FIGURE SKATING

Figure Skating started in the 1800s, with skaters following defined patterns. In the 1860s, skate blades changed and dance and creative moves were introduced. Toe picks, added in the 1870s, allowed skaters to jump. Gradually, moves became more complex. In 1997, Canadian Elvis Stojko completed the quadruple/triple jump. The first Olympics to feature Figure Skating were held in England, in 1908.

σΛ·Δ <LCΔ·Δ³

β αΠ σΓ·Δ <LCΔωσ·α' 1800 Λ>ωb·α; Γ1ጋ4` ∇ ∆^<☞▷ᡅਾ·◀`* ٦·ŀ⁻ 1860 ∧>ᡅŀ·◀, የ ◀∩ ለጋ**ያ**⊶ሁ•<u></u> <Lር∆•**₫**^₽<u>ל</u><u>α</u>∧^•<u></u>b, b P **₫**∩ ⊳<u></u>Γ b°Pር⁄ √√σb³ Γ124[\] PΓ Δ[\]<σ▷⁷ x 1·b⁻ 1870 Λ>_αb·√, ΓLP·4 ΦP, ∇Π8 <ΓC∇·4υβ4 ·ΔL B 4U P.4C.</p> °•C^d, የ የσ•bσ<σ⊳° ٦•b⁻ ∇ •b运l∩′_{*} 1908 b \wedge , ∇ ·bs s^c ds L ∇ orbu ∇ <LCAss·d ¬∪ ⊲₽∟ ₽₽₽↓ ⊲₽₽ C> ¬> ∀>> ₽ 10.4₽.4.*

Silica (SiO₂)

Canadian Figure Skater

Patrick Char

<'r` l

Produced widely around the world

Silica comes mainly from quartz, found in white rock. veins, or beach sand. It is used to make eyeglasses, window panes, cellphones, computers, fibreglass insulation, and hockey helmets.

Amethyst is a purple quartz that is used in jewellery.

ν·Δν.σρσιλα ΓΥ·ΔυΡΕν νη Φζ Φζο

 $\Lambda \cdot \Delta \Lambda^{\circ} daba data, S> \cdot \Delta <^{\circ} b data > D D D^{\circ}, \cdot \Delta < data,$ ΛCΔ6U' U_C>², ·</bd>

 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·
 ·</t <L[^].9<Δbσ 4[^])Ω_•

י<<^b+<>>・
·<<<^b+<>>・
·<<>>
·<</p>
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
·
· ·**Δ·**Δ³ Σ₂·Δ³



Aluminum (AI) **Top Producers:**

Australia, China, Brazil, India, Guinea

Aluminum is silvery white. Found in a rock called bauxite, it is the most common metal element in the Earth's crust. It is very light, easy to work with, and does not rust. It is used to make boats, hockey sticks, pop cans, foil wrap, and airplane propellers.

A 7.25 tonne block of aluminum can make a sheet of aluminum foil over 12.5 km long.

⊲[°]P9L³

Ontario

L.A- P VY L.A. **√^₽`, የ**σ፞ ↓ **√**₽`

·Δ°δ ·Δ<° ΔσL Δ°βδL²* Δια, ΔC·β³* Δ·βαL $L \cdot d^- \Gamma S' d^{n}P'_{x} ab S^{2}$, $Ja d\sigma L^{2} \nabla L\Gamma (\sigma \cdot d')$, $\Lambda \cdot \Delta \Lambda^{\circ} d \Gamma L^{2}$, $< L^{\circ} \cdot 9 < \Delta b \in \Omega^{\circ}$, $P \hookrightarrow^{\circ} U \cdot \Delta >^{\Delta} \Omega \in$, **√°PdLoP', o^C Lb bFaLb' ∢>b'***

σαρών Αν ΓΟΓία Γα ώνο Γρογία Γα $\mathsf{CP} \ \Delta^{\wedge} \mathsf{L} \ \mathsf{P} \cdot \mathtt{a} \ \mathtt{a} < \mathsf{P} \Delta \mathsf{P} \mathsf{b} \ \mathsf{a} < \mathsf{P} \mathsf{a} \ \mathsf{a} < \mathsf{P} \mathsf{a}$ ×۹۵۲۹۵۵×



The first organized Speed Skating race took place in 1763 in England. The track was 24 km long. Lighter, sharper, and longer steel blades were introduced in 1850 in North America. Canada's first recorded race took place on the St. Lawrence River in 1854. In 1897 Norway, Germany, and Canada competed in the World Speed Skating Championship in Montréal. Canada won. In 1924, Speed Skating became part of the Winter Olympics.

ͱͺͺͺͺ

<^₽⊾ጋ⊾σ∙┥` ∇ ₽ᡗᢣር∆⊾σ∙┥` ⊲∽∠⊃℃ъ "′۹°⊳∆∙ĩ6∩°T⊽∙ ∪σ ▷°P
<P </p>
<P </ ⊽ ፈፅያዮ, ፅኈዮ, ኈ^ር ሬሬ ዮ∙ፈዮ <LCA·4^P2~A^·b 1850 b A>~b` ک•م⊐ ۲۰۹۵۲ ∩⊲ ۵۹۰م و ∟۹ •፫፫ን ፟፟፟፟፟ ነለ, ⊳,የ፲ትር⊽ኖዹ•√, ▷C baC^P` 1854 b ∧>ab`x 1897 b A>ab P b·9 < Pa) 4 ע•סשם׳ יפיש ע°ף׳ ע ⊳ור׳ **∀d Lb lLa^P`, baC^P` Lb 4°U** ۵∪ ۲۰۰۹۵، ۲۵ ۵۵ ۷>، ۹



