



Rock Project

Owl - Saint John Paul II: School-age 2

Background

Amy, RECE and Kara, RECE, along with their school-age group of SK's (5, 6 years) and Grade 1's (6, 7 years) began the project on rocks right at the start of the school year in September of 2016. We explored this topic through until February 2017, with Ashley, ECF, replacing Amy in October of 2016.

Phase 1: Beginning the Project

This project started with the children exploring outside in the field. A few of the children brought in different types of rocks that they had found to share with the group. These ranged from pebbles to stones, rocks, and even two broken-off chunks of brick! We decided we should examine our findings further. We also introduced different types of rock such as smooth beach pebbles, and even a gem kit with magnifying glasses. From here, we had a large group talk about rocks in which we discussed what we know about rocks, what we want to find out, and whom we could ask to answer our questions.

What we know	What we want to know	Who we can ask
<ul style="list-style-type: none">- they can be colourful- they can have sand in them- when waves wash over them, they can turn to sand- they can blend in- they are not a living thing- they appear to change colour in rain- they can be bricks- they can sparkle in the sun- volcanoes can explode rock- fossils can have rocks- they are part of roads and houses	<ul style="list-style-type: none">- Do they change colour in the rain?- Why are they hard?- Why do they have sand in them?- Why do they sink?- Why are some smooth and some rough?- Are there rocks in a volcano?- Is hot lava made of rock?- Are they a living thing?	<ul style="list-style-type: none">- scientist:<ul style="list-style-type: none">• Meteorologist?• Geologist• Archeologist• Astronomer- construction worker- house builder

Phase 2: Developing the Project

Brainstorming!

To develop our initial topic and ideas, we used brainstorm webs. We made one with our group (**Figure 1**) as well as a teacher web in which Amy, Kara, and Ashley contributed their ideas (**Figure 2**). Some “rock” subtopics included Types of commonly found rocks, Construction/Building materials, Archeology and Geology. The children’s brainstorm web included Types, Uses, Gems, and Fossils.

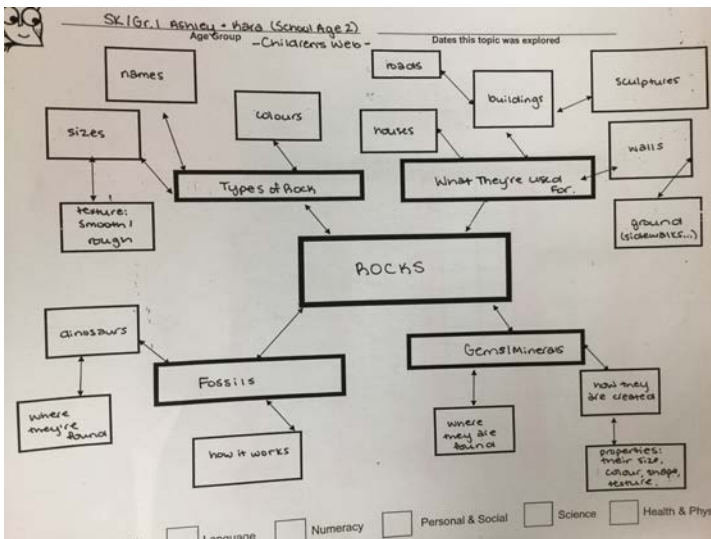


Figure 1

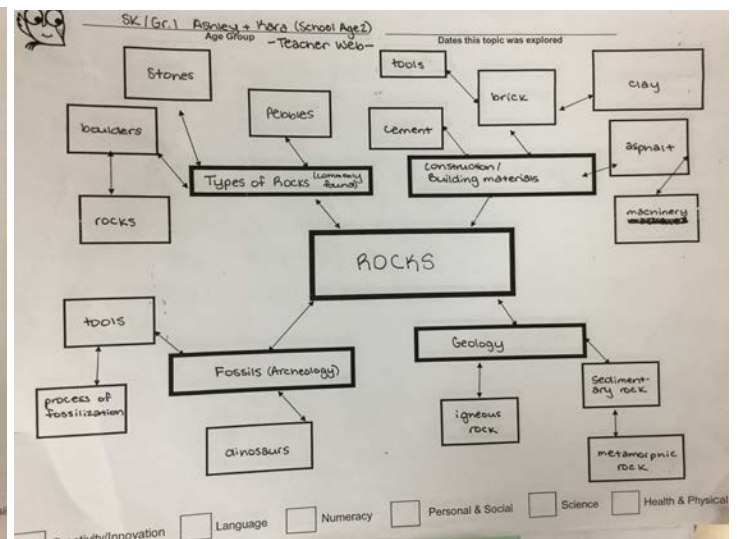


Figure 2

Vocabulary (Literacy)

