NATIONAL EDITION

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MAY 2022

Science News

FOR GRADES 3, 4 & 5

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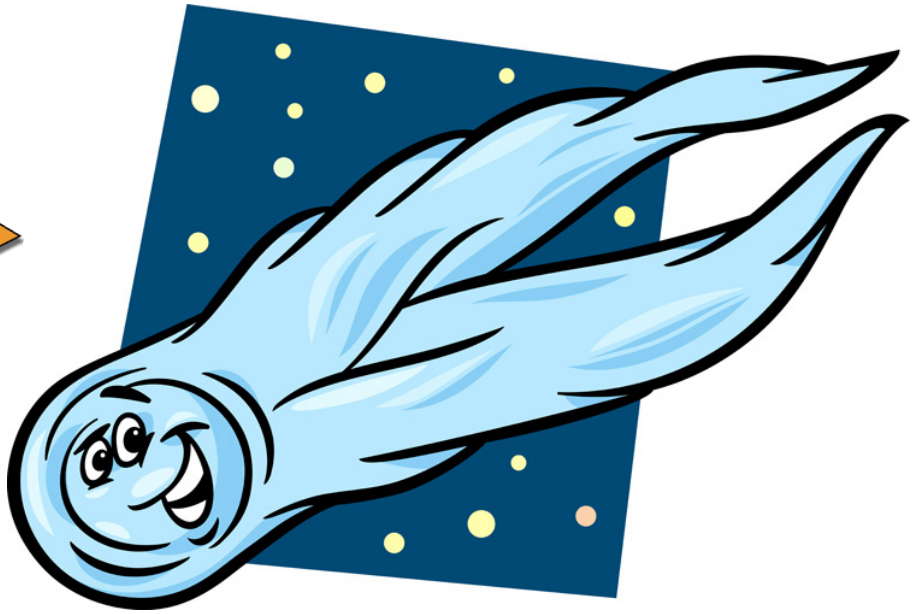
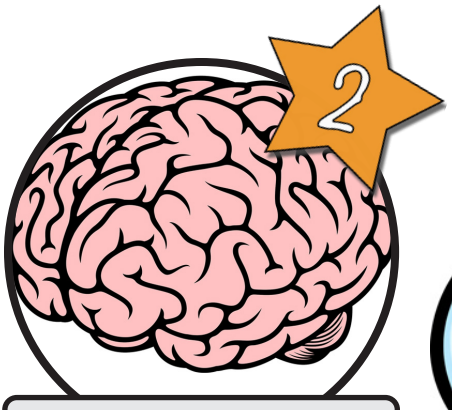
COMETS





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To view videos, go to:
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COMETS

If you looked up at the night sky between April 16 and 25 this year, you might have seen a **meteor** shower. These space rocks sometimes appear after a comet passes by.

Comets are large, frozen chunks of dust, rock, and ice that circle the Sun. As a comet nears and passes the Sun, the comet heats up. As the icy material on the outside of the comet warms, it turns into gases that **reflect** light. This produces a tail that can be seen.

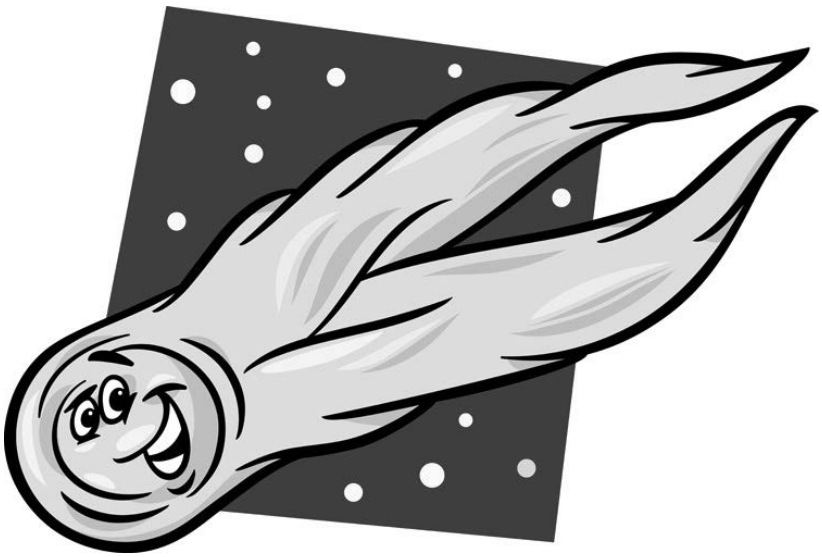
Comets can be anywhere from a few kilometres to many kilometres wide with tails that are sometimes millions of kilometres long. There is one comet that will come close to the Sun in 2031 that is 128 kilometres wide.

