

Bismuth Lesson Outline

Intro:

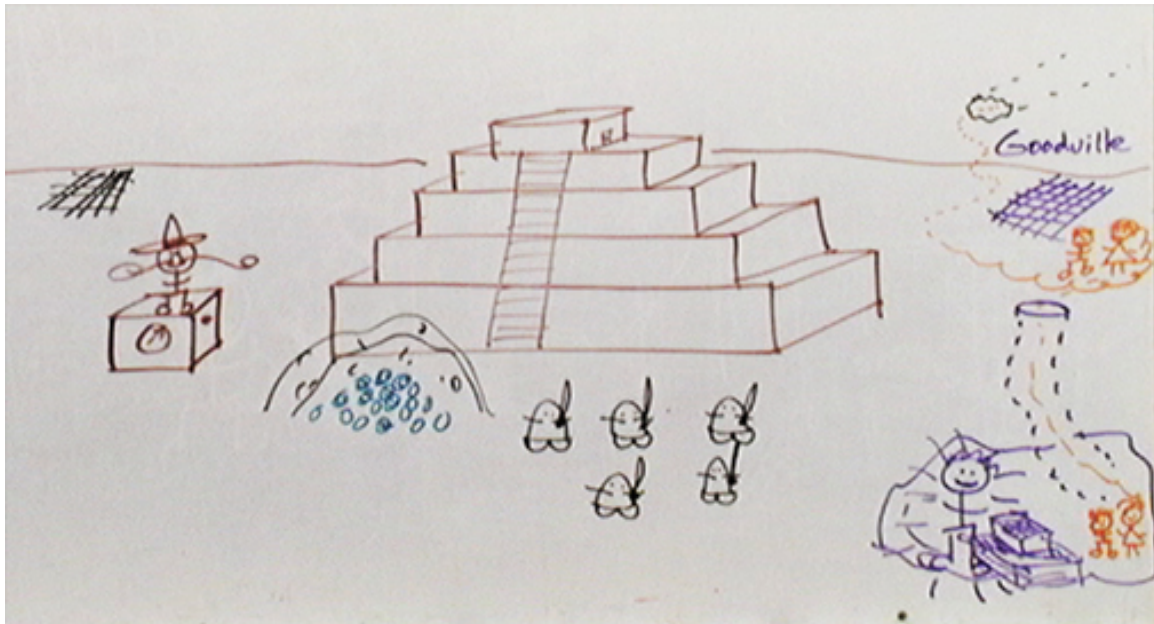
Describe Wood's Metal, tungsten, aluminum, lead, iron, mercury.

Bismuth is next to several toxic metals on the periodic table.

Lead bullets replaced with bismuth.

Show bismuth crystals.

Powerful magnet will float above bismuth.



Story:

EMF wanted to be born again.

He found a cardboard box with a dial on the side.

He put a minion in the box, turned the dial, and the minion disappeared.

Then he made a copy of the box, put it inside the first box along with himself, then turned the dial on the outer box. He disappeared and reappeared back in time, along with his copy of the box. But he forgot to bring his minions with him.

He found himself in a time when people were playing soccer with human heads (Incans or Mayans).

There was a step pyramid with a temple at the top. The stairs were wider at the top so they appeared to go all the way to heaven.

If there was a war, the two kings had to fight. The loser would climb the pyramid, have his head cut off, and it would roll down the stairs.

EMF saw a pile of heads at the base of the pyramid. He made friends with the executioners in the temple and asked to join them. They guys were getting ready to attack Goodville.

Jack & Jill happened to be visiting Goodville with their own cardboard box, and they realized EMF was there.

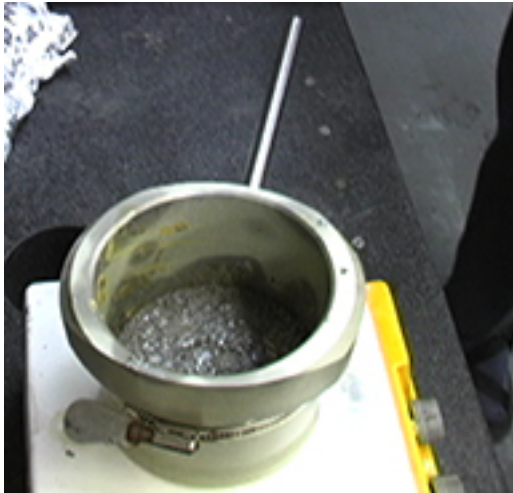
EMF told the Incan guys they should give their peasants baseball bats and let them fight instead of the kings. So they gave the peasants baseball bats. (Draw the peasants to look like minions, for simplicity of drawing.) Under EMF's leadership, they took over a bunch of cities. The pile of heads got bigger.

People in Goodville dug a hole in the ground and hid there. They hit a mine of bismuth. Bismuth crystals looked like temples. They started worshipping the bismuth, cooked their food on it, ate it, and became big and strong. So big they couldn't get out through the tunnel they had dug.

Experiment:

Cost of bismuth, where to find it.