We found there are a lot of vocabulary words associated with learning about rocks! We made a list of formal definitions from sources such as the internet or books (**Figure 3**). We also used our vocab list to challenge us to think of our own informal definitions (**Figure 4**).

Words that we brainstormed and researched include: rock, stone, pebble, boulder, gem/gemstone, jewel, mineral, geology, mineralogy, petrology, geochemistry, metamorphic rock, slate, marble, limestone, igneous rock, sedimentary rock, archeology, fossil, volcano, construction, architecture, masonry, cement, clay, pavement/asphalt, gravel, brick, meteorite, comet, and astronomer. We divided the words into sections because there are so many different words that have to do with rocks!

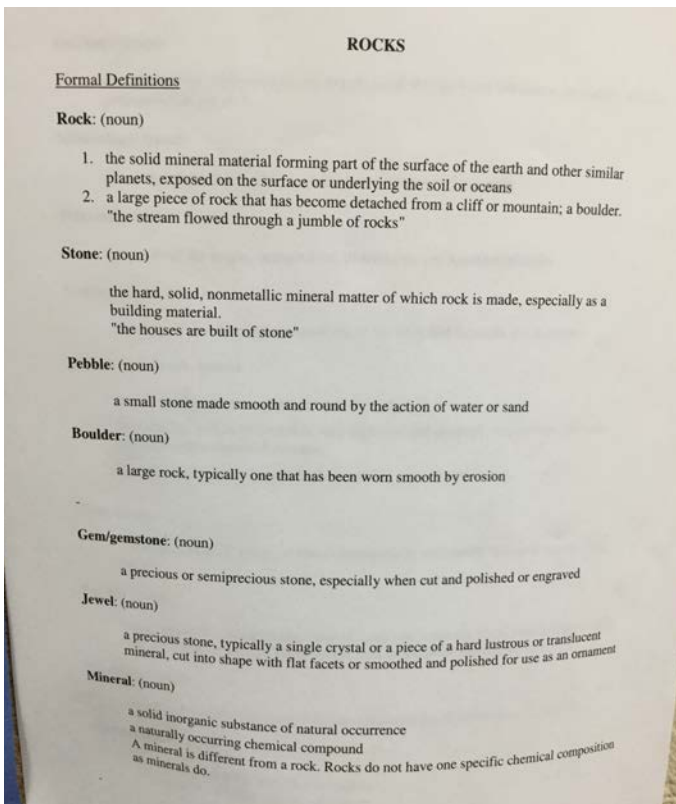


Figure 3

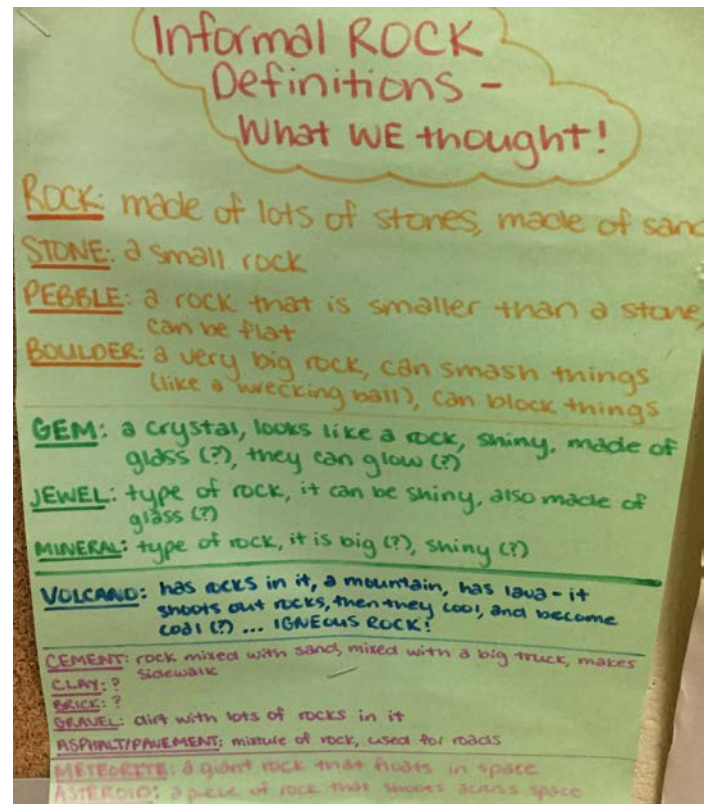


Figure 4

Survey (Literacy, Numeracy, Personal & Social)

