



# Arkansas Rockhound News



President's Day

February 2010

Official Newsletter of the

Central Arkansas Gem, Mineral and Geology Society

## CAGMAGS

The Arkansas Rockhound News is Published monthly by the **Central Arkansas Gem, Mineral, and Geology Society**

**Colors: Blue and White**

**Website:** [www.centralarrockhound.org](http://www.centralarrockhound.org)

**Member of:** American Federation of Mineralogical Societies

Midwest Federation of Mineralogical Societies

**CAGMAGS**  
**4900 Sparks Rd.**  
**Little Rock, AR 72210**

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Next Meeting: February 23, 2010, 6:30 PM -  
Terry Library

Call James (501-568-0315), Dave (870-255-3679)  
or Obie (501-337-0511) to find out about the field  
trip plans.

**2010 Officers:**

**President:** Mike Austen [steelpony@aol.com](mailto:steelpony@aol.com)

**Vice President:** Tom Sharp  
[thom61847@yahoo.com](mailto:thom61847@yahoo.com)

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**Secretary/Treasurer:** Pat Kissire  
4900 Sparks Rd.

Little Rock, AR 72210

501-821-2346 [pkissire@sbcglobal.net](mailto:pkissire@sbcglobal.net)

**Committees / Chairs:**

**Programs:** Pearl Roth

**Library:** Ann Austen

**Membership:** Mike Austen

**Field Trips:** James Burns

**Show Chair:** Weldon Kissire

**Editor:** Barbara Nierstheimer

**Club Contact:** Lenore Murray

**Sunshine Chairman:** Angelee Peeler

**Junior Programs:** Obe Willix

**Webmaster:** Phillip Nierstheimer  
[phillspa@hotmail.com](mailto:phillspa@hotmail.com)

**Time and Location of Meetings:**

4th Tuesday of the month (January-November)

6:30 PM Terry Library, 2015

Napa Valley Drive, Little Rock, AR 7221

(Non-smoking) **Visitors are always Welcome**

**Membership Dues** \$15 Individual \$25 Family  
(Yearly)

**Mission Statement:**

The Central Arkansas Gem, Mineral and Geology Society is dedicated to promoting interest in mineralogy and the related sciences, interest in lapidary and the related arts; to encourage field trips and the enjoyment of collecting and preserving minerals as they occur in nature, and the study of geological formations, especially those of our Natural State of Arkansas. We are a small group of people that enjoy getting together to share our common interests.

**2010 Meeting Schedule**

**February 23 - Program is the CLUB AUCTION**

**March 23**

**April 27**

**May 25**

**June 22**

**July 27**

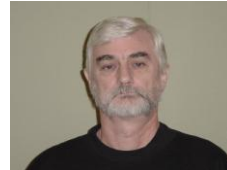
**August 24**

**September 28**

**October 26**

**November 23**

**President's Message**



Dear Rock Club Members,

It has been a good year for rockhounding so far in 2010. Between Christmas and New Years we had visitors from northern Indiana that we met last fall at a rock show in South Bend. They wanted to trade some of their northern stuff for some from Arkansas. So we showed them around to a few sites and had fun even if it did rain 9 inches the day they showed up. They went home with a truck load of stuff including lots of quartz and big smiles on their faces. We have been invited to visit them and we will next summer. Last weekend we were in Tyler Texas for the rock show there and talked to a lot of old friends from their club.

I guess I should mention that this is my first year as your club president, but I have been so busy that it seems like it has already been a while. The show and tell at our January meeting was great, we saw some neat stuff and learned more about some of our members. The program next month is the club auction so make sure you don't miss it, it's always something special. The field trip for February is to Leslie for fossils so don't forget.

I have started a contest to see who can bring in the most new members this year. One point for singles and two points for families, old members can be signed back up if they didn't pay dues in 2009. So get out there and help the club grow, the winner will be awarded a great prize. We need some help with our monthly programs so if any of you can help out, please let me know.

Mike Austen, Club President

**Club events**

**Feb 13 Field trip to Leslie for fossils**

**Apr 17 Swap Meet at Burns Park**

**June 12 Field trip and picnic at the James Burns home in Malvern**

**Oct 2-3 Club Show at Jacksonville**

**Central Arkansas Gem, Mineral and  
Geology Society  
Minutes for January 26, 2010**

President Mike Austen called the meeting to order. There were 21 members and one junior present. Toben Bennett became a member on his first meeting.

