examples: ants, snakes, black bears, beavers, and ground squirrels.***



Stimuli

Migration

- ***Migration is the movement of animals from one place to another in response to seasonal changes.***
- ***They travel to other places where food is available.***
- ***Migrating animals usually use the same routes year after year.***
- ***The cycle is controlled by changes in the amount of daylight and the weather.***
- ***Examples of animals that migrate are monarch butterflies, orcas, caribou, and ducks.***



Behavior

DEFENSE

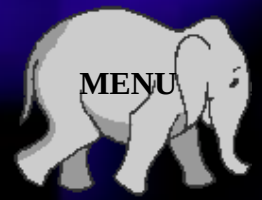
- ***Camouflage*- to survive changes in the environment.**

- In response to the weather: Artic fox, snowshoe hare They develop a white coat for the winter to blend in with the snow and a gray coat in the summer to blend in with the forest.

-Avoid predators: chameleons, other lizards change colors to blend into the environment to avoid predators.

- ***Smells: Skunks***
- ***Stingers: Wasps and bees***

Camouflage Website



Behavior

- ***Ejection*: octopus- gives chance to escape from a predator. When the horned lizard gets really scared, it shoots blood out of its eyes allowing it time to escape.**
- ***Mimicry*: When a weaker animal copies stronger animals' characteristics to warn off predators.**
- ***Example: scarlet king snake***

coral snake
(venemous)

scarlet king snake
(non-venemous)

MENU

Behavior

- ***Grouping*: This social behavior occurs when certain animals travel together in groups to**
- **protect individuals within the group or to fool a predator into thinking the group is one large organism. Examples may include herds (buffalo, zebra, cattle), packs (wolves), or schools of fish.**

MENU

COURTSHIP

- *behavioral process whereby adults of a species try to attract a potential mate.*
- *Courtship behaviors ensure that males and females of the same species recognize each other.*
- *Environmental stimuli, such as seasonal changes, will stimulate courtship.*

- *Often sensory cues (for example, chemical odor cues, sounds, or color) will serve as courtship attractants in animals.*

MENU

Behavior

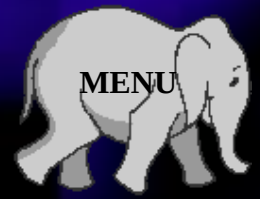
INTERNAL STIMULI-CUES

- *Examples of internal stimuli include: hunger, thirst, and the sleep.*
- *Sleep is required to restore the body's ability to function.*

MENU

Behavior

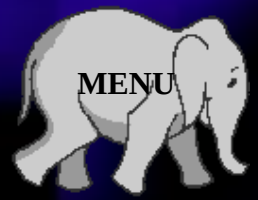
- *A behavior is an activity or action, in response to changes in the environment, which helps an organism survive.*
- *Some animal behaviors result from direct observations or experiences and are called learned behaviors.*
- *Imprinting is a behavior in which newborn animals recognize and follow the first moving object they see. Usually, this moving object is the mother. The imprinting behavior cannot be reversed.*



Behavior

- ***Conditioning*** *(which includes trial-and-error learning) is a behavior in which an animal learns that a particular stimulus and its response to that stimulus will lead to a good or bad result.*

- *For example, chimpanzees learn to use small sticks to dig in the soil for insects, or a child learns that touching a hot object will cause pain.*



Behavior

- ***Some animal behaviors are passed from the parent to the offspring and are with the animal from birth. These are called inherited ehaviors, or instincts.***

- ***Examples of instincts are:***
- ***The ability to swim in whales or fish. They do not need to be taught how to swim.***
- ***Crying in babies is an inherited behavior that is often a response to hunger, thirst, or sleepiness.***
- ***When a snail digs a hole to lay its eggs, a bird builds a special kind of nest, or when a fiddler***
- ***crab waves its claw to attract a female***