Graphite, a soft form of carbon, is grey or black. It easily transfers heat and electricity. Graphite is used to make

pencils, fishing rods, golf clubs, bicycle frames, hockey

 $b\Delta \sigma^{\vee} \triangleleft^{\circ} P^{\wedge}, \Delta^{\circ} \Omega \rightarrow \triangleleft^{\circ} P^{\wedge}, P \cdot \nabla \Omega \rightarrow \partial_{\alpha} \triangleleft^{\circ} P^{\wedge},$

Γ₽Ω•∇Ϟ₀* ቴኒካ₽ዹ, ഛር ∨۹ ⊳Lዉսϧብብօ Lσ•ጊ₀

·<code>L°·9</code>Λ<code>rba</code>Λ·<code>b</code>, <code>D</code>4<code>σ</code>[°] <·<code>T</code><Δ<code>ba</code>Λ·<code>b</code>, <code>b</code>P<code>σ·b·</code>•Λ[°]b[′]

Titanium comes from the minerals rutile and ilmenite. It

temperatures. Titanium does not react with our bodies,

so it is used to make replacement hips and knees. It

also goes into many products like hockey sticks, skis,

Titanium dioxide is used for white pigment in everything

 $d^{n} \mathcal{D} u a d, s \cdot d a b b \cdot \Delta b d c^{n} b a c^{n} b, b a d^{n} d^{n} b d d^{n} d^{n} b d d^{n} d^{n} b d d^{n} b d$

 Δ $\Gamma_{n}P \cdot \nabla_{n}$ $d_{n}bq\Gamma \sigma + d_{n} P \cdot Q < V_{n}$

β (β)^{*} J^σ Γ^σ)C⁹Γβ³ Γ⁵·Δ^{*} Δ³·β^σ ·Δ¹ Δ⁴C^{*}

L). $Partial delta e tend, \Delta e tend, \Delta e tend, d e tend,$

<L⁰·9<Δ62.0[\], ~^vdaCΔ·Δ </L[\], </L^vCA^vC[\], ^{a^vC</sub>}

יאסאר לאסי גער אין אייער אין אייער אייע

is lightweight, durable, and withstands very hot and cold

Lb ∽d⁻ ∇b b ∧Ր>・Δσ・⊲` ・Δ°blσℑ・Δ'dU°

Australia, South Africa, Canada, China

springs, and engine exhaust systems.

white, from paint to toothpaste.

· Φ· ∇α[°] dσb³, < L[°]· 9< Δba Π· b, δ[°] C ΛΓ ΣΓσba

△ ∇ῦ $\nabla \triangleright \mathcal{S}(\sigma \cdot d)$ b L/a $\Delta b b \sigma \cdot d$ L/a $\Delta b a \cap d$,

Pencils, once made with lead, now use non-toxic

Graphite (C)

Top Producers:

graphite cores.

₽σ℃,6/

βσβ·Δσβ³∗

Titanium (Ti)

Top Producers:

•**√**<∧°`

L.4- P V2 L.

Quartz

L.4- 6 AS L.

sticks, and oils for truck engines.

$<LC\Delta \cdot 4^{P} LC\Delta \cdot 4^{O}$

Steel is made from iron, carbon, nickel, chromium, manganese, and molybdenum. It is one of the most commonly used materials. It is used in buildings, tools, trucks, snow machines, outboard motors, axes, shotguns, snare wire, conibear traps, and sports equipment. Steel is often reused and recycled.

β Γ΄ρ·Δ΄ Υ·ΔΥυ

LUU- $d\Lambda^{n}$, Δc) · $d\gamma d$ · $d\Lambda^{n}$, ∇ ·bod d
CP ∇ **▷Ĵ(ଦ·◁) ▷L ף ۲٫ף・⊲, ע·⊲עט, Δ.ף ר**ףג $\triangleleft < C' \cdot \dashv \circ b \Delta b \sigma', \Lambda L \Delta b \sigma', \dashv < \Omega \prime \cdot \Delta \triangleright l < \sigma s',$ P)', ∇ Γσ', Γ $b\Delta$ bσ', < P Γ'bσ', a·bbσ', A', $\Lambda \cdot \triangleleft \Lambda^{\circ} \dashv \cdot \triangleleft \square \Delta \flat \sigma^{\circ}$, $\nabla \dashv L \flat \exists C \cdot \Delta \dashv \triangleleft C \cdot \Delta \sigma^{\circ} \star C \Lambda$

Chromium (Cr)

Top Producers: South Africa, Kazakhstan, India and soon Canada

coloured paints.

help to keep you healthy.