The Minutes and Treasury's report were approved as posted. Lenora reported the 2009 audit.

President Mike Austen opened by stating he would try for shorter business meeting at the monthly meeting and have business meetings on a regular basis. All meetings are open to members and you are encouraged to attend. He will send more e-mails so get on the list if we don't have your address. He encouraged everyone to be a member of some committee, to give us your birthday and anniversary dates (year is optional) to put in the newsletter and to list your other hobbies so that we can get to know each other better.

Library books are listed on the website and will be brought to the meetings for check out if you call Ann Austen – 501-8684553. **Re-approval for buying the book "Encyclopedia of Minerals" in honor of Mary Frances Eubanks that was approved in 2002 and never purchased was given.** Sarah Dodson will check about the purchase.

The February field trip will be to Leslie for fossils on the 2<sup>nd</sup> Saturday. Call James or Obe for information and to let them know you plan to go.

E-mails and flyers have been sent to local clubs for the April 17th Burn's Park Swap. We will need helpers so sign up with Mike or Phillip.

Flyers are available for the October Show so take some with you to distribute when

you go to a show, thanks to David Dodson.

The February program will be the Club Auction. There is a 5 item limit and 20% of sales go to the club. Bring cash so everyone can be paid at the meeting. Come early to sign in.

A membership contest is planned so start signing up new members and gain points for the big prize for the most new members.

The program was Show and Tell. Everyone had something. There were 35 plus items ranging from a mammoth tooth to bricks and a picture from Washington's Grist mill in Pennsylvania with all kinds of rocks and minerals in between. Thanks to all who brought items and told their stories. It was a fun and interesting meeting.

Best of raffle were Obe Willix – pyromorphite and David Murray – Peruvian pyrite.

Meeting was adjourned

Respectfully submitted,  
Pat Kissire, Sec/Tres



February Birthstone: Amethyst

**Amethyst** is a violet variety of [quartz](#) often used in [jewelry](#). The name comes from the [Ancient Greek](#) *a-* ("not") and *methustos* ("intoxicated"), a reference to the belief that

the stone protected its owner from [drunkenness](#); the [ancient Greeks](#) and [Romans](#) wore amethyst and made drinking vessels of it in the belief that it would prevent [intoxication](#).

Amethyst is the violet variety of [quartz](#); its chemical formula is SiO<sub>2</sub>.

In the 20th century, the color of amethyst was attributed to the presence of [manganese](#). However, since it is capable of being greatly altered and even discharged by heat, the color was believed by some authorities to be from an organic source. [Ferric thiocyanate](#) was suggested, and [sulfur](#) was said to have been detected in the mineral.

More recent work has shown that amethyst's coloration is due to ferric [iron](#) impurities.<sup>[1]</sup> Further study has shown a complex interplay of [iron](#) and [aluminium](#) is responsible for the color.<sup>[2]</sup>

On exposure to heat, amethyst generally becomes [yellow](#), and much of the [citrine](#), [cairn gorm](#), or yellow quartz of jewelry is said to be merely "burnt amethyst". Veins of amethystine quartz are apt to lose their color on the exposed outcrop<sup>[citation needed]</sup>.

Synthetic amethyst is made to imitate the best quality amethyst. Its chemical and physical properties are so similar to that of natural amethyst that it can not be differentiated with absolute certainty without advanced gemological testing (which is often cost-prohibitive). There is one test based on "Brazil law twinning" (a form of [quartz twinning](#) where right and left hand quartz structures are combined in a single crystal<sup>[3]</sup>) which can be used to identify synthetic amethyst rather easily. In theory however it is possible to create this material synthetically as well, but this type is not available in large quantities in the

market.<sup>[4]</sup> Amethyst is composed of an irregular superposition of alternate [lamellae](#) of right-handed and left-handed quartz. It has been shown that this structure may be due to mechanical stresses.

Because it has a hardness of seven on the [Mohs scale](#), amethyst is suitable for use in jewelry.

