

# Natural History along the Natchez Trace Parkway



Classroom Lesson:

## Across the Trace (Code EAT)

➤ **Grade Level:**

3<sup>rd</sup>-4<sup>th</sup>

➤ **Subject Areas:**

Science,  
Language Arts,  
Social Studies

➤ **Setting:**

Classroom

➤ **Duration:**

Two class periods  
1: Salamander study  
2: Poster development

➤ **Skills:**

Deduction,  
prediction,

➤ **Vocabulary:**

Salamander, gills,  
cold-blooded, larva

**Summary:**

The students will learn about the life and hardships of the life of the spotted salamander and develop a poster to advertise their plight.



**Materials Needed:** Life stages worksheet and Across the Trace worksheet for each student. A picture of a frog tadpole is optional but helpful. Materials to produce a poster or a drawing.

## Instructional Information

**3<sup>rd</sup> Grade Tennessee Learning Expectations Science:**

**Embedded Technology & Engineering:**

GLE 0307.T/E.5 Apply a creative design strategy to solve a particular problem generated by societal needs and wants.

**Heredity:**

GLE 0307.4.1 Identify the different life stages through which plants and animals pass.

GLE 0307.5.1 Explore the relationship between an organism's characteristics and its ability to survive in a particular environment.

GLE 0307.5.2 Classify organisms as thriving, threatened, endangered, or extinct.

**4<sup>th</sup> Grade Tennessee Learning Expectations Science:**

**Interdependence:**

GLE 0407.2.1 Analyze the effects of changes in the environment on the stability of an ecosystem.

**Biodiversity and Change:**

GLE 0407.5.1 Analyze physical and behavioral adaptations that enable organisms to survive in their environment.

GLE 0407.5.2 Describe how environmental changes caused the extinction of various plant and animal species.

**3<sup>rd</sup> Grade Tennessee Learning Language Arts:**

**Logic:**

GLE 0301.5.1 Develop logic skills to enhance thoughtful reasoning and to facilitate learning.

GLE 0301.5.2 Use learned logic skills to make inferences and draw conclusions in a variety of oral and written contexts.

GLE 0301.5.3 Apply learned logic skills to selections read, as well as to classroom situations.

**Media:**

GLE 0301.7.1 Recognize that media can be a source of information and/or entertainment.

GLE 0301.7.2 Use media to publish and present information.

**4<sup>th</sup> Grade Tennessee Learning Language Arts:**

**Communication:**

GLE 0401.2.1 Continue to develop oral language skills necessary for communication.

**Logic:**

GLE 0401.5.1 Continue to develop logic skills to facilitate learning and to enhance thoughtful reasoning.

GLE 0401.5.2 Use logic to make inferences and draw conclusions in a variety of oral and written contexts.

GLE 0401.5.3 Apply logic skills to classroom situations and to selections read.

**Media:**

GLE 0401.7.1 Recognize that media can be a source of information and entertainment.

GLE 0401.7.2 Use media to publish and present information.

**3<sup>rd</sup> Grade Tennessee Learning Social Studies:**

**Geography:**

3.01 Understand how to use maps, globes, and other geographic representations, tools, and technologies to acquire, process and report information from a spatial perspective.

3.02 Recognize the interaction between human and physical systems around the world.

**4<sup>th</sup> Grade Tennessee Learning Social Studies:**

**Geography:**

3.01 Understand how to use maps, globes, and other geographic representations, tools, and technologies to acquire, process and report information from a spatial perspective.

3.02 Recognize the interaction between human and physical systems around the world.

**Learning Objectives:** The students will learn 1) the life cycle of the spotted salamander, 2) where it lives, 3) the life needs of the spotted salamander 4) how humans influence the spotted salamander life cycle.

**Teacher Set:** Discuss the life history of salamanders with students using drawings provided or photo from books and/or the internet. The students will learn that spotted salamanders live in their neighborhoods (see range map) and along the Natchez Trace Parkway but they have difficulty when it comes to surviving traffic along the Natchez Trace Parkway. The students will be directed to complete the Life Stages worksheet (one is in chronological order, one is mixed up). The teacher will direct the students to make a creative “public service announcement” about the plight of the Spotted Salamander.