L·4- 6 ∆\$ F5 ົ∽∙⊲∍` L6U•ΔϧϞ°₽`, ϧϞ°C², ΔΠϧ ⊲°₽` ͼ۹ ϧͼϹϧϧ

 $\triangleleft < \mathsf{C} \lor \nabla \triangleright \mathfrak{s} \mathsf{C} \sigma \cdot \triangleleft \lor \flat \Delta \mathfrak{s} \flat \mathsf{r} \mathfrak{s} \flat \mathfrak{s} \mathfrak{s} \circ \neg \triangleleft \lor \mathfrak{r} \sigma \lor,$ <LርΔ·**ሻ**°ዮ/ኇ ለ·**ሻ**ለግ`, <Lግ·ዓ<Δዓ·Δ ላግጋበኇ **◊·◊ـــ٠٩·Δσ`*** ◊·◊**₽** ח°C ◊<C` ◊ ◊\$Cơ·◊` <"•b>rb' J4•45' ▷r ¬°C Lb ⊲nd5', ¬°C Lb ρ σσηλγρη <u>λ</u>ωλγρσ^{*}

www.MiningMatters.ca

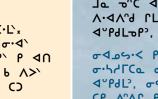
Editors: Victoria Stratton, Kathy Bevan, Andy Fyon

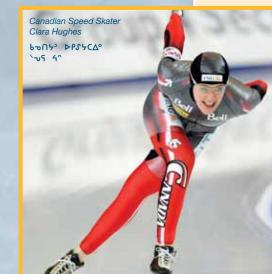


Project Coordinator: Lesley Hymers, Barbara Green Parker Designer: TWG Communications Metal/mineral photos courtesy of the following: Coal Association of Canada: Coal; Fabre Minerals/www.fabreminerals.com: Sulphur, Quartz; PDAC Mining Matters: Dolostone, Limestone, Granite; R. Weller/Cochise College: Magnetite, Garnierite, Chromite, Graphite, Bauxite, Rutile, Gypsum, Gold, Silver, Copper, Cassiterite, Smithsonite, Sphalerite, Galena.

Other photos courtesy of the following: Skate Canada: Patrick Chan; Daktronics: General Motors Place scoreboard; Getty Images: Clara Hughes, Gina Kingsbury, Bradley Bowden and Todd Nicholson, Cindy Klassen; Kathy Bevan; Richmond Oval; Frank J. Zamboni & Co., Inc.: Zamboni® Ice Resurfacing Machine (Zamboni and the configuration of the Zamboni ice resurfacing machine are registered in the U.S. Patent and Trademark Office as the trademarks of Frank J. Zamboni & Co., Inc.).

b P ▷∩σbUb L/a·4Λ°bΔba: d[↑] 4/⊀∇𝔅² baC, '4>Ⴠ Γ²ው·4[↑] www.fabreminerals.com: ኣፕ>ኻ, ·bʰ′^, ΛΠ⊽Υ, LΔσ³ L>ʰ°, ጋᠴ⁰), ϲ٤⁰), `ናჲ⁴/, 석⁺ •∇⊐⁵ dP[°] ·b┍⁻፣比Ⴊ℃⁴/, bʰσ·4/, `?L⁴/, `ና⊑⁴/, >≻ł⁴/, Ⴠᢗᠯ, P'łć, dᠯ/, ᢞᠯ>ኀ, ·b>ʰ, bґ೨ъጘ/, ժ٢Δჲ⁴/, ኣፕ>ኁናፋ/, `⊐ჲ.





ICE HOCKEY

Hockey might have originated as Aboriginal lacrosse or Mi'kmag field games. Modern hockey started being played in Montréal in the 1870s. From there, it spread to the U.S., and then Europe. The sport was added to the Olympic Games in 1920.

cbcsports.ca

Sulphur (S)

Top Producers:

ΔϤͶϲϧ

⊳רס^ף.⊲`∗

L. 4- 6 AS Les

U.S., Canada, China, Japan

heat, makes hard hockey pucks.

including fertilizers and truck batteries.

Sulphur is soft and yellow. It comes from oil and natural

Sulphur goes into sulphuric acid, used for many things,

 $\Gamma S \ J d L^2 \ d^{\rho}$, $b a C^{\rho}$, $b \Delta \sigma^{\nu} \ d^{\rho}$, $b < \sigma^{\nu} \ d^{\rho}$

Δ^νdUrσ _ [°]Pr[°] σ[°]C · ^ΔΛ > ^γ·Δr[°] ΛΓ[°] ∇d Lb

64' **β** Δ·β^σ Δ·β^σ 4<U¹, δ⁰ L¹·Δ δ·β₃ b ▷ፓርσ・⊲` b ΓΓኑ`, b ₽°bL`, ъ°C ⊲<ቦርኑ`*</p>

Δ9C2 >L >JVL, P <L. 4<>L, P ΓΡΛΥL,*

 $\Delta a < C^{\circ} C \Lambda^{\circ} d^{-} a C \cdot \Delta P \Gamma b P \cdot \Delta^{\circ}, a^{\circ} C L b P \cup \langle \sigma J \cdot \Delta \rangle$

gas. It is used to produce almost everything we eat,

wear, and use. Sulphur, combined with rubber and

$\Gamma_{P}P \subset \Gamma_{P} \subset \Gamma_{$

<L^{\\}·9< Δ 9 \cdot Δ ^{\\}, Δ σ σ · $d^{\\}$ σ ^{\\}C^{\\} < d σ L P >C \cdot L^{\\}* ⊲_- <L⁰·9<Δ9·Δ³, Jσ⁺σ⁺ σ⁰C² β ∃C·⊲σ·⊲⁺ ·⊲4° 1870 ∧>•b·⊲x °°·b Гſ JdL' ⊲°°\ P ⊲∩ ገር·⊲σ·⊲². ⊽d ∧σ° ⊲ьг የՐьг`_{*} 1920 ь ∧>` ړ<∧ ⊲م

1 ckey Player Gina Kingsbu 6-∞**Π**³ Δ⁰·9·**4**[\] ▷<L⁰·9<Δ9° -

CUTING EDGE 6 060L6

SKATES

The first skates used animal bones 5,000 years ago. Iron skates were made in 200 A.D. In the 1500s, Dutch people attached wood slats with blades to their shoes. Modern skates are made of steel and are used by hockey players, speed skaters, and figure skaters.

