Flotation: How to Make A Nut Float

Based on Revised Version by Women in Mining
(Source Unknown)

Purpose:
The purpose of this exercise is to acquaint the students with the concept that minerals can be made to float, thus separating them from waste in an economical manner for further processing.

(Teaches science/language arts, grades 3-8)

Materials Needed:

Dry roasted peanuts	Raisins
Clear soda water	Drinking water

2 clear drinking glasses for each student or group

Instructions:
Mix ½ cup dry roasted peanuts with ½ cup raisins. Add ½ of the mixture to each drinking glass. Fill the first glass 2/3 full of plain water. Fill the second glass 2/3 full of the clear soda water. Have students observe which objects float. (In the plain water both peanuts and raisins will sink, but in the soda water the peanuts will float.)

Evaluation:
Why does this work? The density of raisins and peanuts is greater than water, so they sink. In soda water, the bubbles attach to the peanuts and the overall density of this combination is less than water, so they float. Even with bubbles, the overall density of the raisins is greater than the water. Why is this application important to mining? Flotation is one of the methods used in mining for extraction of minerals. Frothers are added to the solution to lower the surface tension of the water. The froth must be strong enough to support the mineral, but weak enough to break down in launders. Common frothers are alcohol and glycols.

Options:
Have the students experiment with other items such as beans or shell macaroni. Are the results the same? What other items could be substituted? Have the students record the time frame that the peanuts float in the soda water. If fresh soda water is added, do the peanuts float again?