

**As You Read . . .****Think about:**

- 1. What makes objects fall toward the center of the Earth?**
- 2. Why do large, heavy objects fall faster than small, light ones?**

**Digging Deeper****Gravity and Friction**

The Earth's gravity pulls all things toward the center of the Earth. The soil materials fell to the bottom of the cup because of the pull of gravity. You know from experience that the speed of a falling object depends on the weight and the size of the object. A bowling ball falls much faster than an air-filled balloon. They are about the same size but the bowling ball is much heavier. A marble falls more slowly than a bowling ball. They are both made of the same type of material, but the bowling ball is much larger, and therefore much heavier. This probably seems very natural to you. However, it is not that simple to explain why. If you dropped those objects on the Moon, they would all fall at the same speed! The difference has to do with a force that



keeps one object from moving against another object. This force is called friction. In this investigation the friction was between the air or water and the falling particles. There is no air on the Moon, so there would be no friction to hold back falling objects.

The soil in your sample probably was made up of differently sized particles. They may have been as large as sand grains or pebbles, or as small as fine mineral particles. The larger particles tended to fall faster, so they reached the bottom of the cup first. It took a long time, however, for the dust to settle in the air and for the muddy water to become clear again. Also, it took longer for the particles to settle in water than in air. That is because the friction is greater in water than in air.