CANADA

- One of the world's largest mining nations. Canada produces over 70 minerals, metals, and their products. All these mines occupy just 0.03 per cent of the land area (less than half the size of Prince Edward Island).
- One of the world's top five producers of minerals such as uranium, potash, aluminum, diamonds, zinc, gypsum, molybdenum, platinum group metals (a group of six rare metallic elements), salt, cadmium, titanium concentrate, and asbestos.
- A country with about 200 principal metal, non-metal, and coal mines; over 3,000 stone quarries, and sand and gravel pits; and about 50 smelters, refineries, and steel mills.
- A major producer and exporter of minerals and mineral-based products; Canada exports about 80 per cent of our mineral production.
- A major producer of diamonds, with four operating mines and several mines under development.

RECYCLING – New Life for an Old Snowmobile

- Once mined and refined, metals can be recycled almost forever—the metals can be used over and over without losing their chemical and physical properties.
- Recycling metals means less energy is needed to transport and process ore.
- Recycling metals conserves valuable natural resources and reduces the amount of waste that people produce.

Recycling is not just about cans, bottles, and paper. Exploration, mining, and processing metal ore are costly activities. Some metals are found in only a few parts of the world. That makes them difficult to produce. Metals that are used to make alloys, such as tungsten, molybdenum, titanium, and vanadium, can be recycled from stainless and specialty steels. Iridium, the most rare of the platinum group metals, can be recovered from electronic, automotive, and other scrap.

Used motor oil can contain additives and contaminants, such as arsenic, lead, magnesium, cadmium, chromium, benzene, and zinc. These can cause health problems in people. One litre of used motor oil can contaminate a million litres of clean groundwater. Used motor oil is insoluble and slow to degrade. It is a health hazard to humans, plants, and animals. Just 7.5 litres of recycled motor oil can generate enough electricity to run a TV for 180 hours—that's 7.5 days!

LCDs used in snowmobiles contain recoverable precious metals such as gold, silver, copper, and tin. The LCDs also can contain toxic metals such as antimony, chromium, cadmium, mercury, and lead. If we do not recycle these harmful metals, they can leak into the groundwater or pollute the air.

Treat the Earth well. By recycling a snowmobile, we help protect the Earth and conserve its resources.

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planetearth Earth Sciences for Society

