

Unit 1 Bubbling Air

Can we see air? Can we touch it?

We cannot see air. We cannot touch it either.

But air is all around us.

Let's do a simple experiment.

Step 1. Fill a large bowl with water.

Step 2. Put an empty plastic bottle in the water and push it down.

Step 3. Put an empty syringe into the water and push down the top.

What happened in this experiment?

Bubbles came out from the bottle and the syringe.

They made a bubbling sound.

Bubbles are made of air. Look around you.

Where can you find air?

Unit 2 Tony's Balloon

Tony had a balloon.

"Mom, what's in this balloon? Can I untie it?"

Mom said, "You shouldn't. You don't want the air to come out."

Tony wanted to see the air. "Can I try?"

So he did.

The balloon got smaller.

"Mom, where's the air? Nothing came out, but the balloon got smaller!"

"Didn't you feel the wind blow when you untied the balloon?"

That was the air when it came out. We can't see air.

We can't touch it, but it's all around us."

Unit 3 Magnets Push and Pull

A magnet has two poles. They are the north and south poles.

Let's look at them.

Take two magnets.

Step 1. Put the same poles together.

Step 2. Put the opposite poles together.

What happened when you put the same poles together?

They pushed away.

What happened when you put opposite poles together?

They pulled together. They stayed together.

Look at the photo below. You can build a tower with ring magnets.

Put the rings with the same poles one on top of the other.

The magnets push away.

This helps make a tall tower.

What else can you do with magnets?

Unit 4 New Pencil Case

Emma didn't zip her pencil case. All her pens dropped from it.

Emma was sad.

Dad gave her a new pencil case.

She didn't need to zip the new pencil case.

She turned it over. She shook it. It didn't open.

"How does it stay closed?" Emma asked.

"There are two magnets in the pencil case," her dad answered.

"When you close it, the two opposite poles touch. The pencil case closes tightly."

"Wow! This pencil case is great!"

Unit 5 Growing Seeds

What do seeds need to grow?

Let's take a look.

You need kidney beans, water, and two dishes.

Step 1. Put cotton on two dishes and place some kidney beans on top.

Step 2. Pour some water in one dish. Everything else (temperature, light, etc.) should be the same for both dishes.

Step 3. Check both dishes seven days later.

Only the kidney beans in the wet dish have buds.

The other beans didn't grow.

All the kidney beans had light and the same temperature.

Only the kidney beans with water grew.

Seeds need water so they can grow.

What do kidney beans need to grow from soil?

Unit 6 Growing Tomatoes

Sarah ate some cherry tomatoes.

"These taste great!" she said.

"We can grow our own cherry tomatoes," said Dad.

"They taste even better."

He bought some cherry tomato seeds.

Sarah planted them in soil. She made sure they had sunlight.

She poured water on the soil.

Nothing happened.

"We have to wait," said Dad.

She waited one week. Leaves grew!

She watered them some more. She waited even longer.

Cherry tomatoes grew!

She ate them.

"These are the best tomatoes ever!" she said.

Unit 7 How Rocks Become Soil

In the mountains, you can see rocks and soil.

Rocks can turn into soil. How does this happen?

Let's do an experiment!

Step 1. Put a piece of rock sugar on a sheet of paper. Look at the piece of rock sugar.

It is large. It has sharp edges, and there is little powder around it.

Step 2. Put the rock sugar in a plastic container and close it.

Step 3. Shake the plastic container hard.

Did anything happen? Yes, it did.

The rock sugar broke into smaller pieces.

This is how soil is made.

Rocks and stones break down in nature.

They become soil.

Unit 8 The Magic of Nature

Peter goes hiking with his uncle. Peter's legs hurt.

He needs to rest.

He lies down on a big rock.

He sees a tree growing on the rock.

He's surprised.

"How can this tree grow here?" he asks.

"That's nature. The tree grows through the rock.

The tree breaks the rock," his uncle says.

"Wow, trees can break rocks!"

"Weather can break rocks, too. It breaks them into small pieces.

