Be a Scientist at Home: Anyone can do it!

You have all the tools you need at home to start to be a scientist who studies the Earth. We call them geologists, scientists who study rocks, and paleontologists, scientists who study fossils.

Why study rocks and fossils? I once read rocks being describes as “the pages of Earth’s story.” As we collect and study each rock and fossil, we fill in the gaps of that story.

Tools that will help you complete this activity
(Do not worry if you do not have everything on this list!)

- Your senses – ability to see, hear, feel, smell, and/or taste
- Some scrap paper
- Something to make marks with (pencil, pen, marker, crayon)
- Box, old plastic bowl, or something to hold items you collect
- Bowl of water
- One or two old paint or tooth brushes that will be designated for this job only.
- Extras if you have them: some type of magnifying glass (sometimes an adult’s reading glasses will magnify ask if they would help you with this); light source- can be flashlight or a cell phone (once again ask for permission first)
- Work station- can be a table that might get dirty or the floor or porch/outside table. Workstation – place where you can lay out your rocks, you have all your tools around you and there is good light.

A scientist uses the power of observation to learn about the natural world. As a paleontologist or geologist your world is right outside your door. This activity will help you take the steps required to “open the door” to being an Earth scientist. This activity could be expanded into different kinds of science, since we all study with similar techniques just different subjects.

Collection

1. First step is to collect some specimens to study. Since yours in outside, ask an adult what you should wear for the weather outside, and dress appropriately. Make sure you have permission to collect in the area you will be exploring and maybe take along a guide- such as a big sibling, friend, or adult.
2. Take your collecting box with you and head outside.
3. You will be looking for rocks of any type.
4. A rock is solid, naturally occurring item and made up of minerals.
5. Pick up and put into your box anything you think might be a rock. Once you have if filled, or it is as heavy as you can carry, bring it into the house.
Preparation for study

1. Before you bring all the rocks back in, sit down with your brush and brush as much dirt off your rocks as possible. Take each one and as you brush, feel and look at your rocks. What does it feel like or is there anything interesting on them.
2. Once you have brushed off your rocks, place them back in your box (that you dumped out the dirt from) and bring them inside.
3. Now go to your workstation- or make one up now. (See above in tools needed to find out what a work station is.)

Sorting, classifying, and observation

1. Sorting or classifying- What is sorting? It is separating and grouping objects which have same properties or characteristics.
2. Take out a rock, one at a time.
3. Observation: With your senses-Seeing; feeling; hearing; smelling; tasting (PLEASE don’t taste your rocks!)
4. Make observations- make sure you observe all sides, so turn your rock over!
   a. How does it feel? Rough/ smooth/ some of both? Heavy/ light? Sharp edges?
   b. What do you notice by looking at it? Does it have sharp edges? In a recognizable shape such a ball or arrowhead? What color or colors do you notice? Do you see any patterns on the rock? Holes/bumps/lines noticed? Might there be fossils present?
   c. Smell it. Any noticeable smell?
   d. Tap it with your pencil or writing device. Make note of the sound- high pitch? Low? No sound? We will come back to sound in the experiment stage.
5. Here is where you should use your scrap paper and pencil. Assign each rock a number, (maybe you can write it on the rock?) write down each observation you make for each rock on the paper.
   a. Below is an example I made of my rock observations. You can just draw out your rock, record the observations, add anything you like or feel is important to include.

<table>
<thead>
<tr>
<th>Rock #1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Feel:</strong> seems medium weight, smooth but sharp broken edges, very crumbly</td>
</tr>
<tr>
<td><strong>Look:</strong> Grey, has lines on it in shape of shell (fossil?) broken edges and fits into my hand. Measures three fork widths wide. (used my dinner fork as measurement)</td>
</tr>
<tr>
<td><strong>Smell:</strong> smells like dirt</td>
</tr>
<tr>
<td><strong>Sound:</strong> sounds dull when I hit it with my pencil while holding the rock.</td>
</tr>
</tbody>
</table>
6. Do this for each of your rocks. As you are finished lay each rock out in front of you.

7. Once all your rocks are completed as above. Look them over and decide how you should sort or classify them. What rocks have similar observations? Color? Shape? Size? Patterns? Now you can bring back the sound part- which ones sound the same when tapped? You can sort/classify and repeat with another observation. Suggestion on your recording. With each sort record the # of the rock in each group such as:

   a. EXAMPLE Size sorting: Forks as measurements
      i. Large Rocks (5 forks) – number 3, 4
      ii. Medium rocks (3-4 forks) Number 1, 5, 6
      iii. Small rocks (0-2 forks) number 2, 7, 8.

Experiments

- Now the fun science (Not that the other wasn’t fun)! Let’s experiment.
  o Lay out your rocks from smallest to largest. Does any pattern appear? Maybe similar kinds of rock are the largest?
  o What happens when you put water on them?
  o Can you build a tower with them?
  o Can you make a shape of something you can recognize with all of them?
  o What happens when you scratch each rock with a fork? Piece of plastic? Other rocks?
  o Can you identify your fossils on your rock?
  o Hold the rock and tap it lightly. Pick up another rock with the first one. Now compare the sounds of the tapping. You will notice there is a different sound for each rock.
  o Can you think of any other experiments with your rocks?

Parents: You can ask your child guiding questions but this is mostly a self-exploration activity. They may need your help outside. Here are a few suggestions.

1. How can you classify objects? Classify would be similar to sorting them into same characteristics. Many ways to do it. Probably no wrong way. Just remain consistent.

2. Why did you put objects into a chosen category?

3. How many objects are in each category? Can you count them?

4. If any of the categories have the same number of objects can they be put together into a new category? Why or why not?
Field Guide to help you identify a possible fossil on your rock is below.

Field Guide for Central New York Devonian Fossils

I can examine my fossil to help me identify it.

I will circle the picture of the fossil which looks most like my fossil.

- Trilobite
- Brachiopods are symmetrical
  - Brachiopods
- Bivalves are asymmetrical
  - Bivalves (clams)
- Crinoids and stem segments
- Rugose (horn) Coral