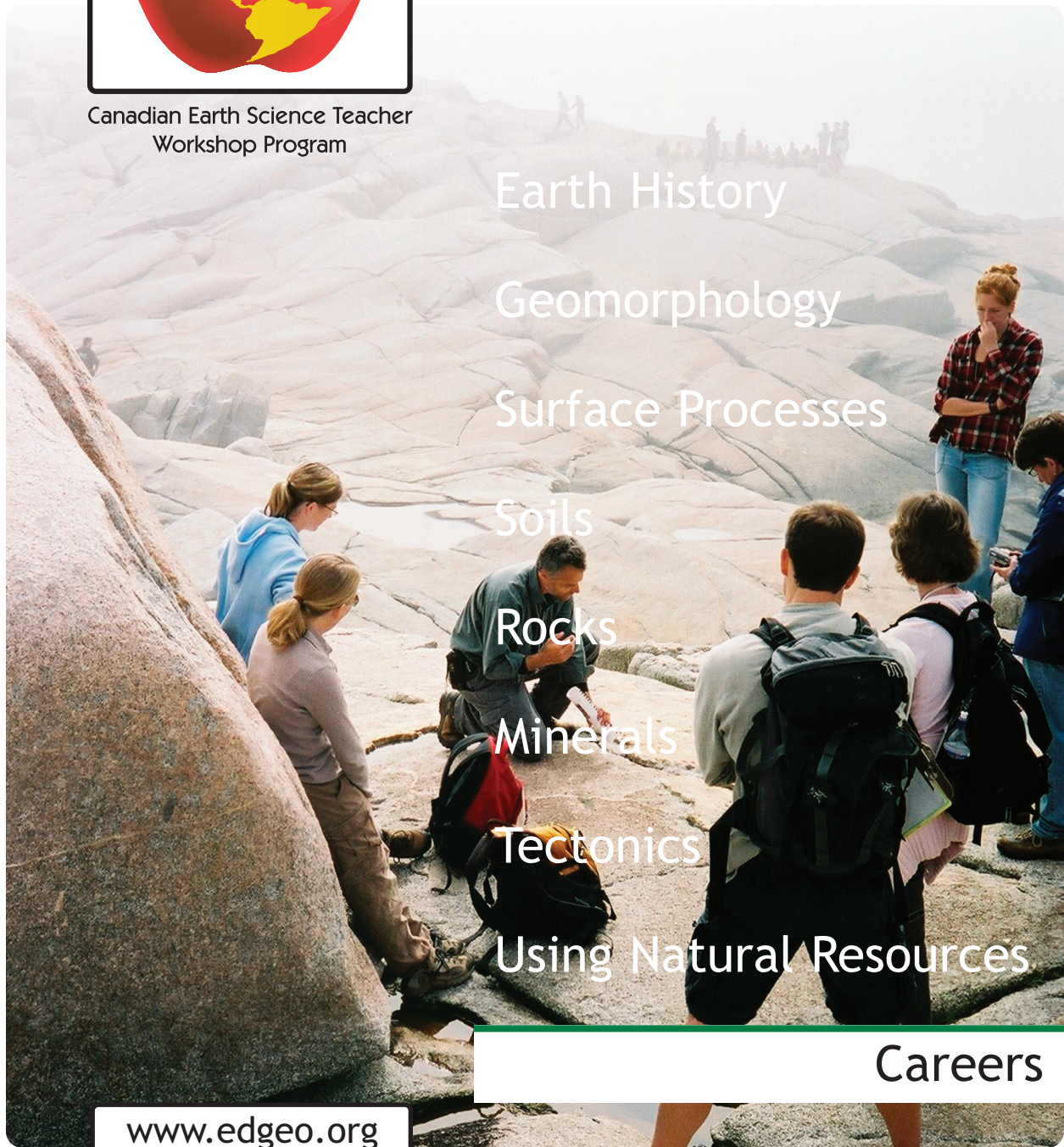




Canadian Earth Science Teacher  
Workshop Program

# Bringing Earth Science to Life



Earth History

Geomorphology

Surface Processes

Soils

Rocks

Minerals

Tectonics

Using Natural Resources

Careers

[www.edgeo.org](http://www.edgeo.org)

In partnership with:



Natural Resources  
Canada

Ressources naturelles  
Canada



# People who work in Earth Science

Students investigate the wide range of careers that are linked to the Earth sciences. They match a list of careers to descriptors and investigate further options using the “Explore a Career in Earth Sciences” website.

