

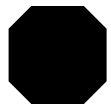
Nature Exchange

How to... Collect Rocks & Minerals

Rocks and minerals can give us valuable information about what the earth might have been like millions of years ago and what it might be like many years from now. They are also used in many common products, like toothpaste and baby powder.

Where To Look

Good places to look for interesting rocks and minerals include rock cuts, along the shores of streams, rivers, lakes and oceans, and at old quarries or mine dumps. **Please note: it is illegal to collect specimen from California caves.**



Safety Tips

Never venture into a tunnel or an old mine, as there could be danger of a rock fall or poisonous gases. Always stay away from open holes and steep cliffs when rock collecting.

Wise collectors...

- Ask permission before collecting on private property.
- Always treat the site with respect and leave it the way it was found.
- Only take what is needed and remember that smaller samples are easier to carry.
- Take notes when collecting specimens.

Why is the location so important?

Location helps a geologist make a positive identification. A sample only has value to a scientist if its location is known. It may turn out to be valuable, or may lead to something valuable, so it makes sense to write down where it comes from.

Example of a specimen label

Specimen # 1 _____
Date collected _____
Collected by _____
Location _____
Description of location _____

Other observations _____



Use a geologist's pick or hammer to break small pieces from larger pieces, or to break smaller pieces open. You never know what treasures are inside!



Safety Tips

Always wear safety glasses and make sure an adult helps you break rocks.



Use masking tape to number each sample for future reference. In a notebook, write down the number of the sample and it's information.

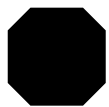


Pack samples in something soft, such as newspaper, to keep them from banging together and breaking.

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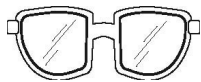
How to... Clean Rocks & Minerals

We seldom think of cleaning rocks or minerals, but a good cleaning will not only make pieces look better, it will also reveal features that might not have been evident before cleaning.



Safety Tip

Always wear safety glasses when cleaning rocks.



Handy Tips

To clean hard to reach places, use an old toothbrush. **Never** use extremely hot water to clean rocks, especially crystals, because the heat could crack or shatter them.

1

Start by soaking the sample in a dish of soap and water.

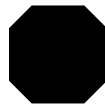


2

Give the sample a good scrubbing with a stiff bristle brush.

3

If there is some scaly material between crystals or in cracks that just won't come out by scrubbing, use a thin sharp object, like a nut pick to try to remove it.



Safety Tip

Make sure an adult helps you use the pick.

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How to... Collect Plants

We sometimes forget just how important plants are to us and all other life on Earth. Only plants can take energy from the sun and make food. In fact, everything we eat comes from plants! The oxygen we breathe also comes from plants. The world of plants is large and varied, from trees and shrubs to wildflowers and mushrooms.

Wise collectors...

- Always treat the site with respect and are careful not to disturb the area too much.
- Only collect plants when there are others of the same kind around, and only take one sample of each plant.
- Find out if there are any plants protected by law in the area.
- Do not collect in national or state parks.
- Take notes when collecting specimens.
- Try to identify the specimen in the field when it is fresh.

Example of a specimen label

Specimen # 1 _____
Date collected _____
Collected by _____
Location _____
Description of location _____
Other observations _____



Safety Tip

Learn what poison ivy and other poisonous plants look like. Either get

someone to show you or look in a plant guide.

1

Cut the plant's stem with scissors. Collect at least two leaves and the flower, if it has one. When collecting leaves from a tree or shrub, cut a small branch about 12 inches long. If there are many samples of the same type of plant, use a shovel to dig up the roots and collect the whole plant. Don't forget to collect seeds or fruits to make your collection complete.



To keep plants from wilting, place them inside a plastic bag such as a sandwich or garbage bag, depending on the size of the specimen, and seal the bag with a twist tie or tape. This helps keep specimens fresh until they can be pressed.

2



Handy Tip

To make sure the plant stays moist add a paper towel dampened with water to the plastic bag before putting the specimen in it.

3

Use masking tape to number each sample for future reference. In a notebook, write down the number of the sample and its information.

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How to... Press Plants

1

Tear a newspaper along the centerfold and fold it in half like a book. This is called a folder. You will need 4 folders per plant.

2

Open one of the folders up like a book and set a specimen in it. Arrange the plant so that all of it will fit on one half of the folder. Arrange one of the leaves so the bottom of the leaf can be seen. Gently fold the plant to make it fit if necessary. Close the folder. Do this for all the specimens.



Handy Tip

For future reference, make sure the specimens have been marked somehow while they are being pressed.

On a piece of cardboard or plywood put 3 empty newspaper folders. On top of this put a folder with a specimen in it. On top of that put 3 more empty folders followed by another folder containing a plant specimen, and so on.

