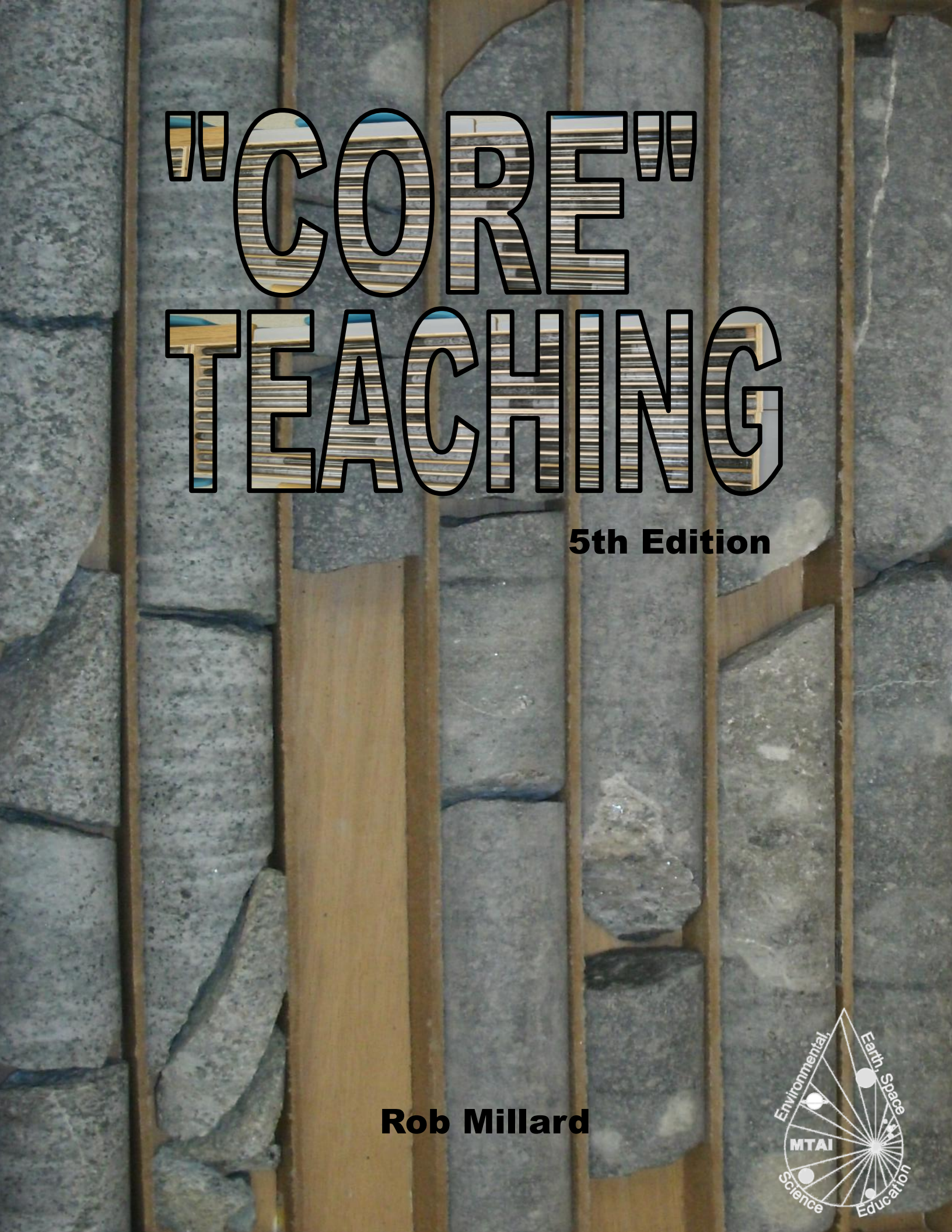

5th Edition

Rob Millard

"Core" Teaching Contents

"Core" Teaching

Welcome,

I am a teacher that believes in giving students more options to broaden their experience, awareness and scope of options. Starting an Earth and Space Science course at my school was one of these opportunities I felt passionate about offering. Administration at my school was hesitant because it was not a “traditional” science and that there was not interest in the course. During my reflection on student interest, I realised there was little “interest” because they had little awareness and exposure. I set out to work Earth and Space science into as much of my teaching as I could. I made it my goal to incorporate at least one geoscience lesson into every unit of every course that I taught. This is where my “core” teaching idea began to develop.

“Core” teaching is simply the concept of using rock drill cores as teaching tools to deliver and assess curriculum. Rock drill cores are long cylinders of rocks that are drilled out of the ground to test and determine the properties of the rock in the drilled area.

Being a math and science teacher I found several opportunities to use rock core samples to help deliver different concepts. I have success using used them in teaching: grade 9 math with linear equations, area and volume problems; in grade 10 math teaching quadratics and linear systems; grade 9 science in chemistry and ecosystems, grade 10 science chemistry and climate change, grade 9 geography. I have even used rock drill cores in lessons in a religion class.