Amethyst occurs in primary hues from a light pinkish violet to a deep purple. Amethyst may exhibit one or both secondary hues, red and blue. The ideal grade is called "Deep Siberian" and has a primary purple hue of around 75–80 percent, 15–20 percent blue and (depending on the light source) red secondary hues.<sup>[4]</sup>

Amethyst was used as a [gemstone](#) by the ancient [Egyptians](#) and was largely employed in antiquity for [intaglio engraved gems](#).<sup>[5]</sup>

The Greeks believed amethyst gems could prevent [intoxication](#), while medieval European soldiers wore amethyst [amulets](#) as protection in battle.<sup>[6]</sup> Beads of amethyst were found in [Anglo-Saxon](#) graves in [England](#).<sup>[citation needed]</sup>

A huge [geode](#), or "amethyst-grotto", from near Santa Cruz in southern [Brazil](#) was exhibited at the [Düsseldorf, Germany](#) Exhibition of 1902.

Amethyst is the traditional [birthstone](#) for February.

The Greek word "amethystos" may be translated as "not drunken", from Greek *a-*, not + *methustos*, intoxicated<sup>[7]</sup>. Amethyst was considered to be a strong antidote against drunkenness, which is why wine goblets were often carved from it. In Greek mythology, [Dionysus](#), the god of intoxication, and wine, was pursuing a maiden named Amethystos, who refused his

affections. Amethystos prayed to the gods to remain chaste, which the goddess [Artemis](#) granted and transformed her into a white stone. Humbled by Amethystos's desire to remain chaste, Dionysus poured wine over the stone as an offering, dyeing the crystals purple.

Variations of the story include that Dionysus had been insulted by a mortal and swore to slay the next mortal who crossed his path, creating fierce tigers to carry out his wrath. The mortal turned out to be a beautiful young woman, Amethystos, who was on her way to pay tribute to Artemis (the hunter goddess). Her life is spared by Artemis, who transformed the maiden into a statue of pure crystalline quartz to protect her from the brutal claws. Dionysus wept tears of wine in remorse for his action at the sight of the beautiful statue. The god's tears then stained the quartz purple.<sup>[8]</sup> Another variation involves the goddess [Rhea](#) presenting Dionysus with the amethyst stone to preserve the wine-drinker's sanity.<sup>[9]</sup>

Amethyst is produced in abundance from the state of [Minas Gerais](#) in [Brazil](#) where it occurs in large [geodes](#) within [volcanic rocks](#). It is also found and mined in [South Korea](#). The largest opencast amethyst vein in the world is in Maissau, Lower Austria. Many of the hollow agates of Brazil and [Uruguay](#) contain a crop of amethyst crystals in the interior. Much fine amethyst comes from [Russia](#), especially from near Mursinka in the [Ekaterinburg](#) district, where it occurs in drusy cavities in granitic rocks. Many localities in [India](#) yield amethyst. One of the largest global amethyst producers is Zambia with an annual production of about 1,000 t.

Amethyst occurs at many localities in the [United States](#). Among these may be mentioned: the [Mazatzal Mountain](#) region in

[Gila](#) and [Maricopa Counties, Arizona](#); Amethyst Mountain, [Texas](#); [Yellowstone National Park](#); [Delaware County, Pennsylvania](#); [Haywood County, North Carolina](#); Deer Hill and Stow, [Maine](#) and in the [Lake Superior](#) region. Amethyst is relatively common in [Ontario](#), and in various locations throughout [Nova Scotia](#). The largest amethyst mine in [North America](#) is located in [Thunder Bay, Ontario](#).<sup>[10]</sup>

Up to 18th century amethyst was included in the cardinal, or most valuable, gemstones (along with [diamond](#), [sapphire](#), [ruby](#), and [emerald](#)). However since the discovery of extensive deposits in locations such as [Brazil](#) it has lost most of its value.

Collectors look for depth of color, possibly with red flashes if cut conventionally.<sup>[11]</sup> The highest grade amethyst (called "Deep Russian") is exceptionally rare and therefore its value is dependent on the demand of collectors when one is found. It is however still orders of magnitude lower than the highest grade sapphires or rubies ([Padparadscha](#) sapphire or "pigeon's blood" ruby).<sup>[4]</sup>



**Fossil Facts: Crinoids**

**Crinoids**, also known as **sea lilies** or **feather-stars**, are marine animals that make up the class **Crinoidea** of the [echinoderms](#) (phylum Echinodermata). Crinoidea comes from the Greek word *krinon*, "a lily", and *eidos*, "form". <sup>[1]</sup> They live both in shallow water and in depths as great as 6,000 meters. <sup>[citation needed]</sup>

Crinoids are characterized by a mouth on the top surface that is surrounded by feeding arms. They have a U-shaped gut, and their anus is located next to the mouth. Although the basic echinoderm pattern of fivefold symmetry can be recognized, most crinoids have many more than five arms. Crinoids usually have a stem used to attach themselves to a [substrate](#), but many live attached only as juveniles and become free-swimming as adults.