3

On the last specimen put 3 more empty folders and then another piece of cardboard or plywood. Now put heavy weights on top of the press. Big books or bricks make good weights.

4



Handy Tip

Instead of putting something heavy on top of the press, canvas straps or belts can be used to squeeze the press together.

5

Place plants in a well-ventilated area and check on them daily. Replace damp folders with dry ones. Plants will dry in about 2-3 weeks.

6

Mount your plants on a thick piece of paper or cardboard, using sticky tape or a few dabs of white glue. Don't forget to put a label with important information next to with the plant on the paper.



7

Handy Tip

Put small weights over the plant to keep the plant in place and flat while the glue is drying.

Keep plant collections in a folder or cardboard box away from dust and moisture.

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How to... Collect Insects

Collecting insects can be both fun and educational. There are three main ways to collect insects: gathering dead insects, using an insect net to catch flying insects, or using an insect trap to trap land-based insects. **Kidspage recommends collecting insects that are already dead, or releasing caught insects after studying them.**

Making an Insect Trap

Dig a hole in the ground. Place a small container in the hole, so the top is just level with the ground. Cover the top of container with a small piece of wood supported by 4 stones at the corners. Put some soil or leaves and some fruit in the container. Check your trap daily for new visitors. Make sure to release insects daily.



Preparing a Specimen for Mounting

Kidspage recommends collecting insects that are already dead. If you have collected a dead specimen, skip to the next section "How to... Mount an Insect". If, however, you find a unique live specimen that you'd like to add to your collection, the insect must be killed before it can be mounted. Because of this, Kidspage asks that you only collect one example of each specimen.

1

Obtain a can or jar with a large opening and a tight fitting lid. If a glass

jar is used, tape up the bottom with a tough adhesive tape to reduce breakage.



2

Place cotton balls on the bottom of the container or tape them to the lid of the container.



3

Add nail polish remover to the cotton balls until they are soaked but not dripping wet. If they have been placed on the bottom of the container, cover them with a piece of wax paper or cardboard after adding the nail polish remover.



Safety Tips

Have an adult help you use the nail polish remover. Use nail polish remover in a well-ventilated area. Avoid inhaling the fumes.

4

Keep the lid on the jar at all times and remove it only to get specimens in or out. More nail polish remover should be added before each use.



Handy Tip

Stinging insects such as bees and wasps are best left alone. In the event that they are to be collected, the following procedure works well, however it is strongly advised that you proceed carefully when netting them.

After the insect has been caught in your net, swing the net rapidly through the air 3 or 4 times, to move the insects to the end of the net bag. Bunch up the net around the insect until it is isolated in a small pocket. Leave the specimen in the net, place the net in the killing jar and seal the jar. After the insect stops moving, carefully remove the net from the killing jar. It should be fairly safe to use the killing jar to scoop the insect out of the net at this time.

Note: if you have or suspect you may have an allergy to bee or wasp stings do NOT try to catch, kill, or mount these insects.



Handy Tip

Butterflies and moths tend to damage their wings by flapping around in containers. To help avoid this, put something in the jar that they can hold on to, such as a leaf or stick.



5

Leave the insect in the killing jar for at least 6 hours before taking it out to mount.

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How to... Mount Insects

Because insects have their skeleton on the outside, they keep well in a collection. The most common way of displaying insects is using a pin, which is passed through the thorax of the insect and pinned to foam.

Relaxing Insects

Before insects can be pinned they must first be relaxed. Begin by carefully trying to move the insect's legs. If the legs move, the insect is safe to pin and you may skip to the section "Pinning Insects". If the legs are stiff, then the insect has to be relaxed or softened before mounting or it will break.

1

A relaxing jar can be made from a container with a tight lid. On the bottom place damp paper towels and a mothball, which will keep specimens from going bad.



Safety Tip

Because a mothball is a poison/fumigant it should be used with caution. Read the instructions on the box and have an adult help you.



Cover the paper towels with a

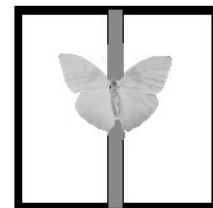
piece of wax paper or plastic wrap. Place the specimen in the jar on top of the wax paper and put the lid on. The insect should be ready for mounting in 2 days. The insect is ready for pinning when its legs are flexible.

2

Pinning Insects

Locate the center of the thorax and gently push a pin through it. The thorax is the middle body part to which the wings and legs are attached. This is the only pin that stays in the insect. It allows the collector to pin it in a display or storage case and handle it without breakage.

Fix the insect down the center of a pinning board, fitting the body into the gap. It is recommended that you purchase a pinning board if you will be pinning numerous specimens. You can also make a pinning board by taking a flat piece of Styrofoam and digging a small (approximately 1/2 inch) trench in the center.