Ontario

ᑲᓇᑕ

- ᐁ·ᑲᓂᒪ ᐯᔭᐠ ᐊᐢᑭᕀ ᒪ·ᐊ⁻ ᑲ ᒥᓵᑭ ᒍᓇᐃᓐᓂᔭᓀ·ᐃᓇ᙮ ᑲᓇᑕᐢᑭᕀ ᐅᔑᑕᐤ ᑲ ᐅᑕᐊᐠ ᑫ·ᑲᓇ ᐊᑕᒪᐢᑭᐠ ᓂ·ᓴᓯᒥᑕᓇ ᓇᓇᑲᐤ ᓐᓂᔭᓇᓯᓂᔭ ᓀᐢᑕ ᐱ·ᐊᐱᐢ·ᑲᓯᓂᔭ ᐁᑯ ᒪᑲ ᐅᔑᕆᑲᓇ ᐅᑕ ᐅᒋ᙮ ᒥᓯ·ᐁ ᐅᐅ ᒍᓇᐃᓐᓂᔭᓀ·ᐃᓇ ᑭᒋ ᒥᐢᑕᐃ ᑕᔑᑫᑐᑕᒪᐠ ᑲ ᐃᔑ ᓄᒋᒋᑫᒋᐠ ᐊᐢᑭᐠ, (ᐊᐱᑕᐤ ᑲ ᐃᐢᐱᒐᐠ ᒥᓂᐢᑎᐠ ᐸᓇᐢ ᐁᑐᔅᐅᐟ ᐊᐃᓚᐣ) ·ᐊᐸᓅᐠ ᑲ ᐃᑕ·ᑲᐠ ᒥᔑ ᒥᓂᐢᑎᐠ ᐯᔭᐠ ᑲ ᑕᔑᑫᑐᒋᑲᑌᐠ᙮)
- ᑲᓇᑕᐢᑭᕀ ·ᐃᓇ ᐯᔭᐠ ᓂᑲᓂ·ᐊᑕᐤ ᐊᑐᐢᑫ·ᐃᓂᐠ ᐁ ᓂᔭᓇᓂᑭ ᐊᐢᑭᔭ ᐅᒪ ᑲᑐᑕᑭᐠ ᐅᑕᐢᑭ·ᐊᐠ ᐁ ᒍᓇᐃᓐᓂᔭᓇᑕᑭᐠ ᓇᓇᑲᐤ ᐱ·ᐊᐱ·ᑲᓯᓂᔭ ᑕᐱᐢᑯ⁻ ᔦᓄᓂᔭᐨ, ·ᐸᑕᐡ, ᐊᓗᒥᓂᐨ, ᑕᐃᒪᐢ, ᓯᐠ, ᒋᐨᓯᐨ, ᒍᓕᑊᐅᑌᓇᐨ, ᐱᑌᓚᑎᓇᐨ ᑲ ᐃᔑ ᐱᐢ·ᑲᓯᓇ·ᑲᑭ ᓇᓇᑲᐤ ᐱ·ᐊᐱᐢ·ᑲᓯᓇᔭᐠ (ᐁ ᐟᑯ·ᑕᓯᓇ·ᑲᑭ ᐱ·ᐊᐱᐢ·ᑲᓯᓂᔭᐠ ᓇᓇᑲᐤ ᑲ ᐃᓇᐸᑎᓯᒋᐠ) ᔑ·ᐃᑕᑲᐟ (ᓴᑌᐟ) ᑲᐟᒥᔭᐨ, ᑕᐟᑌᓂᔭᐨ ᑎᑭᓯᑲᐟ ᐁᑯ ᒪᑲ ᐊᐢᐯᑎᐢ ·ᐊᐢᑲᐃᑲᓂᐠ ᐊᐸᒋᑕᓂ·ᐊᐟ ᐅᒪ ᑲ ᐱᑐᓯᓇᑯᓯᐟ ᐊᓯᓂᔭ ᐸ·ᑫᔑᑲᓂᐠ ᑲ ᐃᔑᓇ·ᑲᐠ ᑫ·ᑲᐟ᙮
- ᑲᓇᑕᐢᑭᕀ ᓂ·ᓴᒥᑕᑐᒥᑕᓇ ᑕᑎ·ᓇ ᓇᓇᑲᐤ ᒍᓇᐃᓐᓂᔭᓀ·ᐃᓇ ᐅᑕ, ᐱ·ᐊᐱᐢ·ᑲᓯᓂᔭ ᑲ ᐅᑕᐅᐟ, ᐁᑲ ᐱ·ᐊᐱᐢ ᑲ ᐃᔑᓇ·ᑲᐠ ᑫ·ᑲᐟ ᐁᑯ ᒪᑲ ·ᐃᐢᑲᓚᓂᐢᑯᑌᐤ ᑲ ᒪᑲᑌ·ᐊᐠ ᒍᓇᐃᑲᑌᐤ ᐅᒪ; ·ᐊᔦᐡ ᒪᑲ 3,000 ᓄᑕ·ᐊᑲᓂ·ᐊᐠ ᑕᑎ·ᓇ, ᐁᑯ ᒪᑲ, ᓀᑲᐤ ᑲ ᐅᑕᐃᑲᑌᐠ ᒍᓇ·ᐊᑲᓂᐠ ᐁᑯ ᒪᑲ ᓂᔭᓄᒥᑕᓇ ᑎᑭᓯᑲᓇ ᐊᐸᑎᓯ·ᐃᑲᒥ·ᑲ, ᑲ ᐃᔑ ᒥ·ᓇᔑᑕᓂ·ᐊᑭ ᐱ·ᐊᐱᐢ·ᑲᓯᓂᔭᐠ ᓀᐢᑕ ᐱ·ᐊᐱᐢ·ᑲ ᑲ ᐃᔑ ᓄᒋᑕᓂ·ᐊᑭ᙮
- ᑲᓇᑕᐢᑭᕀ ᒥᐢᑕᐃ ᑫ·ᑲᓇ ᐅᔑᑕᓂ·ᐊᐠ ᑲ ᒍᓇᐊᑭᐠ ᓀᐢᑕ ᐊᑕ·ᐊᑫ·ᐊᐠ ᒍᓇᐃᐊᔦᓂᔭ ᓀᐢᑕ ᑯᑕᑭᔭ ᓐᓂᔭᓇᔦᓂᔭ᙮ ᑲᓇᑕᐢᑭᕀ ᐊᑕ·ᐊᑫᐤ ᒥᔦ·ᐁᐢᑲᒥᐠ ᒥᑫ ᑫ·ᑲᓇ ᑲ ᐅᔑᑕᒥᐠ ᒍᓇᐃᓐᓂᔭᓀ·ᐃᓂᐠ ᐅᒥ ᐊ·ᐊᔦᑌ ᐊᐱᑕᐤ ᑫ·ᑲᓇ ᑲ ᐅᔑᑕᒥᐠ᙮
- ᑲᓇᑕᐢᑭᕀ ᓂᑲᓂ·ᐃᑕᐤ ᐁ ᐊᐸᑎᓯᑲᑕᐠ ᒍᓇᐃᓐᓂᔭᓀ·ᐃᓇ ᑕᐱᐢᑯ⁻ ᑕᐃᒪᓇ ᓀᐢᑕ ᓀᐅ ᑕᑎ·ᓇ ᑲ ᓄᒋᑕᐟ ᐊᓅ⁻ ᒍᓇᐃᓐᓂᔭᓀ·ᐃᓇ ᐁᑯ ᒪᑲ ᐊᑎ ᒪᒋᑕᓂ·ᐊ·ᓇ ᓇ·ᐊ⁻ ᒥᑫᐟ ᑯᑕᑭᔭ᙮

ᐁ ᑭ·ᐁ ᐃᔑᓇᑯᑕᓂ·ᐊᑭ ·ᐁᐱᓂᑲᓂ ᑫ·ᑲᓇ -- ᐁ ᐅᐡᑭᓇᑯᐃᐟ ·ᐁᐡᑲᒋ ᐃᐢᑭᑐ

- ᐯᔭ·ᑲ ᐁᑭ ᒍᓇᐃᓐᓂᔭᓀᑐᒋᑲᑌᐠ ᓀᐢᑕ ᐁᑭ ᒥ·ᓇᔑᑕᓂ·ᐊᐠ ᐅᒪ ᐱ·ᐊᐱᐢ, ᒥᓇ ᑲᑭ ᑭ·ᐁ ᐃᔑᓇᑯᑕᓂ·ᐊᐟ ᐁ ᑭᐡ·ᑲ ᐊᐸᒋᑕᓂ·ᐊᐠ ᑭᒋ ᓀᐢᐱᒋ ᐃᔑᓇ·ᑲᐠ -- ᐁ·ᑲᓂ ᐁᔑᓇ·ᑲᐠ ᐅᐅ ᐱ·ᐊᐱᐢ·ᑲ ᒥᓇ ᐱᑯ ᐁ ᐊᑎ ᑭ·ᐁ ᐊᐸᒋᑕᓂ·ᐊᑭ ᐁᑲ ᒪᑲ ·ᐁᔦᐡ ᐁ ᓇᑲᑎᑐᒪᑲᐠ ᑲᑭ ᐃᔑ ᐅᔑᑕᓂ·ᐊᓂᑯᐸᓀ ᑲᔭᐡ ᓀᐢᑕ ᑲᑭ ᐃᔑᓇᑯᑕᓂ·ᐊ ᓂᑯᐸᓀ᙮
- ᐁᑲ ᐁ ·ᐁᐱᓂᑲᑌᑭ ᐁᑎ ᑭ·ᐁ ᐃᔑᓇᑯᑕᓂ·ᐊᑭ ᐱ·ᐊᐱᐢ·ᑲ ᒍᓇ ·ᐊᓂᑕᓯᒪᑲᐟ ᐅᒥᓂᐢᑭ·ᐃ ᐃᐡᑯᑌᐤ ᓀᐢᑕ ᒍᓇ ᒥᐢᑕᐃ ᑫᐢᑎᐸᓂᓇᓂ·ᐊᐟ ᐁ ᐱᐟᐱᑌᑭ ᓀᐢᑕ ᐁᑭ ᑭ·ᐁ ᐃᔑᓇᑯᑕᓂ·ᐊᑭ ᑲ ᐃᔑ ᑎᑭᓯᑲᑌᑭ᙮
- ᐁ ᑭ·ᐁ ᐅᔑᑕᓂ·ᐊᐠ ᐱ·ᐊᐱᐢ ᒥᓅᑐᒋᑫᒪᑲᐟ ᒥᔦ·ᐁ ᐱᑯ ᐃᔑ ᒍᓇ ᓀᐢᑕ ᐅᑕᒥᐁ·ᐁᒪᑲ·ᓇ ·ᐁᐱᓂᑲᓂᐠ ᐊ·ᐁᓂᑲᓇᐠ ᑲ ·ᐁᐱᓇᑭᐠ ᑫ·ᑲᓇ᙮

