Name ..... Date .....

Structure & Function Scavenger Hunt

» Snakes and lizards belong to a group of reptiles called **squamates**. Throughout the Academy, you will find examples of squamates with diverse forms and sizes.

» Body parts, or **structures**, have specific **functions**. For example, the structure of our hands and fingers allow us to easily grasp and pick things up.

» Your task is to discover the unique structures of lizards and snakes that function in particular ways to help them survive!

Snakes and Lizards Scavenger Hunt

SQUAMATES

Connecting structure to function

Now look back at the *structures* you sketched. What *function*—or purpose—do you think they serve for the animals that you observed? Write a paragraph below explaining your thoughts.

Here is a list of ways that structures help animals to survive. Each time you find a lizard or a snake, try to check off a function served by one of its body parts.

- ☐ moving within its habitat
- ☐ hiding from prey
- ☐ hiding from predators
- ☐ catching prey
- ☐ balance
- ☐ speed
- ☐ breathing
- ☐ eating
- ☐ attracting others
- ☐ reproducing
- ☐ protection

Snakes and Lizards Scavenger Hunt

SQUAMATES

Sketch some squamates!

Common name: .....

Scientific name: .....

Pick a *limbed* squamate to observe and sketch.

1. Draw your animal.

2. Choose a unique structure (one of the animal's body parts) and sketch it.

3. Describe how your squamate looks and how it behaves:

Common name: .....

Scientific name: .....

Pick a *limbless* squamate to observe and sketch.

1. Draw your animal.

2. Choose a unique structure (one of the animal's body parts) and sketch it.

3. Describe how your squamate looks and how it behaves:

Adapted from the American Museum of Natural History

CALIFORNIA ACADEMY OF SCIENCES

Búsqueda de serpientes y lagartos

SQUAMATAS

» Búsqueda de la estructura y la función

» LAS SERPIENTES Y LOS LAGARTOS PERTENECEN AL GRUPO DE LOS REPTILES LLAMADOS **squamatas**. En la Academia, encontrarás ejemplos de squamatas de diversas formas y tamaños.

» LAS PARTES DEL CUERPO, O **estructuras**, tienen **funciones** específicas. Por ejemplo, la estructura de nuestras manos y dedos nos permite sujetar y levantar con facilidad las cosas.

» Tu tarea es descubrir las estructuras únicas de los lagartos y las serpientes que funcionan de formas particulares ¡que les permiten sobrevivir!

Conectar la estructura con la función

Ahora vuelve a mirar las *estructuras* que dibujaste. ¿Qué *función* (o tarea) crees que cumplen para los animales que observaste? Escribe un párrafo a continuación que explique tus ideas.

Aquí hay una lista de las formas en que las estructuras ayudan a los animales a sobrevivir. Cada vez que encuentres un lagarto o una serpiente, marca una función que cumpla una de sus partes del cuerpo.

- ☐ moverse en su hábitat
- ☐ esconderse de la presa
- ☐ esconderse de los depredadores
- ☐ atrapar la presa
- ☐ equilibrio
- ☐ velocidad
- ☐ respiración
- ☐ alimentación
- ☐ atraer a los demás
- ☐ reproducción
- ☐ protección

¡Dibuja algunos squamatas!

Elije un squamata con *extremidades* para observar y dibujar.

1. Dibuja tu animal.

Nombre común: .....

Nombre científico: .....

2. Elige una estructura única (una de las partes del cuerpo del animal) y dibújala.

3. Describe cómo se ve el squamata y cómo se comporta:

Elige un squamata *sin extremidades* para observar y dibujar.

1. Dibuja tu animal.

Nombre común: .....

Nombre científico: .....

2. Elige una estructura única (una de las partes del cuerpo del animal) y dibújala.

3. Describe cómo se ve el squamata y cómo se comporta:

姓名 ..... 日期 .....