Amy created and tallied a rock survey with our group's help. **Figure 5:** Do you think rocks are shiny? Do you think rocks live? Do you have rocks in your garden? Do you think rocks live underground? Do you think rocks live under sand? **Figure 6:** Do you think rocks live under water? Do rocks burn in the fire? When you find a rock and break it open, is there another rock inside it? ... Some of these reflected our initial "What do we want to know?" questions.

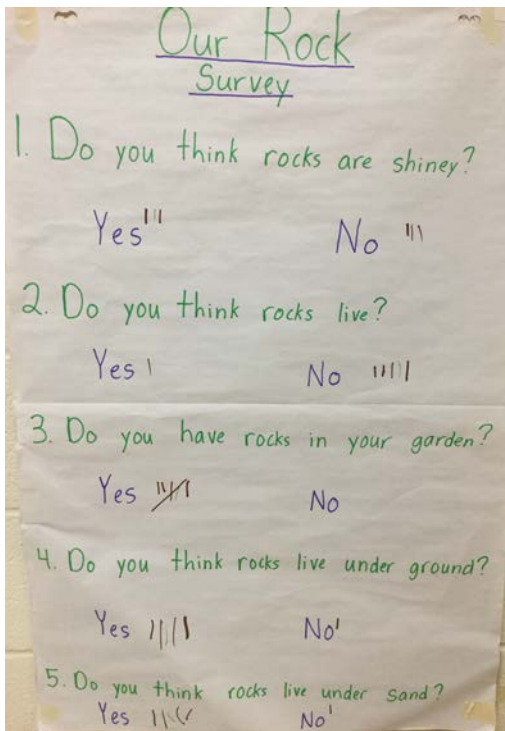


Figure 5

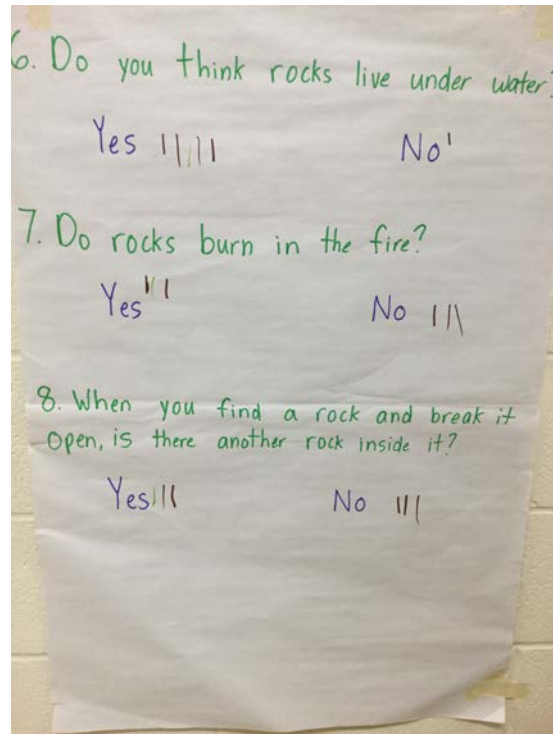


Figure 6

1st and 2nd Representations (Creative, Literacy)

Olivia, age 6, created her first representation of a rock. She described: "It's a red rock. I saw one in the [gem] kit." (**Figure 7**). Olivia also used a reference for her second representation of the rock "citrine" (**Figure 8**). Wow! She even labelled it using the gem kit guide!!