ᐁ ᑭ·ᐁ ᐅᔑᑕᓂ·ᐊᐠ ᑲ ·ᐁᐱᓂᑲᑌᑭ ᑫ·ᑲᓇ ᒍᓇ ᐱᑯ ᑭᓵᐢᑌ·ᐊᐳᔭ ᑲ ᐃᔑ ᐱᒥᑎᑭ ᑎᓂᐠ, ᐱ·ᐊᐱᐢᑯᓇᑲᓇ ᓀᐢᑕ ᐱᑯ ᒪᔦᓇᐁᑭ·ᓇ·ᓇ᙮ ᐊᐢᑭ·ᐃ ᓇᑕ·ᐊᐸᒋᑫ·ᐃᓂᐠ, ᒍᓇᐃᓐᓂᔭᓀ·ᐃᓂᐠ ᓀᐢᑕ ᓇᓇᑲᑕ·ᐁᓂᒥᐟ ᐃᔑᓇᑯᔦᐟ ᓐᓂᔭᓇᔦᓂᔭ ᐊᐸᑎᓯ·ᐃᑲᒥᑯᐠ ᑭᒋ ᐊᓂᒪᑭᑌᐤ ᐅᒪ ᐁᑐᒋᑲᑌᐠ ᓇᑕ·ᐁ ᑭᐢᑫᓂᒋᑫ·ᐃᓂᐠ᙮ ᐊᑎᐟ ᐱ·ᐊᐱᐢ·ᑲ ᒍᓇ ᒥᔦ·ᐁᐡᑲᒥᐠ ᒥᐢᑭᑲᑌᐤ ᐅᒪ ᐱ·ᐊᐱᐢ᙮ ᐁ·ᑲᓂ ·ᐁᒋ ᐊᓂᒥᐃᑯᓇᓂ·ᐊᐠ ᐁ·ᐃ ᒍᓇᐃᓐᓂᔭᓇᑐᒋᑲᑌᐠ ᐁ·ᐃᐅᔑᑕᓂ·ᐊᐠ ᐱ·ᐊᐱᐢ᙮ ᒥᑫ·ᑕᔭᐠ ᐁᓇᐸᒋᑕᓂ·ᐊᐟ ᐱ·ᐊᐱᐢ ᐁ ᐊᔑᑎᓂᑲᑌᐠ ᐁ ᒫᑲ·ᐃᑕᓂ·ᐊᑭ ᑭᒋ ᐱ·ᐊᐱᐢᑯᐠ, ᐊᓂᒪ ᐯᔭᐠ ᑲ ᐃᔑᓂᑲᒋᑲᑌᐠ ᑐᐟᐢᑎᐟ, ᒍᓕᑊᐅᑌᓇᐨ, ᑕᐟᑌᓂᔭᐨ ᐁᑯ ᒪᑲ ᐯᐟᓇᑎᔭᐨ ᓇᓇᑲᐤ ᐅᐅ ᐱ·ᐊᐱᐢ·ᑲ ᑲ ᐅᒋ ᐊᔑᑎᓂᑲᑌᐠ ᑭᒋ ᒫᑲᐅᑕᓂ·ᐊᐠ ᑭᒋ ᐱ·ᐊᐱᐢᑯᐠ ᐁ ·ᐊᐢᑲᐃᑲᓂᑲᓂ·ᐊᐠ ᓀᐢᑕ ᐱᑯ ᒥᔑ ᑫ·ᑲᓇ ᐁ ᐅᔑᑕᓂ·ᐊᑭ, ᓀᐢᑕ ᒪᑲ ᑲᑭ ᑭ·ᐁ ᐅᔑᑕᓂ·ᐊ·ᓇ ᑭᒋ ·ᐊᔦᑯᓂᑲᑌᑭ ᐁ ᒥ·ᓇᔑᑕᓂ·ᐊᑭ ᐱ·ᐊᐱᐢ·ᑲ, ᐊᓂᒪ ᐯᔭᐠ ᑲ ᐃᒥᑲᑌᐠ ᐊᓄᑎᔭᐨ, ᐁ·ᑲᓂᒪ ᒪ·ᐊ⁻ ᐁᑲ ᔦᑭ ᑲ ᐃᑕ·ᑲᐠ ᑭᒋ ᐊᐸᒋᑕᓂ·ᐊᐠ ᐊᓂᒪᐟ ᑭᒋ ᐅᑕᐃᑲᑌᐠ ᐁ ᒍᓇᐃᑲᑌᐠ ᐅᐅ ᐱ·ᐊᐱᐢ·ᑲ, ᒪ·ᐊᑐᓂᑲᑌ·ᐊ ᓀᐢᑕ ᑲᑭ ᐃᔑ ᐊᐸᒋᑕᓂ·ᐊᐟ ᐅᒪ ᐱ·ᐊᐱᐢ ᑕᐱᐢᑯ⁻ ᐅᒥᓂᐢ·ᐃ ᑫ·ᑲᓂᐠ, ᐅᓓᐸᓂᔑᐠ ᓀᐢᑕ ᑯᑕᑭᔭ ᑫ·ᑲᓂᐠ᙮