<C· · · · 44° σ < • • ٤ </p>
FC>FC
∧> • × ▷ · b 200 b Λ>ab'x 7·b⁻ 1500 Λ>ab·4, C⁻ Δσσ·4' $V \cdot 4 V \cdot 9 = 0$ A = 0 $V \cdot 4 = 0$ $V \cdot 4 = 0$ V▷L^P거σ·4` ∇ <LCΔ٩·4٩ſ`* 4□- P L.P.4. V·4V.</p> << c' <LC \d' \beta' \beta <</p>



Chromium comes from the mineral chromite and can be highly polished. It is used to make kitchen sinks, skate blades, and hockey mask cages. Chromium chemicals are used in the tanning of moose and deer hide, and in

Chromium, found in small amounts in apples and cheese,

Δνι, 2.C VC.P. . Δηθ. Δν., διιρ. Ρ Γ.Ρ.Δ, רביערעיסיע, צערעיסיע, LP ניער א גערעיסיע, LP ניער א גערעיסיע, צערעיסיע, גערעיסיע, גערעיסיע, גערעיסיע, גערעיסיע



China, Brazil, Australia, India, Russia Iron, the most common metal on Earth, comes from the minerals named hematite and magnetite. It is the main ingredient in steel, used in skate blades, hockey mask cages,

trucks, snow machines, nails, and building supports. Iron, as part of steel, is used 20 times more than all other metals combined.

V·⊲V_∪∕ **⊳ጊ***L*_P,

L.4- 6 AS L. $b\Delta\sigma^{\vee} \triangleleft^{\circ}P^{\wedge}$, 'ናኑ' $\triangleleft^{\circ}P^{\wedge}$, $\triangleleft^{\circ}D_{UL}$, $\Delta^{\circ}\Pi^{\downarrow} \triangleleft^{\circ}P^{\wedge}$, የግ℃ የጎ℃ና

 $\Lambda \cdot \triangleleft \Lambda^{n}$ $\triangleright \mathfrak{Srb}^{2}$, $L \cdot \triangleleft^{-} b$ $\Gamma 1 \Omega^{n} \triangleright C^{n} P^{n}$, $\Delta \mathfrak{a} \mathfrak{D}$ $\Lambda \cdot \Delta \Lambda^{\circ}$ > ΓLb°_{*} $\nabla \cdot b\sigma L \Delta < C' \nabla > C \sigma \cdot \Delta'$ b L^v·b·d[\] Λ·dΛ^{n[\]}, <LCΔ·dⁿPrσ Λ·dΛ^{n[\]}, ▷レ<σ∽, ^PϽ, ՐC^・ba, ·Φ^bΔbσ ν·CΔbσ[\]x

σδισ γοι



Nickel (Ni)

Top Producers: Russia, Canada, Indonesia, Australia

In Canada, nickel is found in yellow sulphide minerals such as pentlandite and pyrrhotite. Used mostly to make stainless steel, it is in skate blades, hockey mask cages, snow machines, trucks, batteries, airplane parts, spark plugs, and parts of the ice resurfacing machine.

β ·**4**Λ**U**·**4**[\] Λ·**4**Λ[^] LIA- P VI LIA-

 \triangleright C · Δ a bac \cap P', \triangleright L b · \triangleleft \land U · \triangleleft \land \land \land \land \land \land ⊳Гσ°የᡗら`⊳Ს<σᡗ`, ╘ ∧ና<σ` ∇ ~~>/ L^•ԵГ^_{*}



Ice, training, muscle, passion, determination...skaters need

them all to get to the top of their sport. But there's more.

MINING MAKES IT HAPPEN

A·dArd' 6 d<CP, drP' P ⊳NorbU°x JeA9·A3 L6 6 Jr9L6'x

The equipment, the arenas...all made with metals from the Earth.

L°·bΓ, P°Pם⊲L، Δ², ΓU°CC[△], Pr ΔUσCJ·Δ², ۲۹σCJ·Δ², ∇·bσΔ °C·∇σCP



▶ኈበታ³ ҩѴ∙┥` <Lር∆∙∆ Ϸር<ҩ∩`

SLEDGE HOCKEY

Sledge Hockey started in the 1960s in Stockholm, Sweden. Players sit in a metal frame on two Ice Hockey skate blades. Canada started a team in 1982. In 1994, the Paralympic Winter Games in Norway introduced Sledge Hockey. Team Canada won their first Olympic gold medal in 2006. Canada, Norway, the U.S., Germany, Sweden, and Japan have the best Sledge Hockey teams.