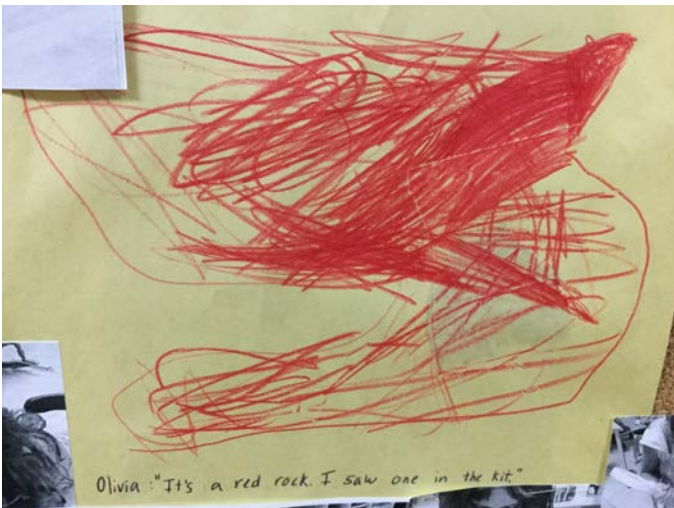


Figure 7

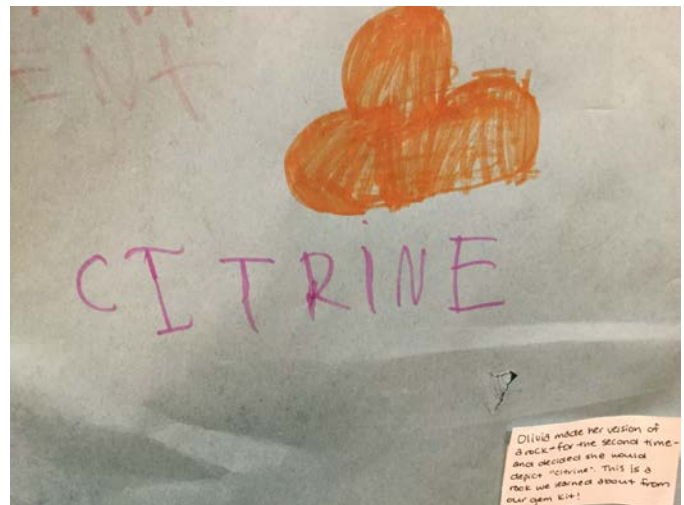


Figure 8

3D Representations (Creative, Innovative, Fine Motor)

To continue with creative "rock" experiences, Kara laid out some moulding and designing materials such as natural shades of clay (grey/black/white) and coloured clay, tooth picks, and aluminum foil (**Figure 9**). Lilyan, age 5, created a natural grey-coloured rock, mostly round with some bumps, which she designed with realistic holes and crevices using a tooth pick (**Figure 10**). Ella, age 7, created a grey rock, very round, then added coloured bits flattened on the top (**Figure 11**). Nick also used grey for his rock, but he flattened it, then added his name using a tooth pick (**Figure 12**).



Figure 9



Figure 10

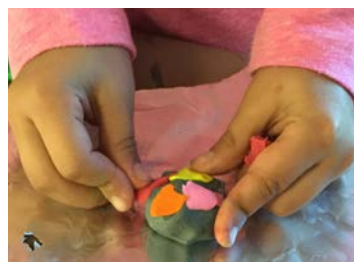


Figure 11



Figure 12

Examining Gem/Mineral Kits (Science, Literacy)

Amy ordered some cool kits for us that were full of different types of rocks, gems, and minerals (**Figures 13 & 14**). We enjoyed examining and reading about the rocks (**Figure 15**). We learned about the properties and origins of individual rocks, as well as their groupings: sedimentary, igneous, and metamorphic.

One of our initial questions involved rocks and sand: Why do rocks have sand in them? Our examination of the rock kit guides gave us an answer: Some rocks can be created out of sand due to the molding and hardening of the grains over time. This is called a sedimentary rock! This also helped to answer the question: Why are rocks hard?

Our learning about sedimentary, metamorphic and igneous rocks and their processes answered this: they are made up of materials that are initially of a hard composition, or they harden over time due to cooling or even fossilization. This sparked interest in volcanic/igneous rock and fossil/archeology studies – description and photos to follow!