ᑲ ᔑᑯᓂᑲᑌᑭ ᐊᐱᒥ·ᐃ ᐊᔦ·ᐊᒋᑲᓇ ᐊᐢᐸᑭᒥᓂᑲᐟ ᐃᑕ·ᑲ·ᓇ ᐊᐟᑕ ᐊᐱᒥᐠ ᓇᓇᑲᐤ ᑫ·ᑲᓇ ᑲ ᐊᐱᒥ>ᓂᑫᒪᑲᑭ ᑕᐱᐢᑯ⁻ ᐊᐱᒥ>·ᐃᐟ, ᓫᐠ, ᓚᐠᓫᔑᔭᐨ, ᑲᐟᒥᔭᐨ, ᑯᓄᓂᔭᐨ, ᐟᐯᐟᔦᐟ, ᐁᑯ ᒪᑲ ᔦᐠ᙮ ᒍᓇ ᒥᓅᑐᑕᑯ·ᐊᐠ ᐊ·ᐁᓂᑲᓇᐠ ᐅᒉᓂᐤ᙮ ᐯᔭᐠ ᑲ ᐃᔑᓇ·ᑲᐠ ᐊᐢᐸᑭᒥᓂᑲᐟ ᑭᒋ ᒥᐢᑕᐃ ᐃᑕ·ᑲᐟ ᐊᐟᑕ ᐊᐱᒥ>·ᐃᐟ ᓀᐢᑕ ᑲ ᓂᔑ·ᐊᓇᒋᒋᑫᒪᑲᐠ ᐁ ᑯᑕ·ᐊᔑᑲ·ᐊᐠ ᐊᐢᑭᐠ ᐊᑕᒪᐢᑭᐠ ᒪᑲ ᐁᑎ ᐊᔑᒋᐸᓂᐠ ᑲ ᐃᔑ ᐱᒪᔑᑲ·ᐊᐠ ᓂᐱᐠ᙮ ᐊᐢᐸᑲᒥᓂᑲᓇ ᑲ ·ᐁᐱᓂᑲᑌᑭ ᒍᓇ ᑎᐸᐢᑲᒥᓂᑲᓂᐤ ᐊᑕ ᓂᐱᐠ ᐁ ᐊᑎ ᐊᔑᑕᔑ·ᑲᐠ ᑭᒋ ·ᐸᐢᑕ·ᐃᒪᑲᐟ ᒪᑲ ᓀᐢᑕ ᑭᒋ ᐊᔑᑕᔑ·ᑲᐠ᙮ ᐊᓂᒪ ᓂᑯᑕ·ᐊᐠ ᐱᒥᑕᐢᑭ ᓂᐱᐠ ᐊᓂᒪ ᐯᔭᐠ ᐊᔑᑯᔭᐢᑲᓂᐠ ᓀᐢᑕ ᒪᓂᑐᒋᑫᒪᑲᐟ ᐅᒪ ᐊᐱᒥᐟ ᐃᓂᓂ·ᐊᐠ ᒪᒋᑐᑕᑯ·ᐊᐠ, ᒪᐡᑯᔑᔭ ᓀᐢᑕ ᐊ·ᐁᔭᔑᔕᐠ᙮ ᐁ ᑭ·ᐁ ᐃᔑᓇᑯᑕᓂ·ᐊᐠ ᐊᐢᐸᑲᒥᓂᑲᓂᐟ ᑲᐟ ᐅᔑᐃᑎᓯᒪᑲᐟ ᐅᒥᓂᐢᑭ·ᐃ ᐃᐡᑯᑌᐤ ᐊ·ᐊᔦᑌ 7.5 ᑎᐸᐃᑲᐟ ᐊᐱᒥᐟ ᑭᒋ ᐅᔑᐃᑎᓯᒪᑲᐟ ᐅᒥᓂᐢᑭ·ᐃ ᐃᐡᑯᑌᐤ ᑭᒋ ᐱᐟᐸᓂ·ᑕᔭᐟ ᑭ ᑎᐧᐯᐨ 180 ᑎᐸᐃᑲᐟ ᐱᔦᒍᑲᓂᐠ ᐁ·ᑲᓂ 7.5 ᑭᔑᑲᐤ᙮

ᐃᐢᑭᑐᐠ ᑲ ·ᐊᐸᑕᒪᐟ ᑲ ·ᐊ·ᐁᐢᑌᐸᓂᑭ ᑲ ᐅᒋ ·ᐃᑕᒪᑯᔭᐟ ᑕᓀᐢᐱᒋ ᑭᔑᐸᓂᔭᐟ ᐊᓂᐃ ᑐ·ᐃ ᑫ·ᑲᓇ ᐃᑕ·ᑲ·ᓇ ᐅᑕ ᑭᒋ ᐅᑎᓂᑲᑌᑭ ᑲ ᒥ·ᓇᔑᑭ ᐱ·ᐊᐱᐢ·ᑲ ᑕᐱᐢᑯ⁻ ᑲ ·ᐊᕙᔭᐱᐢᑲᐠ ᓀᐢᑕ ᑯᑕᑭᔭ ᑲ·ᐊᔦ·ᑲᑭ, ᑲ ᒪᑭᑌ ᐅ·ᓵ·ᐊᑭ ᐁᑯ ᒪᑲ ᑎᐟ᙮ ᐊᐱᒥ>ᐢᑲᑫᒪ·ᑲ·ᓇ ᐅᐅ ᑫ·ᑲᓇ ᓇᐢᐱ⁻ ·ᐊᑫ·ᐃ ·ᐊᓂᑐᑕᑯᓇᓂ·ᐊᐟ ᑕᐱᐢᑯ⁻ ᐅᐅ ᑐ·ᐊ ᐱ·ᐊᐱᐢ·ᑲ ᐊᐟᑎ·ᓇᒥ, ᑯᓄᐟᓂᔭᐨ, ᑲᐟᒥᔭᐨ, ᒍᐠᑯᓇ ᐁᑯ ᒪᑲ ᓫᐟ᙮ ᐁᑲ ᒪᑲ ᐅᑎᓂᑲᑌ·ᑲ·ᐁ ᐅᐅ ᐱ·ᐊᐱᐢ·ᑲ ᒥᓯ ᑭ·ᐁ ᐃᔑᓇᑯᑕᓂ·ᐊᐟ ᑲᑎ ᔑᑲᔑᑲ·ᐃᓇ ᐊᑕᒪᐢᑭᐠ ᓀᐢᑕ ᒪᓂᑐᑕᑭᒪᑲ·ᑲ·ᓇ ᓀᓀ·ᐃᓂᐠ᙮