<LC Δ · Δ \triangleright C<e 1 <L 1 ·9< Δ 9· Δ 2

1960 A>ab·d Þ°b⁻ b <LC∆·∆ ÞC<a^` <L⁰·9<Δbσ·4[\] ¬U⁰ ⁰·C[\]P^c ΔC·Δσ[\] ⁰·ΔΠ³ 4⁰P[\]* $\diamond C < \sigma_{,q} < F C \nabla \cdot d \vee_{,\cdot} P \Delta h A P C e \cdot d h \nabla h$ ρ ⊲Π Δር·⊲` ⊲·∇σδ፩` ⊲σL ۹ Δℑ <L°Δ9<Δ9Γ`</p> ▷C baC^P`x 1994 b A>ab`, ▽·bσ σ°C' ▽ <L[^]·9<Δ9[^] b L[^]P⁺Γ[^] ¬U ³P⁵·∇ ⊲[^]P^{*} 2006 b $\Lambda >$ ', $\nabla \cdot b\sigma \sigma^{\circ}C^{\circ} b < ^{\circ}Pag' bac CD <math>\neg P \Lambda >$ ' Le b $\exists C \cdot \nabla \Gamma$ b $L^{\circ} P' \Gamma_{*}$ be $C^{\circ} P^{\diamond}$, $^{\circ} P^{\circ} \cdot \nabla = d^{\circ} P^{\diamond}$, L℃J9F3 4∪6√ °F7° °L0°6√ °4∪6/ Δ9 FP l<ም ⊲^₽^, ∇•bምP L•⊲⁻ b b°PÞՐ` ⊲ምL ∇ Δ\$ <LCΔſ`_{*}





Bronze is made of copper mixed with tin. Over 5,000 years ago, people learned to harden copper with tin to make bronze tools, weapons, armour, and building materials. Today, bronze is used to make bells, musical instruments, medals, bearings, electrical connectors, springs, and roofing materials.

Copper (Cu)

Top Producers: Chile, U.S., Peru, China, Australia

A lot of copper comes from the mineral chalcopyrite. Natural copper found around Lake Superior was used by Aboriginal people. Copper has a pinkish colour, but air and water turn the surface a greenishblue. Copper moves heat and electricity, so it is used to make pots and the copper wire found throughout houses, cars, hospitals, and power plants. Copper is also used to make jewellery, computer parts, plumbing pipes, and roofs.

Small amounts of copper in our food keep us healthy. In our bodies, copper works with iron to make blood strong

Γ¹*Γ*¹**Γ**¹*Γ*¹ Δ¹ Δ¹ Δ¹

L· d^- b Δβ Γ··· Γ-- $d^{0}P'$, Γβ JdL² $d^{0}P'$, Vi $d^{0}P'$, lΔσ² $d^{0}P'$, d^{0} υιτ

 $\Delta C \cdot b^3 = \sigma^2 C = A \Lambda^3 \Gamma d > h \cdot A \Lambda^3 P \Gamma \Gamma \Gamma a^2 b \Gamma a^2 b d > h,$ $\cdot \Delta \Gamma \cdot C L b^3 \Gamma d^3 P \Gamma L^2 b \cdot A^3 \Gamma d_x$

Tin (Sn)

Top Producers:

China, Indonesia, Peru, Bolivia

Tin comes from the black mineral cassiterite, but it is silvery-white. Around 3500 B.C., people discovered that mixing it with copper made a harder metal, bronze. Tin is used to coat steel containers and in solders to join pipes and wires.

Tin is used to make glass for windows and automobiles. Melted glass poured onto melted tin spreads out to form a level surface.

U°V₀√

L.4- 6 AS L.

ί∆σ[°] ⊲^ዮ`, Δ³ጋσĴኑ ⊲^ዮ`, ∨? ⊲^ዮ`, ≻ϲ∧ኑ ⊲^ዮ`

KEEPING SCORE

Ice Hockey is part of Canadian culture. It is played and watched in small communities and large cities. Vancouver, B.C., hosted the 2010 Olympic Ice Hockey games in an arena that has a large video scoreboard weighing more than 22,000 kg. The scoreboard uses metals to create the red, blue, and green colours of the video picture.

۲۲۰۵۰γγ

L. $P_{1} < P_{1} < P_{2} < P$

WINNING MEDALS

Athletes compete to win medals. Olympic medals are special and say something about the country where the Games are held. The Vancouver 2010 medals featured Aboriginal art on discs shaped to represent rolling waves, drifting snow, and Canadian mountains. The gold and silver medals must be made from almost pure silver metal. The gold medal is covered by a thin coating of pure gold.

