Name: _____ Date: _____

Why Wet Sand Builds Castles and Dry Sand Slumps

Circle group

Pour dry sand on a beach. It makes a low, flat hill. Try to carve a tower from it. The walls crumble right away. Wet sand is not like that. You can pack it in a bucket and flip it over. Lift the bucket, and a sturdy tower stands there with sharp edges.

Water makes the difference. Each grain of sand is a tiny, hard bit of rock or shell. Dry grains slide past each other easily. Little holds them together. So a steep pile slips and spreads out.

Damp sand is different. A thin film of water coats each grain. Where two grains touch, the water makes a tiny curved bridge. Water likes to stay close together. This pull is called surface tension. Each bridge pulls the grains toward each other. Millions of bridges make a strong grip.

There is a limit, though. If sand is soaked, water fills the gaps. The bridges disappear. The grains float apart, and the sand flows like thick soup. The best castles use sand that is wet enough to stick but not too wet. When a castle dries in the sun, the bridges shrink, and the walls crumble.

Questions

1. What happens to a tower made of dry sand?

_____

_____

2. What forms where two damp grains of sand touch?

_____

_____

3. What is the pull that keeps water close together called?

_____

_____

4. What happens when sand is soaked with too much water?

_____

_____

5. Why does a sandcastle crumble as it dries?

_____

_____

6. Why might a builder add water a little at a time?

_____

_____

Words to know

grain: one tiny, hard piece of something, like sand
surface tension: the pull that keeps water molecules close together
sturdy: strong and not likely to fall apart
crumble: to break into small pieces
soaked: made completely wet all the way through

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Why Wet Sand Builds Castles and Dry Sand Slumps

Triangle group

Pour a bucket of dry sand onto a beach and it makes a low, flat hill. Try to carve a tower from it, and the walls crumble right away. Wet sand behaves very differently. You can pack it into a bucket, flip it over, and lift the bucket away to reveal a sturdy turret with sharp edges.

The difference comes from water. Each grain of sand is a tiny, hard bit of rock or shell, and dry grains slide past one another easily. Little holds them together, so a steep pile slips and spreads out.

When sand is damp, a thin film of water coats every grain. Where two grains touch, the water gathers into a tiny curved bridge. Water molecules like to stay close together, a pull known as surface tension, so each bridge tugs the grains toward each other. Millions of these small bridges add up to a surprisingly strong grip.

Builders at sandcastle contests know there is a limit, though. If the sand is soaked, the water fills all the gaps and the bridges disappear. The grains float apart and the mixture flows like thick soup. The best castles come from sand that is wet enough to stick but not so wet that it runs. As a castle dries in the sun, the bridges shrink away and the walls slowly crumble.

Questions

1. What happens to a tower carved from dry sand?

_____

_____

2. What forms where two damp grains of sand touch?

_____

_____

3. What is the pull that keeps water molecules close together called?

_____

_____

4. What happens when sand is soaked with too much water?

_____

_____

5. Why does a sandcastle slowly crumble as it dries in the sun?

_____

_____

6. Why might a builder add water to sand a little at a time?

_____

_____

Words to know

grain: one tiny, hard piece of something, like sand
surface tension: the pull that keeps water molecules close together
sturdy: strong and not likely to fall apart
crumble: to break into small pieces
soaked: made completely wet all the way through

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

Name: _____ Date: _____

Why Wet Sand Builds Castles and Dry Sand Slumps

Square group

Pour a bucket of dry sand onto a beach and it settles into a low, flat hill. Try to carve a tower from it, and the walls crumble almost as soon as you shape them. Wet sand, on the other hand, behaves in a completely different way. You can pack it firmly into a bucket, flip the bucket over, and lift it away to reveal a sturdy turret with crisp, sharp edges.

The difference comes entirely from water. Each grain of sand is a tiny, hard bit of rock or shell, and dry grains slide past one another with very little resistance. Because almost nothing holds them together, a steep pile of dry sand slips downward and spreads outward.

When sand is damp, a thin film of water coats every grain. At each point where two grains touch, the water gathers into a tiny curved bridge. Water molecules prefer to stay close together, a pull known as surface tension, so every bridge tugs the neighboring grains toward each other. Millions of these small bridges add up to a surprisingly strong grip across the whole structure.

Experienced builders at sandcastle contests understand that this effect has a limit. If the sand is soaked, the water fills every gap between the grains and the bridges disappear altogether. The grains float apart, and the mixture flows like thick soup. The best castles are made from sand that is wet enough to stick but not so wet that it runs. Later, as the castle dries in the warm sun, the bridges gradually shrink away, and the walls slowly begin to crumble.

Questions

1. What happens to a tower carved from dry sand?

_____

_____

2. What forms at each point where two damp grains of sand touch?

_____

_____

3. What name is given to the pull that keeps water molecules close together?

_____

_____

4. What happens to the bridges when sand is soaked with too much water?

_____

_____

5. Why do the walls of a sandcastle gradually crumble as the castle dries in the sun?

_____

_____

6. Why would an experienced builder add water to sand a little at a time?

_____

_____

Words to know

grain: one tiny, hard piece of something, like sand
surface tension: the pull that keeps water molecules close together
sturdy: strong and not likely to fall apart
crumble: to break into small pieces
soaked: made completely wet all the way through

Talk together (every group has these)

1. Find one fact that every group read. How did your sheet say it?
2. What did your sheet tell you that you think another group's did not? Ask them.
3. What is one question about this topic that none of the sheets answered?

For the teacher: Why Wet Sand Builds Castles and Dry Sand Slumps

Each student sheet carries a shape, not a level. The same topic and facts, written three ways.

Circle: Why Wet Sand Builds Castles and Dry Sand Slumps

Easier · 195 words · Flesch-Kincaid grade 2

1. The walls crumble right away.
2. A tiny curved bridge of water.
3. Surface tension.
4. The water fills the gaps, the bridges disappear, and the sand flows like thick soup.
5. The water bridges shrink, so the grains lose their grip on each other.
6. To get the sand wet enough to stick but not so wet that it runs.

Triangle: Why Wet Sand Builds Castles and Dry Sand Slumps

This passage · 224 words · Flesch-Kincaid grade 5.5

1. The walls crumble right away.
2. A tiny curved bridge of water.
3. Surface tension.
4. The water fills the gaps, the bridges disappear, and the mixture flows like thick soup.
5. The water bridges shrink away, so the grains lose their grip on each other.
6. To make it wet enough to stick without soaking it so much that it runs.

Square: Why Wet Sand Builds Castles and Dry Sand Slumps

Harder · 267 words · Flesch-Kincaid grade 7.6

1. The walls crumble almost as soon as they are shaped.
2. A tiny curved bridge of water.
3. Surface tension.
4. The water fills every gap, the bridges disappear, and the mixture flows like thick soup.
5. The water bridges shrink away, so the grains lose their grip on one another.
6. To make it wet enough to stick without soaking it so much that it runs.