



JOHNNY CASTLESEED

by
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Almost everyone knows the story of Johnny Appleseed, but very few have heard of Johnny Castleseed. Teachers spend their whole careers attempting to "plant ideas" in the minds of their students. Wouldn't it be wonderful if it were as easy as planting the "castleseeds" that Evan and his father did on the beach that day?

There is great variety in sand grains, and they are beautiful to look at under the magnifying lens. If you collect sand from different beaches around the United States or the world, you can see the differences.

Wet sand will stick to wet sand grains because of a small amount of water left behind between the grains. Sand castles must be built on wet sand so that the water is able to go down as it drains. Sand will only stick together if the water can drain out!

Everywhere, sand constantly is getting wet and drying out. What would sand be like if it couldn't get wet? How would it "behave"? Would it have a different appearance? Use this activity to plant an idea in your students' minds about the chemistry behind toys!

MATERIALS: beach or playground sand, magnifying lens, Magic Sand™, water, plastic glasses

ACTIVITY: Examine both kinds of sand with a magnifying lens. Draw any differences you see. Add a small amount of both sands to water. What do you observe? Spend some time playing with the *Magic Sand*™ by simply pouring back and forth between the 2 glasses.

SOURCE: ICE Activities Workshop 1990, Madison, WI.

STANDARDS:**BSL:** 1.3, 1.7, 3.2, 4.6, 4.8, 8.1, 11.1, 2.1**NCTM:** none**SCS:** A1, B1, D1, H2

EXPLANATION: Beach sand is hydrophilic (water-loving) and Magic Sand™ is hydrophobic (water-fearing). Magic Sand™ has been treated with a chemical similar to Scotchguard™.

Source of Magic Sand™: Educational Innovations, Inc.: 1-888-912-7474.

Online: www.teachersource.com

Ormondroyd, Edward. Johnny Castleseed. Parnassus Press, 1985, ISBN 0-395-47947-9.

TEACHER NOTES:

This activity could be used when teaching Earth Science and/or Ecology.

MAGIC SAND is made from regular sand which has been dyed and then coated with a hydrophobic chemical. *Hydrophobic* means "scared of water" so a hydrophobic chemical is a chemical which is "scared" of water. While chemicals don't exhibit emotions, it is possible to think of chemicals which don't seem to combine easily with water. Oil, for example, is a hydrophobic chemical. Pour a little oil in a cup of water and it just floats on the surface. MAGIC SAND works just the same way, except that MAGIC SAND sinks! The coating on the outside of the MAGIC SAND pushes the water away. Take MAGIC SAND out of the water and it is perfectly dry!

Try This...

Fill a small cup or bowl with water.

Sprinkle MAGIC SAND on the surface of the water until it covers the surface.

Slowly touch the surface of the water and dip the tip of your finger into the water. Take your finger out and it is perfectly dry!

Try This...

Pour a couple of spoonfuls of MAGIC SAND into a small cup or bowl of water.

Observe the results.

Touch the sand under the water with your fingers.

Use a spoon to remove some of the MAGIC SAND from the water. It is perfectly dry!

Use a spoon to remove the MAGIC SAND and place it on a paper towel.

The towel absorbs the water and your MAGIC SAND is ready to use again!

Additional notes:

•Ask your students to bring in sand samples from any beach anywhere in the world that they visit; a film canister is a perfect vehicle for transporting the sand. Use this sand to make sand slides. Plastic slides are safe. Put a smear of white glue on the slide and cover it with sand; shake excess back into container. Have your students:

1. Examine the regular sand with a hand lens,
2. Put dry sand in a sieve and add water; watch the water drain through and see the sand grains "stick together".

•Now, try Magic Sand™ :

1. Coat the inside of a plastic spoon with white glue and sprinkle on Magic Sand"; add a few drops of water with a beryl pipette and observe the reaction between the MS and the water.
2. Make a sand slide of MS and observe with a hand lens.
3. Pour Magic Sand into a clear plastic glass that is 3/4 full of water; pour regular sand into a second glass. Observe the differences. Make a class chart or individual charts in student journals.

•Keep Magic Sand on your desk on in a science corner for further investigation.

•Sand allows students to study the geology of land around the world. Black sand from Hawaii gives evidence of volcanoes; pink sand from the Caribbean gives evidence of coral as residents, etc.