

Sensational Snakes



Reptiles Vol. 3 Wonder Workbook



Fast Snake Facts

- Snakes have eyes like we do, but do you know what they don't have? Eyelids! Snakes never blink! Instead they've got a clear scale over their eye, like wearing goggles all the time. They even sleep with their eyes open. Snakes shed that scale when they shed their skin, so any scratches or dirt get shed with it. This means that while they're getting ready to shed, as the scale is peeling up off the eye, they're nearly blind.
- Snake scales are similar to our fingernails, so they don't feel very much through them. Can you imagine crawling on your belly on the ground all the time? You'd want fingernails to cover your body, too!
- Some patterns help butterflies blend in to their environment. Having colors that match your background helps keep butterflies from being seen or noticed. But camouflage only helps if you're on the right background!
- What do snakes eat? Different kinds of snakes eat different things. Some snakes, like corn snakes, eat mice and rats. Some snakes like to eat eggs, or frogs, or birds, or fish, or even worms and bugs! Some snake will even eat other snakes! Although there are some snakes that are specialists (they only go after one type of prey), lots of snakes are generalists. They go primarily for rodents, but can and will take a wide variety of prey in the wild.
- Snake teeth are good to catch food, but not to chew it. They have to swallow their dinner in one whole piece. Can you imagine swallowing a whole orange? Or a watermelon? Snakes have cool jaws. The left and right half of their jaw aren't fused in front, so they can spread their mouth out very wide and swallow big prey. To move large prey down their throats, snakes do a very cool thing called the pterygoid walk. The pterygoid is a bone in the roof of a snake mouth. They can move the left side of their upper jaw forward, then the right side, then the left again, and inch their whole mouth over the prey bit by bit.
- How often do snakes eat? The Nature Museum snakes eat once a week! The snakes that live in the wild might eat less frequently than that. Really big snakes can go more than a month without eating. Snakes don't need to eat as often as mammals. They don't use as much energy because they don't heat themselves up from the inside, so they don't have to constantly be putting energy into that furnace.

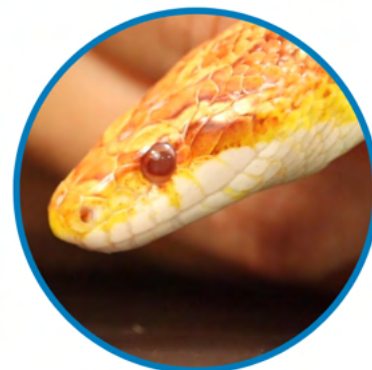


Image Investigator

Summary: Students observe an image and create an accompanying story to construct an explanation as to what might be going on in the image.

Grade Range (suggested): K-5

Materials:

- An image or video
- Image Investigator worksheet



ENGAGE

1. Tell students that today we will be looking at an image/video to try to understand what might be happening in it, and uncover the story that it is telling.

PREPARE TO EXPLORE

2. Introduce the image/video you will be looking at. Ask students to look closely at the image for a minute or two or watch the video once or twice.

EXPLORE

3. Once students have had a minute to look at the image or watch the video, ask them “What is going on here?” The goal of this activity is to guide your student’s thinking and understanding as to what is going on in the image/video. Avoid inserting information--let students look closely and reason out their responses, rather than by discussing the facts.
4. Follow up the first question with, “What do you see that makes you say that?” to encourage students to back up their explanation with evidence from the image. This step can be repeated many times, having students build on their own ideas.
5. When a train of thought comes to an end, ask “What more can we find?” to pull out more evidence or to continue to build the explanation.

REFLECT and SHARE

6. Now that your students have thought about the image/video and what might be going on, have them write a story that explains it using the worksheet. They can use words and/or pictures to tell their story.
7. Have students share their story with someone!

Extensions and Variations:

- Use the same graphic organizer, but look at a different image or video. It could be related to any content!
- Take all of the stories your class creates and put them together in a book to share!

Image Investigator

Use words and/or pictures to tell a story about what you observed.



Investigador de imagen

Resumen: Los estudiantes observan una imagen y crean una historia que la acompaña para construir una explicación de lo que podría estar pasando en la imagen.

