

# **Cover Images**

The phases of the mining cycle, from exploration to reclamation, are represented by the pictures on the front and back cover of this activity book.



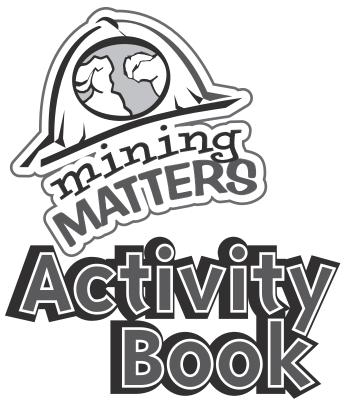
**Mining Matters** is a charitable organization dedicated to educating young people to develop knowledge and awareness of Earth sciences, the minerals industry, and their roles in society. The organization provides current information about rocks, minerals, metals, mining and the diverse career opportunities available in the minerals industry.

### MiningMatters.ca

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Grab your hard hat and get ready to dig into a mine load of fun!

Packed with puzzles, the Mining Matters Activity Book includes codes to crack, things to spot, word searches, crosswords and more.



Discover the three rock groups and the properties of minerals. Be surprised when you learn that rocks, metals and minerals are in the everyday things around

you, from your food, medicine and toothpaste to your cellphone, computer and home.

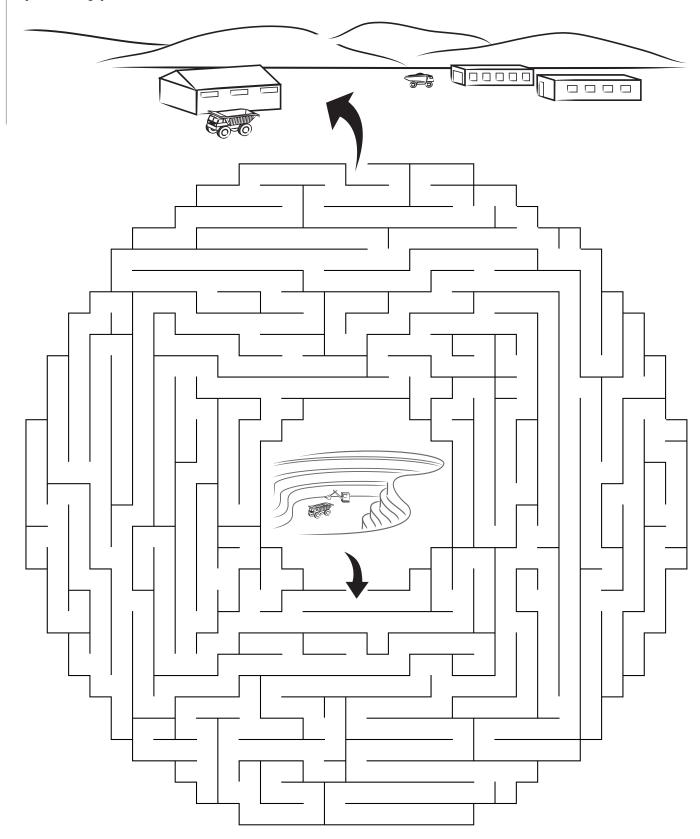
Find out how geologists explore for treasures of the Earth and how engineers go about building a mine. Explore exciting careers in the mining industry.

Be proud that Canada is a world leader in the mining industry. Discover why Mining Matters, and have fun doing it!



# Navigate to the Surface

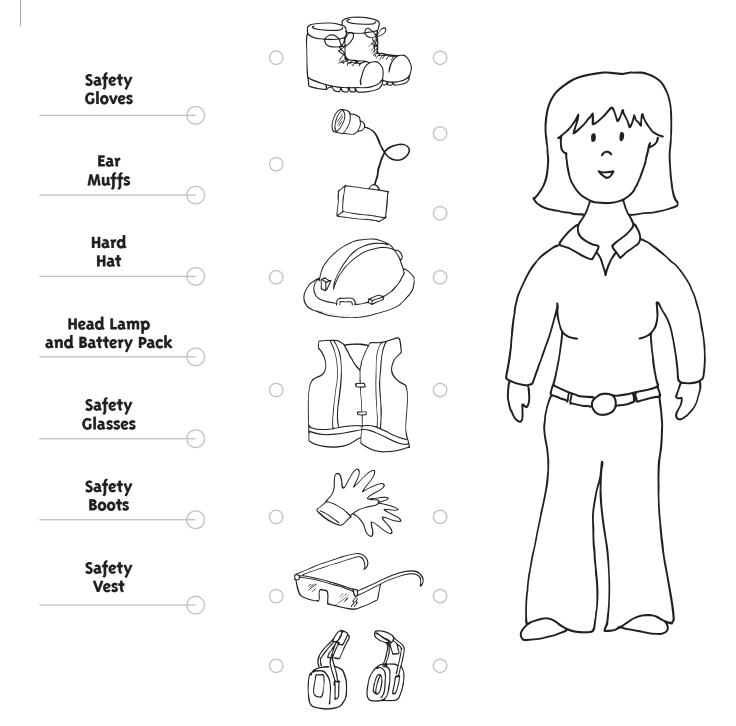
Help the mining truck driver haul the ore out of the surface mine and deliver it to the processing plant. Ore is a rock that contains a valuable metal or mineral.