Comets travel around the Sun in an oval orbit. The time it takes for a comet to orbit the Sun is called the period and it is measured in years. Some comets take just a few years to orbit the Sun, while others can take millions of years. One example is Halley's comet, which passes by the Sun every 75 years.

Comets travel in groups until they are knocked out of **orbit**. Two areas with many comets are called the Kuiper Belt and the Oort Cloud. Most comets have orbits that reach beyond the planet Neptune before they begin the trip back. These "dirty snowballs," as scientists call them, are

like **asteroids** but are made mostly of ice rather than rock.

As they travel through space, comets sometimes hit other objects, including planets. These **impacts** are rare, but they can cause a lot of damage. They can change the landscape, creating deep holes that were not there before.



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Meteor: A piece of rock or metal from space that speeds into the Earth's atmosphere and forms a streak of light as it burns and falls to the Earth.

Reflect: To throw back heat, light, or sound from a surface.

Orbit: The curved path followed by a moon, planet, or satellite as it circles a planet or the Sun.

Asteroid: A small rocky object that travels around the Sun.

Impact: The forceful striking of one thing against another.

COMETS QUESTIONS

1. What are comets?

   _____

2. As the icy material on the outside of the comet warms and it turns into gases that reflect light, what happens?

   _____

3. Comets can be anywhere from a few kilometres to many kilometres wide with tails that are sometimes _____ _____ long.

4. The time it takes for a comet to orbit the Sun is called the _____ and it is measured in years.

5. Some comets take just a few _____ to orbit the Sun, while others can take millions of years.

6. How often does Halley's comet pass by the Sun?

7. Most comets have orbits that reach beyond the planet _____ before they begin the trip back.

8. As they travel through space, comets sometimes hit _____ _____.

PERIODIC COMETS

Comets that pass by the Sun again and again are called periodic comets. Their orbits are often the same and we know when they will pass by Earth. Some comets only pass near Earth once. These are called non-periodic comets.

Below is a list some comets that will be coming near to the Sun in the next 10 years.

Comet name	Period in Years	Date closest to Sun
NEAT	22.61	2024/06/20
NEAT–LINEAR	21.17	2024/08/28
Spacewatch–LINEAR	20.4	2025/03/06
Sheppard	5.24	2026
Read	20.58	2026/08/15
LONEOS	22.2	2026/11/07
LINEAR–Hill	22.42	2027/07/31
Siding Spring	21.86	2028/11/12
Skiff	22.48	2028/12/22
McNaught	20.4	2030/02/02
Lemmon–PANSTARRS	25.72	2030/12/04
La Sagra	20.94	2030/12/21
Hill	21.89	2031/04/08
Boattini	23.42	2031/11/03

Use the infornation on the previous page to answer the questions below.

1. What is the name of the next comet to come close to the Sun?

_____

2. What is the period of the Spacewatch-LINEAR comet?

_____

3. How many comets will pass by the Sun in 2026?

_____

4. Which comet has the shortest period?

_____

5. Which comet on the list has the longest period?

_____

6. What is the name of the comet that will pass by the Sun on 2028/12/22?

_____

7. What is the period of the Hill comet?

_____

8. What is the name of the comet with a period of 20.94 years?

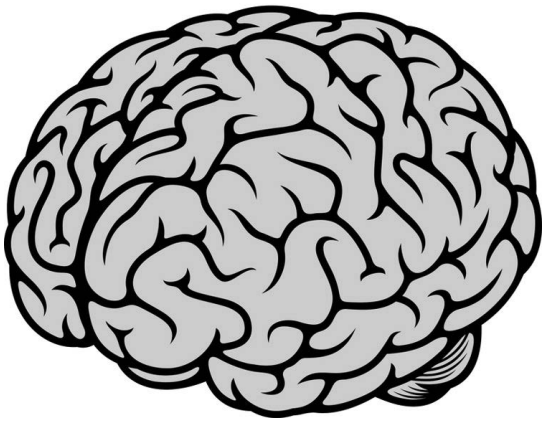
_____

EPILEPSY

Suppose that someone stopped suddenly and stared into space for a few minutes. They may have stopped to think about something, but it could also be an epileptic **seizure**.

