

Natural History along the Natchez Trace Parkway



Classroom Lesson:

Across the Trace (b) (code MAT)

- › **Grade Level:**
5th- 8th
- › **Subject Areas:**
Science, Social Studies
- › **Setting:**
Classroom
- › **Duration:**
3 to 4 class periods
1: salamander study
2: poster development
Report-homework
- › **Skills:**
Deduction, prediction
- › **MS Objectives:**
Science
5th: 3, 4d
6th: 3a, b
7th: 3a
8th: 3a
Social Studies
5th: 3d,f,h 5c, 7, a,b,
6th: 2g, 3d, 5, a,b
7th: 2j,k
8th: 4e,f 8, a,b,c
- › **Vocabulary:**
Salamander, gills, cold-blooded, larva, vernal pool, migrate

Summary:

The students will learn about the life and hardships of the life of the spotted salamander, write a short report and develop a poster that will advertise their plight.



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

Instructional Information

MS Objectives:

5th Grade Science: 3) Predict characteristics, structures, life cycles, environments, evolution, and diversity of organisms. 4d) Describe changes caused by humans on the environment and natural resources and cite evidence from research of ways to conserve natural resources in the United States, including Mississippi.

6th Grade Science: 3a) Describe and predict interactions (among and within populations) and the effects of these interactions on population growth to include the effects on available resources, 3b) Compare and contrast structure and function in living things to include cells and whole organisms.

7th Grade Science: 3a) Assess how an organism's chances for survival are influenced by adaptations to its environment.

8th Grade Science: 3a) Analyze how adaptations to a particular environment can increase an organism's survival and reproduction and relate organisms and their ecological niches to evolutionary change and extinction.

5th Grade Social Studies: 3d) Analyze geographic information using social studies tools, 3f) Evaluate land use with a variety of maps, 3h) Interpret special purpose maps and their uses. 5c) Identify civic rights and

responsibilities. Examine how cooperation and conflict among individuals, families, businesses, and government influence the distribution of resources and analyze the effect on the economy. 7. Investigate how human technology and nature alters the environment, 7a) Analyze the effects of different types of technology on places, 7b) Use social studies tools to determine how changing technology has affected the relationship between people and places.

6th grade Social Studies: 2g) Interpret special purpose maps 3d) Recognize the responsibilities of citizens in the regions of the Western Hemisphere. 5) Describe the impact of technology on development of the Western Hemisphere and its ecology. 5a) Locate areas of ecological disasters brought on by man and the development of technology, 5b) Identify new technology and the direct effect it has had on the development of a specific area.

7th Grade Social Studies: 2j) Interpret special purpose maps, 2k) Analyze information using social studies tools

8th Grade Social Studies: 4e) Interpret special purpose maps, 4f) Analyze statistical information using social studies tools. 8) Describe the impact of technology on the development of the United States and its ecology, 8a) Analyze the effect of inventions on the United States (NPS), 8b) Examine the impact of the Industrial Revolution on the United States, 8c) Evaluate the importance of improvements in transportation and communication

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. 5) how the government and citizens respond to an un-endangered species that is experiencing localized problems.

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. Have the students point out the differences between tadpoles and developing salamanders. Ask them to consider the possible reasons for this difference. (Frog tadpoles develop hind legs first, salamanders develop front legs first. Frogs' hind legs are critical for their survival; salamanders could possibly survive without hind legs.

Teacher Overview: (see attached Fact Sheet) The spotted salamander is indigenous to the areas surrounding the Natchez Trace Parkway. When the salamanders breed, they usually return to the same vernal pond (a temporary, wet-weather 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: Students will participate in a class discussion about the needs and characteristics of the spotted salamander. They will appropriately label the Life Stages worksheet. They will look at the map and deduce the effect of living on one side of the Natchez Trace and laying eggs in pools on the opposite side. The teacher will select appropriate questions for the students to answer. If a short report is assigned, the students will complete the report before they develop an advertising poster. In small groups, they will create a poster that advertises the plight of the migrating salamanders possibly with potential solutions.

Student Task: Read the spotted salamander information provided by the teacher. Color and fill in the life stages worksheet. Do the Across the Trace worksheet. Write a report on the spotted salamander. In small groups develop a poster that might teach people about the spotted salamander's problem and help them survive their yearly migration back and forth across the Natchez Trace Parkway.

