









CURRICULUM OVERVIEW Structures and Mechanisms

Matter and Energy

Earth and Space Systems

Grade 1

Needs and Characteristics of Living Things

exploring the needs of plants and animals, and how our senses of hearing and smell work

Materials, Objects, and Everyday Structures

exploring different kinds of fasteners, properties of different materials, and why position matters in structures

Energy in Our Lives

exploring different kinds and sources of energy, how energy affects us, and what we can use it for

Daily and Seasonal Changes

exploring changes in daily cycles, what humidity is, how rain forms, and how to track the wind

Grade 2

Growth and Changes in Animals

exploring how animals grow and change, and the adaptations they have that help them survive

Movement

exploring different simple machines, and how they make work easier

Properties of Liquids and Solids exploring properties of different

liquids and solids, how they interact with one another, and how temperature affects them

Air and Water in the Environment

exploring the properties of air, and how water moves through the water cycle

Grade 3

Growth and Changes in Plants

learning about seed germination, why water is important to plants and how they transport it, and how plants change to meet needs

Strong and Stable Structures

exploring what makes a structure strong and stable and how to design strong and stable structures

Forces Causing Movement

exploring different kinds of forces around us and how they interact with things

Soils in the Environment

exploring what soil is, where it is from, and why it is so important

Contents

Understanding Life Systems

In this strand, students will learn about the living world around them. They will explore topics such as what an environment is, what the basic needs of living things are, and what the specific characteristics and needs of plants and animals are

Understanding Structures and Mechanisms

In this strand, students will learn about the material and mechanical world around them. They will explore topics such as the characteristics of different materials, how the form of an object relates to its function, simple machines, and structural concepts.

Understanding Matter and Energy

In this strand, students will explore the unseen elements and forces at work in life. They will explore topics such as what energy is and the different forms it takes, the three states of matter and their properties, and what forces are.

Understanding Earth and Space Systems

In this strand, students will explore the world and the factors involved at a macroscopic level. They will explore topics such as daily and seasonal cycles, the importance of air and water, and the characteristics and impact of different soil types.

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Understanding Matter and Energy – Energy in Our Lives



A BALLOON PINWHEEL understanding wind energy



Have you ever wondered what makes a kite fly in the sky? It is moving air, also called wind. Even though we cannot see it, we can feel it, whether it is a gentle ocean breeze or a violent hurricane. Moving air moves things around us.

Difficulty:

Time needed: 20 minutes

In this experiment, you will see moving air in action.



Go to www.popularbook.ca/downloadcentre to learn to build your own paper pinwheel.

What to do:



Tape the balloon to the long end of the straw.



Push the pin down through the straw and into the eraser of the pencil. Make sure the straw can spin freely.



Blow up the balloon through the straw. Then release and observe.

air rushing out

spinning

Pins are very sharp! Ask your parent for help for Step 2.



After releasing the straw, you should see the straw spin round and round until the balloon deflated. The air rushing out of the balloon through the straw created moving air. It pushed the straw and the balloon to spin. The more air you blew into the balloon, the more wind energy was created to push the balloon pinwheel.



Wind energy can be harnessed using wind turbines to make electricity. The first wind farm in Canada was built in 1993 in Pincher Creek, Alberta. Now, every Canadian province benefits from wind energy. Wind is a great source of energy because it will never run out.





Joseph-Armand Bombardier invented one of Canada's most famous and well-loved machines: the snowmobile!

Bombardier was born in Valcourt, Quebec in 1907. He was a mechanic who loved learning about and fixing machines. He wanted to build a machine that would help people travel during the snowy Quebec winters. In 1937, he did just that by building the first snowmobile. It was much larger than the snowmobiles we know today. It had two skis for steering in the front, and wheels on tracks in the back. Bombardier's invention helped people all over Canada,

> especially those in northern Canada where snow makes travelling difficult. Today, many people use snowmobiles for fun, too.



Understanding Structures and Mechanisms – Movement

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Grade **2**

Science Facts

Yes, wedges can be found on vehicles. The front of a boat, for example, is wedgeshaped, which helps push water around the boat, making it easier to move forward.

> No, screws can also lift things. Many years ago, an inventor named Archimedes invented a device that used a screw to move water upward. It was used to empty water from ships and to water crops.

No, simple machines can also be used for fun. At a playground, a seesaw is a lever and a slide is an inclined plane.



life easier by allowing us to move heavy objects upward with less effort. For example, it is easier to push a stroller upward on an incline plane than to lift it up the stairs.

