RED LAKE REGIONAL HERITAGE CENTRE visits.... Evolution MINING

Canadian Mining Week May 8-12 2023

The question:

Why mining?

Humans have been mining for a very long time. Ngwenya Mines in Swaziland has evidence of being used as far back as 43,000 BCE. (https://whc.unesco.org/en/tentativelists/5421/ - very cool!)

There is good evidence that gold was one of the first metals we regularly sought. Not only is it beautiful, but it is often easy to find and extract, as well as being easy to work and mold without fancy tools or extreme heat.

This ability to be stretched into wires is called ductility while ability to be pressed into thin sheets is malleability. Gold is both highly ductile and highly malleable. It is also very good at conducting electricity and is highly resistant to corrosion. (It doesn't rust.)

We often think of gold in it's uses for jewelry, art, religion, or money but it has so many more possibilities. It's a very important resource, Red Lake was built around it. We've been mining gold over 100 years!

Small amounts of gold particles are sometimes added to glass. This allows the glass to reflect heat and solar radiation, helping building with climate control. It's even able to protect astronauts in space.

Gold is one of the best known conductors of electricity, plus it is non-corroding, so it has become an important part of electronic devices. This is especially true for computers and phones that depend on rapid and accurate transmission of data.

Not only is gold used in glass for space travel, but can be used as a lubricant when it might too cold or too risky to use organic lubricants, they can be used in solar panels to generate electricity, and for electronics.

Gold in the electronics of high-tech medical imaging machines and life support systems make them more reliable. It may also be used as a dental filling, in tiny doses as parts of some medications, or even as part of diagnostic test. Gold may even be used in surgical tools since it is non-reactive.

Let's try!

Dear adults: Reactivity and conductivity must be done with supervision. Suggested methods use bleach and a small electric circuit. Google is always a great second option.

Gold has a lot of features that make it a highly desirable material for many different industries. Try some of these household items to see if they can do what gold will do.

Blu/Sticky Tack
(synthetic rubber pressure-sensitive adhesive)

Ductile

Property of a metal to be drawn into a wire without losing flexibility.

Test: Pull the item to see if it can stretch into a wire and/or if it is a wire, does it bend? A ductile item can be made into a **flexible wire.**

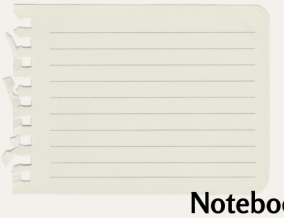
Twist Ties
(steel wire wrapped in paper or plastic)

Aluminum Foil
(thinly rolled sheet of aluminum)

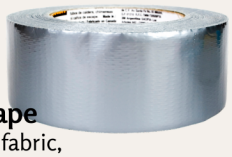
Malleable

Property of a metal to be hammered or rolled into a sheet without losing flexibility.

Test: Roll or squish the item into a paper thin sheet. Can it still bend? A malleable item can be made into a **flexible sheet.**



Notebook Paper
(wood pulp based paper, synthetic inks)



Duct Tape
(polythene, fabric, synthetic rubber adhesive)

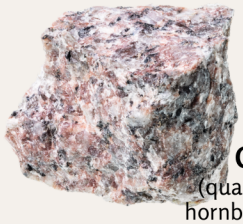
(Empty) Plastic Bottle
(/1\ PET or PETE plastic or /2\ HDPE plastic)

Non-Reactive

A substance that does not readily combine with others (on a molecular level). This is why gold does not corrode.

Test: **With an adult!** Take a small amount of the item and put it in a glass jar. Just cover the item with bleach and leave it over night. Most items will corrode or break down. **Non-reactive items will be the same.**

Potato
(vegetable matter)



Granite
(quartz, feldspar, hornblende, biotite, muscovite, etc.)

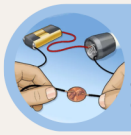
Bleach is **highly reactive**. Do not let it touch your skin or clothing. Make sure you dispose of it and your experiments safely.

Wax Crayon
(paraffin wax, colours, binders)

Conductive

A substance's ability to allow electricity to travel through it.

Test: **With an adult!** You can make a mini conductivity test. If the light stays off, the item is not conductive. If it flickers or is weak, the item is poorly conductive. *If you can't make the test yourself, search the internet for the answer.*



Full instructions: https://www.scientificamerican.com/article/which-materials-conduct-electricity/

Twonie
(aluminum-bronze plated with brass and steel plated with nickel)