Epilepsy is a disorder of the **central nervous system** that causes the brain's signals to fail. People can live long lives with epilepsy, but this disorder can be harmful if it is uncontrolled.

Epilepsy can develop at any stage of a person's life. Unlike other illnesses, epilepsy is not spread by being near an **infected** person. Sometimes it is passed on by the person's mother or father. It can also happen after an illness or a head injury, or because of a brain **tumour**. A lack of oxygen after birth can also cause epilepsy.



Seizures are the main symptoms of epilepsy. These seizures can be minor, meaning that the person becomes unaware of what is happening but can seem completely normal. Major seizures often cause the person to lose **consciousness** and fall to the ground. This can cause serious injuries. Both types of seizures happen because the electrical signals in the brain become mixed up. Sometimes, a sudden burst of electricity happens in the brain and causes a seizure.

Epileptic seizures can be general or **focal**. General seizures happen on both sides of the brain, but focal seizures are in just one area. Seizures

can affect people's ability to see or taste, and they can cause the arms and legs to shake uncontrollably.

People without epilepsy sometimes have isolated seizures, but more frequent seizures could be a sign of epilepsy. Brain surgery can sometimes help, and some people grow out of epilepsy. For others, medication can control the symptoms. Finding a cure for this disorder could help many people.

To view videos, go to:
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Seizure: A state in which you become unconscious and your body moves in an uncontrolled and violent way.

Central nervous system: The brain and nerve tissues that control the activities of the body.

Infected: Caused to be sick or contaminated by introducing germs or viruses.

Tumour: An abnormal lump or mass or cells in the body.

Consciousness: The ability of the mind that makes it possible for you to be aware and process input from your senses.

Focal: Having central or great importance.

EPILEPSY QUESTIONS

1. Epilepsy is a disorder of the _____ that causes the brain's signals to fail.

2. When can epilepsy develop?

   _____

3. Epilepsy can happen after an illness or a _____, or because of a brain tumour.

4. What are the main symptoms of epilepsy?

   _____

5. Major seizures often cause the person to lose consciousness and

   _____.

6. Both types of seizures happen because the _____

   _____ in the brain become mixed up.

7. General seizures happen on both sides of the _____, but focal seizures are in just one area.

8. For some people, _____ can control the symptoms.

WHO IS IN CONTROL?

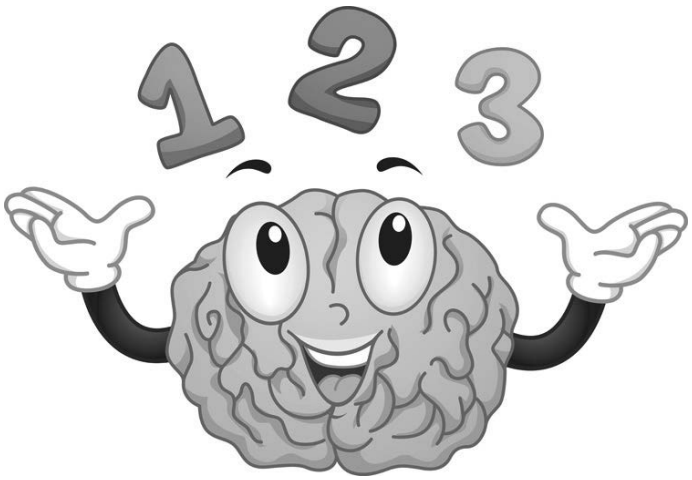
The human brain is divided into two parts or hemispheres, which are connected by the corpus callosum. Although equal in size, these two sides are not the same and have different functions.

The right hemisphere is responsible for control of the left side of the body. It is the more artistic and creative side of the brain. It is the side of the brain that you use to draw, enjoy music, and use your imagination.

The left hemisphere is responsible for control of the right side of the body. It is the more academic and logical side of the brain, and performs tasks that have to do with logic, such as in science and mathematics. It is the part of the brain you use to think things through and learn.