ᓇᓇᑲᑕ·ᐁᓂᑕ ᐊᐢᑭᕀ᙮ ᑲ·ᐃᓇ ᓄᒥᒥᐠ ᐁᔑ·ᐁᐱᐟ ᑭᑎᐢᑭᑐᐨ ᐃᑐᑕ ᑫ ᐃᔑ ᑭ·ᐁ ᐃᔑᓇ·ᑲᐃᐟ, ᓂ·ᐊ·ᐃᒥ·ᑕᓇᐟ ᐁ·ᐃ ᓇᓇᑲᑕ·ᐁᓂᑕᒪᐠ ᐊᐢᑭᕀ ᓀᐢᑕ ᒥᔦ·ᐁ ᑫ·ᑲᓇ ᐅᑕ ᑲ ᓂᑕ·ᐃᑭᑭ ᓀᐢᑕ ᐱᒪᑎᓯᒪᑲᑭ᙮

Authors: Karen Wallace-Dudley, Godfrey Nowlan Project Coordinator: Laura Clinton Editors: Victoria Stratton, Kathy Bevan Design: TWG Communications Ski-Doo images generously donated: BRP International
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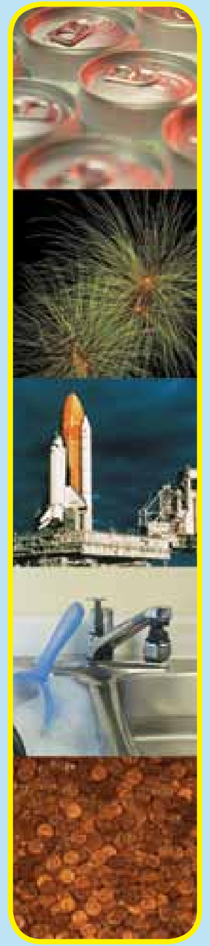
Robert Lavinsky/www.irocks.com: *Zircon* Fabre Minerals/www.fabreminerals.com: *Cassiterite* BHP Billiton Diamonds Inc.: *Rough Diamonds, Cut Diamonds*
Produced in 2007

ᑲᑭ ᑎᐸᒋᒧᒋᐠ: ᑫᓀᐟ ·ᐊᓕᐢ - ᑕᐟᑎᓕ, ᑲᐟᐳᓇ ᓄᓕᐟ
ᐊᑐᐢᑫ·ᐃᓂᐠ ᑲᑭ ᓂᑲᓂ·ᐃᑕᐟ: ·ᓇᕐᑫ ᑭᓕᐟᑕᐟ
ᑲᑭ ·ᐊᓇᔦᓇᐃᑫᒋᐠ: ᐱᐠᑐᕆᔭ ᐃᐢᑐᕐᑕᐟ ᐁᑯ ᒪᑲ ᑳᐟᑫ ᐱᐟᐯᐟ
ᑲᑭ ·ᐊᓇᔦᓇᐃᑫᐟ: ᑎ ᑕᐱᓕᐤ ᒥ ᑎᐸᒋᒧ·ᐃᓇ TWG Communications
ᐃᐢᑭᑐ ᒪᔦᓇ·ᐊᐱᐢᑭᔦᓂ·ᐃᓇ ᑲᑭ ᐸᑭᑎᓇᑭᐠ: BRP International
ᐱ·ᐊᐱᐢ·ᑲ ᓀᐢᑕ ᐊᓯᓂᔭᐠ ᑲᑭ ᒪᔦᓇ·ᐊᐱᐢ·ᑲᐊᐟ ᐅᑯ ᑲ ᓂᐱᑌᔦᓇᔦ·ᐊᐠ:
R.Weller/Cochise College: ᐃᐢᐸᓓᕆᐟ, ᑲᐳᕐ, ᑳᔭᓇᐟ, ᑯᕈᐟ, ᐃᐢᐠ, ᐟᑯᐟ, ᐟᑲᐟᓂᐟ,
ᐁᒪᐟᑕᐃᐟ, ᑲᓕᓇ, ᐃᒪᑕᐃᐟ, ᒍᓕᐡᐯᐟᑕᐃᐟ, ᐸᐟᓇᑎᐟᑕᐃᐟ
Robert Lavinsky/www.irocks.com: ᓴᐅᕐ·ᑲᐟ
ᑲ ·ᐊᔦᑯᔦᒥᐠ ᑲ ᐱᔦᔦᒥᐠ ᐊᔦᓂᔭᐠ/www.fabreminerals.com: Cassiterite BHP Billiton Diamonds Inc.:
ᑕᐃᒪᓇᐠ ᐁᑲ ᐁᐡ·ᑲ ᑲ ᐊ·ᐁᔑᐃᒥᐠᐁ ᑲᑭ ᒪᒋᓂᒋᐠ ᑕᐃᒪᓇᐠ
ᑲᑭ ᑎᐸᒋᒧᓇᓂ·ᐊᐠ 2007

What's in it for YOU?

From pop cans to video games, mining makes it happen! Look at the pictures below to see where else you'll find the metals and minerals used in a snowmobile.