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## Explanation

Inspired by the International Year of Planet Earth, the Earth science community in Canada developed a dynamic website highlighting career opportunities in the Earth sciences:  
<http://www.earthsciencescanada.com/careers/>

Under the themes of energy, education, environment, water, minerals and mining, the website includes a vast variety of occupations to show students “What can I be?” Uniquely, the “What it’s like” section includes photographs, biographies and interviews with Earth scientists working in every province and territory in Canada. For students interested in researching further, the website provides detailed information about programs of study and entry requirements at Canadian institutions.

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## Materials

Earth science careers matching game (see Resources)  
Career descriptors for Energy, Education, Environment & Water, and Mining & Minerals (see Resources)  
Optional: Internet access

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## Caution

Advise students of appropriate use of Internet.

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## Time

Medium

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## Grouping

Individual, pairs

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## Preparation

Reproduce the matching game page for each student.  
Optional: create overheads of the career descriptors.



# People who work in Earth Science

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## Prompt

Brainstorm with students about what they think are the major issues affecting humans today. Once a list is compiled, highlight the issues that have a connection to Earth science: e.g. water resources, energy resources, pollution, climate, food shortages, geological hazards, etc.

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## Delivery

1. Either share with students the prepared overheads and discuss the broad, general areas where Earth scientists are involved, or have students explore the “What can I be” pages of the website.
2. Distribute the Earth science careers matching game and give students time to complete it. They may use the A to Z list of jobs on the website to help.

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## Questions for Discussion

What skills do different careers in Earth sciences require?  
What type of people like Earth science?

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## Extensions

Choose additional careers from the A to Z list, and have students create poster displays about them for the classroom.  
Explore the Earth science careers website, read the biographies, look at the places people are employed and the type of work they do.

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## Resources

### Solution to Earth Science Careers Matching Game

<b>1</b>	<b>K</b>	<b>8</b>	<b>E</b>
<b>2</b>	<b>C</b>	<b>9</b>	<b>G</b>
<b>3</b>	<b>A</b>	<b>10</b>	<b>M</b>
<b>4</b>	<b>N</b>	<b>11</b>	<b>I</b>
<b>5</b>	<b>L</b>	<b>12</b>	<b>F</b>
<b>6</b>	<b>H</b>	<b>13</b>	<b>J</b>
<b>7</b>	<b>B</b>	<b>14</b>	<b>D</b>



## Energy

### What's it all about?

Energy is essential for most everything we do - it lights and heats our homes and offices, cooks our food, and powers our cars, buses and trucks. Energy comes directly from the Sun, moving water, wind, and heat from within the Earth. Energy can be produced from fossil fuels, including oil, natural gas and coal, from uranium through radioactive decay, and from the Earth in the form of geothermal energy. Earth scientists use their knowledge to search for and develop these important resources, all of which are abundant in Canada.

### Why is the work important?

Today, a continuous supply of oil, natural gas, coal and uranium is essential to sustain our way of life. These resources enable us to operate our machines, travel the world, construct our buildings and roads, and manufacture our goods. Without these resources, we would return to the Stone Age. Earth scientists find these precious resources, and also work to minimize the impact of their exploitation on our environment. As these energy sources become scarcer, they must work harder to find minerals and hydrocarbons that are deeper within the Earth and that are located in more difficult environments, such as Canada's Arctic and offshore. In addition, Earth scientists are leaders in the development of renewable energy. We need a new generation of young, innovative, resourceful Earth scientists to ensure our future is bright.



## Education

### What's it all about?

Everyone should have a fundamental understanding of the world in which they live so that they can make informed decisions about how they live and understand their responsibilities to their community. Earth scientists share their knowledge of how our planet ticks, thus raising awareness and improving consumer, corporate, and government decisions that affect our lives. Earth science education is a full-time career for some (such as teachers and professors), while many other Earth scientists are involved in education as part of their job or as volunteers.

### Why is Earth science education important?

Have you ever noticed that continents look like they fit together like jigsaw puzzle pieces? This observation was one the first that led to the theory of plate tectonics, which explains why earthquakes occur, why volcanoes erupt, and how mountains and ocean trenches form. If Earth scientists had not developed this theory and explained it to others, we'd still be scratching our heads and wondering if the world was flat! Those involved in education and outreach are important people.