# Safety Dress Up

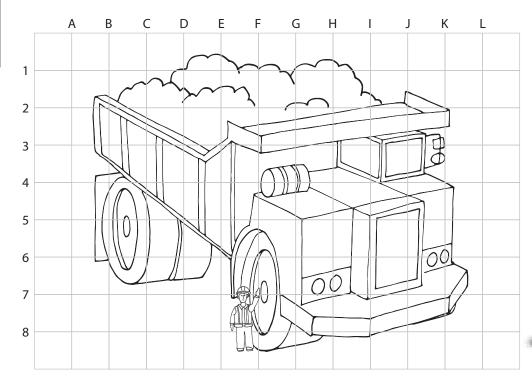
Canada is a world leader in the mining industry. Safety is the industry's number one most important practice. Help Jane get dressed for a day at the underground mine site in her Personal Protective Equipment (PPE).

Match the correct words with the safety equipment, and then match the equipment to Jane.



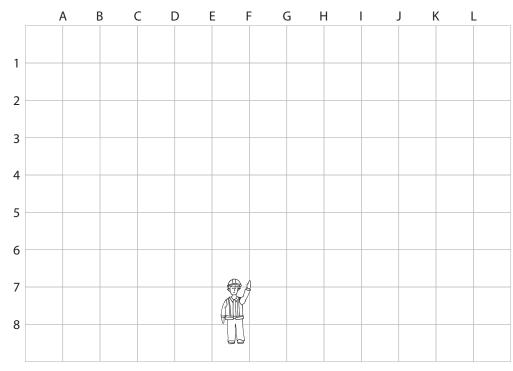
# **Draw the Mining Truck**

Mining trucks can hold up to 450 tonnes of ore. That is approximately the weight of 250 cars! The tires can be up to 3.5 metres tall. It takes a lot of power to move these trucks. The wheels are so big that there is a motor for each one.



Draw and colour the mining truck using the grid below.



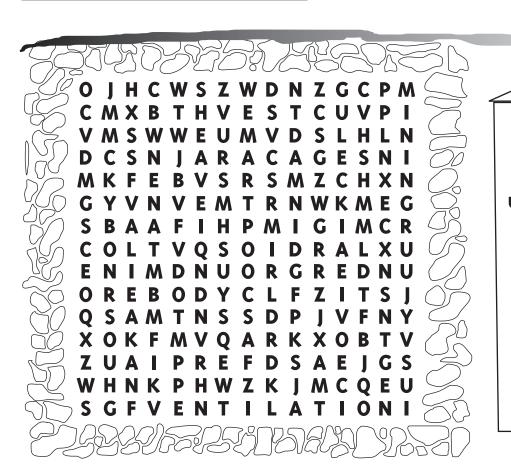


# Dig Deep

MINING is a temporary use of the land during which valuable rock containing metal or minerals, called an OREBODY, is removed from the Earth. An UNDERGROUND MINE is created when deep tunnels are dug to reach an orebody. The main vertical tunnel is called a SHAFT. At its top is a wood, steel or concrete HEADFRAME containing a SHEAVE (pulley system) that is attached to an elevator or CAGE to transport the miners and equipment from the surface to the underground workings. The sheave also supports a bucket or SKIP to lift the broken rock and ore to the surface.

Other vertical tunnels called VENTILATION SHAFTS bring fresh air to the mine. From the shaft, horizontal tunnels called DRIFTS provide access to the orebody. EXPLOSIVES break up the rock so it can be picked up by a low, narrow truck with a bucket up front, called a SCOOPTRAM. It is driven to the shaft and the ore is dumped into the skip, which brings it to the surface.

Can you find the words associated with underground mining? Words can be found in any direction.



### **WORD BANK**

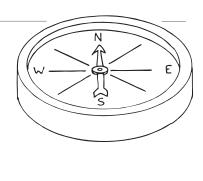
MINING
OREBODY
UNDERGROUND MINE
SHAFT
HEADFRAME
SHEAVE
CAGE
SKIP
VENTILATION
DRIFTS

EXPLOSIVES SCOOPTRAM

Compass Code Puzzle

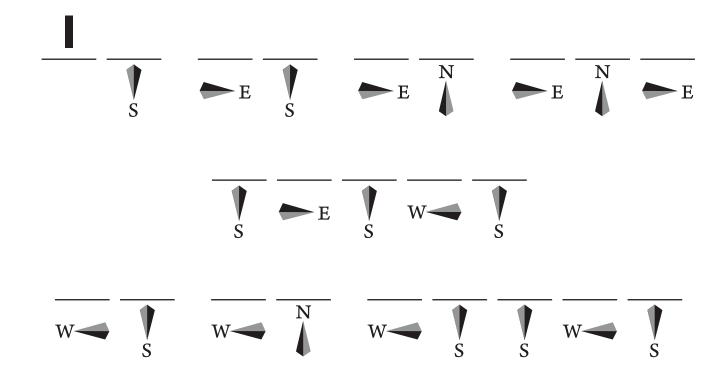
Compasses have been used for hundreds of years to find directions. Nowadays, complex equipment like a GPS (Global Positioning System) is used along with compasses to accurately pinpoint locations.