Rango de grado escolar (sugerido): K-5

Materiales:

- Una imagen o video
- Hoja de trabajo del Investigador de Imágenes



Engranar:

1. Diga a los estudiantes que hoy veremos una imagen / video para tratar de comprender lo que podría estar sucediendo en él y descubrir la historia que está contando.

Preparar para explorar:

2. Presente la imagen / video que estará viendo. Pida a los alumnos que observen detenidamente la imagen durante un minuto o dos o que vean el video una o dos veces.

Explorar:

3. Una vez que los estudiantes hayan tenido un minuto para mirar la imagen o ver el video, pregúnteles "¿Qué está pasando aquí?" El objetivo de esta actividad es guiar el pensamiento y la comprensión de su estudiante sobre lo que está sucediendo en la imagen / video. Evite insertar información: permita que los alumnos observen detenidamente y razonen sus respuestas, en lugar de discutir los hechos.
4. Siga la primera pregunta con: "¿Qué ves que te hace decir eso?" para alentar a los estudiantes a respaldar su explicación con evidencia de la imagen. Este paso puede repetirse muchas veces, haciendo que los estudiantes desarrollen sus propias ideas.
5. Cuando un tren de pensamiento llega a su fin, pregunte "¿Qué más podemos encontrar?" para sacar más evidencia o continuar construyendo la explicación.

Reflexionar y Compartir:

6. Ahora que sus alumnos han pensado en la imagen / video y lo que podría estar pasando, pídale que escriban una historia que lo explique usando la hoja de trabajo. Pueden usar palabras y / o imágenes para contar su historia.
7. ¡Haga que los estudiantes compartan su historia con alguien!

Extensions and Variations:

- Utiliza el mismo organizador gráfico, pero mira una imagen o video diferente. ¡Podría estar relacionado con cualquier contenido!
- ¡Tome todas las historias que crea su clase y compártalas en un libro para compartir!

Investigador de imagen:

Use palabras y / o dibujos para contar una historia sobre lo que observó.

Drawing from the Museum's Collections



Draw/Label:

Use pictures and words to show what you notice about **ONE** of the specimens on this page.

Think:

What can you learn about this organism from observing the specimen?

What questions do you have about this specimen?

Dibuja de la Colección del Museo



Dibuja/Etiqueta:

Usa dibujos y palabras para mostrar lo que notas sobre UN espécimen en esta página.

Piensa:

¿Qué puedes aprender sobre este organismo al observar la muestra?

¿Cuáles preguntas tienes sobre este espécimen?

Q&A with Dr. Allison Sacerdote-Velat

Dr. Allison is the Nature Museum's curator of herpetology, and right now she is outside doing important fieldwork! Fieldwork is the type of research a scientist does where they collect data in the environments that they study.

Let's hear about what Dr. Allison is doing out in the field!

What fieldwork are you doing right now?

Dr. Allison:

Right now, we are in the middle of smooth greensnake nest monitoring and hatching season. Smooth greensnakes are one of only a few regional snakes that lay eggs. Smooth greensnakes have a unique nesting behavior. The females can lay their eggs early in the nesting season (late June), late in the nesting season (late July or early August), or anytime in between. Because of this variation in nest timing, as we monitor nests in the field, we may find new nests as the early nests are almost done with hatching. Early nests usually take about 30 days to develop and hatch, while late nests may only take a few days to hatch.

We monitor nests in the field to learn about their survival rates and threats. In the past several years, we found that egg survival is often less than 50% which can lead to population declines. To try to reverse that decline, we bring a portion of the eggs indoors to incubate, and maintain them through hatching. Our incubation success rate is typically 98%.

Once the eggs hatch, we measure and mark each hatchling, and then directly release most of them, so we can assess survival of the youngest age group. This is a challenging age group to study, because they are only about 4 inches long, and very well-camouflaged with their environment. They hide in the dried vegetation and in cracks in the soil.

Another conservation method we use is called 'head-starting' in which we house a portion of the hatchlings for just under a year, to increase their body size before we release them.

This season, we are comparing the direct release technique and the head-starting technique in a reintroduction site. We released head-starts from 2019 back in May, and once this year's hatching is complete, we will direct-release some hatchlings in the same site. Over time, we can compare recapture rates and survival of head-starts and direct release snakes to help guide future conservation work with smooth greensnakes.

