

Gr. 1 - Understanding Structures and Mechanisms

Materials, Objects, and Everyday Structures

A Strong Wall

Specific Expectations:

1.2 Assess objects in their environment that are constructed for similar purposes in terms of the type of materials they are made from, the source of these materials, and what happens to these objects when they are worn out or no longer needed.

2.1 Follow established safety procedures during science and technology investigations.

2.3 Investigate, through experimentation, the properties of various materials.

2.4 Use technological problem-solving skills, and knowledge acquired from previous investigations, to design, build, and test a structure for a specific purpose.

3.2 Describe structures as supporting frameworks.

3.4 Describe the function/purpose of the observable characteristics of various objects and structures, using information gathered through their senses.

3.5 Identify the materials that make up objects and structures.

3.7 Describe the properties of materials that enable the objects and structures made from them to perform their intended function.

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

Multiple Intelligence:

- Verbal/Linguistic
- Logical/Mathematical
- Visual/Spatial
- Bodily/Kinesthetic
- Naturalist

Gr. 1 - Understanding Structures and Mechanisms

Materials, Objects, and Everyday Structures

Evaluation

Musical/Rhythmic

Interpersonal

Intrapersonal

Delivering The Lesson:

Portion & Timing	Grouping:			Introduction:	Materials
Minds On: 5 mins	W <input checked="" type="checkbox"/>	S <input type="checkbox"/>	I <input type="checkbox"/>	<p>Teacher introduces the notion of strength and stability in structures:</p> <ul style="list-style-type: none"> -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. <p>The steps of the in-class demo can be found here: http://www.stevespanglerscience.com/lab/experiments/strong-sand</p> <p>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? (<i>Answer: compact the sand tightly to make "bricks", or whole walls</i>)</p>	<p>A Strong Wall – Magic Tube – Sick Science! #138</p> <p>Cardboard tube Sand Tissue Paper Rubber Bands Scissors Stick</p>
Action: 30 mins	W <input checked="" type="checkbox"/>	S <input checked="" type="checkbox"/>	I <input checked="" type="checkbox"/>	<p>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.</p> <p>Teacher can circulate and ask questions of the different groups:</p> <ul style="list-style-type: none"> -Do you think it matters that the bricks that touch lots of other bricks seem to make the strongest pattern? (<i>Answer: yes, the friction between these several different surfaces works against the wall moving.</i>) -What types of soil do you think your best wall would hold up well on? (<i>Answer: something compact, such as clay or loam, would hold up better than a looser soil, sand, or pebbles.</i>) 	<p>A Strong Wall Handout (Materials listed)</p> <p>Large tub of water Watering can</p>
Consolidate: 5 mins	W <input checked="" type="checkbox"/>	S <input checked="" type="checkbox"/>	I <input type="checkbox"/>	<p>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</p>	<p>Record Sheet</p>

Gr. 1 - Understanding Structures and Mechanisms

Materials, Objects, and Everyday Structures

			<p>designs.</p> <p>Discuss the environmental concerns that arise with the building of walls: what factors are important to consider when you're building? <i>(Answer: temperature, air flow, precipitation, foundation, soil types, etc.)</i></p>	
--	--	--	---	--