NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Unit 1C-Amphibians-Envirothon Mrs. Weimer

* CHARACTERISTICS of AMPHIBIANS
  + Amphibians are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which means their blood temperature rises and falls with that of the surrounding environment
* They use gills, lungs, skin, and mouth cavity in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* They have moist, smooth, thin skin with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + Feet \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the toes lack claws.
* Amphibians have many prominent characteristics that are adaptations to a life spent both on land and in water:
  + They change from an aquatic larval stage to a terrestrial adult  
    form. This transformation is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **Amphibians enter a state of dormancy or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_when conditions are unfavorable.  
  They often bury themselves in mud or leaves, emerging when conditions are better.**
* Such states of inactivity are known as known as:
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ when it occurs in the winter**
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ when it occurs in the summer**
* Larvae have \_\_\_\_\_-chambered hearts; adults have \_\_\_\_\_\_\_\_-chambered hearts and well-developed circulation.
* Eggs lack multicellular \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. They are usually laid in water or in a moist environment and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Pa Amphibians

Salamanders

Newts

Frogs

Toads

1. Salamanders
   * **Mole Salamanders**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
     + T\_\_\_\_\_\_\_\_\_\_\_\_\_ mole salamanders are identified by having wide, protruding eyes, prominent [costal](http://en.wikipedia.org/wiki/Costal) grooves, thick arms, and rounded tails. Most have vivid patterning on dark backgrounds.
     + Terrestrial adults spend most of their life underground in [\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_](http://en.wikipedia.org/wiki/Burrow) either of their own making or abandoned by other animals.
     + Lunged Salamanders
     + Adults spend little time in the water, only returning to the ponds of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
       - **Marbled Salamander**
         * Although other salamander species in the mole salamander family breed in water, the marbled salamander ­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
         * It migrates to a pond \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rains begin. There, the animal begins to court and mate.
         * Each female lays her clutch of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ eggs in a dry depression, and the embryos begin to develop.
         * A female usually stays with her eggs until autumn rains begin to fill the pond.
         * When the nest sites become flooded, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ within a few hours or days.

* After four to six months, the larvae have grown enough to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (or metamorphose), and leave the pond to live on land.
* Adults remain dormant underground during dry conditions, but they feed during opportune times and use much of their energy to grow and build up fat reserves.
* Adults usually reach a length \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ inches and live an average of four years.
* The bands on female marbled salamanders are more \_\_\_\_\_\_\_than males' bands, which are generally white
* **Jefferson Salamander**
  + - Because of living underground, and being \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, it is uncommon to see the Jefferson's except in the early spring when it migrates to ponds during the breeding season of March and April.
    - Between \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ eggs are laid.
    - Once the larva hatch, it takes \_\_\_\_\_\_\_\_\_\_ months to metamorphose into land living adults.
    - The male Jefferson's will breed with another mole salamander, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Their young are hybrids, known as triploid Jefferson's salamanders, are always \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Other Salamanders-

* **Eastern Hellbender**
  + - Hellbenders are extremely large, completely aquatic  salamanders native to the eastern United States. The largest hellbender ever recorded was nearly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - These salamanders need cool, clear streams and rivers with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. They feed almost entirely on crayfish, but will also eat small fish, invertebrates, and other hellbenders.

* Cool, clear streams are important because hellbenders breathe entirely through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_! They have lungs, but rely on the thousands of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ found in the fleshy folds of skin along their body and legs to get oxygen from the water.

* Hellbenders live a long time! The oldest known hellbender in captivity was \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and individuals in the wild likely live that long or longer. Because they live so long, the removal of adults from the wild can cause populations to dwindle