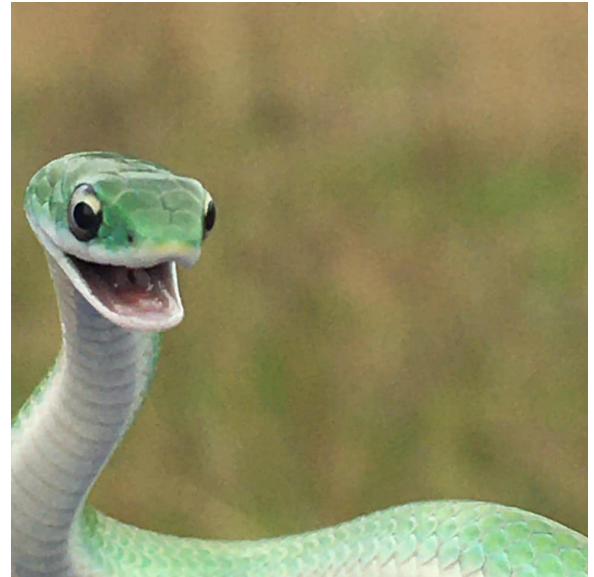


Why is it important to study smooth greensnakes?

Dr. Allison:

Smooth greensnakes are a unique part of our regional natural history, and they are declining in number in many parts of their historic geographic range. Their decline is largely tied to destruction of grassland habitats like prairies and sedge meadows. Habitat fragmentation is a factor in their decline because as roads carve up the landscape, it is difficult for such a small snake to cross roads in order to find new habitat. Even though a lot of grasslands are being restored, it is difficult for smooth greensnakes to colonize the improved sites. Because they are small-bodied, they only lay a few eggs per snake, so egg survival is critical to helping their populations persist and grow.

The smooth greensnake is an Illinois Species of Greatest Conservation Need, meaning we know they are generally declining, but we lack a lot of detailed information about them. By studying their populations, we can learn more about their threats, and what conditions they need in order to have their populations successfully grow. They are state-endangered in Iowa and Ohio, and state-threatened in Indiana—all states that have lost a lot of grassland habitat.



There is also a fairly new disease called snake fungal disease, which has threatened populations of some species of snakes. We have found some fungal infections in several snake species in the Chicago area including gartersnakes, milk snakes, and fox snakes. We check all of the snakes we encounter for symptoms of fungal disease, and collect swabs of potential infections.

What's your favorite part of fieldwork?

Dr. Allison:

My favorite part of fieldwork is that I get to see and work with wildlife in their habitat, and observe unique moments and interactions. While I am outside looking for snakes, I may see a variety of other species as well, like muskrats, wading birds, songbirds, and insects. Every day is different and I get to see the environment change throughout the season.

I enjoy seeing the plant communities go through their annual cycles and observing how the wildlife respond to those changes in food resources. Another fascinating aspect of fieldwork is all of the sounds in the environment. We were in an amphibian breeding pond in May and kept hearing a fawn bleating among all of the unique frog calls surrounding us.



Let's Explore Snake Anatomy

Let's learn more about snakes by taking a look at some really interesting specimens from our herpetology collection!

What is herpetology?

Herpetology is the study of reptiles and amphibians. Our herpetological collection has over 22,000 specimens that are used for scientific research, as well as education. Let's take a look at a few different snake specimens.

First, let's take a look at this little, tiny great plains rat snake. Now, snakes all have the same kind of body shape, but what is the big thing you notice about a snake's body? It's missing arms and legs, right? And that's reflected in its skeletal system.

Here is a skeletal specimen of a bull snake. Now this one is in pieces. You can see it's quite a bit larger than our rat snake that we had, but take a look at that body. It is composed entirely of spinal vertebrae and ribs. So just like on our bodies our spinal column goes down our backs, theirs goes down almost the full length of their body, and this allows the snake to do that beautiful undulating movement. And then the ribs protect all the organs on the inside, just like ours do.

Now let's take a look at another skeletal specimen. This is a smooth greensnake. This is a species found in Illinois, and this specimen was actually collected in the 1940s around the Chicago area. You can see, here's his little head, his skull, and then follow along the curvature. The whole rest of his body is comprised of vertebra and rib bones.

What do you still wonder about snakes?

What are some other things you know about snakes?