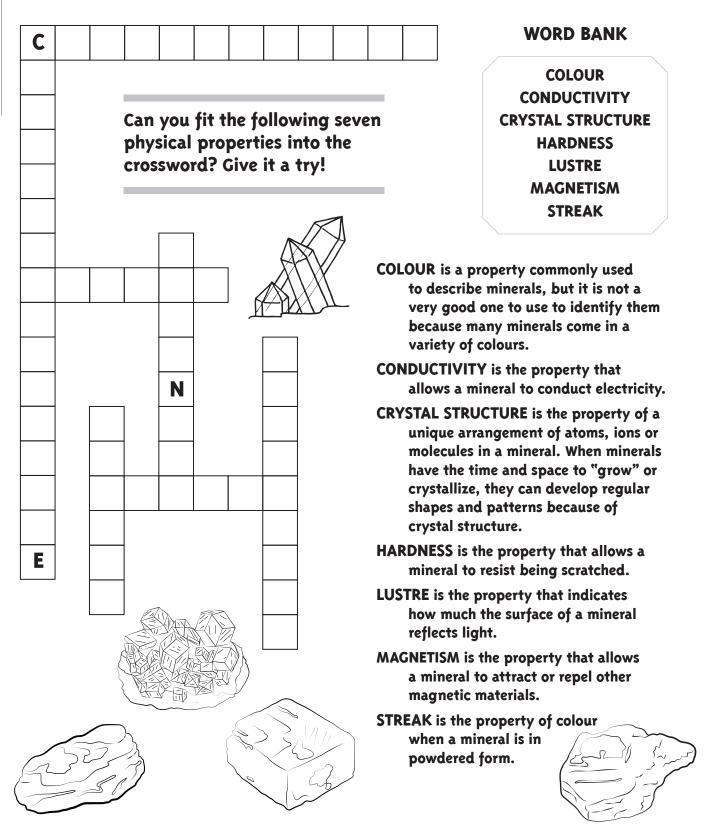
	A	В	0	T	C
F	1	S	N	G	R
Н	Т		J	W	0
K	M	S		N	L
P	ı	I	T	Q	U
E	N	٧	X	В	L
D	W	Y	Z	N	G

Use the compass directions to find a message in the puzzle. Start at the letter "I" in the top left corner of the puzzle and follow directions shown under each letter space at the bottom of the page.



# Mineral Properties

Geologists use a number of tests to determine the physical properties of minerals. Those properties help to identify the mineral.



# Wordoku

Fill in the grid so that every row, every column and every 3  $\times$  3 box contains each of the nine letters seen below ONLY ONCE.

LETTERS: G, E, R, A, L, S, T, O, I

	R	ı	0	Т	E			A
S	Е		G			R		_
	L	0	R	ı			Т	E
0	ı			E		Т		
E			Т	0	_	A	R	
R		L		A		E	I	
			A	S	L		E	G
	A	E		G	Т			R
ı	S	G					A	Т

What is the hidden nine-letter word in the diagonal from top left to bottom right?

Hint: This scientist studies materials, processes and the history of Earth. He or she helps locate and develop natural resources, and studies hazardous natural phenomena such as earthquakes, tsunamis, landslides and volcanoes.



# Patty the Prospector

Patty is an observant lady. She recently took a prospector course and obtained a prospector license. Learn about Patty's job as a prospector by filling in the blanks with the correct words from the word bank.

# tly ed in om

### **WORD BANK**

ADVENTURE
DETECTIVE
EARTH
GOLD
GPS
ROCK HAMMER
SAFETY GLOVES
WOODS

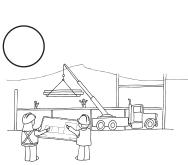
	s different regions of the, trying to discover valuable mineral
•	
	, or even diamonds. She uses
her to help find he	er way through the
She uses her	to break rock to
collect samples. Patty always	wears her safety boots, safety glasses
and	to protect her from nature's
elements. A day in the life of P	atty the Prospector is always an
	1

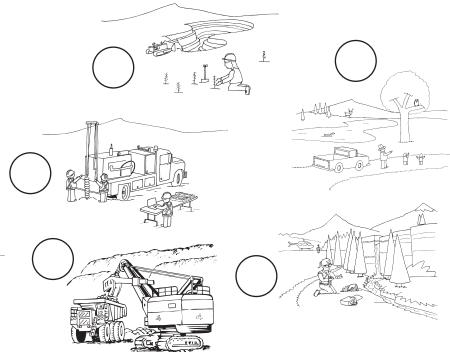
# Connect the Dots Connect the dots to reveal this piece of mining equipment.

# The Mining Process

The mining process is complicated and involves looking for minerals, evaluating a mineral discovery, building a mine, mining and processing minerals, closing the mine and reclaiming the land. From start to finish a mining company has to think about how its activities will affect the environment and nearby communities. The mining process can take a very long time and cost millions of dollars.

Can you put the pictures in order to tell the story of the mining process?





