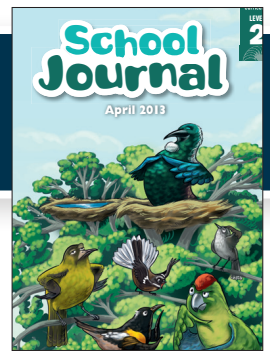


Our Rocks Rock!

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Year 4



Overview

When Jack brings his rock collection to school, his classmates are amazed to find the rocks aren't "dull and boring" like they thought. This article describes the rocks the children collect, "make", and experiment with and explores their wonderment at the variety of rocks in their collection.

By showing how one class explored rocks, the article can be used as a starting point for students to study rocks themselves.

There are many ideas in the article for experimenting with rocks, as well as opportunities to explore and describe them in different ways. The article captures the essential characteristic of all scientific work: curiosity about why things are the way they are.

Texts related by theme

"Māori Rock Science" *Connected 2* 2003 | "A History of Rock" *Connected 2* 2003 |
"Finding Pounamu" SJ 1.4.05

Text characteristics from the year 4 reading standard

some words or phrases that are ambiguous or unfamiliar to the students, the meaning of which is supported by the context or clarified by photographs, illustrations, diagrams, and/or written explanations

a straightforward text structure, such as a structure that follows a recognisable and clear text form

We looked at our varnished pebbles through magnifying glasses. Some pebbles had brown and orange stripes, and others were green. Some had bits of pink and red. Some were sparkly with specks of silver – we think these specks are mica.



On the beach, we saw lots of tan and orange sandstones. We collected some of them, too. They were rough and gritty. Sophie ground the stones together with water and made a muddy paste. We used it as face paint.



John brought his fossilised shells and pitted rocks to add to our display. Daniel brought his flat sandstones. He said that they make good skimmers. Patricia shared her favourite crystals. Jasper wore the pounamu his grandad had carved.

James brought some shingle from his driveway. He had been to a quarry, a place where rock is dug out of the ground, and had watched the shingle being made. Machines had crushed large rocks to make it.

Cassie brought a bag of glass pebbles. Each pebble was a different colour. Our teacher told us that they were probably pieces of glass that had been worn smooth as they were rolled along in rivers or were moved around in the sea.

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some compound and complex sentences, which may consist of two or three clauses

some places where information and ideas are implicit and where students need to make inferences based on information that is easy to find because it is nearby in the text and there is little or no competing information

Reading standard: by the end of year 4

Possible curriculum contexts

SCIENCE (Planet Earth and Beyond)

Level 2 – Earth Systems: Explore and describe natural features and resources.

ENGLISH (Reading)

Level 2 – Structure: Show some understanding of text structures.

ENGLISH (Writing)

Level 2 – Purposes and audiences: Show some understanding of how to shape texts for different purposes and audiences.

Possible reading purposes

- To find out what the title means
- To find out about the different kinds of rocks one class collected
- To use the text to identify rocks.

See [Instructional focus – Reading](#) for illustrations of some of these reading purposes.

Possible writing purposes

- To describe another collection (for example, leaves) for a particular audience
- To create and share a way of classifying rocks.

See [Instructional focus – Writing](#) for illustrations of some of these writing purposes.

Text and language challenges

VOCABULARY:

- Possible unfamiliar words and technical terms, including “collection”, “boulders”, “crumbled”, “pebbles”, “clay”, “river mouth”, “varnished”, “magnifying glasses”, “specks”, “tan”, “gritty”, “pitted”, “skimmers”, “crystals”, “pounamu”, “shingle”, “quarry”, “worn smooth”, “shiniest”, “volcanic eruption”, “possibly”, “tumbler”, “gemstones”, “jewellery”, “chips”, “grinding powder”
- The specialised geological vocabulary, including “conglomerate”, “mica”, “fossilised”, “geode”, “agate”, “obsidian”, “quartz”, “chalk”
- The large number of compound words, including “mudstone”, “riverbank”, “sandstones”, “driveway”, “underwater”, “gemstones”, “driftwood”, “necklaces”, “classroom”
- The word “ground” as a verb
- The similes: “shone like rainbows”, “looked like black glass”.