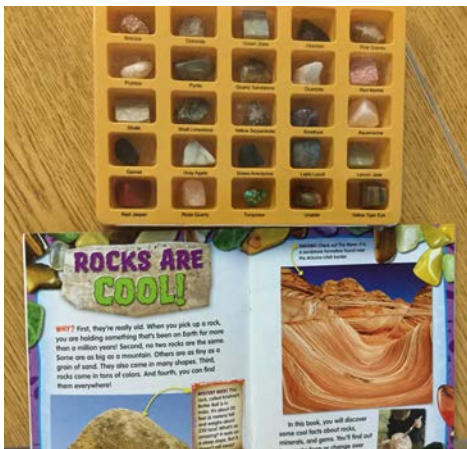


Figure 13

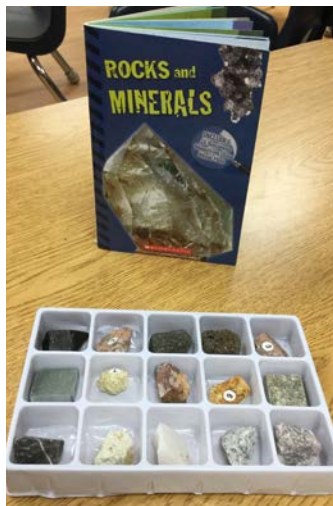


Figure 14



Figure 15

Rock Museum (Outdoor Experience, Science, Literacy)

We were inspired by our rock kits as well as outdoor collecting of pebbles, stones, and rocks so much that we decided to create our own “Rock Museum!” We found a perfect container that had sections as well as a cover so that we could easily categorize and store our special finds! (**Figure 16**) As seen in this photo, Carmela, age 5, and Natalie, age 6, are using magnifying glasses to examine the rocks we found and even compare them with one of our pre-made gem kits! We found some of the rocks looked quite similar, while others were unique.

Lucas, age 6, Nick, age 6, Anthony, age 7, and Myles, age 6, used one of our rock kit guides to try to find similarities and give the rocks in our museum names (**Figure 17**). They found some that looked quite alike and copied the words in the guide onto a piece of paper on the cover of our museum case (**Figure 18**) so that we may have an idea what kinds of rocks we found!



Figure 16



Figure 17

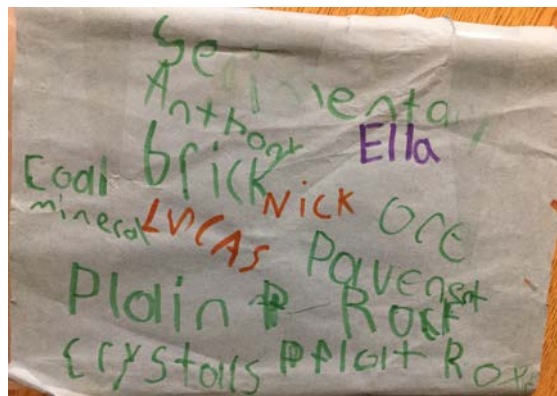


Figure 18

Rock Construction & Art (Creative, Innovative, Numeracy, Motor Skill Development, Social)

Our group enjoyed free play with a variety of rock materials such as pebbles, stones, brick, and different types of gems. We found they were interested in building and designing with them, even counting them. Keira, age 6, and Madelynne, age 6, created a “Rock Play Centre” with the materials, and then wrote signs to advertise it. (**Figure 19**) Colton, age 6, used a rounded basket to help line up the gems in a circle around his rock collection (**Figure 20**). Thomas, age 6, and Evan, age 6, worked together to make a neat design using the different gems and counted as they built it (**Figure 21**). In **Figure 22**, two students are using gems to decorate their paper and marker art.



Figure 19



Figure 20



Figure 21



Figure 22

Rocks & Math

We found that there are many ways we can practice math skills using rocks! In **Figure 23**, Lilyan is counting by ones as she places each gem into the jar. She was so focused on this activity that she counted over 100 gems, and wanted to use more so that she could count higher! Kara asked her about how many gems she thought would fill the jar – it was not big enough to hold over 100 gems, so we had to empty and refill it as we counted even more.