**Teacher Overview:** (see attached Fact Sheet) The spotted salamander is indigenous to the areas surrounding the Natchez Trace Parkway. (see Teacher Information Sheet) When the salamanders breed, they usually return to the same vernal pond from which they hatched. Unfortunately for some populations, this presents a hazard as the Natchez Trace Parkway is in between their forest habitat and the vernal breeding ponds. In the spring during the first few warm rains, the salamanders migrate en masse to the vernal pools. This means that many of them are crossing the road at the same time. Unfortunately, many are killed during this reproductive migration. As time passes, the salamander population may be affected. They are not an endangered or threatened species, but they are a species that has been in Mississippi for as long as anyone knows.

**Student Instruction:** The students will learn about the life stages of the Spotted Salamander and put the life stages in the correct sequence. They may also color the page appropriately. The students will study the map and discuss the plight of the salamanders. The students will create a poster to advertise the problem and they may present a possible solution.

**Student Task:** Students will participate in a teacher lead class discussion about the needs and characteristics of the spotted salamander and then complete the Life Stages worksheet.

They will look at the map and discuss the effect of living on one side of the Natchez Trace and laying eggs in pools on the opposite side. Have the students look at the map. Explain to them that it is a picture taken from above, as if the photographer were in an airplane. Have them locate the Natchez Trace Parkway, the neighborhood, the forested area and the letters showing where the spotted salamanders live and where they lay their eggs. The salamander live at “A” and breed at “B”.

Discuss the facts that:

- ♥ Spotted salamanders lived in Mississippi long before the Natchez Trace Parkway was built.
- ♥ Spotted salamanders almost always lay their eggs in pools where they were hatched.
- ♥ During egg laying season, they migrate during cool rainy nights during the spring.

Ask the students what problems the salamanders would have crossing from one side of the Natchez Trace to the other on dark rainy nights. The student should determine that the spotted salamanders will get run over by motorists traveling 50 miles an hour on the Natchez Trace. Students should also note that the egg pools are in an area that is becoming more and more developed.

In small groups, the students will create a poster that advertises the plight of the migrating salamanders. They may present an idea for a solution. The poster should encourage people to be aware of the spotted salamander and the problem they have crossing the road.

**Teacher Closure:** Ask the students to compare and contrast the spotted salamander development with frog development. Salamanders are similar to frogs because frog lay eggs in the water too. Ask the students if they have ever seen tadpoles. Explain that a frog tadpole starts with only back legs and a salamander larva starts with only front legs. Hang the posters or pictures were other students in the school can see the posters that the class produced.

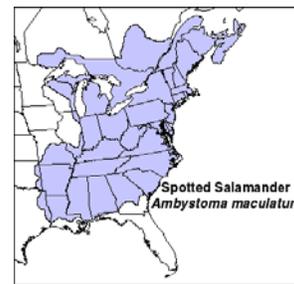
**Student Assessment:** Participation in discussion. Correct answers and color combinations on the Life Stages worksheet. Creativity and appropriateness of poster.

**Suggestions for re-teaching:** Review the spotted salamander when teaching about other animals.

**Teaching extension:** Have the students research and write a short report on the Spotted Salamander or some other animal that lives along the Natchez Trace Parkway.

**Teacher Information: Fact Sheet for  
Spotted Salamander *Ambystoma maculatum***

**Kingdom:** Animalia  
**Phylum:** Chordata  
**Class:** Amphibia  
**Order:** Caudata  
**Family:** Ambystomatidae - Mole Salamander



**Description:** Spotted Salamanders are black, dark grey or brown with 24 to 45 round yellow or sometimes orange spots. The belly is dark grey. The females may grow up to 10 inches (25cm) long. The males are usually 6 inches (15cm) or less. Glands on their backs and sides produce a mildly toxic nasty tasting liquid if the spotted salamander is grabbed by a predator.

**Habitat:** They usually live in shallow burrows they have found and only leave them during breeding season or when they cannot find enough food in their burrow. They are territorial and protect their burrows from other spotted salamanders. Each salamander only uses about 9 square yards (9 m<sup>2</sup> or 29 ft<sup>2</sup>) of forest floor.