There are only a few hundred known modern forms, but crinoids were much more numerous both in species and numbers in the past. Some thick [limestone](#) beds dating to the mid- to late-[Paleozoic](#) are almost entirely made up of disarticulated crinoid fragments.

Crinoids comprise three basic sections; the stem, the [calyx](#), and the arms. The stem is composed of highly porous ossicles which are filled with muscular tissue. The calyx contains the crinoid's digestive and reproductive organs, and the [mouth](#) is located at the top of the dorsal cup, while the [anus](#) is located peripheral to it. The arms display pentamerous symmetry and comprise smaller ossicles than the stem and are equipped with [cirri](#) which facilitate feeding by moving the organic media down the arm and into the mouth.

The majority of living crinoids are free-swimming and have only a [vestigial](#) stalk. In

those deep-sea species that still retain a stalk, it may reach up to 1 metre (3.3 ft) in length, although it is usually much smaller. The stalk grows out of the *aboral* surface, which forms the upper side of the animal in starfish and sea urchins, so that crinoids are effectively upside-down by comparison with most other echinoderms. The base of the stalk consists of a disc-like sucker, which, in some species, has root-like structures that further increase its grip on the underlying surface. The stalk is often lined by small cirri. <sup>[2]</sup>

Like other echinoderms, crinoids have pentaradial symmetry. The aboral surface of the body is studded with plates of calcium carbonate, forming an endoskeleton similar to that in starfish and sea urchins. These make the calyx somewhat cup-shaped, and there are few, if any, ossicles in the oral (upper) surface. The upper surface, or *tegmen*, is divided into five *ambulacral areas*, including a deep groove from which the [tube feet](#) project, and five *interambulacral areas* between them. The anus, unusually for echinoderms, is found on the same surface as the mouth, at the edge of the tegmen. <sup>[2]</sup>

The ambulacral grooves extend onto the arms, which thus have tube feet along their inner surfaces. Primitively, crinoids had only five arms, but in most living species these are divided into two, giving ten arms in total. In most living species, especially the free-swimming feather stars, the arms branch several times, producing anything up to two hundred branches in total. The arms are jointed, and lined by smaller feather-like appendages, or *pinnules*, which also include tube feet. <sup>[2]</sup>

The earliest known crinoids come from the [Ordovician](#). They are thought to have

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evolved from primitive [echinoderms](#) known as Eocystoids. Confusingly, another early group of echinoderms were also the [Eocrinoids](#), but that group is currently thought to be an ancestor of [blastoids](#) rather than of crinoids.

The crinoids underwent two periods of abrupt [adaptive radiation](#); the first during the Ordovician, the other after they underwent a selective [mass extinction](#) at the end of the [Permian](#) period.<sup>[4]</sup> This Triassic radiation resulted in forms possessing flexible arms becoming widespread; [motility](#), predominantly a response to predation pressure, also became far more prevalent.<sup>[5]</sup> After the end-Permian extinction, crinoids never regained the morphological disparity they enjoyed in the Paleozoic; they occupied a different region of morphospace, employing different ecological strategies from those that had proven so successful in the Paleozoic.<sup>[4]</sup>

The long and varied geological history of the crinoids demonstrates how well the echinoderms have adapted to filter-feeding. The fossils of other stalked filter-feeding echinoderms, such as blastoids, are also found in the rocks of the [Palaeozoic](#) era. These extinct groups can exceed the crinoids in both numbers and variety in certain horizons. However, none of these others survived the crisis at the end of the Permian period.

(Birthstone and mineral of the month courtesy of [www.wikipedia.com](http://www.wikipedia.com).)