<^**₽**_bσ·<\ <•_L`

$$\begin{split} & \mathsf{T}(\cdot\nabla\Gamma)\cdot\cdot\Delta\quad \mathsf{b}\cdot\mathsf{9}\ <^{\mathsf{o}}\mathsf{P}_{\mathtt{Q}}\mathsf{9}\cdot\mathsf{q}^{\mathsf{o}}\ <^{\mathsf{o}}\mathsf{c}_{\mathtt{L}\mathtt{s}}\ <^{\mathsf{c}}\mathsf{c}^{-}\ \mathsf{b}\ \cdot\Delta\ \mathsf{b}\cdot\mathsf{9} \\ & <^{\mathsf{o}}\mathsf{P}_{\mathtt{Q}}\mathsf{b}\sigma\mathsf{e}\mathsf{r}\cdot\mathsf{q}^{\mathsf{o}}\ \mathsf{C})\ \ \mathsf{o}\ \mathsf{b}\ \mathsf{A}\!\!>^{\mathsf{o}}\ \mathsf{b}\ \ \mathsf{T}(\cdot\mathsf{q}\sigma\mathsf{e}\mathsf{d}^{\mathsf{o}}, \mathsf{q}^{\mathsf{o}}^{\mathsf{o}}, \mathsf{e}^{\mathsf{o}}\mathsf{A}^{\mathsf{o}}) \\ & \mathsf{o}^{\mathsf{o}}\mathsf{C}\ \ \mathsf{n}<\mathsf{n}^{\mathsf{o}}\mathsf{1}\mathsf{d}\mathsf{b}\mathsf{b}\mathsf{b}\mathsf{e}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{o}^{\mathsf{o}}\mathsf{C}\ \ \mathsf{n}<\mathsf{n}^{\mathsf{o}}\mathsf{d}\mathsf{d}\mathsf{b}\mathsf{b}\mathsf{d}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}\mathsf{d}\mathsf{d}\mathsf{d}\mathsf{d}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}\mathsf{d}\mathsf{d}\mathsf{d}\mathsf{d}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}\mathsf{d}\mathsf{d}\mathsf{d}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}\mathsf{d}\mathsf{d}\mathsf{d}\mathsf{d}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}\mathsf{d}\mathsf{d}\mathsf{d}^{\mathsf{o}}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}\mathsf{d}\mathsf{d}\mathsf{d}^{\mathsf{o}}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}\mathsf{d}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}\mathsf{d}\mathsf{d}^{\mathsf{o}}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}\mathsf{d}\mathsf{d}^{\mathsf{o}}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}\mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}^{\mathsf{o}}\mathsf{d}^{\mathsf{o}}\ \mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}}\mathsf{d}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}} \ & \mathsf{n}^{\mathsf{o}} \\ & \mathsf{n}^{\mathsf{o}} \ & \mathsf{n}^{\mathsf{o}} \ \\ & \mathsf{n}^{\mathsf{o}} \ & \mathsf{n}^{\mathsf{o}$$



Gold (Au) Top Producers:

China, South Africa, U.S., Australia

Gold is very rare. It is soft, conducts heat and electricity, and is not damaged by the weather. Gold occurs as a pure metal and also within other minerals. It is used mostly to make coins, jewellery, and ornaments. It is also used in medical equipment and the electronic components in computers, cellphones, and ice resurfacing machines.

Gold coatings on windows help keep buildings warm in the winter and cool in the summer.

᠔᠋᠂᠕᠃᠘᠃᠈

L.4- 6 AS Les

Silver (Aq)

Top Producers:

Peru, Mexico, China, Chile

 $LbU\cdot\Delta r^{\circ} \triangleleft^{\circ}P^{\circ}, \ s\cdot \triangleleft a^{\circ} LbU\cdot\Delta r^{\circ}P^{\circ}, \ Ts \ JdL^{\circ} \triangleleft^{\circ}P^{\circ}, \ \triangleleft^{\circ}D^{\circ}r^{\circ}$

$$\label{eq:states} \begin{split} & \mathsf{L}_{\mathsf{A}} = \mathsf{L}_{$$

איַראַראָבערי' דיאַרעאַדאַבערי' אייערעאַדאַבערי' אייערעאַזי אייערנדאַ אייערעא א



Silver occurs as a pure metal and also within other minerals. It is soft, conducts heat and electricity, and can be highly polished. Silver is used to make coins, medals, jewellery, silver spoons, batteries, catalytic converters in vehicles, electronic components, mirrors, and solar cells, which make electricity from the sun.

Silver kills germs. It is used in antiseptic bandages, bacteriareducing cellphone covers, odour-reducing clothing, and water purifiers.

᠂᠕ᠴ᠋ᢣ᠊ᠣᠫ᠘ᠰ᠈



In the Arena ... MINING MAKES IT HAPPEN $< LCA \cdot \Delta b \Gamma d^{2} \dots d A Q \cdot A^{3}$ Lb b $2\Gamma Q Lb^{2}$

Coal





Coal is made of carbon (C) that formed from plants that grew in great swamps long ago. Over many years, dead plants formed layers that got squeezed together, heated, and changed into coal. Coal is burned to make heat and electricity. In parts of Canada, Aboriginal people collected coal for their fires. Some coal is very soft and some is very hard. A hard coal, called coking coal, is added to iron to make carbon steel. That steel is used to make buildings, bridges, ships, and cars.

Coal is used to make many items such as soap, aspirins, solvents, dyes, and plastics and fibres like rayon and nylon.

•**Ღ**"ႲՐႭ_ຑ຺ຨ

L· \mathbf{d}^- b Δ \mathfrak{s} Γ· $\mathbf{d}^$ b $\Delta \sigma^*$ \mathfrak{d}^{n} P`, Γ \mathfrak{s} JdL² \mathfrak{d}^{n} P`, \mathfrak{d}^n Durb, Δ^2 D b \mathfrak{d}^n P`, ··(4 \mathfrak{s}^+ P· ∇ (1 \mathfrak{s}^+ , \mathfrak{s}^+) \mathfrak{d}^n P`

9.6 b P σ C· Δ PP L'93' · ∇ 'b⁻, ∇ dC σ · ∇ P \triangleright J>Lb' · Δ 'bl σ J'dU', T1' \wedge >a P'.6, 9.6 b σ C· Δ PP b P σ \wedge LbP, 4N 4 \Rightarrow PC· Δ JP LL· Δ P·a, ∇ PJU9 Lb · Δ 'bl σ J'dU' 4N Δ JP·a, Δ ·bPb' Lb \triangleright L · Δ 'bl σ J'dU' ∇ · Δ \Rightarrow JC σ ·4' P'/b' \Rightarrow C Lb \triangleright F σ P· Δ 'dU', \triangleright U baC'P', $\Delta \sigma \sigma$ ·4' L·4Ua·Ld<' · Δ 'bl σ J'dU' ∇ dC·49P', 41' · Δ 'bl σ J'dU' a h·4, 4N' Lb PP L'b·4·4, ∇ L'b·4' · Δ 'bl σ J'dU' Pab· Δ abU' ·A(J)· Δ ·4A'd' ∇ \Rightarrow JC σ ·4' ∇ L'b·4' \wedge ·4A' \wedge \Rightarrow \triangleright L \wedge -4A' \wedge 4<C' ·4'b\Deltab\sigma', 4 \Rightarrow bo', FJ PL σ ', \Rightarrow C Lb \triangleright L< σ J',