Great plains rat snake



Bull snake



Smooth greensnake

Snake Skeletons in Motion!

Have you ever seen a snake slither? Let's look at some snakes in motion! Check out the pictures below:

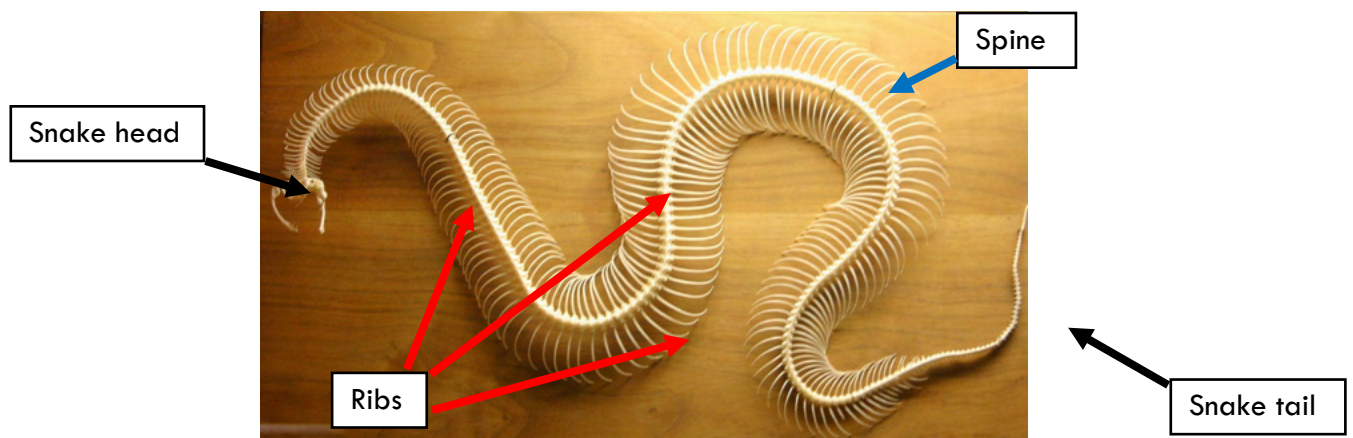


Do you notice anything in common with the snakes in the video or in the pictures? **Trace your finger along the snake to feel what shapes they make.**

Snakes move their body in an “S” shape to go forwards, backwards, and sideways. Moving in an “S” pattern helps snakes slide over the ground and even climb trees!

How do they move like this?

Snakes have strong muscles, grippy belly scales (like the tread on the bottom of your shoe), and very **flexible** bodies! Their bodies are so flexible because they have a long **spine** with many **vertebrae** going from head to tail, and many **ribs** that run almost the whole length of their body. If you feel your own spine, you'll feel bumps and dips. The bumps are your vertebrae. If you put your hand on your side to feel your ribs, you can feel the bottom of your ribcage stops around your stomach. But snakes have ribs going almost all along their body!



How does a long spine with many ribs make snakes so flexible? What do you think?

Let's make a snake skeleton to find out!

Materials:

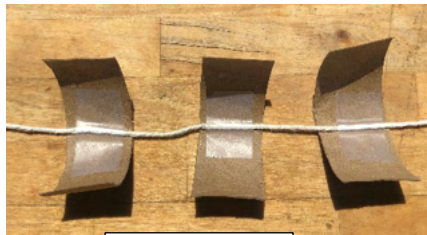
- Toilet paper or paper towel tubes
- String or yarn
- Tape, glue, hot glue, or stapler (with adult supervision or help!)
- Scissors
- Markers/colored pencils/crayons and paper

Instructions:

1. Optional: Decorate your toilet paper or paper towel tubes: these are part of your snake!
2. Cut toilet paper or paper towel tubes into rings at least 1 inch wide.
3. Cut the rings in half, so that you have two semicircles.
4. Cut string as long as you want, but at least long enough to fit all of your half-rings.
5. Lay out all of your half-rings in a row with the underside facing up. Lay the string across all of the half-rings, and tape it to the half-ring. Space them close together—but not too close!
6. Leave some string at the end to hold on to, wiggle your snake in an “S” pattern as you pull it forward.