**Life History:**

**Eggs:**

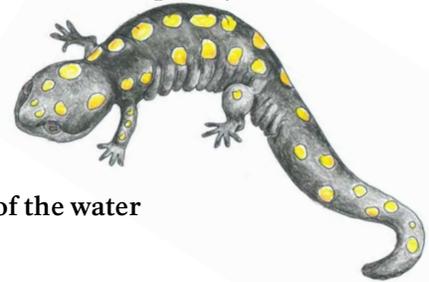
- laid in water in jell-covered groups of 100-300 eggs
- attached to vegetation or debris on bottom of pool
- take 28 to 49 days to hatch, depending on the temperature of the water

**Larval stage:**

- has gills and weak front legs when they hatch
- about 12 to 17 mm (1/2" to 2/3" inch) long when they hatch
- are dull olive green
- live in leaf litter on the bottom of vernal pool
- take 60-120 days to metamorphose into small adult (27 to 60 mm)

**Adult:**

- active only at night
- eats insects, worms, spiders, millipedes
- take two to three years to become an adult (or in the north, up to 7 years)
- may live up to 30 years

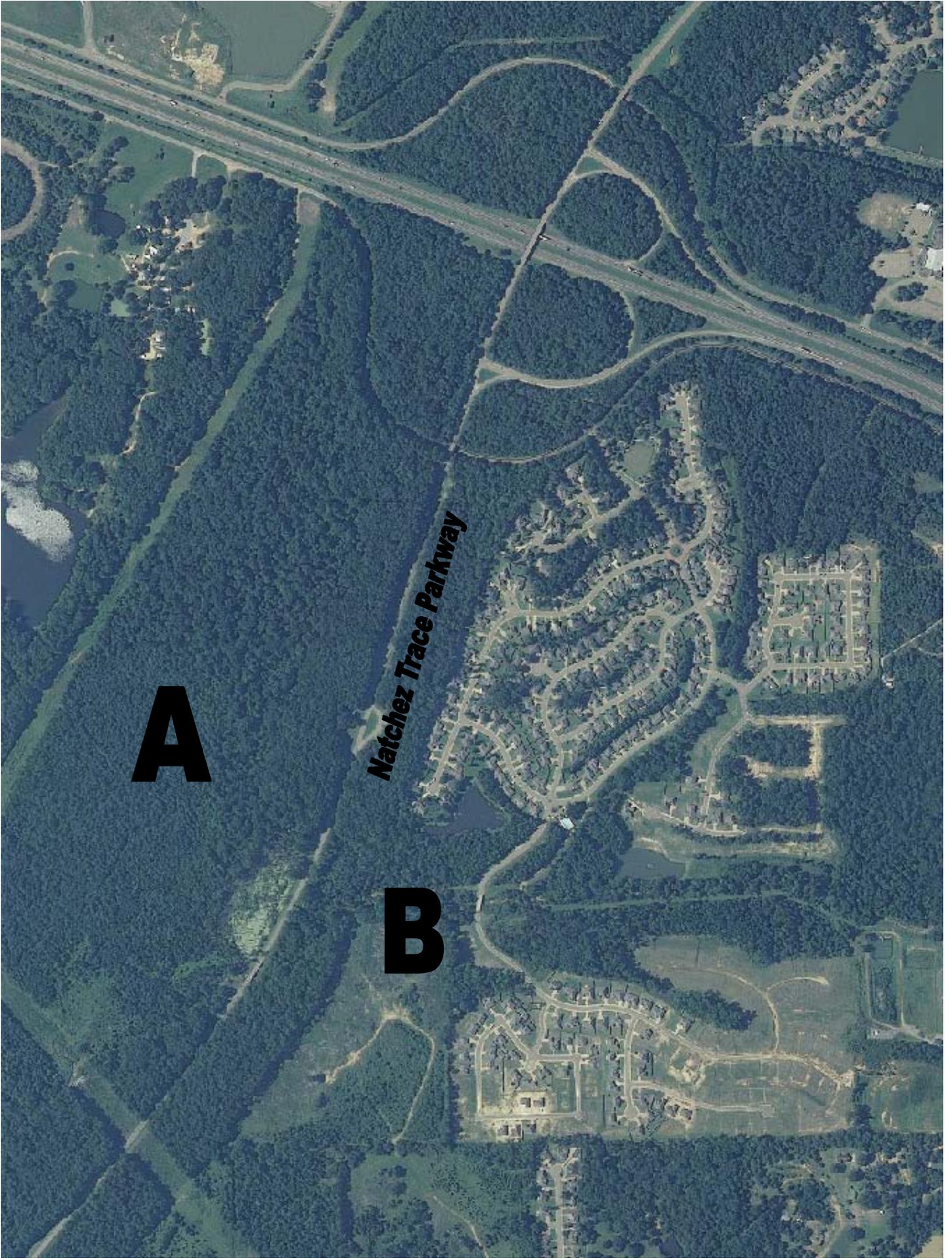


**Breeding behavior:** Vernal ponds are ponds that exist during rainy seasons but disappear during warmer dryer seasons. They lay eggs in vernal ponds because these ponds do not contain fish that would eat the salamanders' eggs. The pond where a salamander lays its eggs is usually the very same one from which it hatched. Salamanders return to the same pond year after year to breed. They will bypass closer ponds to find their home pond.