Inclined planes make

Pulleys can be found in construction cranes and elevators. People in Amsterdam use pulleys to lift big and heavy furniture into their apartments. Understanding Earth and Space Systems – Air and Water in the Environment

WATER IN THE AIR understanding that there is water in the air

A weather forecast not only tells us the highest and lowest temperatures during the day, it also tells us what the humidity is. Do you know what humidity is? Humidity is the amount of water that is in the air. We normally cannot see water in the air but it is everywhere. Try this experiment to make this surrounding water visible.

Difficulty:

Time needed: 3 hours

In this experiment, you will learn that there is water in the air.

Can you see the water in the air?

What you need:

	4
ас	cup

Grade

2

D1



an ice tray



food colouring



sheet

What to do:



Fill the cup with water and add a few drops of food colouring.



Pour the cup of water into an ice tray. Put the baking sheet in the freezer for two hours.



Put the ice cubes into the cup.

Leave the cup on the baking sheet for 20 minutes. Then observe.

з

water

WHAT just happened?

In this experiment, you should have noticed that clear water droplets formed outside the cup and there might even be a puddle under it. Since this water was clear, it could not have came from the water inside the cup. So where did this water come from?

This water came from the water vapour in the air around the cup. The cold cup caused this surrounding water vapour to condense and become water droplets on the outside of the cup, which then trickled down to form a puddle on the baking sheet.

Water in Our Bodies

So how much water is inside us? There is actually quite a lot! In fact, about three fifths of our body is water. This is because our body uses water to get a lot of things done such as producing saliva for eating, flushing out waste, sweating to stay cool, and much more.

GROWING UP learning about seed germination

We all know that seeds become plants. The process of a seed sprouting and beginning to grow is called "germination". But what causes a seed to germinate? How does a seed know when it is time to start growing?



What you need:

a transparent jar

cotton

water

lima beans



In this experiment, you will find out what a seed needs to germinate and make observations as it happens.

What to do:

- Dampen the cotton with water.
- 2 Fill the jar with the damp cotton.
- Place your lima beans between the side of the jar and the wet cotton. Make sure you can see the beans.
- Position some beans facing up and some facing down as shown.
- 5 Wait three to seven days and note the changes you see in the beans.



The outer layer of a seed is not just a tough shell; it helps the seed find out what is happening in its environment! Most seeds need water, air, and the right temperature to start growing. In the experiment, your lima beans already had air and the right temperature to grow. All they needed was some water so that they could start germinating.

Note that a seed's root always grows downward and its stem and leaves always grow upward. This is because plants are also able to tell which way is up and which way is down.

outer shell

root



Maple tree seeds in Canada are not ordinary seeds. They are seeds with "wings"! On windy days, these "helicopter seeds" use their wings to travel to new locations to grow. They get their name because when they fall, their wings make them twirl, similar to the way helicopter blades twirl. The next time you come across some maple tree seeds, try tossing them into the air to see how they twirl as they fall.



Go to www.popularbook.ca/downloadcentre to learn more about different kinds of seeds.

MAGNETS

Every magnet has a magnetic field, which is the space around a magnet within which it can pull metals. The north pole and the south pole are the two parts of a magnet where the magnetic force is the strongest, that is, they have the strongest pulling power.

Fun and Useful Facts

Magnetic Field Lines of Different Magnets

a bar magnet

a cylinder magnet

a horseshoe magnet

Do you know which end of a bar magnet is the north pole?



Find out which direction is the north with a compass. Then hang the magnet from a piece of string so that it can swing freely. When it eventually stops swinging, the end of the magnet that points to the north is the north pole of the magnet.

Magnets & Animals

The Earth has a magnetic field. Various animals may detect the Earth's magnetic field and use it to help them navigate or find their way on very long journeys called migrations.

Animals that migrate:

• Whales:

They usually start from their winter areas of warm tropical seas and move to their summer areas of polar seas, where food is plentiful.

Sea Turtles:

Sea turtles wander the world's oceans. They return to the beach where they were hatched from eggs to lay their own eggs.



• Pigeons:

They probably use magnetism to navigate. A bird's own body compass may be somewhere inside its head, near or inside the brain.

Monarch Butterflies:

They always go on long annual migrations of as long as 4800 km.

Magnets & People

Have you used a magnet today? Magnets can be found in many places, such as the refrigerator and the washing machine. Look around the house to see how we live with magnets every day.