- A LOOKING FOR MINERALS
  Geologists do field work to identify
  different rocks, study satellite images of
  Earth and use airplanes or helicopters to
  measure things, such as magnetism in
  the underlying rocks.
- B EVALUATING A MINERAL DISCOVERY
  The company drills holes in the ground to take out long, thin cylinders of rock called cores, which can be studied to find out how much valuable mineral they contain. The company determines how much it will cost to construct and operate the mine, to sell the minerals, to take care of the environment, and whether or not the company will make any money.
- BUILDING A MINE
  Huge diggers scrape away the surface
  material and explosives are used to
  blast the solid rock to reach the valuable

minerals located close to the surface, or tunnels are dug into the Earth to reach valuable minerals buried deep below the surface. Roads, mineral processing plants, employee housing and offices are also constructed.

- MINING AND PROCESSING MINERALS

  Miners use drills and explosives to break up
  the rock. Large scoops and machines move the
  rock to the processing plant where it is crushed
  into a fine powder and valuable minerals are
  separated from the waste rock.
- E CLOSING THE MINE

  Buildings are removed, pits and tunnels are

  made safe, the environment is protected from

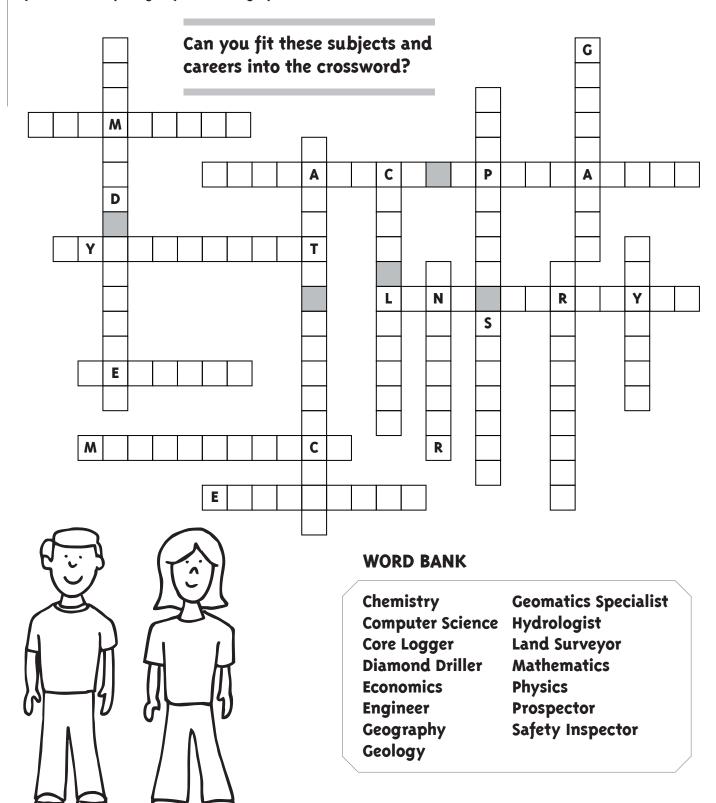
  mine waste, and the land is replanted with

  grass and trees.
- F RECLAIMING THE LAND

  The land is made safe, usable and a natural part of the surrounding environment.

# Subjects for our Careers

There are many subjects that we study in school which can lead us to a career in mining. These subjects and their applications can be found in every stage of the mining cycle.



# Hidden Word Sudoku

Fill in the grid so that every row, every column and every  $3 \times 3$  box contains each of the nine numbers below ONLY ONCE.

		3	6	8	4			9
4	5		7			2		3
	8	9			2		-	4
3	9		4		6	8		
6			ı	9		4	3	
2		I		7		5	9	
			2	6		9	4	5
	6	4		3	8			7
5	I	2			7		6	

What are the two hidden words in the diagonal from top left to bottom right? Hint: This term describes the endless processes that create, change, destroy and recreate the three main groups of rocks — igneous, sedimentary and metamorphic.

# **Product Matching**

Everything in our world that isn't grown is made using rocks, minerals, metals and petroleum resources that are extracted from the Earth. We use rocks, minerals, metals and petroleum to build homes, electronics, and schools, to generate heat and power, and to make everyday comfort items like shampoo and toothpaste.

Minerals help our food grow too — you can find up to 14 minerals in fertilizer. Minerals and metals make our homes and buildings strong and safe — from the floors to the plumbing to the rooftop, construction materials are all based on minerals and metals. We even use minerals and metals to make life beautiful! There are minerals in paint and cosmetics, and we use metals to make jewellery and sculptures. Minerals and metals are also used to help keep our environment clean by improving our cars, and filtering the air we breathe and the water we drink.

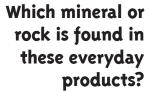


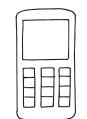
### **GYPSUM**

Gypsum is a soft, chalky, white mineral that is used to make drywall, plaster, cement and caulking.

### **MICA**

Ground mica is a mineral used in wallpaper, paint, cosmetics, tiles and roofing — tiny flecks of mica give a sparkling effect.





### HALITE

Halite is a mineral that adds flavour to food, melts ice on roads and is also used in the manufacture of glass, fire extinguishers, paint, plastics, synthetic rubbers and cosmetics.



Chalcopyrite is a mineral containing copper.

Copper is used in electrical wires, plumbing, coins and kitchen appliances, to name a few.