**Mudpuppy**

* + They never lose \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ during maturation from the tadpole into the adult stage-- beneficial since they will spend their entire lives underwater
  + Mudpuppies prefer shallow water with lots of places to hide, but have been found at depths of up to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + The mating season is late autumn however eggs are not laid until late spring when \_\_\_\_\_\_\_\_\_\_\_\_ eggs are deposited in a nest cavity under a rock or other object. It takes 1 to 2 months for the eggs to hatch and 4 to 6 years for the young to reach maturity.
  + Mudpuppies may live for up to \_\_\_\_\_\_\_\_\_\_!
* **Four Toed Salamander**
  + 4 in., rusty brown back, white belly with black spots, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on the hind feet.
  + Eggs are deposited in April and May in hummocks of sphagnum moss associated with water filled pools.
  + A single female lays about \_\_\_\_\_\_\_\_\_\_\_\_\_\_ but several females may lay eggs in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ resulting in several 100 eggs per nest.
  + Larvae transform in ­\_\_\_\_\_\_\_\_\_\_\_ weeks.
* **Longtail Salamander**
* Their tail comprises over \_\_\_\_\_\_\_\_\_\_the total length and has black marks on the sides that form a herringbone pattern.
* They reach \_\_\_inches in length.
* Long-tailed salamanders are usually encountered along streams, in seepage areas and springs, and in caves.  They may also occur in terrestrial habitats.
* **Northern Dusky Salamander**
* They are about 2.5-4.5” long.
* They are found in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* About ­\_\_\_\_\_\_\_\_\_\_\_ eggs are deposited from June to July in cavities under rocks, logs, leaves, or mosses close to water.
* Nests are guarded by the \_\_\_\_\_\_\_\_And eggs hatch in late summer or early autumn.
* Larvae transform into juveniles in about \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **Northern Spring Salamander**
  + Largest \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ @ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* They will lay eggs from July to August. The clutch size is from 20-60 and they hatch in about 3 months.
* The adults are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the aquatic juveniles are more active in the day.
* This species is dormant in the summer
* The females mature at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **Northern Two Lined Salamander**
  + They are found in or near small streams with rocky bottoms, seepages, and flood plains.  They are frequently found under rocks and logs in forests.
  + In March and April, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ eggs are either attached to the undersides of rocks or broadcast among small rocks and sand.

* **Northern Red Salamander**
  + They have the potential to be quite long-lived, surviving for \_\_\_\_\_\_\_\_\_ years as aquatic larvae, and may mature to a ripe 20 years of age!
  + Living in or near cool, clear springs or streams, adults tend to be mostly aquatic in the fall and winter, and become more terrestrial in the warmer months of spring and summer.
  + On land, they stay mostly underground in \_\_\_\_\_\_\_\_\_\_\_, or they may seek a variety of shelter including under rocks or logs
* **Northern Redback Salamander**
  + It is a small, hardy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Throughout most of its range it is often the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + The red-backed salamander is found in mostly two color variations: the nominate red variety, as well as a darker phase known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_which lacks most or all of the red pigmentation found in the red phase.
* **Slimy Salamander** 
  + They are 5-7” Woodland Salamanders
  + This amphibian has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that secrete a thick, gluey substance. Its is extremely sticky and very difficult to remove.
  + They mate both in spring and the fall
    - Eggs are laid in the early fall
  + Mostly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **NEWTS**
* **Red-Spotted Newt**
* Eastern newts have three stages of life: the aquatic \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* The larva possesses gills and does not leave the pond environment where it was hatched. Larvae are brown-green in color, and shed their gills when they transform into the terrestrial red eft. The red eft is bright [orangish](http://en.wikipedia.org/wiki/Orange_%28colour%29)-[red](http://en.wikipedia.org/wiki/Red) in color, with darker red spots outlined in black.
* After \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the eft finds a pond and transform into the aquatic adult. The adult's skin is olive green, but retains the eft's characteristic outlined red spots. It has a larger and wider tail and characteristically slimy skin.
* FROGS

**Bullfrog\***

* They are the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in N. America.
* It can grow to a length of 6 inches with a weight of up to one pound.
* \_\_\_\_\_\_\_\_\_\_\_\_are typically larger than males.
* They are aptly named since their call is a loud, guttural bellow that carries a long distance, giving the impression that the frog is much larger than it actually is, which is an advantage in keeping \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Eastern Gray Treefrog\***

* 1 1/4 - 2 in. green to gray to brown; light spot beneath eye; bright yellow or orange on underside of hind legs; large toe pads; a rough or bumpy skin on its back, usually with darker blotches.
* Habitat: \_\_\_\_\_\_\_\_\_\_\_\_\_ growing in or near water.
* Breeding: May through mid-July.
* Voice: A short, loud trill lasting up to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; slower and more melodic.