身體構造與功能尋寶遊戲

» 蛇與蜥蜴屬於爬蟲綱中的有鱗目. 在加州科學館裡, 你將會找到許多不同形狀和尺寸的有鱗目.

» 不同的身體部位或身體結構, 有不同的功能. 像我們的手跟手指可以讓我們抓東西或是拿東西.

» 你的任務就是探索蛇與蜥蜴獨特的身體結構有什麼樣的功能來幫助他們生存.

蛇與蜥蜴尋寶遊戲

有鱗目

連結身體構造與功能

現在, 看看你畫的素描. 你觀察的動物的身體結構有什麼功用或是目的呢? 寫一小段來描述你的想法.

以下是幫助動物生存的身體結構的功能. 每一次你看到一隻蜥蜴或是一條蛇的時候, 想想看他們的身體結構是否提供這些功能.

- ☐ 在棲息地移動
- ☐ 躲獵物
- ☐ 躲獵食者
- ☐ 抓住獵物
- ☐ 平衡
- ☐ 速度
- ☐ 呼吸
- ☐ 進食
- ☐ 吸引其他同類
- ☐ 孕育下一代
- ☐ 保護

蛇與蜥蜴尋寶遊戲

有鱗目

有鱗目素描!

通名:.....

學名:.....

選一隻有肢的有鱗目動物.

1. 畫下這整隻動物.

2. 選一個特殊的身體結構 (此動物某個身體部份) 並且畫那部份.

3. 形容你選的這隻有鱗目動物長得怎麼樣還有它的行為是怎樣:

通名:.....

學名:.....

選一隻無肢的有鱗目動物.

1. 畫下這整隻動物.

2. 選一個特殊的身體結構 (此動物某個身體部份) 並且畫那部份.

3. 形容你選的這隻有鱗目動物長得怎麼樣還有它的行為是怎樣:

改編於美國自然博物館

CALIFORNIA ACADEMY OF SCIENCES

At-Academy Activity: Structure and Function Hunt

GRADE LEVELS	3th – 8th; California Content Standards for 3rd,4th , and 5th
SUBJECTS	Life Sciences, Investigation and Experimentation
DURATION	Preparation: 5 minutes Activity: 30 minutes
SETTING	Entire Academy

Objectives

Through this scavenger hunt, students will:

1. observe and draw in detail examples of snakes and lizards throughout the Academy.
2. practice connecting the physical characteristics of lizards or snakes with their apparent functions.

Materials

Snakes and Lizards Structure and Function Hunt (one per student)
pencils

Vocabulary

- **adaptation**: a structure or behavior that increases an organism's chance of surviving and reproducing in a particular environment
- **ectothermic:** refers to an organism whose body temperature varies according to ambient external temperatures, i.e. cold-blooded
- **reptile**: any cold-blooded vertebrate of the Class Reptilia including snakes, lizards, tortoises, turtles, alligators, crocodiles . This Class includes the Orders:
  - Squamata: snakes, lizards, and worm lizards
  - Crocodilia: crocodiles, alligators, and caimans
  - Testudines: turtles and tortoises
  - Sphenodontia: tuatara – there are 2 species of tuatara, and they most closely resemble (and are most closely related to) lizards
- **squamate**: an animal in the Order Squamata that includes the legged and legless lizards, including snakes

Teacher Background

What is a reptile?

Reptiles are vertebrates that belong to the Class Reptilia. They are cold blooded, or ectothermic, which means their body temperature is not regulated by internal mechanisms. For humans, our normal body temperature is approximately 98.6 degrees Fahrenheit. But in reptiles, their internal temperature is dependent on the temperature of their surroundings. This is why you might see a snake or lizard sunning itself on a rock.

- All reptiles have three-chambered hearts, except crocodiles, which have four-chambered hearts (2 atria, 2 ventricles), like mammals and birds. Reptiles have well-developed lungs

from birth and breathe air. Most of them have two lungs, except some snakes which have a single lung.

