Magic Sand

Discovering the properties of sand!

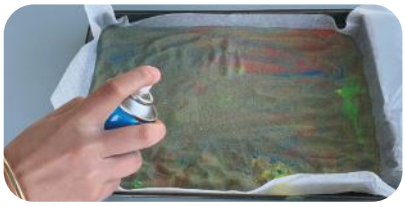
MAKING MAGIC SAND

You will need:

- Coloured sand
- Fabric protector spray (scotch guard)
- Large vase or bowl of water
- Shallow container
- wax paper or tin foil
- Spoon

Instructions:

1. Begin by lining your shallow container with wax paper. Spread the coloured sand onto it. In a well-ventilated area, spray a heavy coat of fabric protector spray onto the sand.



2. After 10 minutes or so, stir the sand around and spray another coat onto it. Make sure all the sand is coated. You can repeat this again if you feel like the sand needs more.

3. Leave the sand to completely dry for about 1 hour.

4. Pour magic sand into a container and it is now ready to experiment with!

DID YOU KNOW?

The coating on Magic Sand is like Scotchguard, which is sprayed on fabric to protect it from stains. Magic Sand was originally developed as a way to trap oil spilled from oil tankers near the shore. The idea was that when Magic Sand was sprinkled on floating petroleum, it would mix with the oil and make it heavy enough to sink. This would prevent the oil from contaminating beaches. However, it is not being used for this purpose, perhaps because of the expense of making Magic Sand.

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How can something submerged in water stay dry?

When ordinary sand gets wet, the result is a clumpy mess. However, "Magic Sand" begins as normal looking sand, until it's coated with a substance that repels water. This special coating keeps the sand dry even after it has been dumped into a container of water.

MAGIC SAND IN ACTION!

You will need:

- Magic sand
- Drinking cup or vase
- Medium size container
- Plastic soda bottle
- Vegetable oil or mineral oil
- Food colouring

Instructions:

1. Fill a cup 3/4 full with water.

2. Slowly pour Magic Sand in a continuous stream into the water. Look closely at the sand. What is that silver-like coating on the sand?

3. Pour off the water from the sand into a second container. Touch the sand and see what you find. To your amazement, the sand is completely dry!

To better understand how Magic Sand works, try this demonstration:

1. Fill a plastic soda bottle 3/4 full with water.
2. Fill the remaining portion of the bottle with vegetable oil or mineral oil. Immediately, the students will notice that the oil and water do not mix.
3. Add a few drops of food coloring to the mixture. Notice how the food colouring only colours the water and not the oil... even when the bottle is shaken.

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HOW IT ALL WORKS!

This is a great experiment to learn about the properties of substances that are hydrophobic and hydrophilic.

Hydrophobic substances do not mix with water. The term “water-fearing” is often used to describe the word hydrophobic. Hydrophilic substances, on the other hand, are “water-loving.”

Notice how the drops of food colouring colour only the water and not the oil. Since oil is hydrophobic, the oil did not mix with the food colouring or the water.

So, how does Magic Sand work?

The surface of sand grains is made wet by water, which means that water molecules are attracted to sand grains. Remember, this water-loving property of sand is called a hydrophilic property. Magic Sand is regular sand that has been coated with an oil-like substance that is water-hating or hydrophobic.

HOW TO MAKE MAGIC SAND WET?

In your container of Magic Sand and water add a couple of drops of washing up detergent and mix with a spoon. See what happens to the magic sand? The detergent cleans the sand removing the oil coating- making it like normal sand again!.

Coastal Habitats

Beaches and Sand Dunes

What is sand?

Sand is made up of small, loose pieces of rock, soil, minerals, and even gemstones. It may also contain the remains of living things.

Sand particles, called grains, are smaller than gravel. They are larger than particles of mud or clay.

Sand grains can be described by their size, color, and shape as well as the way they feel to the touch. Some grains are hard, while others are softer. Some are jagged or rough. Others are smooth and polished. Sand particles may be flat, oval, or round in shape and small, medium, or large in size. Looking at sand under a microscope gives many clues about where it came from and how it formed.

Where is sand found?

Sand is found in many places all over the world. It collects at beaches and in lakes and rivers. It lies at the bottom of oceans. In some deserts and on some beaches, the wind blows sand into large hills called dunes. Sometimes sand gathers at the openings of deep canyons.

Because sand grains are so small and light, they travel more easily than most other kinds of rock. Wind, water, and ice can carry sand far away from the place where it first formed.

Animals that live in sand!

Many animals live in the sand to protect themselves from heat, rain, predators and other dangers. Some animals live in the sand close to the water, while other animals inhabit sand dunes at some distance from the nearest body of water. There are many animals that live in or around coastal beach shorelines including birds(seagulls, pelicans, penguins), mammals (seals), reptiles (sea turtles), molluscs and crustacean (crabs).

Animals that depend on sand for survival!

A female sea turtle and how she lays her eggs is a great example of how sand plays a vital role ensuring the survival of the sea turtle species.

A female sea turtle crawls above the high tide line across the beach to find a protected spot to lay her eggs. Using her front flippers, digs out a “body pit.” Then using her hind flippers, she digs an egg cavity. The depth of the cavity is determined by the length of the stretched hind flipper and can be up to 1m deep.

A female deposits 50 to 200 (depending on the species) Ping Pong ball shaped-eggs into the egg cavity. The eggs are soft-shelled, and are papery to leathery in texture. They do not break when they fall into the egg cavity. The eggs are surrounded by a thick, clear mucus.

The female covers the nest with sand using her hind flippers. Burying the eggs in sand serves three purposes: it helps protect the eggs from surface predators; it helps keep the soft, porous shells moist, thus protecting them from drying out; and it helps the eggs maintain proper temperature. Experts can identify the species of turtle by the type of mound left by the nesting female and by her flipper tracks in the sand.