ΓΊጋጓ` Δያ ዻ<ር² ·Δ"ьႱჾያ"ሪሀ° ∇ Ϸያርσ·ዻ` ٩·ь² ርለ"ሪ-ረ', Ϸ°Ո·ьσ² ንጋሬͽ², ͼ°<·<Րь², Ϥበፖь², ∧ϲ°Ո` ⊽ሪ Lb ϧ <·ьъዮσቴϧσ·Ϥ`∗



Crushed stone, sand, and gravel are very common geological materials. Dolomite, limestone, and granite are often mined for aggregate. Aggregate is used to make roads, airport runways, house foundations, sewers, and mixed with cement, fertilizer, and construction materials.

It takes about 50,000 tonnes, or seven dump truckloads, of aggregate to build one km of Trans-Canada Highway.

۵۲۵-۵,

۵3∇⊳ β∧ ∆۰۲

Gallium (Ga)



Top Producers: China, Germany, Kazakhstan, Ukraine

Gallium is not common in the Earth. It occurs mixed within other minerals such as the zinc mineral sphalerite. Most mined gallium is mixed with arsenic to form gallium arsenide, which is used to make light-emitting diodes (LEDs), laser diodes, and solar cells.

Solid gallium melts in the human hand. It becomes liquid near room temperature and can be used to make high temperature thermometers.

·44.PVu/

L·⊲⁻ b Δኇ ୮ሩ› ቦ∆ኇ৺ ⊲^ዮ`, ႱL² ⊲^ዮ`, ኔኣኔ^ር² ፋዮჀ⊾ዻ²

✓ LኣC・⊲、 ▷L ・⊲ኣ・▷ヘ、 Ubn<², △ Callar, △ Units and balance.</p>
✓ LኣC・⊲、 ▷T ·⊲ኣ・▷∀, Ubn, ², Callar, ⊲U
> vous and balance.
> vous and ba



Gypsum (CaSO42H2O)

Top Producers:

China, U.S., Iran, Spain, Canada Gypsum formed long ago when ancient ocean waters evaporated,

leaving it behind on dry ocean beds. It is soft and has many colours: white, grey, red, brown, and yellow. Gypsum is used to make construction drywall, caulking, paint, and Portland cement, an ingredient in concrete.

Teachers use coloured chalk to write on blackboards. That coloured chalk is a type of gypsum.

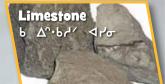
۹۰۵۹۵

L·d- b AS FSPN' LAs' d'p', FS JdL' d'p', AG' d'p', "Va' d'p', bec'p'

δ β'ρωαμαίας στο αφαίας στο

Limestone (CaCO₃)

Top Producers:



China, U.S., Russia, Japan, Germany

Limestone is a rock mostly made of the mineral calcite. Calcite formed from the remains of corals and sea shells that accumulated long ago on the beds of warm oceans. Limestone is a key building material, cut into building blocks or crushed to go into cement. Limestone is also used to make glass, including windows, bottles, windshields, and fibreglass insulation.

The Great Pyramid of Giza, one of the Seven Wonders of the Ancient World, is made entirely from limestone.

ρ ∇υ·ρς, Δια

 $L \cdot d^- b \Delta S \Gamma S P \Omega'$ $L \Delta \sigma^{\vee} d^{\circ} P^{\circ}$, $\Gamma S J d L^2 d^{\circ} P^{\circ}$, $\upsilon S J^2 d^{\circ} P^{\circ}$, $L < \sigma^{\vee} d^{\circ} P^{\circ}$, $L L^2 d^{\circ} P^{\circ}$



Top Producers: China, Australia, Peru, U.S., Canada

Zinc (Zn)

In Canada, zinc comes from a zinc mineral named sphalerite. Zinc minerals usually occur with copper or lead minerals. A lot of zinc is used for galvanizing, a process that puts a thin layer of zinc on iron and steel to prevent rusting. These zinccovered metals are used in vehicles, bridges, and building construction. Zinc minerals go into glowing dials, X-ray and TV screens, paints, and fluorescent lights.

Humans, animals, plants, and even tiny organisms need zinc to function. Zinc helps us taste and smell and keeps our hair and nails healthy.