Possible supporting strategies

Decide if you will introduce the specialised vocabulary before reading or make this a focus during reading (keeping in mind that if your students don’t know over 90 percent of the vocabulary before reading, then they probably can’t read the text). Either way, provide a variety of reference materials so you can show students how to find definitions of the geological terms. If appropriate, include bilingual dictionaries.

Identify other words students may not know, including words used in a subject-specific way (for example, “ground”, “worn”) and plan to provide support for these words.

The large number of names or words that describe colours, surfaces, and textures can be the focus of a word study for students who need support with these aspects of English language. (See text features and structure.)

The text also provides opportunities for studying compound words, comparative adjectives, and technical words such as “conglomerate”.

The English Language Learning Progressions: Introduction, pages 39–46, has some useful information about learning vocabulary.

SPECIFIC KNOWLEDGE REQUIRED:

- Knowledge of rocks and some experience of where they are found, what they look like, and how they may be used
- Experience of collecting
- Familiarity with activities mentioned, such as using the Internet, going on a field trip, examining specimens, face painting, skimming stones, seeing a quarry, and making jewellery.

Possible supporting strategies

Find out what the students already know about rocks. If possible, arrange a field trip before or after reading. Your school may also have a rock collection as part of the school’s science resources.

Ask students to share information about any collections they have, for example, of a kind of toy. Talk about why we collect things and the ways we might categorise and/or use items in our collections.

TEXT FEATURES AND STRUCTURE:

- A first person plural (“we”) recount of a class’s exploration of rocks
- The introduction, which sets the reason for the rock study
- The listing (in running text) of the students and the rocks they shared
- The descriptions of the rocks
- Comparisons, for example, of colours, surfaces, textures, shininess, hardness, softness, and uses
- The brief explanations of the origins or uses of some rocks
- The explanation of the process for polishing gemstones
- The varied sentence structures, including many that begin with a name, for example, “James brought ...”
- The supportive photos
- The title, which requires students to understand the idiomatic use of “rocks”.

Possible supporting strategies

Remind the students of similar recounts they have read, especially those told in the first person plural. Support students to identify the main idea of the recount: to tell about one class’s experience of collecting and studying rocks.

If necessary, support students to identify the repetitive form of the “lists” of children and what they found. Point out that for many of the rocks listed, there is additional information.

After reading the first paragraph on page 13, prompt the students to identify the main ideas about the rock. Use these ideas as the basis for a table to record information about each rock. Include the following as headings – Name of rock, Who found it, Where they found it, Characteristics, Other information. Model selecting the information and transferring it to the table. Have the students copy the table and create more empty rows to fill in as they read. Direct them to read the second paragraph on page 13 and think, pair, share about how to fill in the table. Fill in the class version of the table with the agreed answers. Discuss the words and phrases in the fourth column that describe colours, surfaces, and textures – and tell them that you will be studying these during and after reading. Have the students fill in the table during reading. Select points at which pairs can compare their answers and then check them as a whole group.

Instructional focus – Reading

Science (Planet Earth and Beyond, level 2 – Earth Systems: Explore and describe natural features and resources.)

English (Level 2 – Structure: Show some understanding of text structures.)

Text excerpts from “Our Rocks Rock!”

Austin brought some conglomerate rocks, which he'd found on a riverbank. They looked like stones and sand that had been glued together. We mixed sand, pebbles, and clay with water to make our own “conglomerate rocks”.

Students (what they might do)

The students consider the unfamiliar word “conglomerate” and use word-recognition strategies to pronounce it. They read on, searching for clues to its meaning. They infer that it means a rock made from a mixture of stones and sand.