3

If the insect's wings are folded, they must be flattened against the board. Do this by carefully inserting a strip of paper between them. Gently apply pressure to the wing

moving towards the board. Be careful not to break the wing. If the wings show a lot of resistance or won't stay flat on the board then the specimen needs to be relaxed more (see "Relaxing Insects").

4

Cover each wing with a strip of paper (parallel to the groove) and pin the bottom end of it.

5

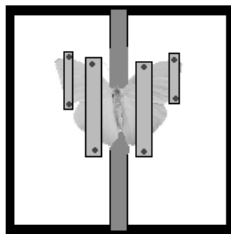
Gently tease a front wing out with a sharp needle placed against the large vein on the edge of the wing. Try not to puncture the wing because it can easily rip. If this is too difficult, try using a pair of tweezers. Move the wing ahead until the bottom edge of the wing is straight out from the body (at a right angle). Keep it in position by gently applying pressure to the strip of paper and inserting a pin in the paper near the top edge of the wing. Do not put pins into the wings as they are easily ripped.

6

Repeat the same with the lower wing, which should come up just under the top wing. Once again gently apply pressure to the strip of paper and insert a pin near the bottom edge of the lower wing.

7

Repeat the same on the other side.

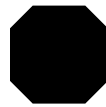


8

Leave your insect pinned to dry for about 2 weeks. Put it somewhere out of the way so it won't get damaged.

Storing Insects

Store specimens in a container with a tight fitting lid. To the bottom of the storage or display case affix something the specimens can be pinned to it, such as Styrofoam, cork or balsa wood. For display purposes use a container that has a window in the cover that let's you see the specimens. To discourage other bugs from eating your collection, place a mothball in each display case. Wrap it in cheesecloth and pin it to the bottom of the case or put it in a small fumigant box. Check storage or display case periodically and replace any mothballs that have evaporated.



Safety Tip

Because a mothball is a poison/fumigant it should be used with caution.

Read the instructions on the box and have an adult help you.

Nature Exchange

How to... Collect Seashells

The sea contains some of the richest life on earth. There is something about the sea that people find fascinating, perhaps because the creatures living there are so different from creatures on land, or because there is so much we don't know about life in the ocean.

Where To Look

The sea is divided into "tidal zones", different areas that are exposed twice a day and contain creatures adapted to living in that zone. The "splash zone" is the area where the incoming waves can reach. The "high tide" zone is the shallow water and as you move into deeper water you have the "middle tide zone", the "low tide zone" and the "pelagic zone" which is where free-swimming animals are found. Although you might find seashells while walking along the beach (the "splash zone"), you may want to wait until the tide is out and investigate the other zones where some of the nicer shells can be found. Other good places to look are in clumps of seaweed or tidal pools (small pools of water left behind when the tide goes out). **Please note: it is illegal to collect specimen from some California tidal pools. Make sure to check the rules for the beach you will be visiting before collecting.**



Safety Tip

When doing serious collecting or investigating, it is a good idea to wear something to protect your feet from shells with sharp edges. Also wear gloves to protect your hands if you will be digging.

Wise collectors...

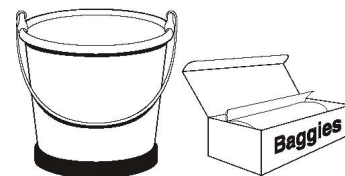
- Always treat the site with respect and are careful not to disturb the area too much.
- **Take only shells that are dead or empty.**
- Leave living creatures so that they will be around for others to enjoy.
- Take only what is needed and are picky about the shells they collect.
- Take notes when collecting specimen.

Specimen # 1	_____
Date collected	_____
Collected by	_____
Location	_____
Description of location	_____
Other observations	_____

Example of a specimen label



Bring something to put specimens in, like a bucket, or plastic bags.



Use a shovel or small stick to dig through the sand and seaweed.

Collect the shells you find interesting.

Remember to take only a few specimens and leave the rest

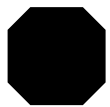
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How to... Clean Seashells

Shells should be cleaned as soon as possible after collecting, otherwise they may start to smell and/or rot.

1

Start by boiling the shells in water for a while, then allow them to cool.



Safety Tip

Boiling water is very dangerous, have an adult help you.

2

Any remaining flesh must be removed. With **bivalves** (animals with 2 shells) it's usually just a matter of scraping the inside of the shell with a knife.

Univalves (animals with 1 shell) sometimes require you to use a hook-like tool to reach in and clean out any flesh. You can make a hook from a wire coat hanger. Have an adult help you clean your shell.

3

Rinse shells carefully.



To clean the outside of shells, give them a good

brushing with dish soap and water.

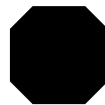
4

Sometimes the outside of the shell will have hard deposits, such as barnacles or coral. Have a parent help you use something sharp, like a pick, to gently scrape the deposits from the shell.