Bismuth is pre-melted.



Students work in pairs and wear goggles and gloves. Scoop some liquid bismuth into a small pan (hold it with pliers) and pour it into an aluminum roasting pan. Slosh it around so it coats the pan. When it dries, dump it out in a sheet.

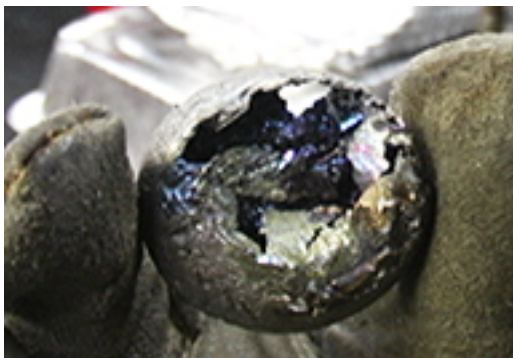
Set out cups of water for fire extinguishers. Put some aluminum foil on half the roasting pan as a splash guard. Break up the bismuth, put it into the small melting pan, and melt it with a torch.

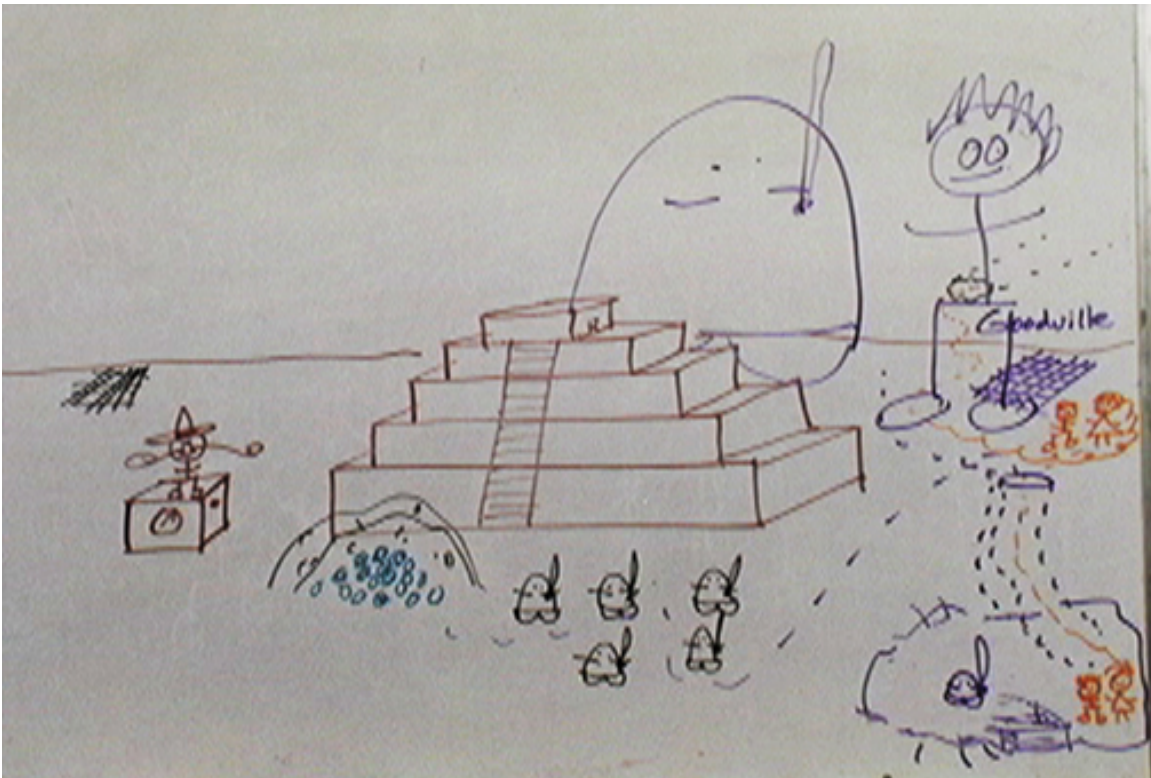
When the bismuth starts to harden around the edges, pour out the remaining bismuth into the roasting pan, under the splash guard.

Turn small pan over and tap it on the table to get the crystals out. View crystals under microscope.

Give students ziplock bags for their crystals.

Dump excess bismuth pieces into one aluminum pan for re-use.





End of Story:

The big metal-coated guy opened up the hole and climbed out. EMF started to freak out. Then the big guy started singing songs and picking daisies. EMF wanted to make a big guy of his own. So he took his minion/peasants down into the hole. He wanted the bismuth to melt faster, so he told the minions to hit the ground with their baseball bats to create friction for heat.

The bats caught fire, melted the bismuth and created a huge molten lake of bismuth underground.

EMF asked for a volunteer to dive in and be the seed crystal for a giant monster. He threw in a minion.

Bismuth started hardening around the minion, and he started growing bigger and bigger until he burst out of the ground.

EMF got excited, ran over, and started giving the giant minion orders. The minion hit EMF with his giant baseball bat.