Steps 2 & 3



Step 5



Step 6

The rings represent the **snake's ribs**, and the string represents the **snake's spine**! Your snake can move in an “S” pattern because all of the rings (ribs) allows it to be very flexible. If your snake didn't have so many ribs, and was instead represented by a single long paper towel tube, would it be as flexible? Could you move it in an “S” pattern in the same way?

Have a friend help you track your snake's movement: place your snake on a piece of paper and have your friend slowly move it in an “S” shape while you trace its motion with a marker, pencil, or crayon. Snakes make several different “S” patterns to move. Check out this chart of snake motion for ideas to try.

SNAKE MOVEMENT



Concertina



Serpentine



Sidewinding



Caterpillar (Rectilinear)

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Snake Senses with Cartman the Corn Snake

Can you list our five senses? We have seeing, hearing, smelling, tasting, and touching. How do we use our sense? To experience the world, right? Snakes, like people, use their five senses to see the world. Let's take a closer look!

How do snakes smell?

Snakes actually use their tongue to smell. What do you use to smell? You don't use your tongues, do you? Cartman has a nose, but he doesn't use it to smell. Instead, he uses his tongue and if you look closely at his tongue...does it look like ours?

A snake's tongue is forked, so it has two different pieces, left and right, and that's so he can smell in two different directions. We can hear if something is coming from our right side or our left side because we have ears on either side of our head. The snake's tongue works the same way, so they can tell which direction a scent is coming from and follow that scent.



They also use a special organ on the roof of their mouth, called a Jacobson's organ, in order to analyze that smell. So they'll catch scent particles on their tongue, bring it back into their mouth, and bring it to their scent organ to help them determine what that smell is.

What about a snake's sense of taste?

Snakes, they don't really taste like we do. They actually swallow their food whole, rather than chewing and really tasting it. They can unhinge their jaw and swallow food bigger than their head. If we were snakes, we could swallow a whole watermelon or a whole Thanksgiving turkey!

How do snakes hear?

If you look carefully at Cartman's head, can you see any ears? Or any holes for ears?

Snakes actually don't have ears on the outside, so they don't have ears like we do. They have inner ears, and so they actually hear vibrations with their jawbone. Put your hand on your throat and hum. Can you feel the vibrations? That's similar to how snakes feel sound vibrations. If Cartman was on your arm, and you were talking, he would probably be able to hear you because he'd be able to feel the vibrations. But he wouldn't be able to hear anyone else talking in the room.



What about Cartman's sense of touch?

Another sense that snakes have is touching, just like we do. What do we usually use to touch? We usually use our hands, but if you take a look at Cartman, what do you see? Snakes don't have exposed skin. They are covered in scales and the scales are made out of keratin, which is the same stuff as your hair or your fingernails.

Press down on your fingernails. What does it feel like? That is sort of similar to how a snake feels the world. So they're not as sensitive with touch like we are.



How do snakes see?

How many eyes do we have? Two! How many eyes does Cartman have? He has two eyes, and just like us, he has eyes that face forward. That means he has what's called depth perception, just like we do. That means he can tell how close or how far away something is, and he can also see in color just like us. But snakes' sight isn't quite as good as ours/

Another cool thing about snakes is you can have a staring contest with them and you'll never be able to beat them. Why? Snakes don't have eyelids! He can't actually close his eyes. Instead, snakes have a clear scale over their eyes that helps protect them. You can tell when they're about to shed their skin because it turns a little cloudy. If you see a snake shed, sometimes you can see the eye scale in the shed, too!



What do you still wonder about snakes?

What else do you know about snakes?



Smooth Greensnake (*Opheodrys vernalis*)

This friendly snake depends on tall grass prairie, sedge meadows, prairie ponds, and oak savannas. It is designated as a Species in Greatest Need of Conservation in Illinois, and is State Endangered in Indiana.

Featured Plants: Rattlesnake Master (*Eryngium yuccifolium*) and Long-awned Bracted Sedge (*Carex gravida*).