5

6

If the shells still aren't clean enough, you can soak them in a solution of bleach and water. Mix 1/4 cup of bleach to 4 cups of water. Soak the shells for 3 to 4 hours in this solution.



Safety Tip

Make sure an adult helps you with the bleach solution. Bleach is corrosive, so wear rubber gloves and be careful not to splash any in your eyes or on your clothes. Wear safety glasses.



7

Rinse your shells thoroughly to remove any bleach solution.

8

You can add a nice shine to shells by rubbing them with a soft cloth and a little Vaseline.

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How to... Collect Shed Snakeskin

Snakes are fascinating creatures and are well adapted to life without arms or legs. Some are able to climb and hunt in trees, others use camouflage and mimicry to hide and hunt, and some use poison to immobilize their prey. They also come in a variety of sizes, the record being held by an anaconda that measured at 42 ft in length. As with all reptiles, they must shed their skin when it gets too small for them. With snakes, the skin is often shed in one piece. A properly mounted shed skin can make an attractive addition to your nature collection, and no harm need come to the snake.

Where To Look

The best place to look is around crevices in rocks or woodpiles, since snakes will rub against something to help in the shedding of the old skin.

Wise collectors...

- Always leave the area as it was found.
- Handle the snakeskin carefully because it is brittle and easily damaged.
- Take notes when collecting specimen.

Example of a specimen label

Specimen # 1 _____
Date collected _____
Collected by _____
Location _____
Description of location _____
Other observations _____

Soak the shed skin in water for about 1 hour.

2

Make the pinning board that will be used to dry the snakeskin. It should be long enough to accommodate the skin and should be made of something which straight pins can easily be pushed into. A long piece of Styrofoam works well.

3

Spread the wet snakeskin on the pinning board. Be careful when doing this because the shed skin is thin and tears easily.

Using sharp scissors carefully cut along the belly or back, depending on which side of the skin you want

4

to display. Think of the shed skin as a hollow tube that is to be spread out flat, so that it should be cut lengthwise through one side.

Carefully spread the edges of the skin out onto the pinning board.

5

1



Handy Tip

The skin is much easier to work if it is kept wet. If the skin starts drying out add water by dipping your fingers in water and rubbing it on the skin.

6

Pin the edges of the skin with straight

pins placed approximately 1 in apart. This will keep the snakeskin flat while it dries.

7

Let the skin dry thoroughly. This should take a day or two.

8

Mount the snakeskin on a flat surface using small drops of white glue, or pins, depending on the surface of the mounting material.



Handy Tip

Dry snakeskin is very fragile, so handle it carefully and display it somewhere where it won't get damaged.



Handy Tip

Don't forget to add a label, with all the information you gathered about the skin somewhere on the mount.

Nature Exchange

How to... Collect Fossils

Fossils are the remains of plants or animals that lived a long time ago and have, over the course of time, turned to rock. They are extremely important because they give us clues to the earth's natural history. **Please note:** in some areas you are not allowed to take any fossils, so if you're not sure, always get permission before you collect.

Where to Look

Fossils are found in sedimentary rocks, which form from debris eroded from rocks or from the accumulation of the hard parts of seashells and coral. One way sedimentary rocks can be identified is by their layering. Good places to look are river valleys and streambeds.

Wise collectors...

- Always treat the site with respect and leave it the way it was found.
- Take notes when collecting specimens.

Why is the location so important?

Location helps a geologist make a positive identification. A sample only has value to a scientist if its location is known. It may turn out to be valuable, or may lead to something valuable, so it makes sense to write down where it comes from.

Safety Tip.

Be sure to wear safety glasses when collecting fossils.

Example of specimen label

Specimen #1 _____
Date collected _____
Collected by _____
Location _____
Description of location _____

1

Observations _____

Use a small brush, such as a paintbrush or even an old toothbrush, to brush away dust and dirt from the

sample area.

2

Carefully chip away the rock around the fossil with a geologist's pick.

Depending on how delicate the fossil is, a chisel or

awl may be used to carefully remove surrounding rock.

3

Pack the fossils in something soft, such as old newspaper or rags, to keep them from banging together.

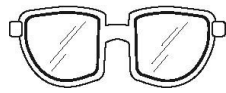
Nature Exchange



How to... Clean Fossils

Safety Tip

Be sure to wear safety glasses when cleaning fossils.



1

Soak the sample in dish soap and water.



Give the fossil a good scrubbing with a stiff bristle brush, such as a toothbrush.

3

2

To remove any leftover scaly material from around the fossil, use something thin and pointed, such as a geologist's pick or a nutpick.



Handy tip

For small or delicate pieces, use a magnifying glass while removing scale.