Students make connections between the text and their experiences of handling rocks to visualise the rock and the children’s mixture. They use their knowledge of text features to infer that the use of quotation marks means the children did not make a real conglomerate rock.

John brought his fossilised shells and pitted rocks to add to our display. Daniel brought his flat sandstones. He said that they make good skimmers. Patricia shared her favourite crystals. Jasper wore the pounamu his grandad had carved.

The students use strategies to work out the unfamiliar words. They recognise “fossil” in the verb, “fossilised”; “ise” as in “memorise”; and the final “d” to indicate past. They infer the word means “made into a fossil”.

Students make connections between the text and what they already know about the stones, for example, skimming a stone on water and wearing a pounamu. With support, they integrate these pieces of information to infer that stones can be used in a lot of different ways.

Chalk is the softest rock in our classroom. The hardest rock is a diamond. It's also the most valuable. But it's not part of our collection. It's in the ring on our teacher's finger!

Students make connections between the text and what they already know about chalk. They ask and answers questions to ascertain that chalk is a type of rock and infer that it's used for writing because of its particular characteristics (white, soft).

The students draw on their knowledge of comparative adjectives to compare chalk and diamond and infer that all the other rocks they have learnt about come somewhere in between the softest (chalk) and the hardest (diamond).

Teacher (possible deliberate acts of teaching)

EXPLAIN strategies to work out unfamiliar words.

- Look for any familiar words or parts inside the word. Can they help? Try to use what you know about sounds within the word: can you chunk it into syllables and pronounce it?
- Read on to see if the word is explained in the text. In this example, the next sentence describes the rock, and that probably tells you what the word means.
- Finally, look up the word in a reference tool such as the Internet, a book about rocks, or a dictionary. Check that the meaning you've found makes sense in this context. Provide bilingual reference materials for English language learners.

PROMPT the students to ask questions as they read.

- Asking questions in your head is a good way to focus on the information. As you read, you'll be looking for answers. If your questions haven't been answered at the end of the text, think about how you might find the answers.

MODEL working out “fossilised”.

- I know what a fossil is, and the last part of the word is like the ending of “memorised”. The “ise” part means to make (into a memory), and the “d” shows it is a past verb used as an adjective. So “fossilised” means shells were made into fossils. What other strategies are helping you work out words in this text?

ASK QUESTIONS to prompt prior knowledge.

- What do you already know about the rocks mentioned here?
- Have you ever skimmed a stone? What does it mean?
- Who has crystals at home? What are they used for?
- Several of us have a special pounamu, which is also known as greenstone or jade. Did you know it was carved from a rock? (See <http://www.teara.govt.nz/en/pounamu-jade-or-greenstone> for information on pounamu.)

DIRECT the students to work individually and then with a partner to review the information about the rocks and consider their characteristics. Have them think, pair, and share their answers to the questions below.

- From the text and what you already know, what can you say about the characteristics of rocks?
- What characteristics make a rock more suitable for a purpose than others?

TELL the students to work in pairs or small groups to compare and/or categorise rocks, ideally using real rocks. The students could make posters of their results or write a blog to share what they have learnt.

Provide support for students who find categorising and comparing challenging. Review the words and phrases in the Characteristics column of their table. Explore the types of words and phrases used, their opposites, and comparative forms. Provide some other rocks. Select one characteristic with which to model categorising and comparing. With the students, co-construct sentences comparing the rocks orally and in writing.

GIVE FEEDBACK

- You used some good strategies to work out ... Which one was most useful for this word?

METACOGNITION

- Show me a place where an experience of your own helped you make connections with the article.
- How did you work out what a “river mouth” was? What strategy did you use?

Reading standard: by the end of year 4

The Literacy Learning Progressions

Assessment Resource Banks

Instructional focus – Writing

Science (Planet Earth and Beyond, level 2 – Earth Systems: Explore and describe natural features and resources.)

English (Level 2 – Purposes and audiences: Show some understanding of how to shape texts for different purposes and audiences.)