Figure 24 displays the materials we used to do a rock measuring activity. Ashley helped the children to use a measuring tape and record the length of each rock. We then could examine our record and compare which was longest, shortest, tallest and smallest.

Figure 25 depicts two students using the three varieties of gems to do a sorting activity. The children enjoyed making separate groupings of the different gems.

Nick attempts to lift a very heavy rock that Ashley brought from home (**Figure 26**). We asked Nick and Carmela if they thought the rock would be heavy or light. Nick thought heavy, Carmela thought light. After Nick had a try, we questioned, “Was it heavier than you thought?” Nick thought “yes!”



Figure 23



Figure 24



Figure 25

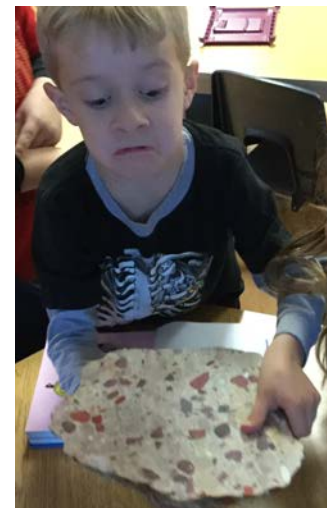


Figure 26

Rocks & Writing

On the children's own initiative, we observed that there was a lot of writing being done. Some of this was imaginative, as shown with the story Anna, age 7, wrote about rocks* (**Figures 27 & 28**), while others used a rock reference to write descriptions, such as Anna (**Figure 29**), and make a check list, such as Maddix, age 6, and Myles (**Figure 30**)

Anna's story reads, "Rocks are not just little hard things. They can be special. Some rocks are sparkly; some can be a certain colour. There are a lot of species of rocks, and you can make a lot of things with rocks. Rocks are really special." Anna's rock description reads: (rock 1) "It looks like a diamond. (rock 2) It has white spots. It has a hole with sparkles. It is brown."

