**Graphite: The Mineral of Extremes**

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**bold=speech**, normal=what will appear on screen

Connect bright LED circle array to battery in a dark room. The LED is underneath the battery and is lighting it up.

Text on screen: “what is inside of a lithium-ion battery and where is it found?”

Turn light off

Music starts

**These are all lithium ion batteries, one of the most common types of rechargeables. They are found everywhere: Tablets, phones, and much more; all powered by these.**

Show batteries on the table. When objects are mentioned, replace the battery with object.

**But what’s hidden within? Let’s cut one open.**

**Inside, there is the cathode, the separator, and the anode. This is soaked in a liquid called the electrolyte, then put together like a nesting doll into the casing, which is usually made of plastic or metal, the type depending on the manufacturer. The separator is usually plastic, and the electrolyte can be any liquid that lets lithium ions move through easily. The cathode is commonly lithium cobalt oxide, and the anode is almost always made of graphite.**

Animation: cylindrical battery, cut open from the side, separated into 5 parts: orange casing, black, light grey, dark grey, blue liquid, put labels. Highlight the column that is being mentioned.

**Graphite. You’ve heard of it before. This naturally occurring form of carbon is soft, conducts electricity, and withstands high temperatures.**

Show “graphite” on screen. Show picture, writing, conducting. Show pencil lead in toaster oven, with text on top saying “pretend this is 3000 degrees C (graphite can resist this!)”

**Graphite’s creation story begins long ago, when carbon rich sedimentary rock was compressed and heated in the earth to form metamorphic rocks that contain small flakes or large chunks of graphite.**

Just animate whatever is said

**In 2018, China was the leading country in graphite mining, followed by Brazil, then Canada, at 40,000 metric tons.**

CHART!!!

**Most of Canada’s graphite mines are found in eastern Ontario, southern Quebec, and southern British Columbia.**

MAP!

**Underground or open pit mining is used to extract the ore, and it is sent to a processing plant. The ore is crushed, filtered, and put in water. The graphite floats to the top and is collected. This is called ore beneficiation** (ben if fish e a shin). **We now have near-pure graphite that can be used in batteries, pencils, crucibles, and much more!**

Show all these processes with animation.

Show battery, pencil, drawing of crucible.

**Graphite is amazing. Without it, our lives would be so much harder. But we will run out of it eventually, so let’s not waste it, and let’s appreciate all that it does for us, and, of course, all the lithium ion batteries that contain it.**

Timelapse of me drawing a battery with graphite stick from pencil

On the last beat of music, put thanks for watching then quickly end the video.

References

Content

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All other images and videos are drawn or taken by me.

Drawings and animations done in Adobe Flash.

Edited using Windows Movie Maker.

Music created by me using GarageBand.