Their breeding routine starts with spring rains. They migrate en masse from their forest habitat areas to the ponds. They move to the ponds only on rainy nights. The males get to the ponds before the females and do a special "dance", bumping each other and coming up to the surface to gulp air.

Of the approximately 200 eggs laid, only about 40 survive to leave the pool. Of those 40, perhaps only one will survive to adulthood.

Information from: Pajerski, L., G. Hammond and N. Stout. "Ambystoma maculatum" (On-line), Animal Diversity Web. Accessed May 25, 2010 at [http://animaldiversity.ummz.umich.edu/site/accounts/information/Ambystoma\\_maculatum.html](http://animaldiversity.ummz.umich.edu/site/accounts/information/Ambystoma_maculatum.html).

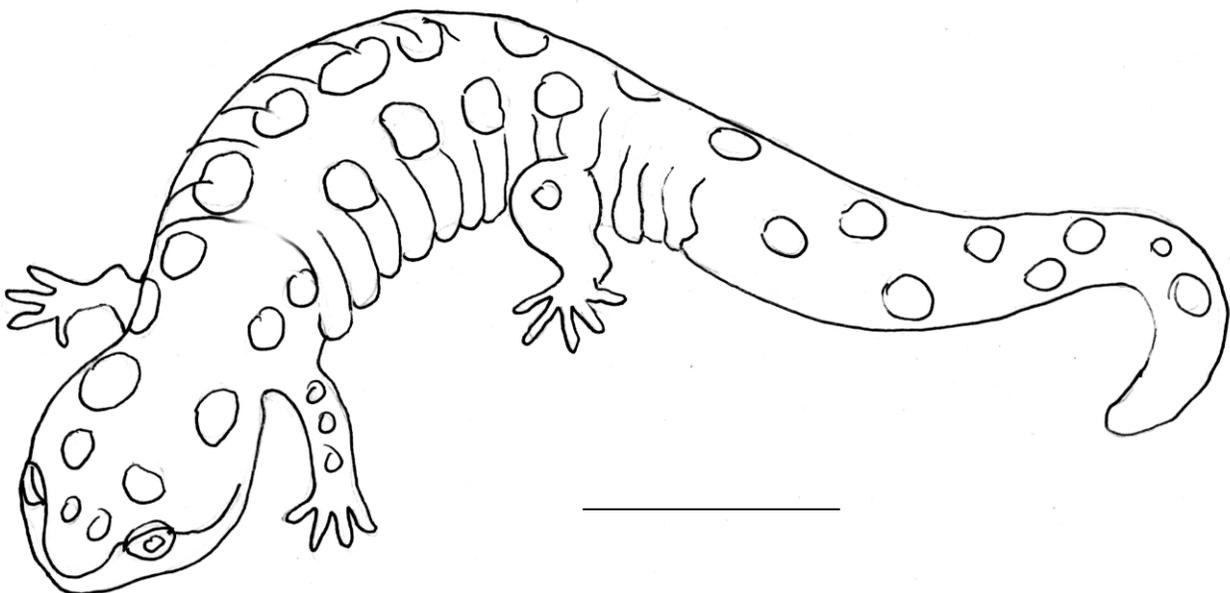
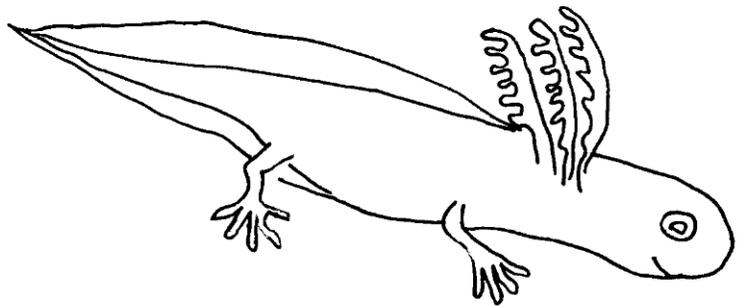
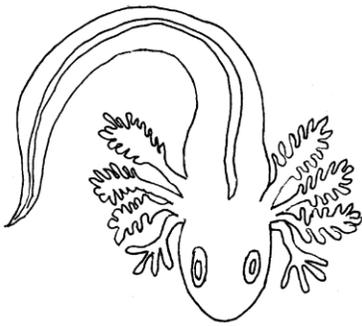
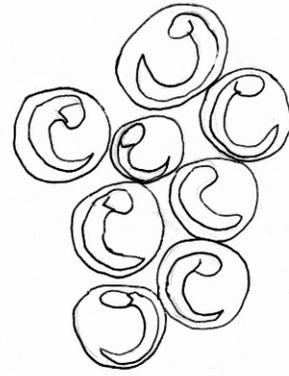
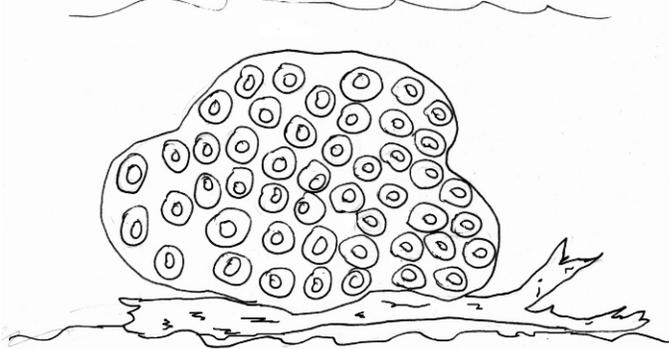