### **GOLD**

Gold is a mineral that is easily shaped and conducts electricity. It is mostly used in jewelry, electronics, dentistry, and medals.

### **CALCITE**

Calcite is a mineral used in the manufacture of fertilizers, metals, glass, rubber, paint and cement. We also use it to help keep our teeth clean.

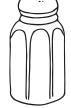
### **SPHALERITE**

Sphalerite is a mineral containing zinc. Zinc is used to coat steel to prevent corrosion and is found in many common products including batteries, medicines, insect repellent and sunscreen.

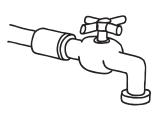
### **LIMESTONE**

Limestone is a rock used as a construction material; in making steel, glass and paper; in refining sugar; and to prevent water and air pollution.













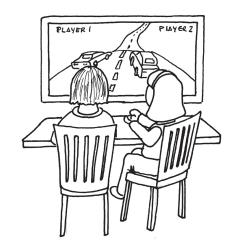
# What's in your Computer?

Did you know we use minerals every day? The products of mining provide many essential items, including highways, electrical and communications networks and housing.

In the puzzle below, can you find the metals and minerals that make up computers, cell phones and most other high-tech gadgets?

**COPPER** 

**ALUMINUM** 



**ZINC** 

TIN

### **WORD BANK**

**NICKEL** 

**GOLD** 

	CHRO COBA		M		LIUN			LEAD LITHIUM		SILVER TANTALUM		TITANIUM TUNGSTEN				/	
J	Z	D	W	P	J	M	С	S	ı	L	٧	E	R	D	В	т	В
L	0	C	R	1	U	S	R	Т	T	U	0	N	N	S	ı	U	J
Q	Z	C	Н	1	J	E	В	J	I	L	M	D	S	T	В	N	R
D	X	В	L	R	C	A	R	G	E	T	٧	F	L	X	T	G	U
N	T	L	X	0	0	0	G	E	R	M	A	N	1	U	M	S	X
I	A	G	I	P	В	M	F	A	T	D	٧	N	D	S	P	T	В
G	N	M	0	W	R	M	I	Н	M	J	U	R	1	M	В	E	C
M	T	X	X	L	M	E	M	U	Q	L	D	W	0	U	Z	N	0
U	A	D	0	D	D	В	P	U	M	٧	K	٧	R	K	M	F	В
N	L	T	L	L	0	Y	X	P	ı	N	I	C	K	E	L	Н	A
I	U	L	E	A	D	W	٧	J	0	C	C	J	P	U	J	N	L
M	M	G	Z	X	K	G	C	P	Н	C	G	P	C	S	ı	L	T
U	0	L	E	U	S	N	D	Y	N	н	F	P	C	T	н	E	D
L	В	Q	F	В	ı	Н	L	A	Q	ı	N	S	т	В	E	L	X
A	K	Т	G	Z	0	J	٧	L	ı	Т	Н	ı	U	M	ı	R	٧

# Word Jumble **EHYATTSM WORD BANK TIMETHAE AMETHYST SLMNETIOE** CALCITE **FLUORITE EIALHT GNEISS** SGNISE **GRANITE** Unscramble **HALITE RATEING** the names **HEMATITE HLTYORIE** of these **KIMBERLITE** rocks and **LIMESTONE LITORUFE** minerals **RHYOLITE** CCLIATE to unearth **SCHIST** the hidden **LEBKIMIETR** phrase. **STHCIS**

# Spot the Differences

Can you find eight differences between these two pictures?



# **Gemstone Month**

Gemstones, also called precious or semi-precious stones, are cut and polished minerals used to make jewellery. Certain rocks (lapis lazuli) or organic material (amber) that are not minerals, are also used for jewellery and are therefore often considered to be gems as well. Each month has an official gemstone.

Can you unlock the key to figure out which gemstone belongs to each month in the calendar? There are six different popular gem shapes which represent a vowel in this challenge to help you get started.

	Circle	Square Cushion E	Marquise	Emerald  O	Heart	Baguette Y
January				July		
February	0 0			August		
March	<u></u> ○ ♡	0 0	0 0	September		
April				October		
May				November		<del></del>
June		——		December		$ \bigcirc \bigcirc$

### **WORD BANK**

AMETHYST AQUAMARINE CITRINE DIAMOND EMERALD GARNET OPAL PEARL PERIDOT RUBY SAPPHIRE TURQUOISE

# Rocks, Minerals, Metals and Mining Word Search

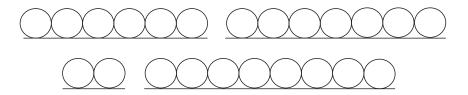
Mining is one of Canada's most important economic sectors and a major job creator. Approximately 400,000 people across Canada work in mineral exploration, mining and mineral processing. Thanks to its rich geology, Canada is one of the largest mining nations in the world, producing more than 60 minerals and metals.