Earth science education enhances our ability to make informed decisions about how to extract and use non-renewable resources, how to manage and protect the environment, and how to prepare for and respond to natural hazards. Young people who gain this knowledge early in their lives can influence older generations of leaders and decision makers, and get involved in future trends and policies that will improve the long term health and safety of society.

We still have much to learn about our planet - new discoveries will be made, new technologies will come on stream that help Earth scientists decipher the 4.5 billion years of Earth history, and solutions will be found to the pressing environmental problems humanity faces. You can be part of this exciting future.



## Environment & Water

### What's it all about?

Our planet is incredibly complex and beautiful - everything on it is interconnected. We must understand these connections to maintain a healthy and sustainable world for future generations. Many Earth scientists are employed to protect the environment.

### Why is the work important?

There are more than six billion people on Earth today, and in 30 years we will number nine billion. Our existence as a species requires that we wisely manage what the Earth provides. We must use our resources carefully to keep our planet beautiful and healthy. Earth scientists have a vital role to play in finding solutions to the pressing environmental problems we face.



## Mining & Minerals

### What's it all about?

Look around you - almost everything you see comes from the Earth. It is no exaggeration to say that life as we know it would not exist without metals and minerals, including hydrocarbons. They are used in everything from cars to computers. They are essential to countless industrial processes and fabricated materials that we use every day of our lives. Metals such as gold and minerals such as diamonds and sapphires are highly valued. Can you guess who locates and brings them into production? It's Earth scientists!

### Why is the work important?

The mining industry has made an enormous contribution to Canada's prosperity. Not only does this industry provide employment to large numbers of people, it is a leader in sustainable development. The Canadian mining industry was the first to develop and adopt a national environmental policy, and Canada is recognized around the world as a leader in technological innovation. Canada is a much richer country thanks to the contributions of the mineral industry.





# Earth Science Careers Matching Game

Match each career title with the correct description.

1	Atmospheric Scientists	A	Enforce federal, provincial and territorial regulations governing the protection of wildlife, fisheries and natural resources. They run conservation programs and raise public awareness of conservation laws.
2	Computer Programmers	B	Study the materials, processes and history of the Earth. They help locate and develop natural resources, and study hazardous natural phenomena such as earthquakes, tsunamis, landslides, and volcanoes.
3	Conservation Officers	C	Develop and run complex programs, models and machines used in the Earth sciences. They are essential at all levels of operation, from administration to research and development.
4	Engineering Geologists	D	Study the thin soil layer at the boundary between the Earth's crust and the atmosphere to support agricultural productivity, to detect and remediate contaminated soils, and to understand soil-forming processes.
5	Environmental Engineers	E	Study the occurrence, movement, and quality of surface and subsurface waters. They are concerned with sustainability and contamination of groundwater, and assist with waste management, environmental impact assessment and site remediation.
6	Geographers	F	Study fossils to understand past life forms and their changes through time (evolution).
7	Geologists	G	Study the chemistry, atomic structure and physical properties of minerals to understand the processes of mineral formation and alteration. Some become gemologists who focus on precious and semi-precious stones such as sapphires, emeralds and diamonds.



# Earth Science Careers Matching Game

8	Hydrogeologists	H	Study the Earth's surface, the multitude of processes that shape it, and the interaction between humans and the physical environment. They design and create maps using computers.
9	Mineralogists	I	Study the physical, chemical and biological aspects of the oceans. They spend many hours working at sea or underwater, as well as in laboratories and using computers.
10	Mining Engineers	J	Study planets and their moons in order to understand the evolution of the solar system.
11	Oceanographers	K	Study weather processes, global and regional climate, solar radiation and its effects, and the role of atmospheric chemistry in ozone depletion, climate change and pollution.
12	Paleontologists	L	Develop solutions for environmental problems such as air or groundwater pollution and wastewater disposal. They make advancements in environmental protection and conservation.
13	Planetary Geologists	M	Design mines and plan mining operations. They apply their knowledge of soil and rock mechanics, transportation systems and machinery to ensure that mines function efficiently.
14	Soil Scientists	N	Apply geological data, techniques and principles to the study of rock, surficial materials surface water and groundwater. They investigate geological factors and natural hazards that affect structures such as bridges, buildings, airports, roads and dams.