Teacher Closure: Ask the students to compare and contrast the spotted salamander development with frog development. Salamanders are similar to frogs because both lay eggs in the water and they are amphibians. Ask the students if they have ever seen tadpoles or salamander larva. Hang the posters where other students in the school can see the posters that the class produced.

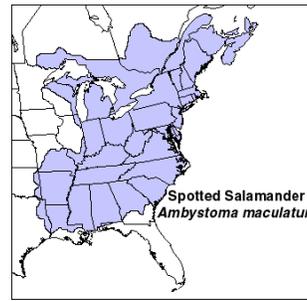
Student Assessment: Participation in discussion. Correct answers and color combinations on the Life Stages worksheet. Creativity and appropriateness of poster.
Suggestions for re-teaching: Review the spotted salamander when teaching about other animals.

Teaching extension: Have the students research and write a short report on an endangered amphibian or some other animal that lives along the Natchez Trace Parkway. Visit an area of the Natchez Trace Parkway to view the habitat of the spotted salamander.

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 m² or 29 ft²) 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)

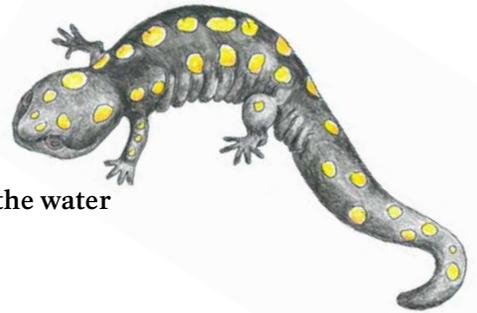
Adult:

- 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.

Research Report Guidelines:

1. As you investigate the spotted salamander, keep notes and keep track of where you find the information. It will save time later.
2. Decide if your report will focus on the facts or your opinion. This will determine the slant of your advertisement.
3. Use different sources to obtain information. *Keep good notes and be sure to keep track of references. *

Follow the guidelines below to write a (five paragraph) report.

1. Your investigation should cover the 5w's and H.
 - a. Who, what, why, where, when, and how
2. Journalists start off by grabbing your attention. This is called a lead.
 - a. Your lead should be a summary of the most important events or facts
 - b. Catch the readers' interest.
3. Your title should be exciting!
4. Your angle is your point of view.
 - a. Are you writing a fact sharing report
 - b. Are you writing about your opinion about the subject
5. Be sure all reports contain accurate facts.

Display Board Guidelines

- Catchy Title
- Should include pictures
- Answer 5w's and H
- Bulleted information
- Possible format- question and answer
- Neat
- Attractive
 - Use constant font
 - Put information in logical arrangements