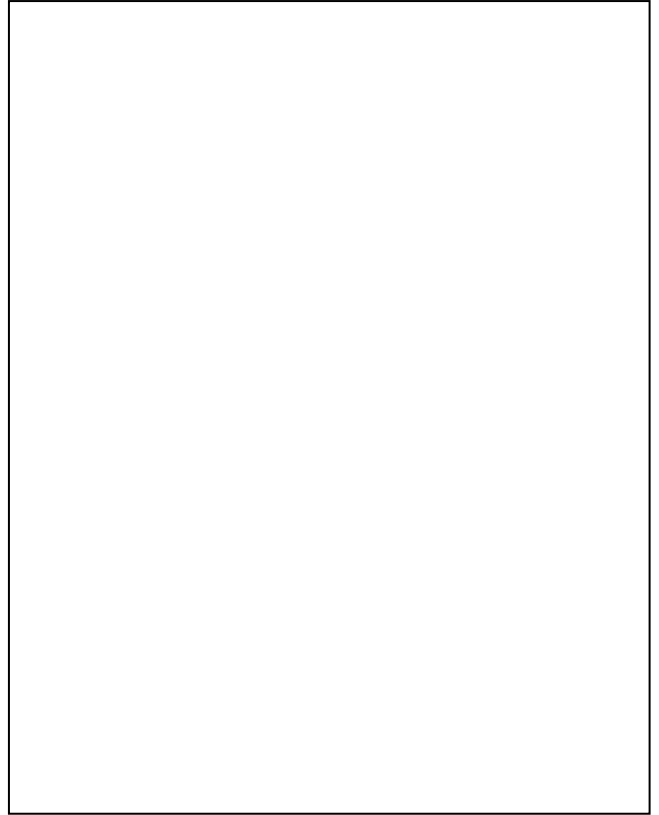
© Chicago Wilderness 2016. Illustration by Ember Seven.

Neighborhood Species

Species name:

Description (color, size, etc.):

Diet:



Habitat (where did you see it?):

Behaviors (what was it doing?):

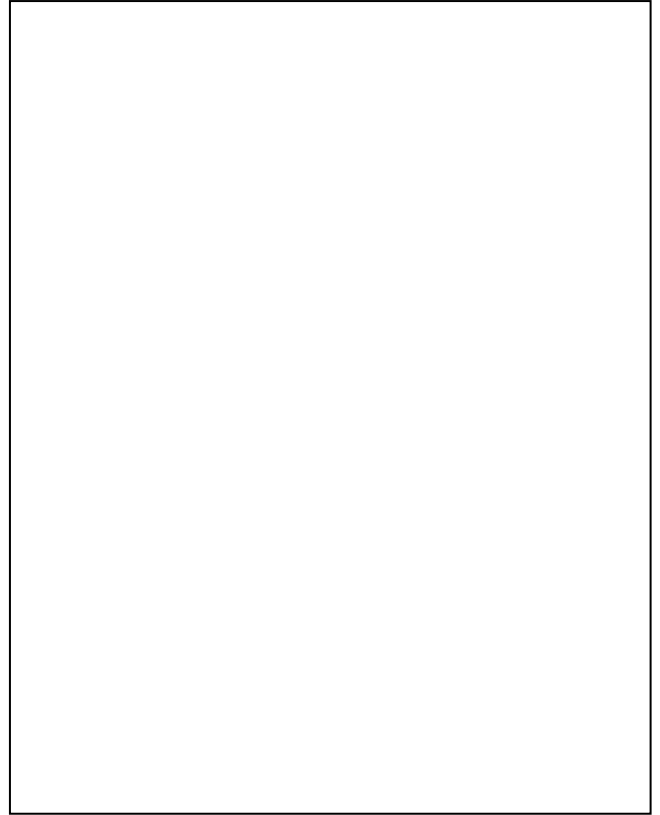
Drawing and research done by: _____

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Behaviors (what was it doing?):

Drawing and research done by: _____

My Observations

I'm observing_____.

I notice:

(use words and drawings to describe what you're observing)

I wonder:

(write all the questions you have about what you're observing)

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Story Time Graphic Organizer

Story Time Book Title: _____

Use words and pictures to share about
a main idea in the story you read.

Describe some adventure or exploration that happened.

How is nature involved in the story?

As you were reading the story, how did you feel?

Does the story give you any ideas in your own life?

After reading the story, what do you wonder?

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Make your own snake scale texture

Snakes have a unique texture because of the scales that cover their bodies. Let's see what we can use to make our own textured snakes! Find objects in your home and outside that have interesting textures. Place this coloring sheet over them, and rub a crayon or colored pencil over the paper to create a unique texture for your snake!