See if you can tell what hemisphere is being used in each task!

1. Drawing a picture	Left	Right
2. Doing your math homework	Left	Right
3. Daydreaming when you should be studying	Left	Right
4. Talking to a friend	Left	Right
5. Listening to a parent or teacher	Left	Right
6. Writing a letter to a friend telling them about your birthday	Left	Right
7. Writing a story	Left	Right



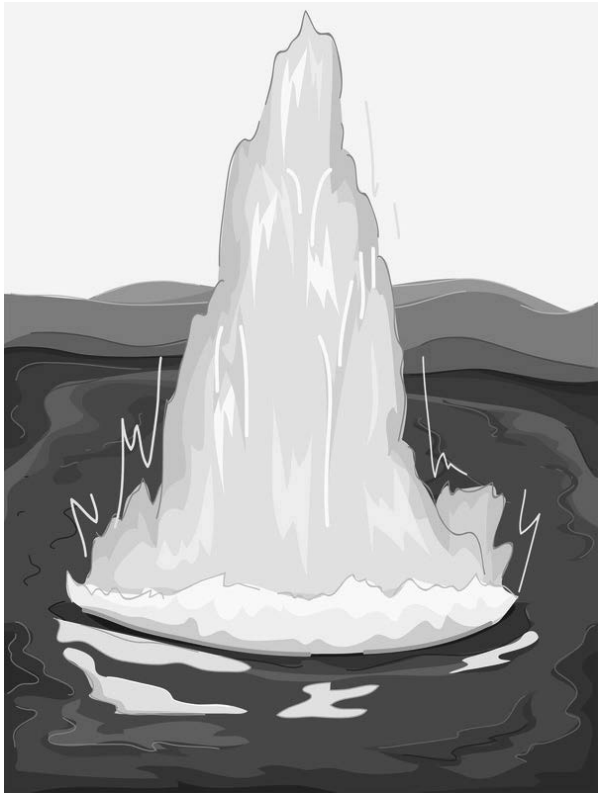
GEOTHERMAL ENERGY

At the beginning of March, two energy companies in Alberta announced that they had received the money they needed for a geothermal energy project. Their work will help change the way Canadians heat and cool their buildings and cook their food.

Oil and gas are the major sources of energy in Canada. The problem is that they can pollute the Earth, and supplies are limited. Wind and solar power can supply some energy, but they can be expensive and difficult to use. Another option is to use the natural heat from underground, also known as geothermal energy.

Deep inside the Earth is a hot, **molten** core. The deeper you go under the surface of the Earth, the warmer it gets. By the time you get to the surface, much of that heat is gone.

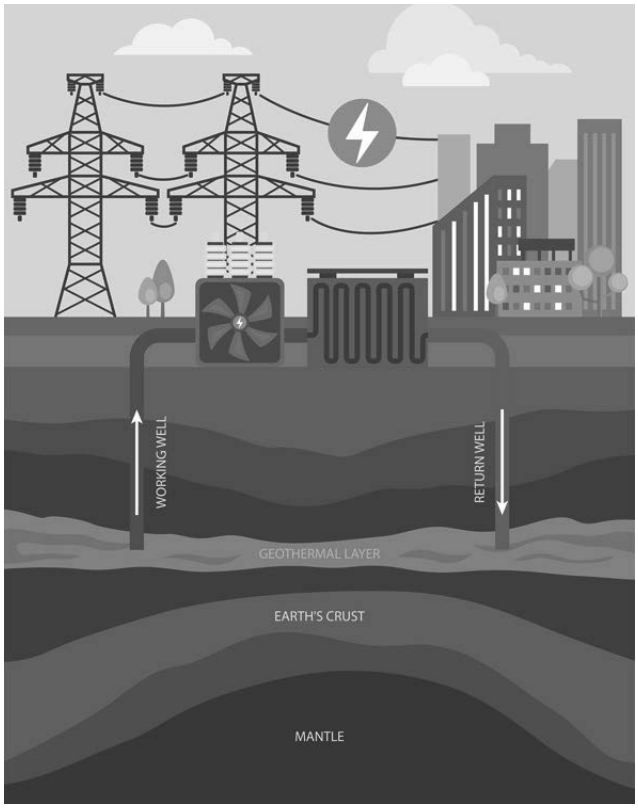
People in some countries have used this internal heat, called geothermal energy, for thousands of years. Some of this heat is close to the surface, such as in **geysers** and hot springs. Most of it is a bit more **complicated** to find.



