Magic Mud

Grade Level: 2

Strand: Matter and materials

Topic: Properties of Liquids and Solids

Specific Expectations:
- Students will observe and investigate how a solid (corn starch) and a liquid (water) interact.
- Students will learn that some materials, when mixed together retain their properties (i.e. corn starch remains a solid, water remains a liquid) and are suspensions.
- They will manipulate material by putting pressure on it and observe results.

Materials Needed:
150 ml (10 tablespoons) corn starch
90 ml (6 tablespoons) water
Mixing bowl and spoon (for messy exploration)
OR
Magic Mud in Zip lock bags (for neat and tidy)

Procedure:
- Talk about solids and liquids.
- Give one Mud kit per group of 4/5 students.
- Have them mix water and cornstarch, stir with spoon, and make observations.
- Discuss findings.

Scientific Explanation:
When the corn starch is mixed with water, it does not dissolve; it forms a suspension. The cornstarch and water mixture ("magic mud") acts as a solid when pressure is applied; and a liquid when sitting because there are two states of matter in one. When it is "shocked" or sudden pressure (squeezing, picking up, stirring) is applied, most of the water runs out from between the grains of corn starch leaving solid corn starch particles to act like a solid. As soon as the pressure is released, the water flows back in between the grains, causing the mixture to act fluid again.

References:
http://content.scholastic.com/browse/article.jsp?id=7638
http://dictionaryreference.com

Penrose, Gordon. (1987). Magic Mud and other Great Experiments. Toronto, ON. Greey de Pencier Books.
Auger, Wendy Frood & Rich, Sharon J. (2007). Curriculum Theory and Methods. Nipissing University: John Wiley & Sons Canada, Ltd.

Opportunities and other considerations:

Using "magic mud" is a great way to get students excited about materials. It is important for the children to have an opportunity to do the experiment. "(Children) do not learn merely by being told about something, but rather by being actively engaged in physically handling objects and in relating their understanding directly to their own actions as they interact with others."(Auger, 2007, p. 46).

Also, relating the magic mud to something they already know is also a good idea. As an extension, the teacher can discuss how ketchup is also a suspension and how the commonly used technique of hitting the bottom of the bottle to loosen it actually makes the ketchup turn solid. A better method is to instead turn the bottle over, stick a knife inside so that the blade will give the ketchup a surface to flow along. Make sure not to shake it too hard or it will turn back into a solid.

Another possible application would be to have students explore materials which dissolve in water (i.e. sugar, honey, salt) and those that do not (i.e. sand).

Glossary:

Solid- firm, hard, or compact in substance

Liquid- composed of molecules that move among themselves but do not tend to separate like those of gases; neither gaseous nor solid

Suspension- the state in which the particles of a substance are mixed with a liquid but are not dissolved

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