As I have expanded my work increasing the exposure of the Earth Sciences, I have talked with many teachers and have helped to develop “core” teaching Ideas in other classes and grades as well.

The following is a rough sample to some of the areas that I have used my “core” teaching concept in. The intent is not to say do it this way, but just to get the wheels turning and to give a spark to find other ways to work geosciences into our daily teachings. Feel free to use them in your classes and pass on the ideas. If you have success or other ideas furthering the “core” teaching idea please do not hesitate to contact me. I have placed some of the “cores” I have used on my website under the earth science and materials page. Feel free to use them and any other ideas that may inspire you.

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"Core" Teaching

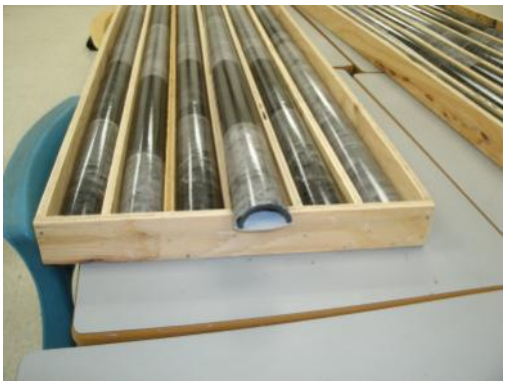
Core Samples
Every lesson uses a small real rock core sample to engage the students and let them see and feel what they are. Students then mostly use simulated rock core for the rest of the lesson.
There are a number of reasons for this. Real rock cores tend to be heavy, they are rock after all. Real rock core samples can be very complex and difficult for inexperienced students to interpret. It is also very difficult to find a rock core sample that is just right for a particular activity. For these and many more reasons I use simulated core.

Simulated core
Simulated core can be as simple or as complex as you want to make it.
Paper Core- The simulated drill core samples use photos of real rock attached together to form a long rectangular picture. Print the photo on several sheets of paper, tape them together and cut them out. That is it, instant core.

I have found that students do enjoy using the simulated core if it looks more like real core. (rounded) I have made the following variations of rounded core.

Fluorescent light protectors-These are long plastic sleeves that are used to cover fluorescent light tubes. They can be purchased at most hard ware stores, and come in a couple of different sizes. The rounded core can be made by rolling the rectangular core sample picture and sliding it into the tube. Once in the tube students can right on it with dry erase marker if needed.

Wooden Dowel- These cores are more work to make. Laminate the core picture and then wrap the picture around a dowel or other tube. These cores tend to be a bit on the thin side and often roll off of the work surface.



PVC pipe-These cores are more work to make, but do not roll off the table. Laminate the core picture, so that students can write on the core with dry erase markers. Then wrapped the picture around 1 1/2” PVC pipe that has been cut in 1/2 lengthwise end to end.
To add to the authentic look you could make a core box out of wood to hold the core samples.

Estimating

Learning Goals: By the end of the lesson students will use a rock or simulated core to practice estimating in a variety of contexts..

Lay out a core sample in front of the students on a desk or table with a stack of sticky notes. Two different colours would be preferable.
Have students examine the core sample.
Have students work through the series of estimating questions on the next page.
When they guess the thickest and thinnest layers, use the different colour sticky notes to indicate their guesses. This can create a type of sticky note bar graph.

You may want to consider using more than one core sample placed around the room and students can rotate through them for additional practice.

Follow up the estimating task, with the measurement task to measure and confirm/disprove their hypotheses.

"Core" Math

Estimating

Learning Goals: Today you will be practice estimating.

Rock core samples are taken to determine what the rock is doing underground. A diamond tipped drill bit is shaped like a can, without atop or bottom. As it drills into the ground it cuts the rock in a circle but does not cut the rock in the hole. Every now an then the rock from the center hole is brought up to the surface to be analyzed for patterns, and to determine the type of rock and what types of minerals are present in the rock.

1) Make a quick sketch of the core sample.
2) Look at the simulated drill core on the table. What would be the best unit to use to measure the entire length?
3) How long do you think it is?
4) What would the best unit to measure how thick a layer is?
5) Which layer looks to be the thickest? Take a sticky note from the stack and place it beside the layer you think is the thickest.
6) Which layer looks to be the thinnest? Take a sticky note from the stack and place it beside the layer you think is the thinnest.
7) Which layer do most people in your class think is the thickest?
8) Do you all agree?
9) Which layer do most people in your class think is the thinnest?
10) Do you all agree?
11) Which two layers look like they might be the same thickness?
12) How many different layers do you think there are in the rock core?

Look carefully at the core section each band is made of a different type of rock.

7) Which rock looks like it makes up the most of the core?
8) Which rock looks like it makes up the least amount of the core?
9) Rocks can be igneous, sedimentary or metamorphic. Which type of rock do you think is there the most of?
10) Is it mostly towards the top, middle, bottom or every where about the same?