·4A >5·475

L·⊲⁻ b Δ\$ Γ\$P∩′ bΔσ[°] ⊲[°]P[°], ⊲[°]J_{"u}t, V? ⊲[°]P[°], Γ\$ JdL³ ⊲[°]P[°], b_αC[°]P[°]

PC bac(°P^{\)}, 4·4 ·4Λ Ph·4/σ Δ'dU·Δ 4°/σ[\] ΔJ Pσb·ΔJ³, 4·4 J·Δ 4/σ Ph[\] Pσb·ΔJ³ Fd/·Δ P/·4Λ'd[\] $\sigma^{\rm C}$ Λd <°P/bar/σbσ[\], Γ°CΔ 4·4 ·4Λ Ph·4/σ $4\Gamma\Pi r^{\circ}$ ∇ PJC σ ·4[\] Λ·4Λ'd9·b³, J~Δbbσ·4³ ·4P⁻ $\Delta_{\rm aD}$ ·4ΛU·Δ4/σ[\] $\sigma^{\rm c}$ Lb P LΔ·^{\st}b·4[\] Λ·4Λ^{\\} ∇ b PΓ 4·bdΠP_x PP b P J·~VΔbUP Λ·4Λ'·b ·4C·a PL<σJ^{\\}, 4~bσ[\], $\sigma^{\rm c}$ ·4°bΔCσ 4<ΓC·Δσ^{\\}, ∇ dPP 4<CP ∇ PJC σ ·4^{\\} b ·4°UP Δ·CΔba, Λ·<</p>

 $\Delta \sigma \sigma \cdot 4^{,}$ $4 \cdot \Delta 5 \cdot 5^{,}$ b $\sigma C \cdot \Delta PP$ 9 · b $a = 0^{\circ}C$ Lb Lb · 4 Γ b $4 \lor 5 \cdot P$ 9 · b $a = b \land L \cap A \sqcup b P$ ° C · $\nabla \sigma C \cdot b a \Rightarrow P$ Γ P 4 < ∩ A L b P *



BUILDING DREAMS

Hockey is a popular activity in many Aboriginal communities. Playing hockey on outdoor ice rinks is common, but indoor rinks let people skate anytime, rain or shine. The first artificial ice rink was built in 1876 in London, England and named the Glaciarium. In 2010, modern building technology and design went into the Winter Olympics Speed Skating arena in Richmond, B.C. The Richmond Oval has space for two hockey rinks or eight tennis courts when the Speed Skating track is not in use. It could seat 8,000 people at the 2010 Winter Olympics. To prepare the construction site, builders used 170,000 cubic metres of sand. The building's roof is made from trees killed by the mountain pine beetle. The building incorporates 5,600,000 kg of steel rebar and is supported by 2,200 stone columns.

Lead (Pb)

Top Producers: China, Australia, U.S., Peru



Lead, found in the mineral galena, is heavy and resists corrosion. Today, lead is used mostly in lead-acid batteries like those found in cars and trucks.

Lead can be recycled almost forever without changing its physical qualities. Most old lead-acid batteries are recycled—more than any other consumer product.

L·⊲- ₽ ₽₹ L?bU

ί∆σ^ν ⊲^ף`, ⊲^ጋ∿⊾ᢣ, Γĵ JdĽ ⊲^ף`, VP ⊲^ף`

Ϥ·Ϥ <[^]0₽²bσ
 Ϥ·Ϥ Ϥ·Ϥ Ϥ·Ϥ
 </

 $\label{eq:linearconductor} \begin{array}{ccccc} \Gamma_{\bullet} & \Lambda D^{\vee} & \Delta \Omega_{\bullet} < \Lambda D^{\vee} & \Lambda D^{\vee} &$

CLEANING UP

An important part of making good ice is the ice resurfacing machine. People love watching the machine give scratched ice a shining new surface. Frank Zamboni invented the first self-propelled ice resurfacing machine in 1949, in California.



In 1967, his company started a second manufacturing plant in Brantford, Ontario. Since the creation of the first machine, more than 9,000 have been made. How does the Zamboni® ice resurfacing machine work? First, it uses a sharp steel blade to shave a thin layer from the ice. Augers collect the shavings and put them into a snow tank. It then cleans the ice surface with wash water before using a cloth towel to spread clean water over it. Along with steel parts and lead-acid batteries, the Zamboni® ice resurfacing machine is made with many metals and minerals from the Earth.

∇ βνσβα·

L·d⁻ b aC· $\nabla \sigma$ C·b' Pr F·aJ' b AJ <LCAb σ·d', ∇ ·bσL L·bF L/·bF $\leftrightarrow \Delta b^{3}_{x}$ a'A⁻ F· $\sigma \sigma$ C·L' d· $\nabla \sigma$ ba' ∇ ba·d<9r' $\nabla \leftrightarrow e^{2}$ / L'·bF b AJ <LCAa σ·d'x '5^Δ h>σ AJ σb/ b ∇b bJC' $\forall \neg \sigma^{\circ}$ b $\leftrightarrow \Delta b b \sigma$ d'obb · JU ba> σb b JC' $\forall \neg \sigma^{\circ}$ b $\leftrightarrow \Delta b b \sigma$ d'obb · JU ba> σb b AC' $\wedge \gamma \rho C^{\rho}$ fJ JdL' d'P'x 1967 b A>ab', dCP σ° b '< σ · · · · A σ° P bJC° '5' b '' AC·A σ', b'Uab, bC baC'P'x d'A' dσL σ/C' b '' 2>bJC σ·d' bL d<rC·A', d·d/U s·b P2 FCC P bJC σ·d·ax C σa
A'Lb' Lb bL h>σ d<rC·A' dd9° d'C ∇ bs' A·dA'' b $\leftrightarrow e^{2} \cdot d \nabla q$ Lb' L'·bF'x AC·b' Lb d'C 9·b' L)·AAC' dax P'·b Lb Pr'C<·dab σ·d' a L'·bF ·<LJ J~Vbb'x d σA 9·ba b A·dA'b·dP σ° C da $\wedge \Gamma \sigma^{\circ}$ P b <
d'C' f' ∇ d σA d'P' P $\wedge C$ hbU·dx