Aluminum
Engine
Pop Cans

Boron
Light Bulbs
Fireworks

Ceramics
Spark Plugs
Space Shuttle

Chromium
Spark Plugs
Water Taps

Copper
Spark Plugs
Pennies

Diamonds
Engine
Jewellery

Gold
Electronics
Gold Bullion

Indium
Electronics
Solder

Iridium
Spark Plugs
Fountain Pens

Iron
Engine
Nails

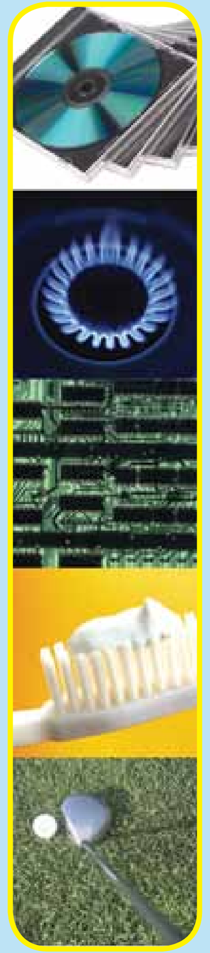
Liquid Crystal Display
Electronics
Watches

Lead
Battery
X-ray Shields

Molybdenum
Springs
Red Dye

Nickel
Engine
Coins

Oil & Natural Gas-Plastics UHMW
Skis, Windshield
Fishing Line



Oil & Natural Gas-Plastics Polycarbonate
Skis, Windshield
CDs

Oil & Natural Gas-Fuel
Fuel and Oil
Home Appliances

Silica
Light Bulbs
Computer Chips

Tin
Electronics
Toothpaste

Titanium
Springs
Golf Clubs

Tungsten
Light Bulbs
Home Lighting

Vanadium
Springs
Construction Steel

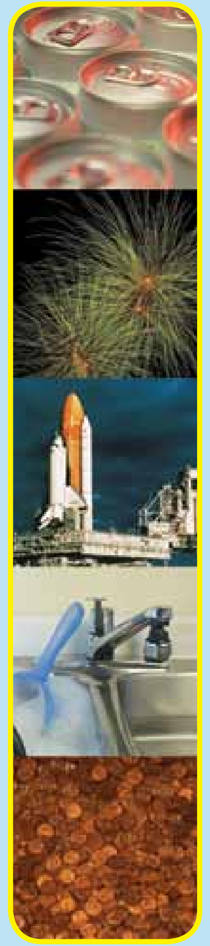
Yttrium
Springs
Computer Monitors

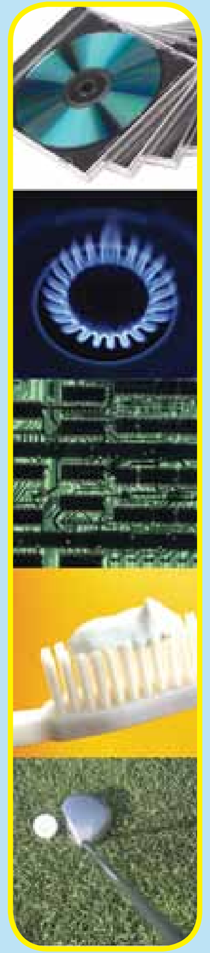
Zinc
Spark Plugs
Die-cast Toys

Zirconium
Springs
Ceramic Glazes

ᑫ·ᑲᐟ ᐃᑕ·ᑲᐟ ᐅᑕ ᑮᓇ ᐅᒋ

ᑭᓴᐢᑌ·ᐊᐳᔭ ᔑᑯᓂᑲᓇᐱᐢ·ᑲ ᓀᐢᑕ ᑲ ᒣᑕ·ᐊᑫᒋᐠ ᑎᐱᐢ, ᒍᓇᐃᓐᓂᔭᓀ·ᐃᐟ ᑲᑐᒋᑫᒪᑲᑭ᙮ ᑲᓇ·ᐊᐸᑕ ᓚᐸᔑᐟ ᐅᑕ ᒪᔦᓇ·ᐊᐱᐢᑲᐃᑲᓇ ᑕᐟᑌ ᑫ ᐃᔑ ·ᐊᐸᑕᒪᐟ ᐱ·ᐊᐱᐢᑯ ᑫ·ᑲᓇ ᓀᐢᑕ ᑯᑕᑭᔭ ᐱ·ᐊᐱᐢ·ᑲᔦᓂᔭᐠ ᑲᑭ ᐊᐸᑕᑭ ᐁ ᐅᔑᐃᐟ ᐃᐢᑭᑐ᙮





From Northern Lights to Urban Trails

·ᐊ·ᐊᑌᐠ ᐅᒋ ᐱᓂᐡ ᐃᑕ·ᐃᓂᐠ ᓄᒋᒣᐢᑲᓇ·ᐊ

For the Land...From the Land ᐊᐢᑭᕀ ᐅᒋ...ᐊᐢᑭᐠ ᐅᒋ

Look at a snowmobile. Do you see a sleek, powerful machine or a pile of rocks and minerals? It's both! Snowmobiles are made from the metals and minerals of the land.

ᑲᓇ·ᐊᐸᒥᐠ ᐃᐢᑭᑐ·ᐊᐠ᙮ ᑭ·ᐊᐸᑌᐟ ᓇ ᐃᐢᐱᒋ ᒫᐡᑲ·ᐃᒪᑲᐠ ᓀᐢᑕ ᐱᑯ ᐅᒋ ᐱᐢ·ᑲᐢᑌ·ᐊ ᐊᓯᓂᔭᐠ ᓀᐢᑕ ᐱᑯᐊᓯᓂ·ᐃ ᑫ·ᑲᓇ, ᑕᐱᐢᑯ⁻ ᐊᓂ᙮ ᐃᐢᑭᑐ·ᐊᐠ ᐅᒋ ᐅᔑᐊᑲᓂ·ᐊ·ᓇᐠ ᐱ·ᐊᐱᐢᑯᐠ ᐅᒋ ᓀᐢᑕ ᐱ·ᐊᐱᐢᑯ ᑫ·ᑲᓂᐠ ᐊᐢᑭᐠ ᑲᑭ ᐅᐟᑕᐃᑲᑌᑭ᙮

silica COPPER **GOLD** diamonds **titanium** **TIN** MOLYBDENUM
indium IRON **IRIDIUM** zirconium ZINC **lead** YTTRIUM **vanadium**
ALUMINUM **boron** chromium nickel **TUNGSTEN** oil & gas