Geothermal energy works by digging a hole deep into the crust of the Earth. Water is pumped down the hole from 500 metres to several kilometres below the surface. There, the heat from the Earth heats up the

water. The hot water rises back to the surface where people can use it.

Geothermal systems use either steam or hot water from underground. This warmth can go directly into the heating systems of buildings, or it can go into **turbines** to create electricity that can be stored to be used later. The energy can also be used to grow plants or even for heating sidewalks in winter.



Geothermal energy has great **potential** for the future. It could help reduce pollution and bring a **reliable** source of energy to people.

To view videos, go to: http://resources.dynamic-classroom.ca/books/kwln

Video

Molten: Melted at a high temperature.

Geysers: An underground hot spring that shoots boiling water and steam into the air.

Complicated: Difficult to use or understand because of having many different parts or ideas.

Turbine: An engine powered by water, steam, wind, or gas passing through the blade of a wheel and making it spin.

Potential: The possibility of being developed into something.

Reliable: Able to be relied upon or trusted.

GEOTHERMAL ENERGY QUESTIONS

1. What are the major sources of energy in Canada?

   _____

2. Another option is to use the natural heat from _____, also known as geothermal energy.

3. What is deep inside the Earth?

   _____

4. The deeper you go under the surface of the Earth, the _____ it gets.

5. Some of this heat is close to the surface, such as in _____ and _____.

6. Geothermal energy works by _____ deep into the crust of the Earth.

7. What is pumped down the hole?

   _____

8. This warmth can go directly into the heating systems of buildings, or it can go into turbines to create _____ that can be stored to be used later.

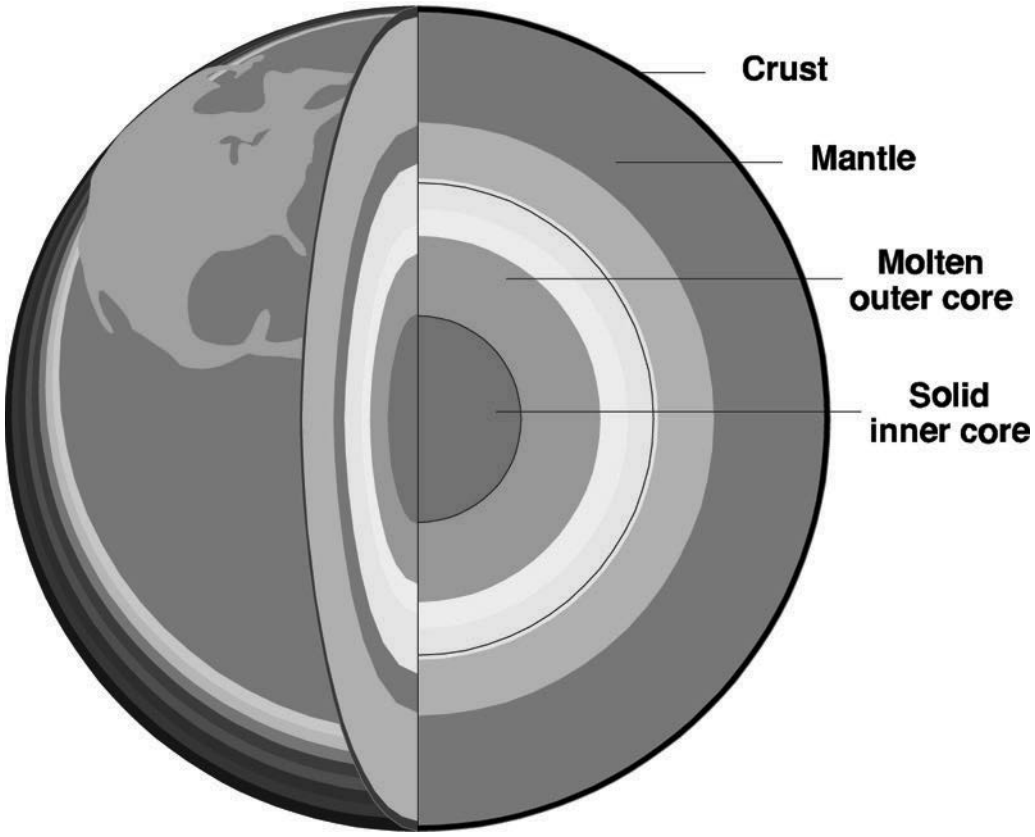
THE LAYERS OF THE EARTH

The inner core

This solid metal ball has a radius of 1220 kilometres. It is located 6400 to 5180 kilometres beneath Earth's surface. It is made mostly of iron and nickel. It is also intensely hot: 5400° Celsius. That is almost as hot as the surface of the sun.