Text excerpts from “Our Rocks Rock!”

Most of us in Room 9 used to think that rocks were dull and boring – until Jack brought his special collection to show the class.

Some pebbles had brown and orange stripes, and others were green. Some had bits of pink and red. Some were sparkly with specks of silver – we think these specks are mica.

He had been to a quarry, a place where rock is dug out of the ground, and had watched the shingle being made.

Tori and Ngakeisha had found out that their pumice also came from a volcano – possibly an underwater one. They’d learnt that pumice is the only rock that can float. That’s because it’s full of tiny air bubbles.

Examples of text characteristics

INTRODUCTION

The introduction to an article can set the topic and let readers know what to expect. It also gives clues about the purpose and audience.

DESCRIPTIONS

Descriptions don’t have to be complex. Using everyday words the audience knows, and showing how one thing is different from another, is a good way to help the audience understand what is being described.

SIMPLE AND COMPOUND SENTENCES

Simple sentences have one main verb.

Compound sentences have two simple sentences joined together, usually with a conjunction.

A dash can be used to join two simple sentences.

COMPLEX SENTENCES

A complex sentence is formed by adding a subordinate clause to a simple sentence. The subordinate clause often adds information to the main clause it is attached to.

ADDING INTERESTING DETAILS

A factual article can be made more interesting by adding details that are unusual or unexpected.

METACOGNITION

- You thought about your purpose and audience before you started writing. How did you make sure you kept them in mind during writing and revision?
- What helped you make decisions about which descriptive words to use?
- What was the hardest part about writing this? What was easiest? Why?

Teacher (possible deliberate acts of teaching)

ASK QUESTIONS to help the students form intentions for writing.

- What is your purpose for writing?
- What information will you need?
- Who are you writing for? What do you know about your audience?
- How will you let your readers know your purpose?

You could use the table the students have filled in during reading as the basis for co-constructing a writing frame and/or a text frame. Modify the headings to create appropriate sections for a report. See ESOL Online for explanations and examples of writing frames and text frames: <http://esolonline.tki.org.nz/ESOL-Online/Teacher-needs/Pedagogy/ESOL-teaching-strategies/Writing/Writing-frames-or-text-frames>

PROMPT the students to consider their descriptions.

- Read over your writing, thinking about your audience. Will your audience understand your descriptions? If your descriptions are too complicated, how can you make them simpler? What is the most important piece of information they will need?

ASK the students to work with a partner, focusing on this extract.

- What idea does each sentence give the reader?
- What is the purpose of the dash in the last sentence?
- What is the subject in the second sentence? Why has the writer left out the word “pebbles”? What does the writer expect her audience to do?

If necessary, model this analysis on the board, pointing out that the sentences are either simple or compound, and that the dash acts like “and” in joining two simple sentences. The writer omits “pebbles” because she expects the reader to know that “some” refers to the pebbles because the sentences follow the same pattern.

DIRECT the students to examine their writing.



- How much do you expect your audience to know? How much will you have to spell out?
- With any complex sentence, check that the whole sentence makes sense. Will your audience follow the meaning through the sentence?
- If the meaning is unclear, you may need to use simpler sentences. Remember, if your readers can’t understand what you’re saying, you will not achieve your writing purpose.

ASK the students to exchange their work with a partner.

- Read each other’s work carefully, focusing on how well the writing holds your interest. Ignore spelling and other errors at this stage. Are there places where it seems to flag? Would some interesting information or detail help?
- Give your partner constructive feedback, then make revisions to your own work. Remember to keep your purpose and audience in mind as you revise.

GIVE FEEDBACK

- The adjectives you’ve used will be clearly understood by your audience. You’ve removed or explained some technical terms that would have confused them – this shows me you’ve been thinking about your audience.
- Changing that long complex sentence into three shorter, simple sentences makes the explanation clearer. It was confusing, but now I can follow each stage.

 **Writing standard: by the end of year 4**
 **The Literacy Learning Progressions**