**Gr. 3 - Understanding Earth & Space Systems**

*Soils in the Environment*

**A Strong Wall**

**Specific Expectations:**
1.1 Analyse the impacts on society and the environment, and suggest ways in which humans can enhance positive effects and/or lessen or prevent harmful effects.

1.2 Assess the impact of human action on soils, and suggest ways in which humans can affect soils positively and/or lessen or prevent harmful effects on soils.

2.4 Use appropriate science and technology, including *clay, sand, loam, pebbles, earth materials*, and *soil*, in oral and written communication.

3.1 Identify and describe the different types of soils.

**Big Idea (for lesson):**
Students investigate what makes a strong and sturdy wall, and test their wall in various conditions that are intended to replicate environmental and man-made forces.

**Accommodations:**
- Increase time
- Visual Aids
- Manipulatives
- Chunking
- Step-by-Step
- Scaffolding
- Copy of Notes
- Student Grouping

**Differentiated Instruction:**
- Content: Use demo to show the content as you offer verbal descriptions.
- Process: Have students work in pairs and support each other if physical impediments exist.
- Product: Students may show their final product in pairs, and communicate their findings either verbally, visually, or through written means.
- Other: ____________________________

**Bloom’s Taxonomy:**
- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

**Multiple Intelligence:**
- Verbal/Linguistic
- Logical/Mathematical
- Visual/Spatial
- Bodily/Kinesthetic
- Naturalist
- Musical/Rhythmic
- Interpersonal
- Intrapersonal

**Delivering The Lesson:**

<table>
<thead>
<tr>
<th>Portion &amp; Timing</th>
<th>Grouping:</th>
<th>Introduction:</th>
<th>Materials</th>
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## Gr. 3 - Understanding Earth & Space Systems

### Soils in the Environment

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<th>Minds On: 5 mins</th>
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| Teacher introduces the notion of strength and stability in structures:  
- For stability, the teacher can have the class quickly compete against one another to see who can stand on one foot the longest.  
- For strength, the teacher can do a demo with sand and tissue paper, or show the analogous video using napkins and salt.  
The steps of the in-class demo can be found here: [http://www.stevespanglerscience.com/lab/experiments/strong-sand](http://www.stevespanglerscience.com/lab/experiments/strong-sand)  
Ask students if they consider sand to be a stable or strong surface to build a structure on. Ask them if they could use what they saw in the demo to make a strong structure? (Answer: compact the sand tightly to make “bricks”, or whole walls) | A Strong Wall – Magic Tube – Sick Science!  
#138 Cardboard tube  
Sand  
Tissue Paper  
Rubber Bands  
Scissors  
Stick |

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<th>Action: 30 mins</th>
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| Have students build and test their different walls according to the instructions on the handout.  
Have a water station (a big bin with small watering can) set up beforehand.  
Teacher can circulate and ask questions of the different groups:  
- Do you think it matters that the bricks that touch lots of other bricks seem to make the strongest pattern? (Answer: yes, the friction between these several different surfaces works against the wall moving.)  
- What types of soil do you think your best wall would hold up well on? (Answer: something compact, such as clay or loam, would hold up better than a looser soil, sand, or pebbles.) | A Strong Wall Handout  
(Materials listed)  
Large tub of water  
Watering can |

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<th>Consolidate: 5 mins</th>
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| As they finish, have the students draw their wall pattern down on the record sheet and compare with one another. Discuss any discrepancies, and the strengths/weaknesses of the different designs.  
Discuss the environmental concerns that arise with the building of walls: what factors are important to consider when you’re building? (Answer: temperature, air flow, precipitation, foundation, soil types, etc.) | Record Sheet |