

The Piggy In The Puddle

(GPN # 87)

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Program Description: LeVar discovers how artists worked with clay animation to bring this feature book to life. He finds out how the characters and the puddle are sculpted and painted, and helps with the painstaking process of filming the action frame by frame.

May The Best Mud Win

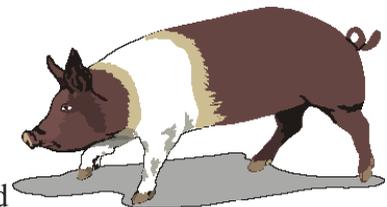
Key Words: mud, soil, sand, clay, mixing, observations

Concept: Different types of soils have different characteristics.

Not all types of soil make good, gooey mud puddles like the one Piggy found. One way soil scientists group soils is by how much clay, silt, or sand particles they contain. Clay particles are very small, or fine. Silt particles are larger than clay particles. Sand particles are larger and coarser than either clay or silt. Soils containing mostly clay make great smooth, creamy mud puddles. Soils containing mostly sand will make rough, gritty puddles.

Materials: Powdered clay (available at art and school-supply stores), top soil (available at garden stores), sand (available at large toy stores and many garden stores), plastic cups, spoons, room temperature water, sheets of white paper, craft sticks, chart paper, markers, paper towels.

1. Prepare three types of soils by mixing powdered clay, topsoil, and sand in different amounts. **Sandy soil:** four parts sand to one part clay and one part topsoil. **Clay soil:** four parts clay to one part sand and one part topsoil. **Topsoil:** four parts topsoil to one part sand and one part clay. Place small samples of the soils in separate cups, and label them.
2. Ask students to describe the mud in Piggy's puddle. How do they think the mud looks and feels? (They might say the mud feels soft, smooth, and slippery and looks shiny.) Write their responses on a sheet of chart paper. Tell them they will be examining three soil samples to find out which type would make the best mud for Piggy's puddle. Explain that the substances that make up the soil affect the kind of mud that soil makes.



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3. Give each group samples of the three soils. Ask them to place a small amount of soil from a sample cup on a sheet of white paper. Have them examine and describe the sample using a craft stick as a probe and a hand lens for a closer look. Write their descriptions of the soil sample on chart paper. Have them return that sample to the cup and examine another sample. After they have examined and described all three soil samples, have them predict which sample will make the best mud when mixed with water.
4. Have students make mud by putting a spoonful of water in each cup and stirring the mixtures with craft sticks. They should continue adding spoonfuls of water until the mixtures are the consistency of pudding. Ask them to count and compare how many spoons of water each cup took. Then have them describe each mud sample and write descriptions of each on the chart paper. Finally have them tell which type of soil they think would make the best mud for Piggy's puddle, and explain why.
5. Have students place a small amount of mud from one of the cups on the back of their hands. Ask them whether the mud feels warm or cool. (Cool) Why do they think pigs like lying in mud? (Pigs are not just attracted to mud because of the way it looks and feels; mud actually helps them stay cool in hot weather. People and other animals perspire to cool down, but pigs perspire very little. To stay cool, they roll in mud; the wet mud conducts heat away from their bodies. The mud also works as a natural sun block to protect pigs from sunburn.)



Puddle Production

Key Words: mud, soil, water, drainage

Concept: Mud puddles form in places where soil drainage is poor.

Mud puddles often form in the same places. They are found in places where the soil becomes saturated with water often because of poor drainage. Some soil types, such as sandy soils, usually allow water to drain away quickly. But soils that are high in clay or silt drain slowly. Another factor is the compaction of the soil; for example soil on a road may be compacted from cars driving over it, so it will drain slowly. The height and slope of the surrounding land is also a factor.

Materials: A large coffee can with the top and bottom cut off, large watering can, 2" x 4" x 8" piece of wood or other small solid board, hammer, ruler, watch, paper and pencil, schoolyard or other soil covered area.

1. Have students select a soil-covered spot in the schoolyard where they think a puddle will form. Ask them to make a simple map showing the selected location and to write a description of the soil there.
2. Help them push one end of a coffee can down into the soil about an inch. Be sure that the can is completely embedded in the soil so that water will drain down into the soil and not run out from under the can. If necessary have students step back while you place a piece of wood over the can and hammer on the wood to force the can down into the ground.
3. Have students pour several cups of water into the coffee can. They can measure and document how well the soil drains by placing a ruler upright in the can and timing how long it takes for the water level to go down an inch.
4. Help students repeat this process in other locations around the school. (Areas with different amounts of traffic and soil types will tend to give visibly different results.) Have them compare the drainage time from each location. In which area did the water drain most slowly? Most quickly? Or were the results similar? Why might the water have drained more slowly in some areas? (Because of soil type, compaction, or the height and slope of the surrounding land.) Have them predict which area might be the most likely to become a mud puddle.

Extension: Have the students look at the sampled locations shortly after a rainstorm. Did any of the locations produce a puddle? Were their predictions correct? Which areas dried most quickly? Were these the areas with good drainage?