### **WORD BANK**

AGATE	FELDSPAR	HALITE	METALS	RHYOLITE
AMETHY	ST GABBRO	HEMATITE	MICA	ROCKS
<b>BASALT</b>	GEM	IRON	MINE	SANDSTONE
CADMIU	M GNEISS	LEAD	MINERALS	TIN
COPPER	GOLD	LIMESTONE	MINING	ZINC
CRYSTAI	L GRANITE	MAGNETITE	NICKEL	
DIAMON	ID GYPSUM	MARBLE	QUARTZITE	/

Locate and circle all of the words from the word bank. Use the leftover letters to find a secret catch phrase.

S	A	N	D	S	Т	0	N	E	M	G	G	M	I	N
D	T	R	ı	G	M	C	N	Т	G	Y	0	E	S	M
A	ı	0	E	R	U	R	D	ı	E	P	L	T	L	Т
E	N	C	Т	A	I	Y	1	Т	Т	S	D	A	A	S
L	R	K	1	N	M	S	A	E	ı	U	E	L	R	Y
A	E	S	L	ı	D	Т	M	N	T	M	T	S	E	Н
т	P	0	A	Т	A	A	0	G	A	G	1	L	N	Т
L	P	R	н	E	C	L	N	A	M	E	Z	1	1	E
A	0	В	M	1	N	E	D	M	E	M	T	M	M	M
S	C	В	E	T	I	L	0	Y	н	R	R	E	M	A
A	Z	A	Т	T	N	1	C	K	E	L	A	S	1	E
В	1	G	R	S	S	S	1	E	N	G	U	T	N	Т
0	N	M	1	C	A	A	G	A	Т	E	Q	0	1	E
v	C	E	L	В	R	A	M	1	R	0	N	N	N	E
R	A	P	S	D	L	E	F	R	Y	0	N	E	G	E



# Geology Word Search

Geologists tell us the story of the Earth and help find important rock, mineral, metal and petroleum resources.

Find the geology words in the word search.

M	S	Q	V	R	Z	S	N	A	D	R	w	N	G	A
E	U	X	L	K	E	F	٧	D	C	V	G	R	P	F
т	0	E	P	C	G	A	N	0	ı	S	0	R	E	U
A	E	K	K	0	L	U	N	Т	0	R	E	J	C	G
M	N	٧	Y	R	A	Т	N	E	M	ı	D	E	S	N
0	G	x	w	T	1	G	X	K	0	0	S	U	A	1
R	1	J	Y	N	W	Y	1	R	0	C	K	S	٧	R
P	K	A	E	X	Т	R	U	S	1	٧	E	R	L	E
н	S	N	M	1	N	E	R	A	L	S	U	J	K	н
1	T	E	L	E	M	E	N	T	S	Т	E	Т	U	т
С	K	E	C	W	ı	N	Т	R	U	S	ı	٧	E	A
M	E	L	0	N	٧	Q	L	J	U	U	Т	D	T	E
R	J	F	F	1	C	Z	Q	Q	M	A	G	M	A	w
D	E	G	E	0	L	0	G	Y	L	Q	V	н	M	D
w	0	N	A	С	L	0	V	Y	J	Z	G	V	0	J

GEOLOGY: Geology is the study of the Earth.

ELEMENTS: Elements are naturally occuring pure substances. They make up all matter, including minerals.

MINERALS: Minerals are made of elements that occur naturally.

ROCKS: Rocks are made up of two or more minerals.

SEDIMENTARY: One of three types of rocks. Sedimentary rocks are formed from the deposition of rocks, minerals or organisms.

IGNEOUS: One of three types of rocks.
Igneous rocks are formed through
cooling of lava or magma.

METAMORPHIC: One of three types of rocks. Metamorphic rocks are created by the transformation of existing rock through heat and pressure.

VOLCANO: An opening in the Earth's surface through which melted rock and gases escape.

CONTINENT: Large mass of land on Earth.

MAGMA: Melted rock deep beneath the Earth's surface.

LAVA: Melted rock that comes out of a volcano.

EXTRUSIVE Rock: A rock formed from lava that came out of a volcano.

INTRUSIVE Rock: A rock that cooled from magma deep under the Earth's surface.

WEATHERING: The breaking down of rocks into smaller and smaller pieces by the effects of weather.

EROSION: The movement of rocks, soil, minerals and other materials from their natural source to a different location, usually by wind, water and ice.

# **Rock Cycle Crossword**

The rock cycle describes the endless processes that create, change, destroy and recreate the three main groups of rocks - igneous, sedimentary and metamorphic. Use the clues to fill in the crossword. **ACROSS** 2 Solid materials moved and deposited in a new location by water, wind or ice are called \_\_\_\_ . Over time, layers of these can make sedimentary rock. 4 Molten rock that comes out from a volcano is called\_ 6 Fossils are found in this type of sedimentary rock. 9 This metamorphic rock forms from applying heat and pressure to limestone. 11 Water, wind and ice break down rocks in a process called . 12 This igneous rock forms **DOWN** through slow cooling of 1 The name of this basic rock 8 Metamorphic rocks are formed by magma and sometimes type means to "change" or to "transform." heat and . has pink, white and black minerals in it. 10 The transport of rocks by 2 This metamorphic rock forms from wind, water and ice is called 14 This igneous rock forms applying heat and pressure to from lava eruptions shale. and sometimes has 13 The name of this rock type is microscopic pink, white 3 This sedimentary rock forms from derived from the Latin word and black minerals in it. meaning "fire." 16 Rocks change from one 5 A person who studies the Earth. 15 There are \_ basic type basic rock type to another of rocks. in a process called the 7 Molten rock deep under the surface "rock \_\_ of the Earth is called .

