Static Power

Grade Levels: 1-4

Background

When coal is burned in a power plant, small particles, called ash and soot, are produced. Too much soot can hurt living things if they breathe too much of it. Coal companies use many different ways to stop all the bad products from being released into the air. One way is to separate the soot from the air released.

Question

Can a mixture of salt, sugar, and pepper be separated using filters, water, and/or static electricity?

Possible Hypothesis

A mixture of salt, sugar and pepper _____.

Materials

- Sugar, salt, and pepper
- Small plate
- Plastic comb
- Piece of wool
- Flour sifter
- Bowl of water

Procedure

1. Make three small mixtures of the salt, sugar, and pepper. Put each mix in its own pile or container. Each mix will use a different method of separation. On the plate, make a small pile of salt, sugar, and pepper, but don't mix these together.
2. Sift: Pour one pile of the mixture into a flour sifter. Does it separate the three spices?
3. Water: Pour the second pile into the water. Do some of the spices sink while others float?
4. Electricity: Stroke the comb with wool to give it an electric charge. Using the unmixed spices. Start a few inches above the plate, and move the comb closer to the particles. Observe to see if one type of spice reacts before the others.
5. Repeat the electricity experiment with the last pile of salt, sugar, and pepper mixed together.

Analysis and Conclusion

What methods worked for separating the spices? Are the spices attracted to the comb at different heights above the plate? Can you separate a mixture of salt, sugar, and pepper using static electricity?

Real World Connection

How could power companies that burn coal reduce the amount of ash and soot they put into the air?