**Pickerel Frog\***

* 1 3/4 - 3 in. brown or tan; rectangular spots, without light borders, in parallel rows down the back; bright yellow or orange on concealed surfaces of hind legs; light stripe on upper lip; ridges along its back which extend to the groin.
* Habitat: Cool, clear waters of spring fed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Breeding: April through mid-June.
* Voice: A steady, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with little carrying power; similar to leopard frog

**Northern Green Frog\***

* 2 1/4 - 3 1/2 in. green to brown; ridges along its back that do not reach groin; green on upper lip.
* Habitat: All types of \_\_\_\_\_\_\_\_\_\_\_\_\_\_-Bodies of water.
* Breeding: June through July.
* Voice: Similar to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, usually given as a single note.

**Northern Leopard Frog\***

* 2 - 3 1/2 in. green or brown; rounded spots with light borders; light stripe on upper lip; ridges on its back which extends to groin.
* Habitat: Lakes, streams, rivers, ponds; often far from standing water.
* It is sometimes called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Breeding: April through mid-June.
* Voice: A deep, rattling snore interspersed with "chuckling" or the sound of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; similar to pickerel frog.

**Northern Spring Peeper\***

* 3/4 - 1 1/4 in. They are tan to brown to gray depending on their surroundings. Peepers have a dark, often imperfect, "x" on the back; a plain belly and large toe pads.
* Habitat: Wooded areas with temporary or semi-permanent \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Breeding: March through May.
* Voice: A high ascending "peep," sometimes with a short trill; chorus \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Did you Know. . . that in winter, peepers' bodies freeze--but their cells don't rupture because of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in them. These sugars act as a kind of natural anti-freeze.
* One the first frogs to leave its winter home and prepare for breading.
* Breading season: March- May
  + initialized by the 1st warm rains.
* Tadpoles develop in 6-12 days
* Complete Metamorphosis in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

90-100 days

**Upland Chorus Frog**

* 3/4-1 1/2 in. greenish-gray to brown; 3 dark stripes down the back; light stripe on upper lip; small, round toe pads.
* Habitat: Forested areas often \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Breeding: March through May.
* Voice: A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Wood Frog\***

* Adults emerge from hibernation in early spring and migrate to nearby pools.
* Eggs are deposited in masses that float on the surface, often aggregated with those of other females in \_\_\_\_\_\_\_\_\_\_\_\_
* Larvae quickly develop and emerge in early to mid summer.
* Following successful metamorphosis, juveniles travel to neighboring moist woodlands. A small percentage will disperse and breed in other pools, but the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to breed.
* Adult Wood Frogs spend summer months in moist woodlands, forested swamps, and bogs where they forage and maintain body moisture as surrounding environments dry out.
* By late fall most leave forested swamps and travel to neighboring uplands to \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Diurnal: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Solitary and Natural Camouflaged
* Medium size frog: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than male
* Capable of jumping farther more than most
* Found throughout PA
* Call: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Habitat: Damp Woodlands
* Eats Mostly insects and other

small invertebrates

* **TOADS**
* **American Toad\***
* 2 - 4 1/2 in. brown to red to olive; dark, warty skin; \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ found at the ridge behind the eye or connected by a short spur.
* Habitat: Common in a variety of habitats wherever there are insects, moisture, and a variety of shallow waters for breeding.
* Breeding: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Voice: A musical trill lasting up to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, with considerable individual variation in the tone.
* **Fowler’s Toad\***
* Similar to the American toad, though it is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Habitat: flood plains and river bottoms, as well as woodland borders and they dig burrows into the sand in which they hide during the day.
* Females deposit as many \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ eggs in long, double-row strings.
* Reproduction: mating call sounds like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ during the night.



FOUR TOED SALAMANDER



LONG TAIL SALAMANDER



NORTHERN DUSKY SALAMANDER

* **Threatened and Endangered Amphibians**
* **Endangered:**

* **Threatened:**



MARBLED SALAMANDER



JEFFERSON SALAMANDER



EASTERN HELLBENDER





SLIMY SALAMANDER



RED SPOTTED NEWT



BULLFROG



EASTERN TREEFROG

MUDPUPPY



NORTHERN SPRING SALAMANDER



NORTHERN TWO LINED



NORTHERN RED SALAMANDER





WOOD FROG



AMERICAN TOAD



FOWLER’S TOAD

Spring peeper

Upland Chorus

NORTHERN REDBACK SALAMANDER



PICKEREL FROG



NORTHERN GREEN



NORTHERN LEOPARD