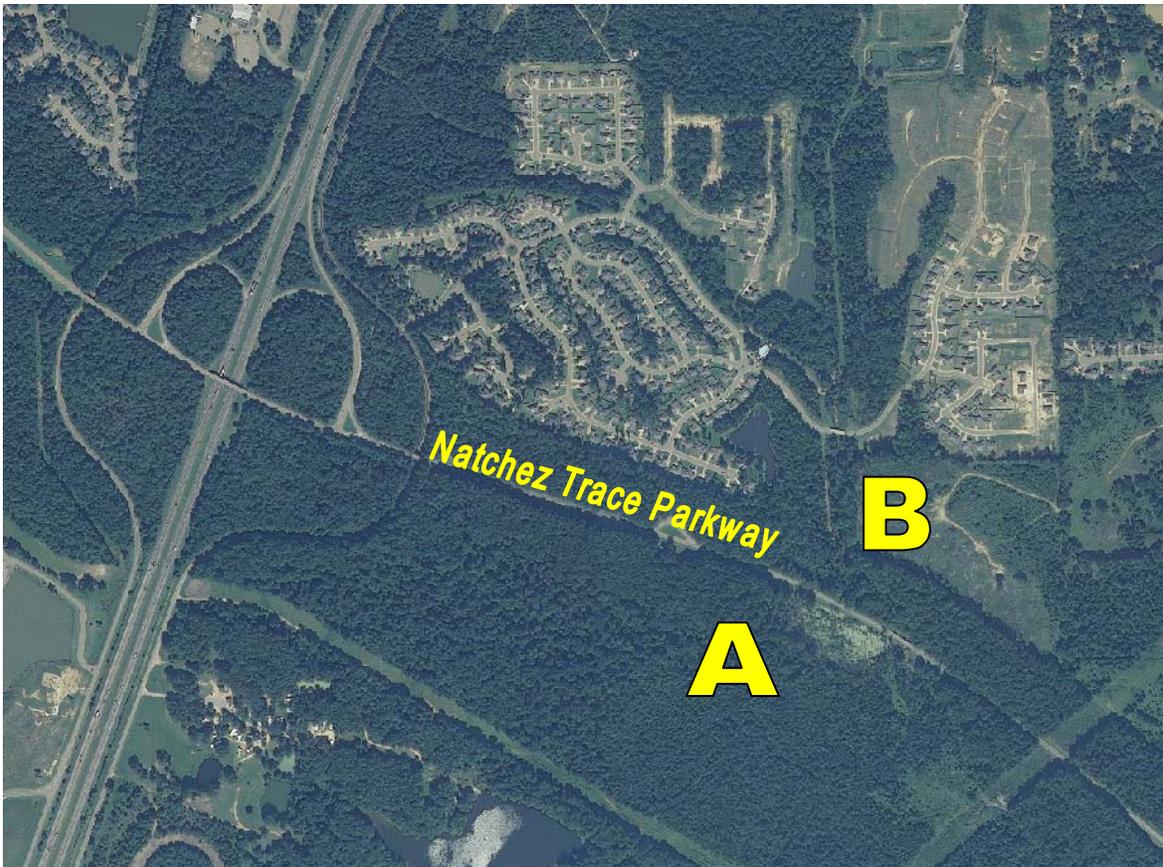
Across the Trace Map Exercise

Look at the map below.

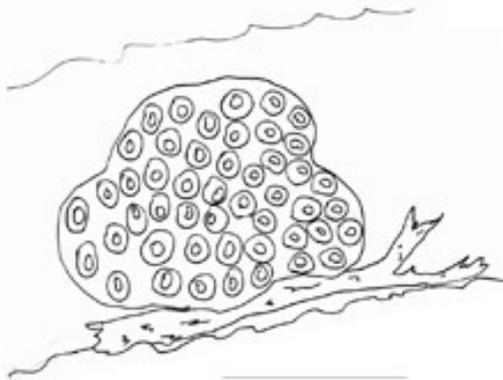
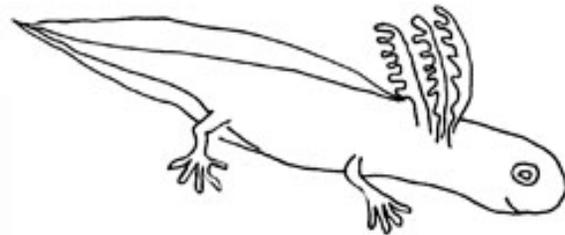
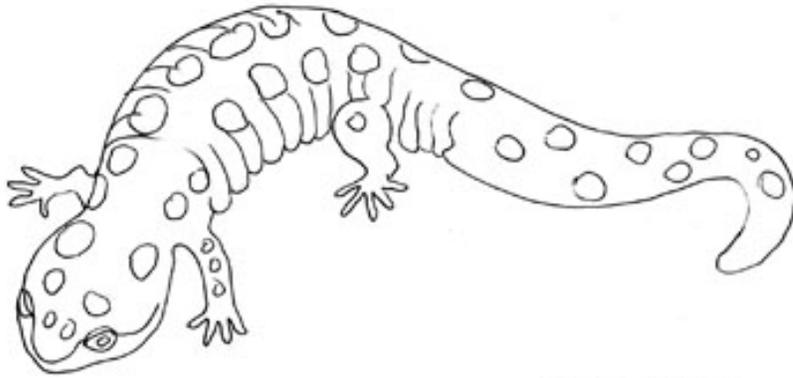
Spotted Salamanders live in the forest along the Natchez Trace Parkway. The area where many of them live is marked with the letter A. The pond-area where they lay eggs is marked with the letter B.

Here are the facts.

- ♥ Spotted salamanders were around 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.
- 1 Using the knowledge that you have, make a list of the problems that the salamanders would encounter when they make their yearly migration to their home pools.
 - 2 How do you think this situation should be handled?
 - 3 Do you think this would be a problem in another time period? Explain.
 - 4 Do you think this would be an issue in another region of the world? Explain.