ᓯᓕᑲ, ᑲ·ᐸᕐ, ᐟᑯᕐ, ᑕᐃᒪᐟ, ᑕᐟᑌᓂᔭᐨ, ᑎᐟ, ᒍᓕᑊᐅᑌᓇᐨ, ᐃᐟᑌᔭᐟ, ᐊᔦᕐᐟ, ᐃᓇᑎᔭᐨ, ᓯᕐᑲᐟᓂᔭᐨ, ᓯᐠ, ᓫᐟ, ᐃᑐᓇᔭᐨ, ᐸᐟᓀᑎᔭᐨ, ᐊᕈᒥᓂᐨ, ᐸᕐᓇᐨ, ᑯᕐᐟᒥᔭᐨ, ᓂᑯᕐ, ᑐᐟᑎᐟ, ᐊᔦᓕ (ᐱᒥᔦ), ᑲᐢ, ᒥᔦ·ᐁ ᐅᐅ ᐊᐢᑭᐠ ᐅᒋᑕᐃᑲᑌ·ᐊ᙮

Mining Makes It Happen

Skis, Windshield

Oil and Natural Gas - Plastics *Top Producers:* Saudi Arabia, Russia, U.S., Iran, Canada
Oil and gas are used to make many types of plastic. Polycarbonate is a strong, lightweight plastic. It is shatter and heat resistant and is perfect for a snowmobile windshield. Other uses include CDs, cell phones, helmets, automobile parts, water bottles, eyeglass lenses, greenhouse windows, and bulletproof glass.

Ultra High Molecular Weight Polyethylene (UHMW) is durable, strong, and very smooth. It makes good sliding material for snowboards and snowmobile skis. It can also be used to make Spectra fibre, one of the strongest man-made fibres, used in body armour, climbing ropes, fishing line, and even dental floss!

Spark Plugs,

Zinc (Zn) *Top Producers:* China, Australia, Peru, Canada
Zinc comes from minerals such as sphalerite, and usually occurs with copper and lead. Mixing zinc with chromium makes zinc chromate, used to coat spark plugs to reduce corrosion.

Canada is an important producer of zinc and zinc products. The world's largest zinc mine is in New Brunswick.

Zinc has a low melting point. It is easily cast into parts for appliances, automobiles, and toys.

Iridium (Ir) *Top Producers:* South Africa, Russia, Canada, U.S.
Iridium is a heavy, hard, and brittle member of the platinum family. It resists corrosion better than any other metal. Iridium hardens platinum alloys and also makes good electrical contacts for such things as spark plugs.

In Canada, iridium is produced as a by-product of nickel and copper mining in Ontario and Manitoba.

Iridium is rare on Earth but common in meteorites. Because it is so hard, it makes good nibs for ink pens.

Copper (Cu) *Top Producers:* Chile, U.S., Peru, Australia
Copper is easily shaped and is an excellent conductor of heat and electricity. An important copper ore is chalcopyrite. When exposed to air and water, copper forms a blue-green layer that protects it from further corrosion. Copper wire runs throughout a snowmobile; a spark plug's central copper electrode carries the electric charge to the tip.

Canada's largest copper producer is B.C., followed by Ontario, Quebec, and Manitoba. Aboriginal people in the Lake Superior area mined copper metal a long time ago.

If pennies were made from copper they'd be worth more than one cent! Pennies made after 1996 were zinc or steel coated in copper.

Tin (Sn) *Top Producers:* China, Indonesia, Peru
Tin comes from the mineral cassiterite. It is easily shaped and resists corrosion. Tin is used as a protective coating on other metals used to make bearings, gasoline tanks, and the solder in electrical connections.

Tin mixed with fluoride is used in some toothpaste. Because tin is non-toxic to humans, it safely delivers fluoride to your teeth.

Electronics,

Gold (Au) *Top Producers:* South Africa, , U.S., Australia
Gold is a rare element. It is the most easily shaped metal known and conducts heat and electricity. It does not tarnish, rust, or corrode. Gold is mined from quartz veins and also as a by-product of mining for other metals. It is used to make coins, jewellery, ornamentation, electrical connections, printed circuit boards, and sensors for ignition and exhaust systems.

The famous Klondike Gold Rush in the Yukon began with the discovery of placer gold deposits; that is, gold nuggets, flakes, and dust found in river sand and gravel. Ontario, Quebec, and B.C. are Canada's top gold-producing provinces.

Thin sheets of gold, called 'gold leaf,' decorate such things as picture frames and statues. A sheet of gold leaf can be 400 times thinner than a human hair.

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Liquid Crystal Display (LCD)
An LCD is a thin, lightweight display that uses liquid crystals. Liquid crystals are made of organic materials made from petroleum. In the mid-1800s, researchers noticed that some materials behaved like both a liquid and a solid when they were heated almost to melting. In the 1950s, these liquid crystals were used in industrial materials. Snowmobiles use LCDs for tachometers, speedometers, and odometers.

Where would we be today without the LCDs in our laptop computers, digital watches, cell phones, calculators, electronic games, and TVs?

Indium (In) *Top Producers:* China, Japan, Canada
Indium is a rare, soft, and easily shaped metal. It is produced mainly as a by-product of processing zinc ores. Indium's main use is to mix with tin to make a thin coating for liquid crystal display (LCD) panels.

Canada has the world's largest reserves of indium. Indium is recovered as a by-product at smelters in B.C. and Ontario.

Indium is used to make alloys that melt at a low temperature, such as solder.

Chromium (Cr) *Top Producers:* South Africa, Kazakhstan, India
Chromium comes from the mineral chromite. It is a hard metal that can be highly polished. Chrome plating gives a high-polish finish to decorative and industrial items. Chromium mixed with zinc makes zinc chromate, used to coat spark plugs to reduce corrosion.

Rubies and emeralds get their red and green colour from chromium. Some green glass is coloured by chromium.

Zinc (Zn) *Top Producers:* China, Australia, Peru, Canada
Zinc comes from minerals such as sphalerite, and usually occurs with copper and lead. Mixing zinc with chromium makes zinc chromate, used to coat spark plugs to reduce corrosion.

Canada is an important producer of zinc and zinc products. The world's largest zinc mine is in New Brunswick.

Zinc has a low melting point. It is easily cast into parts for appliances, automobiles, and toys.