The outer core

This part of the core is also made from iron and nickel, but in liquid form. It sits 5180 to 2880 kilometres below the Earth's surface. This liquid churns in huge, turbulent currents. That motion generates electrical currents that generate Earth's magnetic field.



The mantle

At close to 3000 kilometres thick, this is Earth's thickest layer. It starts 30 kilometres beneath the surface. Made mostly of iron, magnesium, and silicon, it is dense, hot, and semi-solid.

The crust

Earth's crust is like the shell of a hard-boiled egg. It is extremely thin, cold, and brittle compared to what lies below it. The crust is made of light elements that include silica, aluminum, and oxygen. It also varies a lot in its thickness. Under the oceans, it may be as little as 5 kilometres thick. Beneath the continents, the crust may be 30 to 70 kilometres thick.

1. Which layer is the thickest?

_____

2. Which layer is a solid metal ball?

_____

3. Which layer is like the shell of a hard-boiled egg?

_____

4. Which layer is made of liquid iron and nickel?

_____

5. Which layer sits 5180 to 2880 kilometres below the surface?

_____

6. Which layer sits 6400 to 5180 kilometres beneath the surface?

_____

7. Which layer starts 30 kilometres below the surface?

_____

ANSWER KEY

COMETS

1. What are comets? **Large, frozen chunks of dust, rock, and ice that circle the Sun**
2. As the icy material on the outside of the comet warms and it turns into gases that reflect light, what happens? **This produces a tail that can be seen.**
3. Comets can be anywhere from a few kilometres to many kilometres wide with tails that are sometimes **millions of kilometres** long.
4. The time it takes for a comet to orbit the Sun is called the **period** and it is measured in years.
5. Some comets take just a few **years** to orbit the Sun, while others can take millions of years.
6. How often does Halley's comet pass by the Sun? **Every 75 years**
7. Most comets have orbits that reach beyond the planet **Neptune** before they begin the trip back.
8. As they travel through space, comets sometimes hit **other objects**.

PERIODIC COMETS

1. NEAT
2. 20.4 years
3. Three
4. Sheppard
5. Lemmon-PANSTARRS
6. Skiff
7. 21.89 years
8. La Sagra

EPILEPSY

1. Epilepsy is a disorder of the **central nervous system** that causes the brain's signals to fail.
2. When can epilepsy develop? **At any stage of a person's life**
3. Epilepsy can happen after an illness or a **head injury**, or because of a brain tumour.
4. What are the main symptoms of epilepsy? **Seizures**

5. Major seizures often cause the person to lose consciousness and **fall to the ground**.
6. Both types of seizures happen because the **electrical signals** in the brain become mixed up.
7. General seizures happen on both sides of the **brain**, but focal seizures are in just one area.
8. For some people, **medication** can control the symptoms.

WHO IS IN CONTROL?

1. Right
2. Left
3. Right
4. Left
5. Left
6. Left
7. Right

GEOTHERMAL ENERGY

1. What are the major sources of energy in Canada? **Oil and gas**
2. Another option is to use the natural heat from **underground**, also known as geothermal energy.
3. What is deep inside the Earth? **A hot, molten core**
4. The deeper you go under the surface of the Earth, the **warmer** it gets.
5. Some of this heat is close to the surface, such as in **geysers** and **hot springs**.
6. Geothermal energy works by **digging a hole** deep into the crust of the Earth.
7. What is pumped down the hole? **Water**
8. This warmth can go directly into the heating systems of buildings, or it can go into turbines to create **electricity** that can be stored to be used later.

THE LAYERS OF THE EARTH

1. The mantle
2. The inner core
3. The crust
4. The outer core
5. The outer core
6. The inner core
7. The mantle