

Squirrels, Squirrels, Squirrels!

First Grade



Science: 2.a., 2.b., 2.c., 4.a.

Objective:

To teach students about squirrels and their adaptations.

Method:

Students ask questions about the different parts of the squirrel, then get to learn about them through some fun activities.

Materials:

Open area with trees

Optional: black butcher paper and tape, or blindfolds

Paper

Markers

Freshly sliced fruits and vegetables

Background Information:

Squirrels are some of the most common wildlife that we see, and that makes them a great animal to teach kids about. The most common squirrels we have in the San Joaquin Valley are California ground squirrels, which live in burrows and not in trees. The squirrel's different body parts help it survive in the wild.

Procedure:

1. Tell your class that you all are going to learn about ground squirrels. Ask if they have ever seen a ground squirrel or its burrow.
2. Draw a picture of a ground squirrel where all of the students can see it. The picture can be on a whiteboard, chalked onto a blacktop, or drawn in the dirt with a stick.
3. Explain that the students can point to any part of the squirrel and ask a question about it.
 1. There are activities to teach the students about some of the squirrel's parts. Please refer to the "Exploring Squirrels" section below.
4. Once you have explored all the parts of the squirrel, you are finished.

Exploring Squirrels:

Paws & Claws

Squirrels use their paws to dig burrows, where they live. The burrows are about 4 – 5 inches in diameter, and they can extend underground for 5 – 35 feet. Sometimes the burrows have just a single entrance, and other times there are several entrances. The burrow may be occupied by just one squirrel or an entire family of squirrels.

Burrows provide protection from predators. If a predator is spotted, the squirrel can run and hide in its burrow. Squirrels spend most of their lives within 100 feet of their burrow entrance, and they very rarely go further than 150 feet from the burrow.

Burrows also provide shelter from the summer heat. The relatively moist soil keeps in cool inside the burrow. Plants and soil above the burrow provide further insulation against the heat and summer sun.

Squirrels will use their paws to throw sand if they suspect that a rattlesnake is nearby. The sand will cause the snake to rattle its tail and reveal where it is hiding and how large it is.

Squirrels also use their paws and claws to grasp plants and nuts that they want to eat. The soft pads of their paws allow them to grip food items.

Claws help the squirrels grip the trunks of trees, too. The claws can sink into the bark and pull the squirrels up when they have to escape danger.

Paws & Claws Activity 1

1. Take the students to an outdoor area with several trees.
2. Explain that one way ground squirrels use their claws is to dash up trees if they are chased by a predator. Their claws and padded feet allow them to grip the bark really well.
3. Tell the students to each find a tree. They should wrap their arms and legs around a tree and hold themselves on it as long as they can. Their feet should not be touching the ground.
4. Whoever stays on the longest wins!

Paws & Claws Activity 2

1. Talk about squirrel burrows with the students. They use their paws and claws to dig through soil and make their burrows.
2. Tell the students that squirrels live most of their lives in or near their burrows, so they have to be designed very well. Squirrels think about camouflage, safety, and cleanliness when they design their burrows. They even include a bathroom chamber!
3. Ask the students to pretend they are a squirrel. Have them draw their own burrow, mapping out the different rooms and tunnels. Ask them to label the different parts of the burrow and explain why they chose to include them. They should label each chamber in the burrow with what its purpose is, such as a sleeping room.
4. Distribute markers and paper to the students.
5. Afterwards, have each student show their picture to the class and explain why they designed their burrow the way they did.

Paws & Claws Activity 3

1. Take the students to a sand box or an area where they can dig.
2. Talk to the students about burrows.
3. Have the students dig their own burrows. They should think about camouflage when choosing a place to dig.
4. After everyone is finished, have the class tour all of the burrows.

Teeth & Diet

Squirrels like to eat plants and, when they can get it, meat. They graze on roots, seeds, fruit, and nuts. Some of their favorite foods are acorns, which are abundant in this area's valley oak woodland. They use their sharp, scissor-like teeth to snip roots and crack nuts. Squirrels will also eat carrion, dead animals, when they have the opportunity. In addition, they eat insects and

bugs.

Teeth Activity

1. Explain that the squirrel's teeth are important for cutting into its food.
2. Tell the students that our teeth are also designed for snipping foods, especially for chopping fruits and vegetables.
3. Pass out some fruit and veggie slices for the kids to eat.
4. Ask them to pay attention to how their teeth slice the food, and how a squirrel's teeth would do the same.