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## CALENDER OF AREA ROCK SHOWS

(from Rock and Gem Magazine)

### FEBRUARY 2010:

12-14--KIRKWOOD, MISSOURI: Show; Cabin Fever Productions; Kirkwood Community Center, 111 S. Geyer; Fri. 4-9, Sat. 10-6, Sun. 10-4; adults \$3, seniors and students \$2, children 12 and under free; jewelry, gems, rocks, minerals, fossils, attendance prizes; contact Melanie Vick, 1801 Barbary Way, Swansea, IL 62226, (618) 830-8471; e-mail: cabinfeverprod@aol.com; Web site: www.cabinfeverproductions@yolasite.com

20-21--PLAINVIEW, TEXAS: 48th annual show; Hi Plains Gem & Mineral Society; Ollie Liner Center, south I-27; Sat. 10-6, Sun. 10-5; adults \$2, students \$1; dealers, demonstrators, grand prizes, silent auction, kids' wheel; contact Mildred Matlock, 701 Zephyr, Plainview, TX 79072, (806) 293-3476; e-mail: jmmatlock@suddenlink.net

27-28--JACKSON, MISSISSIPPI: 51st annual show; Mississippi Gem & Mineral Society; Mississippi State Fair Grounds/Trade Mart Bldg., 1207 Mississippi St.; Sat. 9-6, Sun. 10-5; adults \$5, students \$3; free demonstrations, door prizes, educational and hands-on booths, 24 dealers; contact Keith Peacock, 114 Quail Ridge Rd., Braxton, MS 39044, (601) 863-6535; e-mail: kpcoc@aol.com; Web site: missgems.org

### MARCH 2010:

5-7--RICHMOND, INDIANA: Show; Eastern Indiana Gem & Geological Society; Wayne Co. Fairgrounds, 861 N. Salisbury Rd.; Fri. 9-6, Sat. 10-6, Sun. 11-4; adults \$4, seniors \$3, students \$1, children 6 and under free; contact John LaMont, 14158 St. Rd. 1, Brookville, IN 47012, (765) 647-4503; e-mail: [Midwestchar@peoplepc.com](mailto:Midwestchar@peoplepc.com)

6-7--BIG SPRING, TEXAS: 41st annual show; Big Spring Prospectors Club; Howard County Fair Barn; Sat. 9-5, Sun. 10-5; dealers, demonstrators; contact Jerald Wilson, 707 Tulane, Big Spring, TX 79720, (432) 263-4662 or (432) 263-3340

# Kid's Corner

## Editor's Note

Beginning in this issue, we will include a page dedicated to the education and entertainment of children who are interested in rock, rock hunting, and in the world around them in general. Your input to this page is important and your contributions will be gratefully accepted. The page will contain pictures, games, activities and articles aimed at and devoted to instilling the love of rock hounding and rock collecting to our children. This is a first for attempt for me and is a work in progress, so be patient.



NAME:

**Clear Crystal Quartz CLASSIFICATION:** Mineral  
 Quartz is plentiful in your own backyard. Arkansas is one of the best collecting sites in the world for quartz. Quartz crystal is found here in Hot springs, Mt. Ida, and in other various locations around the state. For Arkansans it is one of the most plentiful specimens to collect and is a great stone to begin or add to a collection.

- <http://kidsforsavingearth.org/>
- <http://www.rocksforkids.com/>
- <http://www.kidsgeo.com/>
- <http://www.rockhoundkids.com/>

**Directions:** Find the words listed below. Words can be found listed across, down or diagonally; forwards and backwards. **GOOD LUCK!**

W	H	O	X	J	H	S	H	O	A	K	P	W	Q	D	P	R	D	V	
Q	D	I	C	V	O	L	S	Q	Y	S	A	O	P	C	T	U	T	H	O
K	V	P	J	I	N	C	B	C	L	E	A	V	A	G	E	J	Y	I	R
A	J	P	L	I	H	C	E	M	E	N	T	A	T	I	O	N	L	H	O
E	P	T	S	V	H	P	F	I	G	E	M	E	S	H	W	R	I	X	C
R	G	L	Q	A	S	R	C	O	M	P	A	C	T	I	O	N	D	X	K
T	C	I	N	T	R	U	S	I	V	E	R	O	C	K	H	U	N	E	C
S	N	O	R	R	P	M	X	G	M	A	U	U	L	A	K	U	I	C	Y
I	N	O	R	G	A	N	I	C	P	Q	L	O	X	W	S	B	T	O	C
H	X	E	G	L	P	G	U	I	E	W	H	F	T	U	L	N	P	S	L
X	A	K	C	O	R	E	V	I	S	U	R	T	X	E	N	T	N	M	E
C	K	C	O	R	Y	R	A	T	N	E	M	I	D	E	S	Y	P	E	D

intrusive rock	rock cycle
inorganic	extrusive rock
cleavage	cementation
compaction	streak
sedimentary rock	gem

Courtesy of Obe Willix

Four of the most important things to do! **Keep** track of the rocks! (Do not lose the mineral). Yes it is a mineral as well as a rock, most likely! **Make** a label on an index card. List the name of the rock or a ? mark if you do not know yet. **Write** the date you found it. **Write** down the location where you found it.

