Based on "A 'Bit' of Engineering"
From Deep Earth Academy, Activity of the Month—June, 2009
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Materials: Ziploc bags of sediment, plastic tubing and straws, coffee stirrer, ruler
(What makes good sediment: layers of cake with different colors or textures; play dough of different colors; dirt and sand mixed with water. Try different things. This could be an experiment of itself.)

What you do

1. Break into small groups (2-3) and select a sediment.
2. You have 3 drilling tools (plastic tubing, jumbo straw and slim straw) and a coffee stirrer. Hypothesize which tools would be appropriate for drilling and order from which would work best to which would be the most difficult.
3. Designate a driller who will use all of the tools.
4. Hypothesize what would be the best way to collect the cores.
5. Collect the cores. It is important that you do not bend the tools while drilling. A bend represents a break in the drill pipe. Twisting the drilling device enhances capture.
6. Hypothesize how to remove the core from the drilling device.
7. Remove the core.
8. Describe what you see—color, material, changes, lengths (measure), texture, gaps, etc.
9. Record how your hypotheses compared to your actual experimentation.

What you could do

Elementary applications: Have students gather materials from the school yard to create their own sediment. The teacher could also provide common rock forming minerals to add (like quartz, calcite, etc). For 2nd and 4th grades, this provides a natural opportunity to teach about rocks and soil. **Link to CA Standards** *Investigation & experimentation*: Grade 1, 4b; Grade 2, 4c; Grade 3, 5d; Grade 4, 6f; Grade 5, 6f *Earth Sciences*: Grade 2, 3a,b &c; Grade 4, 4a & b
Middle School applications: 6th grade focuses on Earth sciences with plate tectonics and the mid-ocean ridge taking front and center. This provides an introductory lesson explaining how scientists studied the ocean crust and learned much of what is being taught. See the resources document for more advanced activities. **Link to CA Standards** *Plate Tectonics and Earth's Structure*: Grade 6, 1a & c.
High School applications: Much of the application of this activity to this level relates to the process and technology of drilling itself. The motion and forces exerted and balanced in this process are highlighted in some of the more advanced activities on the Deep Earth Academy and *JOIDES* Resolution web sites. **Link to CA Standards** *Motion and Forces 1c, d & e; Dynamic Earth Processes 3 a, b, c, e, f; Biogeochemical Cycles 7a, b, c, d*