**A**

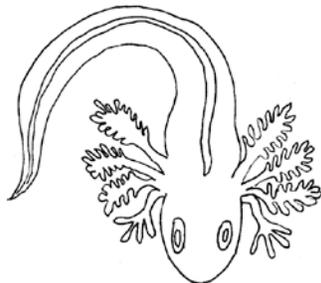
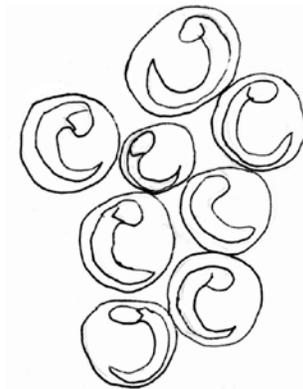
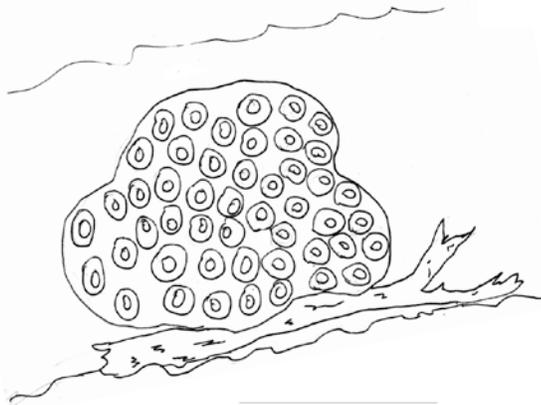
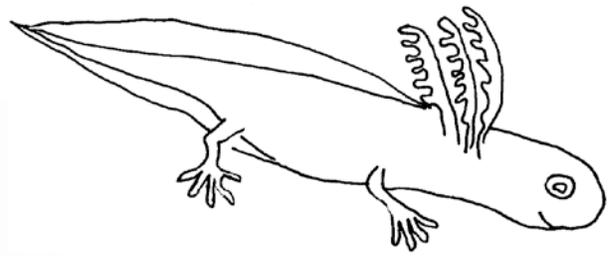
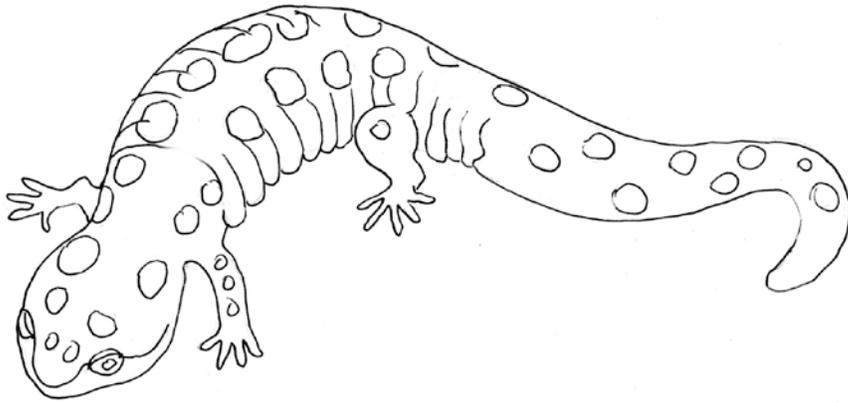
*Natchez Trace Parkway*