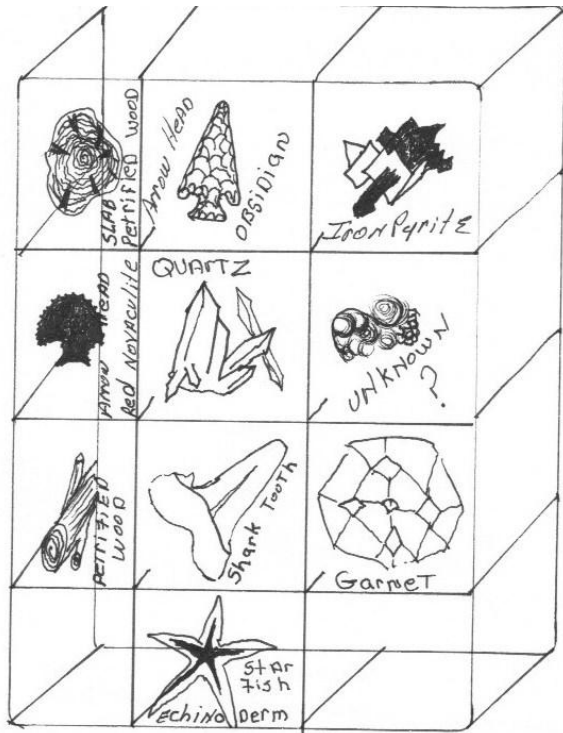
Simply place the label in the bottom of each square hole and set the rock on top. By placing them that way, you can take it out and adjust the label if you find out your Bauxite was really Quartz.. (By the way, that happens to me all the time!)

Where do I get my boxes, you may ask? Use your fishing box has lots of holes. Many plastic sewing boxes have lots of holes. (have Grandpaw make you one or Be sure to help him.) I like the

what this is) and you can still find them at yard sales. Another box idea is simply a sturdy cardboard box with duct tape and big paper clips.

**Remember**, Take care of your rocks, minerals, fossils, and gems and you may still have them when you are 50 or 60 years old.





collector's

## The Big Rock Hunt

### PROJECT:

Find and identify a variety of rocks

### GOAL:

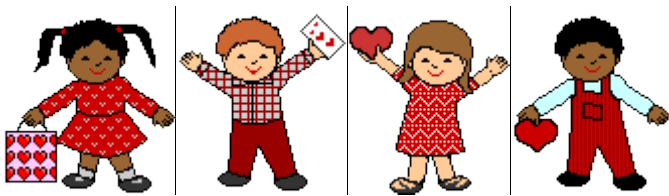
To start a rock collection and learn basic geology skills such as using simple tools, identifying appropriate areas to search and correctly identifying rocks and minerals

### AGES:

Five to 12

### MATERIALS:

- Rock and mineral guide
  - A lightweight sledge or "drill" hammer, a half-inch chisel or rock hammer, and a half-inch cold or "pocket" chisel
  - Two or three inexpensive screwdrivers
  - One hand lens (10X magnification) for each child
  - One pair of safety goggles per child
  - Hard hats or bike helmets (if you're collecting on cliffs or road cuts)
  - Work gloves
  - Two sturdy bags for equipment and specimens
  - Blank stickers, note pads and pencils
  - Newspaper, plastic bags, tissue paper or bubble wrap (for packing specimens)
  - A compass and map
  - Water, snacks, sunscreen, hat and a first-aid kit



## Valentine's



As much as children love picking up rocks here and there, it may take some time for them to develop a high level of enthusiasm for an advanced rock-hunting expedition. Over time, though, they'll get better at spotting interesting rocks and minerals to investigate as well as extracting specimens for our collections, and learning how to go about identifying our samples.

