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Demonstrating Density

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Teacher-written tests aren't always the best form of evaluation, yet they are frequently used because "nothing better exists." This activity would serve well as a culminating activity or an evaluative measure.

Applicable during any season of the year, employing the activity in late fall, winter, or early spring might present more of a challenge. At least it would be an eye opener to the fact that life in Iowa doesn't cease when the leaves fall from the trees!

As important to the "search" as the action is the follow-up. Sharing logs, whether large or small group or some other instructor-devised method, should spark interesting interactions between pretend Martians. In our seminar undergraduates, graduates and instructor donned coats and gloves and trekked outside one November evening to see what we could find. Logs revealed some interesting things. Some life forms were sedentary, with main parts that separated into many parts. These parts were rather stiff and had small bulges at their ends. (Trees with terminal buds.) Some life forms were very mobile with hard shells and light devices. They had a very intricate signaling and movement pattern with a well developed communications system. They also had one individual respected by everyone, whom they moved aside for when they passed. (Can you guess? Cars on the highway with stop lights and an ambulance that went by!)

Demonstrating Density

The concept of density is difficult for the average seventh or eighth-grade student to understand. Most of the current physical science textbooks, however, include it as one of the characteristic properties used to distinguish between various materials. The following demonstration has proven useful in promoting inquiry discussions when the concept of density is introduced.

Fill a large, clear, glass container, such as a 100 ml cylinder, approximately one-third full with a saturated salt solution. Laboratory grade NaCl will keep the solution clear. Place a golf ball in the salt solution and then carefully pour fresh water down the side of the container until it is approximately two-thirds full. The result will be a golf ball, which has a greater density than fresh water but is less dense than salt water, floating in the middle of a clear liquid.

If the demonstration is visible as the students come into the classroom, the result is usually a high degree of interest and curiosity. Spin-off activities, such as comparing various brands of golf balls in standardized solutions or investigating what causes the schlieren lines which result when the golf ball is pushed down with a glass rod and then released, may take several days.