**B**

# Spotted Salamander Life Stages



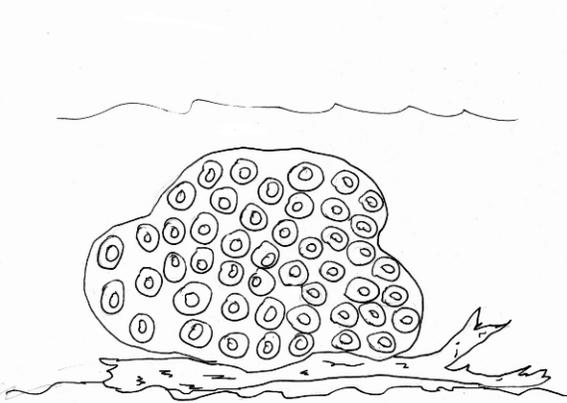
# Spotted Salamander Life Stages



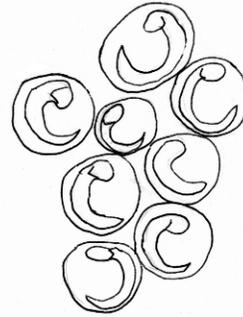
These are not in the correct order. Starting with the eggs, put a number by each growth stage to show the correct order.

# Spotted Salamander Life Stages

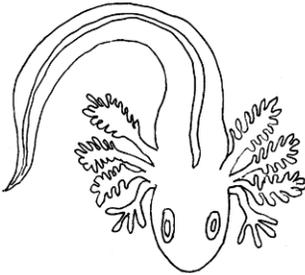
## Answer Sheet



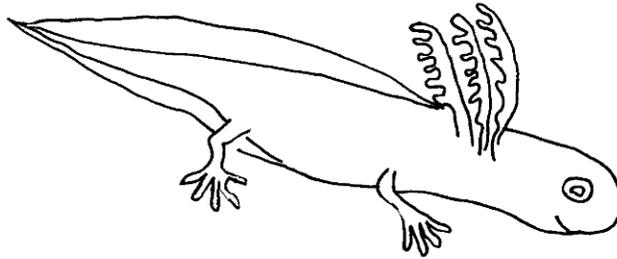
1 or eggs



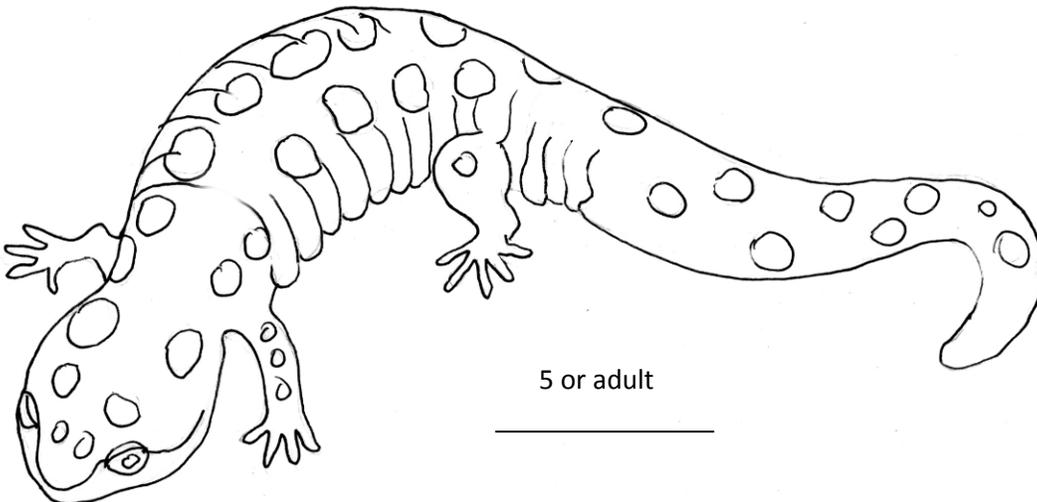
2 or small baby in egg



3 or small larva



4 or large larva



5 or adult