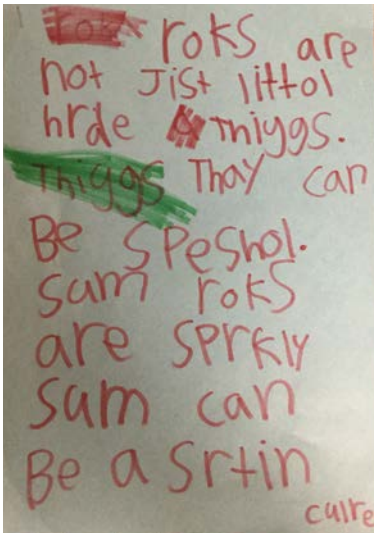


Figure 27

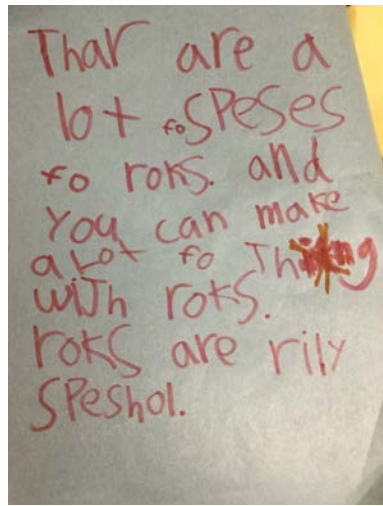


Figure 28

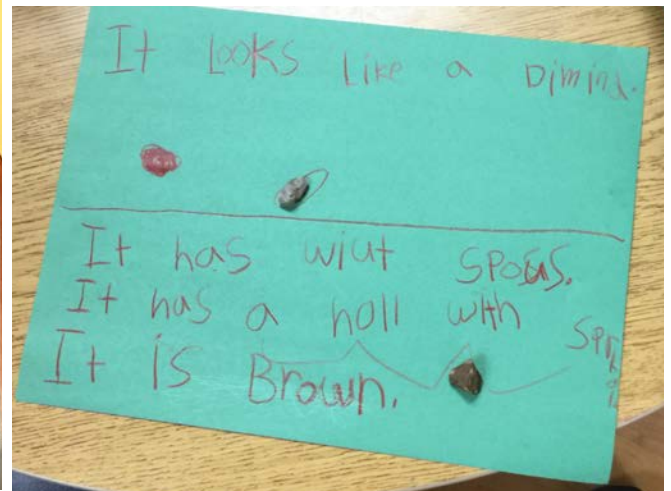


Figure 29



Figure 30

Outdoor Exploration

While our group played outside each day, we did a lot of searching for, and collecting different types of rocks! We would use anything we could to carry around our findings, and then bring them inside to examine with the help of print resources such as “Rocks & Minerals” (**Figure 31**). In **Figure 32**, Ella is testing out our theory about there being something inside of rocks! Some children wanted to know, “When you break open a rock, can there be more inside?” Ella discovered the answer to this as she used a larger rock to crush a small rock. Yes, there are small pieces of rock – crystals – inside!

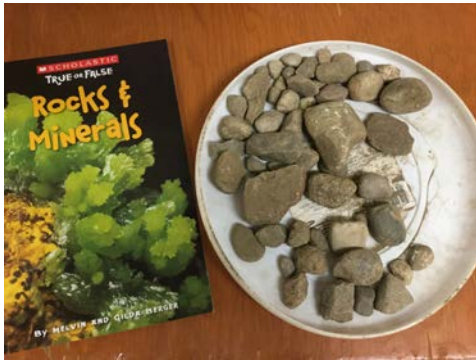


Figure 31



Figure 32



Figure 33

Rock Store (Social, Creative, Dramatic)

As shown in **Figure 33**, some students in our group created a “Rock Store”. Nick, Anthony, Thomas, and Lucas worked together to gather rocks from small to large, arranging them on the “farmer’s market” platform in our outdoor play area. They then set up cones around the area to mark where the boundary of the store would be. Anthony used a plastic jug to scoop dirt and pour it onto some the rocks (**Figure 34**). The boys declared they were also making rock cakes for Leah’s birthday!

Rock Walk (Social, Science)

As a “field study”, our group went on a walk to explore rocks in the school neighbourhood. We saw that there were many types of rocks that made up the sidewalks, driveways, and houses. We also observed houses in the process of being built – there were stacks of bricks as well as large boulders around. This confirmed that many types of rock are used for construction. Along the way we collected some small rocks that we thought were cool (**Figures 35 & 36**). These were later put in our rock museum for further examination!



Figure 34



Figure 35



Figure 36

Rock Scientists (Dramatic, Social, Science, Literacy)

During free play, we observed quite interesting uses for our rocks and other program materials. In **Figure 37**, Natalie is using her winter gloves and a flashlight to examine a rock from one of the kits. She described, “I’m a scientist!” With the help of Carmela, Natalie extended the activity to a literacy experience. Using a clipboard, paper and marker she explained, “I am making a list of the rocks we find in the kit.”



Figure 37



Figure 38

Technology & Research (Science, Social, Literacy)

To further investigate questions we had yet to fully answer, we encouraged the children to have a look on the group iPad and see what information they could find. Myles was quite interested in doing Google research, while Mason, age 6, Evan and Ashley enjoyed watching videos on topics such as volcanoes. Our research taught us more about igneous rock, answering our questions: “**Are rocks in a volcano?**” and “**Is hot lava made of rock?**” We learned that rocks can be produced by volcanoes as the lava or magma cools and hardens!

Fossil Digging (Science, Social, Literacy)

With our iPad searches, we came across *fossils*, a topic that we initially brainstormed about. Kara brought in a fossil digging kit so that the children could discover how the remains of animals such as dinosaurs can be found within rock. This activity spanned over a whole week! In **Figure 39**, Ashley is asking and recording what we think we will find in the rock: a T-Rex, Stegosaurus or Pterodactyl. **Figure 40** displays Everett, age 6, using a mallet to chip away the rock. Myles had his turn while Lauren, age 5, Lilyan, Keira, and Olivia look on (**Figure 41**). It was hard work, but we discovered four dinosaur “remains” inside the rock!



Figure 39



Figure 40



Figure 41

Rock Music (Music, Social, Literacy)

As a special treat, Ashley brought in her guitar and we tried to create a song about rocks.



