There’s More Where That Came From

Brody McRoid was an extremely talented hockey player who played for the Saskatoon Leopards, though he had a very short temper and would often retaliate putting him and his team in situations that make everyone anxious and nervous. This is an example of Brody Mcroid not only hurting his team's chances to be city champs but also all the hard work it took someone to make his very expensive stick that he later destroyed. Let me take you to the year 2018, Brody was a strong young man, he didn’t like getting beat and he especially didn’t like when other people thought they could beat him. It was the final game that determined if they were city champions or losers. There were five minutes left on the clock and his team was down one, the time seemed like it was speeding by and his team couldn’t score a goal. Then in the last three minutes, he got a retaliation penalty. On his way to the box, he lifted up his stick and brought it down quickly. Let me stop the story right there…

Hockey sticks are made from many things, some being non-renewable, including fiberglass, graphite and kevlar. When hockey players get mad all they want to do is break their stick, but no one ever thinks about what you're breaking or what goes into making these sticks, why would you? Fiberglass is made from a variety of natural minerals and manufactured chemicals. The main ingredients in fiberglass are limestone, mined in Northwest Territories, British Columbia, Alberta, Manitoba, Ontario, Nova Scotia and Newfoundland. The mines are here for a reason, this is where major consumers are and where there are reserves of suitable limestone. The second ingredient is Sand which makes glass, the sand that goes into making glass is sand which is mostly made up of silicon dioxide. Silica sand is the most common for manufacturing glass and is found in granite, gneiss, and sandstone. The next item is soda ash which is also known as sodium carbonate (Na_2CO_3). Soda ash is an alkali chemical that has been refined from a mineral called trona. There are many steps to produce soda ash from trona. Trona is mostly found in the United States in Wyoming, though there is a mine for trona located at Ceylon Lake, Saskatchewan Canada.

Graphite Is another material used for hockey sticks. Graphite is mined in Canada in Ontario, British Columbia and Quebec. Graphite can be mined in two different ways; the open pit method or the underground method. The open-pit method is done when the graphite ore is very close to the surface, when miners are doing this they rely on quarrying where you get the graphite by breaking rocks using things such as explosives and drills. The underground method is when the graphite ore is lower in the ground and the miners have to use ways such as drift mining (not digging straight down but more cutting into the side of the earth) and hard rock mining (when you mine in igneous and metamorphic rocks by drilling and exploding to get to ore). Kevlar is the last item and is made of a chemical compound called poly-para-phenylene terephthalamide. How this is created is by a chemical reaction from an acid and a chemical solution containing nitrogen and hydrogen. Nitrogen is produced most commonly from the fractional distillation of

liquid air. Hydrogen is mostly produced when natural gas is heated with steam to turn into syngas which is a mixture of hydrogen and carbon monoxide. Then after that, the syngas is separated to have just hydrogen. Syngas is a synthetic gas that is a combination of hydrogen, carbon monoxide, a small amount of carbon dioxide and trace gasses. It may seem silly that this is all about a hockey stick but people rely on this for their jobs whether they use it or make it. These materials can also be used in things such as your house, piping or personal protective equipment, kevlar is even used for bulletproof vests and helmets and graphite is useful in making electronic products, and as lead for pencils.

So as Brody brings down his stick quickly, he stops and thinks and just walks into the penalty box leaving his stick untouched. After two mins he jumps out of the box as the puck is coming towards him and he picks it up and skates down the ice on a breakaway. He shoots top left corner and scores! After winning 3-2 his team piles into their dressing room cheering, on a winning high! As he leaves the dressing room he thinks about how if he would have broken his stick his team wouldn't have won! As well as all the hardwork it goes into making these sticks.

Bibliography

Fiberglass citations:

Walker, Kris. "What Is Syngas?". *Azocleantech.Com*, 2013,

Woodford, Chris. "Glass". *Explain That Stuff*, 2021, https://www.explainthatstuff.com/glass.html#:~:text=Believe%20it%20or%20not%2C%20glass,C%20(3090%C2%B0F). Accessed 29 Mar 2022.

"How Silica Sand Is Used In Glass Manufacturing | PFS Aggregates". *PFS Aggregates*, 2022, https://www.pfsaggregates.com/2021/04/07/how-silica-sand-is-used-in-glass-manufacturing/.

"What Is Soda Ash". *IMA-NA*, 2022, https://www.ima-na.org/page/what_is_soda_ash. Accessed 29 Mar 2022.

***Wcwrpc.Org*, 2022, http://wcwrpc.org/IndustrialSilicaSandsofMN.pdf.**

"Trona From Ceylon Lake, Saskatchewan". *Mindat.Org*, 2022, https://www.mindat.org/locentry-1221493.html#:~:text=Ceylon%20Lake%2C%20Saskatchewan%2C%20Canada,-Locality%20type%3A. Accessed 29 Mar 2022.

"Our Facilities - North America - Tata Chemicals Limited". *Tata Chemicals Limited*, 2022, https://www.tatachemicals.com/operations/north-america/Our-facilities.

Graphite citations:

2022, https://www.mindat.org/glossary/hard-rock_mining. Accessed 29 Mar 2022.

"Drift Mining, Mining Process, Mining Techniques, Gold, Zinc, Coal, Mineral Mining". *Greatmining.Com*, 2022, https://www.greatmining.com/drift-mining.htm.

"The Components Of A Mine Shaft: Mine Skips, Cages, Vents And Tunnels". *Wabi Crop*, 2022, http://www.wabicorp.com/components-mine-shaft-mine-skips-cages/.
"Slope Mining, Shaft Mining, Drift Mining, Mining Techniques, Coal Mining, Underground Mining,". *Greatmining.Com*, 2022, https://www.greatmining.com/slope-mining.html.

Kevlar citations:

"Nitrogen - How Nitrogen Is Obtained". *Science.Jrank.Org*, 2022, https://science.jrank.org/pages/4683/Nitrogen-How-nitrogen-obtained.html#:~:text=Nitrogen%20is%20produced%20commercially%20almost,F%20(%2D200%C2%B0C).

"All About Kevlar® - Fiber Brokers International, LLC.". *Fiber Brokers International, LLC.*, 2022, https://www.fiberbrokers.com/body-armor-disposal/all-about-kevlar/#:~:text=Kevlar%20is%20a%20manufactured%20plastic,solution%20containing%20nitrogen%20and%20hydrogen.

“Dupont to Leave $500m Kevlar Factory after Just Six Years.” *Manufacturing.net*, 8 Mar. 2017, https://www.manufacturing.net/operations/news/13115501/dupont-to-leave-500m-kevlar-factory-after-just-six-years.

Hockey Stick:

"What Is A Hockey Stick Made Of?". *Prostockhockey.Com*, 2022, https://www.prostockhockey.com/sticks/what-is-a-hockey-stick-made-of/#:~:text=Blades%20begin%20with%20a%20hard,are%20glued%20to%20the%20blade.

Image:

“Super Tacks Classic pro Hockey Stick - Senior.” *Www.sportsexcellence.com*, https://sportsexcellence.com/en_us/super-tacks-classic-pro-hockey-stick-senior-2019.html.