Coat

California ground squirrels have a very light brown coat. Their eyes and necks are ringed with light, almost white fur. Their coats blend in perfectly with the dry, brown grass and allows them to camouflage themselves in order to hide from predators. Predators such as rattlesnakes, hawks, coyotes, bobcats, and foxes prey on the squirrels.

Additionally, squirrels camouflage their scent by rubbing chewed rattlesnake skin on their coat. The mother finds a shed skin, chews it into a paste, and rubs it onto her and her pups' coats. That tricks rattlesnakes into thinking the squirrels are another rattlesnake.

Coat Activity

1. Talk to the students about the squirrel's coat.
2. Take them out into the schoolyard.
3. Choose one person to be a red tailed hawk that is hungrily looking for ground squirrels to eat.
4. Tell the students to look at the colors they are wearing.
5. Ask them to find a place in the schoolyard where they would camouflage. The place they choose should have similar colors to their clothing.
6. Set the red tailed hawk loose to find the squirrels. The squirrel with the best camouflage will win!

Tail

The squirrels use their tail to defend themselves and their pups from rattlesnakes. When the squirrel detects a rattlesnake, it may superheat its tail to trick the snake. The snake has a pit for detecting infra-red heat when it is hunting. The squirrel pumps blood into its tail to heat it. Then, it rapidly swishes its heated tail back and forth, making the squirrel appear to be a much larger, faster animal than it actually is. This discourages the snake from pursuing it, and it distracts the snake from any squirrel pups nearby. (To see this happen, go to <http://www.newscientist.com/article/dn12477-squirrels-wield-a-hot-secret-weapon.html>).

The trail swishing trick also works because squirrels make their tails smell like a rattlesnake. The squirrel finds shed rattlesnake skins and chews them up. Then, they make a paste from the skin that they spread onto their tail. The smell fools the rattlesnakes into thinking that the squirrel's swishing trail is actually another rattlesnake. That scares the rattlesnake away and keeps the squirrel and its pups safe.

Circulatory System

Squirrels build up immunity to rattlesnake venom during their lifetime. When they are pups, they do not have any immunity for at least 2 months. However, the squirrel's blood changes to withstand venom as it ages.

Heart, Lungs & Surviving Extreme Temperatures

California ground squirrels are able to essentially shut down their bodies during times of extreme heat or cold. During cold winter months, the squirrels can hibernate deep underground for months on end. When they are hibernating, they breathe only once every couple of minutes, and their heart rate slows to just 1/10th its normal rate. They wake every 4 – 5 days to eat and use the restroom in a special burrow chamber.

During the extreme heat we get here during the summer, the squirrels may undergo estivation-- or summer sleep-- for a few days. Estivation keeps the squirrels from desiccating, or drying out, in the heat or being damaged by the heat on other ways.

Throat & Voice

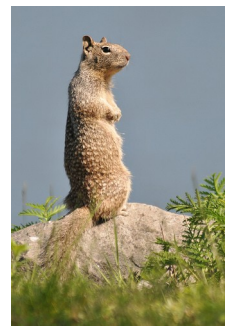
When the squirrel senses danger, it makes a series of loud chirps to warn away other squirrels in the area. This protects their relatives from predators, such as rattlesnakes. They use a different chirp for different types of predators. When a fast-moving predator, such as a hawk, is approaching, they let out a single chirp. When a slow-moving predator, such as a snake, is approaching, they let out a series of chirps.

Voice Activity (NOTE: This can also be an Ears Activity)