Figure 42



Figure 43

After letting the children explore the guitar and explaining how it is used, we got to work writing lines that could be sung along with the guitar. We did a lot of improvisation! Our verses described what we know and learned about rocks and our chorus was one simple line:

“Rocks are shiny, sparkly
Smooth and rough
We love rocks! We love rocks!
They can be small, medium, or big
We love rocks! We love rocks!
Rocks are cool! We love rocks!”

Phase 3: Concluding the Project

As a fun conclusion to our project, we invited Ashley's sister to help us create a cool rock mold of our hands! As we prepared and throughout the activity, we asked questions like, "What kind of material do you think this is, and how does it work?" Leah, age 6, thought the grey goopy solution would harden and dry to become rock. That is exactly what it did! Mason and Keira described the feeling as "goopy" and "itchy."



Figure 44



Figure 45

The children waited patiently as the mold material dried over their hands (Figure 45), and then watched as the mold was filled with the powder and water mixture to form the rock! (Figure 46) The molds came out looking very detailed (Figure 48). Some of us could even tell whose hand was whose!



Figure 46



Figure 47



Figure 48

We had a few final questions that still needed to be answered:

Are rocks a living thing?

Do they change colour in the rain?

Why do they sink?

Why are some smooth and some rough?



Figure 49



Figure 50

To answer if rocks are living, Hailey, age 7, thought, no, rocks are not a living thing because they do not require food or water. We all agreed that indeed was correct!

We happened upon the answers to our last few questions nearing the end of our project as some of the children were looking through one of the rock books (**Figures 49 & 50**). Also, if we look back on what we learned about sedimentary rock, we can conclude that the sand particles in this type of rock can cause them to be rough. On the contrary, those rocks that are located in or around water can be smooth, as the water repeatedly washes over them and rubs away the rough edges.

We can also see from this that rocks in water can appear to change colour, although in reality it is just washing the dirt away and making them look darker and cleaner!

We thought rocks sink depending on their heaviness. If it is a small pebble, it will sink more slowly. If it is a big boulder, it will sink quickly! The book also showed us that holes in a rock, such as pumice, would cause it to be lighter and therefore float.

Some answers we learned through our exploration and others our peers could help us with!

Teacher Reflections

Kara:

This project was a wonderful experience in which the children demonstrated their knowledge and ability for learning through exploration, both hands-on and with the resources, we could provide them.

We really enjoyed observing the children learning first-hand with a variety of experiences within all learning domains. We explored outdoor rocks, gem and mineral kits, sorted/counted and made art with smooth and shiny gems, created rock and gem art, sculpted our own creations with clay, used rocks in construction and dramatic play, read rock guides and stories about rocks... and more!

The children made comparisons with rocks to information from written and technological materials such as rock kit guides, science books, and our class iPad. Along with their hands-on, real world exploration, this helped to answer many of their initial questions. We witnessed just how interested and engaged the children can be. We continued to build on this throughout the months, as the children remained interested.

We were also able to use this project to support development in personal and social domains. Many experiences were offered as open-ended provocations in which individuals or small groups could choose to participate alone, alongside peers or together. This raised much discussion and helped the children practice social skills such as communication, sharing, and problem solving. We also supported these skills through large group experiences in which we invited the children to participate. We had outdoor rock hunts, a neighbourhood walk, a music experience, a hand moulding experience with a special guest, and more. We hoped to always offer something of interest to any child. Every student contributed to one or more experiences in some way.

We all definitely learned more about this area of interest and had a lot of fun doing it! Ashley and I continue to be impressed at our group's abilities and competence.



Ashley:

This project was a great way for me to become more familiar with the children and their interests. Kara and I worked with the children to expand their knowledge of different types, shapes and sizes of rocks. The “Rock Museum” was a fun and educational way for the children to use their investigative skills, memory skills and social skills. The children expressed themselves by creating representation drawings, 3D sculptures and having in depth conversations about the rocks we had collected throughout these past few months.

Kara and I did our best to provide the children with items like the large rock Nick lifted and the small magnifying glasses, which were used to inspect the rocks for any changes that might have occurred.

I truly enjoyed having my twin sister, Erin, in the classroom as a guest speaker and instructor for the children. She taught them how to make a liquid substance into a hard “rock” by using only their hands. It was a great memory for the children, Kara and myself. We believe that our children are talented, inquisitive and fun to be with every day, and I adore being a part of their educational journey.