The rocks turn into soil."

"This soil used to be a rock."

"That's amazing!"

Unit 9 The Shaking Drum

Sounds can be big or small.

We can hear them.

We can also see them.

Don't you believe it?

Let's do a simple experiment.

Step 1. Place some grains of rice on the top of a small drum.

Step 2. Hit the small drum softly.

Step 3. Now, hit the small drum hard.

What happened when you hit the drum softly?

The drum made a small sound. It shook a little.

The rice jumped a little.

What happened when you hit the drum hard?

The drum made a big sound. It shook a lot.

The grains of rice jumped high.

Sound made the drum move.

It made the grains of rice jump.

We saw sound.

Unit 10 Ticking Clock

Jessica is sitting in the living room.

She hears many sounds.

She hears the clock ticking.

Her brother is laughing in the yard.

She can't hear the falling leaves.

"Mom, I can't hear the leaves fall," she says.

"The leaves are small, so you can't hear them,"

Mom says. "Let's see what other sounds are like."

We measure sound in decibels (dB).

When decibels are high, a sound is loud.

The sound of the clock ticking is 20 dB, and the sound of falling leaves is 10 dB.

Unit 11 Different Shadows

We can see shadows all around us.

Sometimes we see dark shadows.

Sometimes we see light shadows.

Why do you think this is? Let's find out.

Step 1. Prepare a clear cup and dark cup.

Step 2. Put the clear cup next to a light.

Step 3. Put the dark cup next to a light.

Did the shadows look different?

First, the light hit a clear object. The light kept going.

It made a light shadow.

Then the light hit a dark object. The light stopped.

It made a dark shadow.

Unit 12 Stop Following Me!

It was a hot day.

Jane was at the lake with her family.

She was running around in the sun.

“Mommy! A little kid is following me! Help!”

Her mom was under a tree. Jane ran to her.

“Oh! Where did the little kid go?” Jane said.

Mom said, “Jane, it’s not a kid. It’s your shadow!”

Jane lay down in the shadow of a tree.

She couldn’t see her shadow anymore.

The tree’s shadow hid it.

Unit 13 Gravity Pulls

Jump up in the air.

Do you come back down to the ground?

Of course, you do!

This is because of gravity.

Step 1. Take a bucket and a paper cup. Poke a hole in the bottom of the paper cup.

Step 2. Put your finger over the hole. Pour water into the cup.

Step 3. Take your finger off the hole. See what happens. The water came out of the hole.

Step 4. Now, put your finger over the hole. Pour water into the cup again.

Step 5. This time, take your finger off the hole and drop the cup into the bucket.

What happened?

The water didn't come out through the hole.

The water and the cup fell at the same speed.

Gravity pulled them both to the ground at the same speed.

Unit 14 A Fallen Apple

Mary was sitting under a tree reading a book.

“Ouch!”

An apple fell on Mary’s head.

There was no wind. Why did the apple fall?

Dad said, “Earth did it. Earth’s gravity pulled the apple down.

Gravity pulls apples to the ground.

It pulls your book to the ground, too.”

“Gravity is so strong!” Mary said.

“Thanks to gravity, you can sit on the ground.

The fish can swim in our pond without floating in the air!”

Unit 15 Modern Farming

Farmers work hard.

They plant seeds. They feed animals. They pick fruits and vegetables.

Farmers use big machines. But the farmers need to help the machines.

In the future, farmers can use computers.

The computers can check the seeds.

They can see when the seeds need more water or sunlight.

Modern farmers can also use small machines.

Small robots can plant seeds.

The farmers don't need to help them.

Modern farmers can grow more food.

They can grow tastier food, too!

Unit 16 Robot Pill

Take a picture of your eyes with your smartphone.

An app looks at the picture. It looks at your eyes.

It knows that you are sick.

You go to the doctor. She gives you a pill.

You swallow it.

There is a robot inside the pill. It fixes your body.

Does this sound possible?

Not now, but in the future, it could be.

Biotech engineers think of new technology like this.

They use this technology to help us stay healthy.