1. Talk to the students about the squirrel's chirp warning system.
2. Take the students out to a field or open area.
3. Choose a 'base.'
4. Select two students to be predators and pull them aside. One is a hawk. The other is a rattlesnake.
5. The rest of the students are ground squirrels.
6. Have the ground squirrels stand in the field, all facing in the same direction.
7. Stand the predators about fifty feet behind the squirrels. The squirrels should not be able to see the predators.
8. Explain the rules to the students.
 1. The predators are going to sneak up behind the squirrels. They are going to try to 'eat' them. If a squirrel gets tagged, that means that they got eaten.
 2. The squirrels cannot turn around and look for the predators. They must use their ears and listen for the predators.
 3. Squirrels all warn each other of danger. If one of the squirrels thinks they hear a predator sneaking up behind them, then they can chirp. *Demonstrate a chirp for the students. Squirrels make a high, metallic sounding chirp.*
 4. When a squirrel gives a chirp warning, then all of the squirrels can run to the base. The base is their burrow, where they are safe from predators.
 5. If a squirrel gets tagged before they reach base, then they are eaten.
 6. Eaten squirrels become hawks in the next round. Hawks that do not tag a squirrel 'die' and become a squirrel. *(NOTE: You can change the rules if the students seem to want to get tagged by the predators so that they can be a predator in the next round. If this is a problem, have the tagged squirrels sit on the sideline instead.)*
9. Show the students the 'base.'
10. Play as many rounds of the game as you want!

Eyes

The squirrel's eyes allow it to spot predators, shelter, and food. It can see



about as well as a human can. To keep watch for predators, they often stand on their hind legs with their front legs folded over each other, stand completely still and scan the area.

Eyes Activity

1. Talk about the ground squirrel's eyes.
2. Mimic how the squirrel stands and look for predators.
3. Ask the students to 'stand and scan' like a squirrel.
4. Ask if they notice anything while they are scanning the horizon that they didn't before.

Hind Legs

Their back legs allow them to move rapidly. They can sprint away from predators or quickly catch bugs.

Hind Legs Activity:

1. Talk to the students about squirrels' hind legs.
2. Explain that we have strong legs for sprinting, too. They could help us escape a predator, too, which would have been very helpful when all people lived in the wild.
3. Tell the students that we are going to have a sprinting race. They are going to pretend that they are squirrels fleeing from a rattlesnake. Whoever is last gets eaten by the snake!
4. Establish a start and finish line.
5. Line up the students along the line, and start the race!
6. You may have several races, eliminating one 'squirrel' each time, until you have a winner.

Whiskers

Whiskers help the squirrel navigate its burrow and feel for insects and roots.

Whiskers Activity:

1. Turn all of the lights out in a narrow hallway so that it's completely dark. If possible, cover any windows with dark butcher paper.
 1. If this is not possible, you may also blindfold the students. Blindfolds can be made out of cheap picnic tablecloth that can be found at almost any outlet store. They can also be made from scarves, t-shirts, or bandannas.
2. Explain to the students that a squirrel's whiskers are like its finger. The whiskers help it feel things, like food and whether it's going to bump into the walls of its burrow in the dark. A squirrel can't feel things as easily with its paws because it has to walk on them; that's why they need whiskers.
3. Tell the students to hold their hands behind their backs. They are not allowed to move them during this activity.
4. Bring the students to the end of the hallway.
5. Set them loose! They have to find their way to the other end of the hallway without bumping into anything.
6. Reflect on how useful whiskers would be to find your way down a dark tunnel, like a squirrel has to do every day.

Nose

Noses help the squirrels smell and find their food. They like to eat acorns, nuts, leaves, roots, plant stems, flowers, bugs, and even bird eggs or carrion.

Nose Activity

1. Prep
 1. Choose 3 – 10 different things for the students to smell. They can be different things a squirrel would eat (flower, acorn, roots, leaves, berries, nuts), or other things, such as spices or essential oils.
 2. Put the smelly things into paper cups. Each smell should have its own cup; don't mix the smelly things together.
 3. Cover the tops of the cups with paper, and tape the paper down around the sides of the cups. Next, punch holes in the paper so the students can smell what's inside.
 4. Number the tops of the paper cups.
 5. Using the numbers you wrote on the cups, make a key reminding you which smell is in which cup.
2. Start this activity after you tell your students about the squirrel's nose. Explain that without its nose, it would have a hard time finding the foods that it likes to eat.
3. Explain the rules of the smelling game.
 1. Several cups are going to be passed around the room.
 2. They can smell each cup for as long as they want, but they cannot look inside.
 3. Then, they get to guess what's inside the cup. They should write down the numbers of the cups and what they think is inside of them.
4. Give each students a paper and pencil to write down their guesses about what smell is in each cup.
5. Start passing around the cups.
6. Go over the correct answers and see who got the most right. Congrats!

Ears

Ears help the squirrel hear predators and warning calls from other squirrels.