- Scales and scutes make up the outer layer of their skin, which is dry and has high levels of keratin, to help protect the body and prevent water loss through the skin. Most reptiles that have two sets of paired limbs have five clawed toes on each foot. In some reptiles, like snakes and worm lizards, the legs are absent.
- Reptiles were the first animals with amniotic eggs that are laid on land and not in water. Their eggs have leathery protective shells and membranes that allow oxygen and other gases to pass through. Not all reptiles lay eggs; some give birth to live young from eggs hatched inside the body of the mother.
- Reptiles have keen sense organs which help them find food and escape predators. Eyes are one of the most important sense organ and in most reptiles, they are located at the front of the head for binocular vision.

The focus of this activity is on a particular group of reptiles called squamates **(pronounced *skwah-mates*)**.

What is a squamate?

Squamata means "scaly" in Latin. Squamates include lizards, worm lizards, and snakes, which are sometimes called limbless lizards. This group of reptiles is one of the most successful among vertebrates. There are 8,000 known species of squamates and they live in diverse habitats including rivers, lakes, seas, treetops, deserts and mountain ranges. Like other reptiles, squamates are cold-blooded and cannot generate body heat on their own, so cold temperatures are a limiting factor of where they can survive.

From fossil evidence, we know the first squamates appeared over 200 million years ago, most likely as small predators that lived on the ground. Over time, squamates have evolved unique adaptations that allow them to survive in a variety of diverse habitats. For example, while many squamates have well-developed limbs some do not. The absence of limbs in squamates such as snakes, may allow them to easily navigate narrow underground tunnels and burrows. Why might it be an advantage to live underground? Many squamates live in underground burrows to escape predators, help regulate their body temperature by avoiding intense heat during the day and cold temperatures at night, and have a safe place in which to lay their eggs.

Geckos and chameleons are lizards that have evolved special adaptations for life in the trees. Geckos' toe pads are covered with millions of tiny hairs (setae) that allow them to climb vertical surfaces and even cling upside-down! Scientists are still trying to fully understand exactly how geckos accomplish this. Chameleons' feet are highly modified for grasping tree branches.

Activity

Preparation

1. Print out the *Snakes and Lizards Structure and Function Hunt* for each student.
2. Go over the scavenger hunt questions with your adult chaperones ahead of time and make sure they are familiar with the activity and vocabulary.

Introduction

Snakes and lizards are reptiles. Crocodiles, alligators, turtles and tortoises are also reptiles, but today we are only going to focus on a group within reptiles called the squamates, which include lizards and snakes. There are over 8,000 different kinds of lizards and snakes, and they are very diverse in where they live, what they look like, how they move and what they eat.

- ❖ Go over the questions on the scavenger hunt with your students and make sure they understand what they will be doing. Point out that they can choose the squamates on which to focus.

Procedure

1. Divide students into their chaperone groups. You may wish for groups to start in different areas of the Academy. This activity is designed so that students can choose the animals on which they want to focus. Plenty of squamates can be found in the Rainforest and the Aquarium. There are also squamates on display in African Hall, Altered State: Climate Change in California, and Islands of Evolution.
2. Allow time for students to explore, observe, and answer the questions on the scavenger hunt. All of the squamates on this hunt were on exhibit in the Academy as of March 2011.

Wrap-Up

Discuss the different squamates students chose to draw and describe. Ask students to share examples of the different structures and the functions they found that help squamates survive. If students want to research their chosen organisms more in depth, they can visit the Naturalist Center on Level 3, which features books, computers, and helpful staff.

References

American Museum of Natural History. (2006). *Lizards & Snakes: Alive! Educator's Guide* www.amnh.org/lizards

Correlated California Content Standards

Grade Three

Life Sciences

3a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.

3b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.

Grade Four

Investigation and Experimentation

6a. Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.

Grade Five

Investigation and Experimentation

6a. Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.