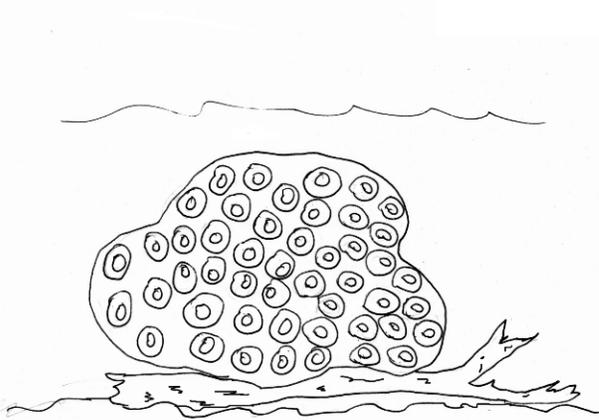
Label the growth stages of the Spotted Salamander.



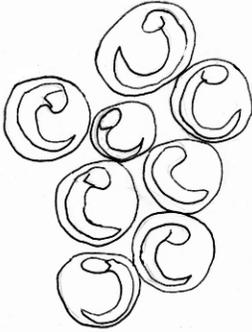
These are not in the correct order. Starting with the eggs, put a number by each growth stage to show the correct order.

Spotted Salamander Life Stages

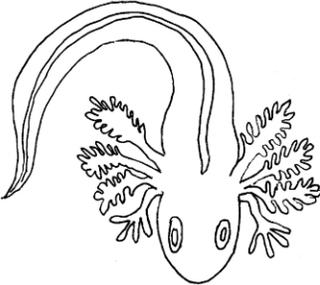
Answer Sheet



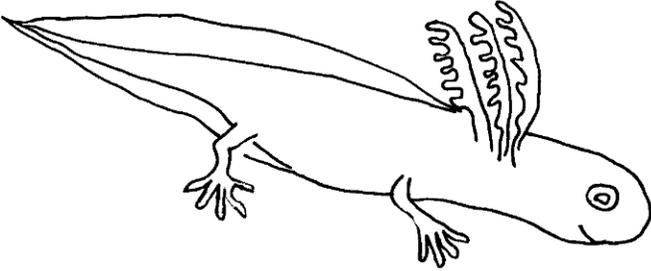
1 or eggs



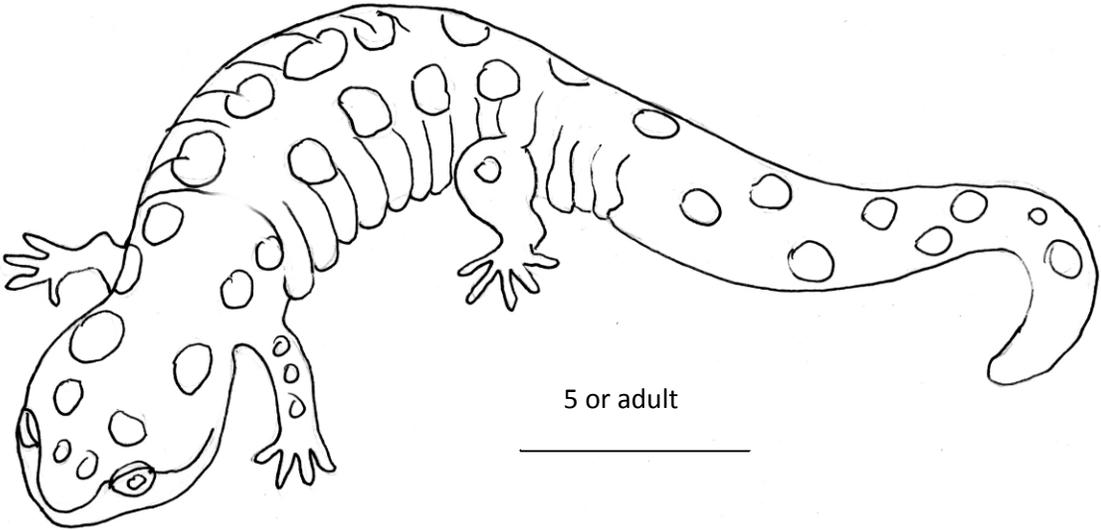
2 or small baby in egg



3 or small larva



4 or large larva



5 or adult