### **PREP: OUTFITTING YOUR ROCK HOUNDS**

The library is a good place to start your research. You'll need to find a good book on rock and mineral hunting in your area and do a little research. Unless you own a big piece of property, you'll also need to make a few phone calls to find a good rock-hunting locale. Try calling either the geology department of a nearby university or the minerals department of a local museum. Be sure to find out if you need permission to gather specimens from the properties (no matter what anyone says, it's illegal to take anything, including rocks, from any national park).

When you've settled on a spot, you and your kids can begin organizing the rock-hunting materials. You can either buy official tools or improvise from your home toolbox. For breaking rocks and prying out samples, rock hunters use a hammer called a geologist's pick (or g-pick), which has a square end for smashing large rock and a pick at the other end for prying and splitting sedimentary rock. You can buy one of these at a rock show or specialty store. You also can do just fine with a standard lightweight sledgehammer, a half-inch cold chisel and a couple of cheap screwdrivers.

While you're at the hardware store, be sure to purchase a pair of safety goggles for each child, regardless of whether or not they'll be working with the hammers and chisels--rock fragments can fly great distances. Also, if you'll be chipping rocks out of a cliff face or road cut, be sure everyone has a helmet. You needn't buy hardhats--bike helmets will work fine.

### **STEP 1: FINDING A PRIME SPOT**

There are a few specific locations that will increase your odds of finding interesting specimens. The road cut is every rock hunter's favorite destination (other fruitful locations are stream beds, hillside ledges and the rock faces of sea cliffs, quarries and mine dumps). The beauty of the road cut, as with quarries, is that the bulldozers and dynamite have already done most of the hard work, uncovering different formations for you. Road-cut exploration, like quarry exploration, requires certain safety precautions, though, especially with children. Before we headed out, I went over the rules with all the children: stay with me, stay off the road, keep your eyes and ears open, and wear your helmet.

### **STEP 2: USING THE TOOLS**

First, let the kids practice cracking open some fallen rocks. When using the lens, hold close to your eye and move the specimen toward you until it comes into focus. If the kids aren't sure how to do this, let them practice on a scrap of newspaper. When the letters are crisp and clear, the kids will know they have them in focus.

In rock-hound jargon, a "hog" is a person who takes more samples than he or she can use, while a "waster" is someone who needlessly busts them up. Kids, particularly those armed for the first time with a rock hammer, need to be warned against hacking away at whatever is in front of them.

Instead, encourage them to break up rocks that are already on the ground. It will also help cut down on overload if you explain to your kids that as they work, they should be careful to number their specimens, enter the date and location on their note pads, and carefully wrap pieces for transport home. Besides slowing the kids down a little, this is a crucial step for anyone starting a collection. It's amazing how easy it is to forget where a rock came from or when it was collected.

### STEP 3: ROCKS 101

While you're out in the field, you can begin talking about how the landscape around you came to look the way it does. Don't try to recite the events of the Cretaceous period, just spend some time speculating on how the landscape got its shape. Here are some of the basics:

## IGNEOUS ROCKS

are fire rocks (if they know the word ignite, that can help kids hold onto the meaning of igneous), either liquid rock that broke through the earth's surface and then cooled out in the air, or liquid rock that cooled underground and then made its way up toward the surface.

## METAMORPHIC ROCKS

have been changed by intense heat or pressure, and are akin to a blueberry muffin where the batter becomes solid and the blueberries lose their shape in the heat of the oven.

## SEDIMENTARY ROCKS

are igneous or metamorphic rocks that have shifted from their original positions, becoming layered and stacked. For kids, they're best compared to a laundry basket or a pile of dirty clothes lying on the floor: one item gets deposited on top of another and the bottom layers are the oldest.

## MINERALS

are natural solids such as talc, quartz, silver, topaz, sulphur, mercury and diamonds. When one or more minerals combine, they form a rock.

### STEP 4: ROCK GAMES

As soon as your kids get the hang of finding and identifying rocks, you can add to the excitement by introducing a few theme hunts. Here are our favorites:

- Ask the kids to find "shape rocks." Kids will get a kick out of finding rocks shaped like button mushrooms or eagles with outspread wings.
- In a stream bed, ask the children to find "rainbow rocks"--ones that contain at least one rainbow color.
- Play "I Spy"--have the kids challenge each other to find a rock with a big pink vein, a dotted rock, a split rock and so on.

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