### **WORD BANK**

CYCLE EROSION GEOLOGIST GRANITE IGNEOUS LAVA LIMESTONE MAGMA MARBLE METAMORPHIC PRESSURE RHYOLITE SANDSTONE SEDIMENTS SLATE THREE WEATHERING

# Symbol Sudoku

Fill in the grid so that every row, every column and every  $3 \times 3$  box contains each of the nine symbols below ONLY ONCE.

# **SYMBOLS**



















Safety Glove

Gold Bar

Diamond

Ore Cart

Safety Boot

Hard Hat

Rock Hammer

Magnifying Glass

Quartz

					SM3		
	Sm						
			Manue	Sm			
Thomas of the second				50			
						Manuel	
					Mario		500
		Channe Control					

# Periodic Table Spelling Bee

Elements are the basic building blocks of everything around us. They can be found either in their pure form or chemically combined with other elements to make compounds.

Minerals are elements or compounds that occur naturally in the Earth's crust. Rocks are mixtures formed of minerals.

Hydrogen H Lithium Li Beryllium Be Sodium Na Magnesium Mg		-	sym thre	bols e-le	? Cha tter,	allen four	ge yo -lett	ourse er,	lf	Boron B Aluminum	Carbon C Silicon Si	Nitrogen N	Oxygen O Sulfur S	Fluorine F Chlorine Cl	Helium He Neon Ne Argon Ar
Potassium Calcium Sca	Sc Ti	Vanadium V	Chromium	Manganese Mn	Fe /	Cobalt	Nickel Ni	Copper	Zinc Zn	Gallium Ga	Germanium Ge	Arsenic As	Selenium Se	Bromine Br	Krypton Kr
Rubidium Strontium Ytti	rium Zirconium Zr	Niobium Nb	Molybdenum Mo	Technetium TC	Ruthenium Ru	Rhodium Rh	Palladium Pd	Silver Ag	Cadmium Cd	Indium In	Tin Sn	Antimony Sb	Tellurium Te	lodine	Xenon Xe
	** Hafnium	Tantalum Ta	Tungsten W	Rhenium Re	Osmium Os	Iridium Ir	Platinum Pt	Gold Au	Mercury Hg	Thallium TI	Lead Pb	Bismuth Bi	Polonium	Astatine At	Radon Rn
	Rutherfordium  Rt  Rf	Dubnium Db	Seaborgium Sg	Bohrium Bh	Hassium Hs	Meitnerium Mt	Darmstadtium DS	Roentgenium Rg	Copernicium	Ununtrium	Flerovium	Ununpentium	Livermorium LV	Ununseptium	Ununoctium
*	thanum Cerium Ce	Praseodymium Pr Pr	Neodymium Nd	Promethium Pm	Samarium Sm Plutonium	Europium  Eu  Americium	Gadolinium Gd	Terbium Tb	Dysprosium Dy Californium	Holmium Ho	Erbium Er	Thulium Tm Mendelevium	Ytterbium Yb  Nobelium	Lutetium Lu Lawrencium	
**	Ac Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr	
THREE	LETTERS		FOU	JR LE	TTERS	5		FIVE I	ETTE	RS		SIX	LETT	ERS	
	At		<b>F</b>	<b>()</b> 1	Те			S Po	0	N		CI	0 L	J Dy	] 

# **Careers**

A career in mining is more than you think! There are over 120 different careers in the mining industry. Discover a world of opportunities.





# Can you unscramble the careers described below?

SCRAMBLE	CAREER
ı. LOOSEGGIT	Evaluates the geological aspects of mine sites
2. EINM ENIRNEEG	Designs plans for mine sites and mining operations
3. CRETILNIACE	Repairs a variety of electrical equipment
4. OADMIDN IDLRERL	Uses a drill with a diamond tipped bit to bore deep holes
5. TNNUACCTOA	Manages the money spent by the company
6. YETFSA TSRNEPICO	Visits the mine to ensure safe working conditions
7. REANLYMOINTNE ICESTSTNI	Ensures that the mine operations follow environmental guidelines
8. IYPSOCTEHIGS	Interprets geophysical data to locate mineral reserves
9. EPSPCRRTOO	Searches for valuable mineral deposits
IO. LEBSTRA	Blasts large rocks and other surfaces for mining
II. AWYELR	Obtains permits, rights and licenses
12. EALLTGURISMT	Supervises the extraction of metals from ores
13. EIETQPUNM ROTEORPA	Operates equipment used in daily mine operations
14. EAHVY UYDT NIMCEHAC	Repairs and maintains heavy duty equipment
15. PUTRMECO ATSESIPLIC	Maintains and operates robots and computer networks
16. STIHCME	Analyzes samples collected daily from the mine
17. MNAREILS VRUESRYO	Maps and develops plans for sites of mineral extraction