Boron (B) *Top Producers:* Turkey, U.S., Argentina
Large deposits of boron minerals are rare. One source is warm salty lakes where boron-rich water collects during the rainy season. When that water evaporates, the boron settles on the bottom of the lake. Boric oxide makes glass strong so it is not damaged by high temperatures. This type of glass is used to make halogen light bulbs and glass ovenware.

Boron gives a distinctive green colour to fireworks and is also used to make Silly Putty!

Tungsten (W) *Top Producers:* China, Russia, Canada
Tungsten occurs mainly in the minerals wolframite and scheelite. It has the highest melting point of all metallic elements. Tungsten is used to make light bulb filaments and is mixed with other metals to make them hard and strong.

Canada has the largest operating tungsten mine in the western world. It is located on the border of the Yukon and the Northwest Territories.

In a typical 60-watt light bulb, the tungsten filament is about 2 m long, but only 1/4 mm thick.

Aluminum (Al) *Top Producers:* Australia, Brazil, Jamaica
Aluminum comes mainly from bauxite, a weathered rock. Aluminum is lightweight and easily shaped. It resists corrosion and is durable. Aluminum is used to make many things, from pop cans, window frames, and foil wrap, to airplane propellers and snowmobile chassis.

Canada has no bauxite deposits, but has several aluminum smelters located near inexpensive sources of electricity. It takes a lot of electricity to make aluminum.

Until the 1880s, pure aluminum was rare because it was so difficult to manufacture. Emperor Napoleon III of France reserved aluminum cutlery for his most important guests. Everyone else used gold and silver utensils!

Fuel and Oil,

Oil and Natural Gas *Top Producers:* Saudi Arabia, Russia, U.S., Iran, Canada
Oil and natural gas occur in sedimentary rocks. Oil and gas are important sources of the power that heats and lights our homes. It also fuels our vehicles.

There are seven areas where oil and gas occurs in Canada. Canada is the third largest producer of natural gas and ninth largest producer of oil. Canada has the world's second-largest oil reserves when oil sands are included in the resource.

Gas appliances cook our food, heat our water, and dry our clothes.

Nickel (Ni) *Top Producers:* Russia, Australia, Canada, New Caledonia
Nickel occurs as garnierite concentrations in deposits formed by weathering of rock and also in sulphide deposits. Nickel is used mostly to make stainless steel. Nickel plated steel is used for many industrial and decorative items. Snowmobile exhaust systems, thermostats, spark plugs, gears, and drive shafts contain nickel.

Canada is one of the largest nickel producers in the world. Nickel is mined in Ontario, Quebec, Manitoba, and Newfoundland and Labrador.

Nickel is magnetic and is used to make Canadian dimes, nickels, and quarters. Vending machines use that magnetism to ensure the coins used are real.

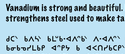
Iron (Fe) *Top Producers:* China, Australia, Brazil, India, Canada
Iron comes mostly from the minerals hematite and magnetite. It is the most abundant metal on Earth. Iron is used to make steel, which is used for snowmobile parts such as the chassis and engine, springs, brakes, clutch, starter, generator, exhaust system, and gearbox.

Iron ore is one of Canada's most important mineral products. Iron mines are found in northern Quebec and Newfoundland and Labrador. In B.C., iron is produced as a by-product of smelting base-metal ores.

The surface of the planet Mars is red and rusty! The reds, oranges, and yellows of its soils and rocks come from iron oxides—the same minerals that cover rusty nails.

Engine,

Light Bulbs,



Battery,

Lead (Pb) *Top Producers:* China, Australia, U.S., Peru
Lead occurs in the mineral galena. It is heavy, easily shaped, and resists corrosion. Lead is mostly used in the lead-acid batteries that power our cars and trucks.

Canada is a major producer of lead. In Canada, lead is produced mainly from mineral deposits that also contain zinc. Lead is also recycled from old car batteries.

Have you ever had an x-ray? A lead apron protects your body from excess radiation.

Molybdenum (Mo) *Top Producers:* U.S., China, Chile, Canada
Molybdenum occurs in the mineral molybdenite. It is also a by-product of copper mining. Molybdenum makes steel alloys very strong. It is also used to make lubricants, such as grease and oil in snowmobiles.

Canada is the fourth-largest producer of molybdenum. All operating mines are in B.C.

Molybdenum pigments, coloured red to orange, are used to colour fibres, pottery, inks, and paints.

Titanium (Ti) *Top Producers:* South Africa, Australia, Canada
Titanium occurs in the mineral ilmenite. It is lightweight, resists corrosion, and can withstand very high and very low temperatures. Titanium alloys are lightweight, strong, and flexible. They are used to make products like golf clubs, airplane engines, and spacecraft.

Canada's has one titanium mine, located in Quebec. It is the largest ilmenite deposit in the world. The mine could last for 100 years.

Most titanium goes into titanium dioxide, a white pigment used in everything white, from paper to makeup and toothpaste—even the white coating on gum.

Springs,

Zirconium (Zr) *Top Producers:* U.S., South Africa, Australia, Brazil
Zirconium, a product of the mineral zircon, is corrosion resistant and can withstand great heat. In specialty alloys, including steel, it enhances strength and reduces rusting.

In the ceramics industry, zirconium whitens and hardens tiles; ceramic glazes on kitchen tiles and bathroom porcelains contain zirconium compounds.

Vanadium (V) *Top Producers:* South Africa, Russia, China
Vanadium occurs in small amounts in crude oil and in a number of minerals, including vanadinite. It is produced as a by-product of mining operations and petroleum extraction. Vanadium is used in steel alloys. It increases resistance to corrosion and helps to keep engine and transmission parts from breaking.

Vanadium is strong and beautiful. It is named after Vanadis, the Scandinavian goddess of beauty. It strengthens steel used to make tall buildings and heavy drilling platforms.

Yttrium (Y) *Top Producer:* China
Yttrium occurs in unusual minerals that contain other rare metals called "rare earth metals." It is also a by-product of mining other metals, such as uranium and tin. Like vanadium and titanium, yttrium helps to make strong metals.

Look closely at your TV screen or computer monitor; see the red, blue, and green dots or stripes? The red ones come from red phosphors produced by yttrium compounds.