ACCOUNTANT
BLASTER
CHEMIST
COMPUTER SPECIALIST
DIAMOND DRILLER
ELECTRICIAN

ENVIRONMENTAL SCIENTIST EQUIPMENT OPERATOR GEOLOGIST GEOPHYSICIST HEAVY DUTY MECHANIC

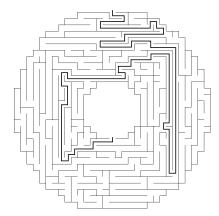
**LAWYER** 

**WORD BANK** 

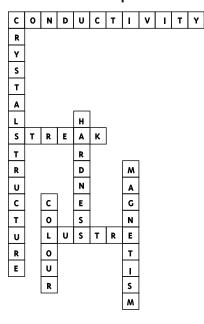
METALLURGIST
MINE ENGINEER
MINERALS SURVEYOR
PROSPECTOR
SAFETY INSPECTOR

# **Answers**

### Navigate to the Surface



### **Mineral Properties**



### Safety Dress Up



# Wordoku

G	R	ı	0	Т	E	S	L	Α
S	E	Т	G	L	A	R	0	_
A	L	0	R	ı	S	U	Т	E
0	ı	A	٦	Е	R	Т	G	S
Е	G	S	Т	0	ı	A	R	٦
R	Т	L	S	A	G	ш	I	0
Т	0	R	A	S	L	ı	E	O
L	A	E	ı	G	Т	0	S	R
ı	S	G	E	R	0	L	Α	Т

### Subjects for our Careers G Ε 0 C H E M I S T R Y 0 G N G E O M A T I C s SP E C I A L I S T D 0 R т Н H Y D R O L O G I S Е Е Υ Р Е R 1 N D S U R V E Y O R L 0 G S 0 S G N С S 1 G С S N Р G E O L O G Y ī Р Ε Ε E Ε S Ε Ε N С Т M A T H A M A T I C S С 0 Ε O M I C S R E C O N

### Dig Deep

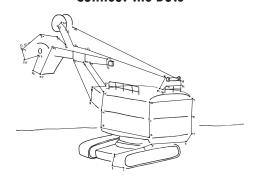


Compass Code Puzzle

IF IT IS NOT GROWN IT IS MINED

Patty the Prospector IN ORDER OF USE:

EARTH
DETECTIVE
GOLD
GPS
WOODS
ROCK HAMMER
SAFETY GLOVES
ADVENTURE
Connect the Dots



The Mining Process













# **Answers**

### Hidden Word Sudoku

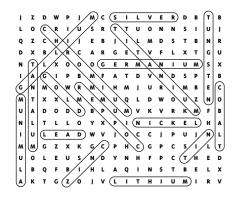
1	2	3	6	8	4	7	5	9
4	5	6	7	ı	9	2	8	3
7	8	9	3	5	2	6	ı	4
3	9	5	4	2	6	8	7	ı
6	7	8	ı	9	5	4	3	2
2	4	ı	8	7	3	5	9	6
8	3	7	2	6	1	9	4	5
9	6	4	5	3	8	ı	2	7
5	ı	2	9	4	7	3	6	8

ROCK CYCLE

# **Product Matching**



# What's in your Computer?



### Word Jumble

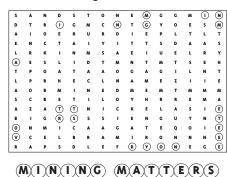
<u>H E</u>	M	<u>A</u>		M		T E	<u>H</u>	<u>Y</u>	<u>s</u>	T			
	Н	Α	L		т	E							
			G	N	E		<u>S</u>	<u>S</u>					
				G	R	Α	N		T	E			
				R	Н	Υ	0	L		T	E		
	F	L	U	0	R		T	E					
	C	Α	L	С	1	<u>T</u>	E						
				K	1	M	В	E	R	L	1	T	E
				S	С	Н	I	S	T				

Spot the Differences

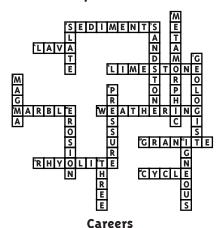
# Gemstone Month



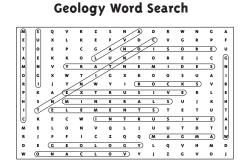
# Rocks, Minerals, Metals and Mining Word Search



# Rock Cycle Crossword



(T)(O) (E)(V)(E)(R)(Y)(O)(N)(E)



# Symbol Sudoku

(A)

O			God	$\mathbb{V}$	S.	Ţ	_	<i>\text{\tin}\text{\tetx{\text{\tetx{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\ti}\}\text{\text{\text{\text{\text{\text{\text{\text{\tex{\tex</i>
$\mathbb{V}$	E m	Tool	0	_	F			
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0	٨	P	9				S.	
_0		$\square$		S <sup>m</sup>			7	
		S.	$\square$	7	0		9	9
S <sup>m</sup>	7	0		0	9		Go d	$\nabla$
	$\mathbb{T}$	8	S.	0		_0		T
	_		F	(Te)	$\square$	0	0	Sm

Geologist
Mine Engineer
Electrician
Diamond Driller
Accountant
Safety Inspector
Environmental Scientist
Geophysicist

Prospector

Blaster
Lawyer
Metallurgist
Equipment Operator
Heavy Duty Mechanic
Computer Specialist
Chemist
Minerals Surveyor

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