Welcome to Parallel Universe

A Collection of Science Stories for Young Children

Lignin Stories

Esplora Interactive Science Centre

Co-Funded by Erasmus+ Programme of the European Union

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GIRLS AND SCIENCE IN CONTEMPORARY CHILDREN'S LITERATURE

By Sandy Calleja Portelli
and Giuliana Fenech
for

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Dear teachers and parents,

Welcome to Parallel Universe, a collection of science stories and resources for young children.

As the world enters an era of unprecedented change, the United Nations' sustainable development goals become even more urgent. Climate change, health pandemics, economic inequality, racial and gender imbalances are no longer issues that we can afford to ignore or put on the back burner. As these issues force us to rethink our lives and relationship to those around us and the planet, many are left asking how they can make a positive change.

The first step is quality education. It is only by continually educating ourselves and our children that we will be able to overcome the challenges ahead. We need to couple awareness with a solid understanding of the way in which solutions are found. Large scale global problems often make us feel helpless but applying the scientific process to our lives we understand that even at a local level we must investigate what can be done, study the consequences of what we do and collaborate to find better ways of acting.

Both stories and science invite us to ask the question 'What if?' and to explore the various possibilities that arise when we approach the world with an open mind and an open heart. We acknowledge that alongside the world that exists in front of our eyes, there is another that runs parallel, which we have yet to discover. Teaching children the joy of discovery is a lesson that will last for all of their lives.

Through Parallel Universe we hope to provide free access to well-researched resources that acknowledge the power of science to ask the right questions and never give up on finding solutions. We also use stories featuring strong female leads to address the gender imbalance that currently exists in the world of science and encourage more girls to step forward into STEM.

To make it easier for you to use these stories, we link them to core components in primary school syllabi - this means that your children will already recognise some of the topics and themes and the stories will help them to associate with the characters and inspire them to take action. The audio tracks can be downloaded and listened to over and over again. The activities and experiments are entertaining and encourage engagement.

At Lignin Stories we believe that it is only through collaboration and creativity of the most committed kind that we can supercede the challenges that we face. We also believe that science education and increased mobilisation of girls in the fields of STEM are fundamental to healthy, democratic societies that respect life in all forms.

We welcome you to our storytelling community and look forward to hearing about your experiences with sharing these stories.

The Lignin Stories Team

Giuliana, Lara, Sandy

Instructions For Use

1.Watch the training videos that show you the most effective ways of sharing stories with children.

2.Review the story list and table below to decide which story is most relevant to the topic you wish to discuss.

3.Download the story PDFS and story audio.

4.Print a storyboard for use with the children in class or at home.

5.Tell the children the story and choose which activity or experiment to do.

6.Invite the children to create their own story using the storyboard.

7.Review and give feedback on the scientific content in the children's stories.

8.Allow the children to tell their stories or display them.

9.Send the children the story and audio so that they can read or hear it as many times as they want.

10.Review our recommended book lists for all ages.

11.Set up a school or home library showcasing STEM books for your children's age group.

12.Discuss the stories found in the books with your children. Ask them questions about the characters and experiences that they have.

13.If you would like to know more about the research behind this project, read our research report and list of recommended articles.

14.Contact us if you need help: info@ligninstories.com

Story List

Storyboard

Choose your favourite character:

What happens to the character?

Who will help the character solve the problem?

How is the problem solved?

How has your character changed?

How does your character feel?

Contact Details:

Web: www.ligninstories.com

Email: info@ligninstories.com

Story Links to the Curriculum

Water Drop's Big Adventure	Water cycle, weather.
Marija and the Stars	Planets, the universe, gravity, and magnetic fields.
Statika's Scary Storm	Electricity, weather, and energy.
Too Much Cake, Too Little Time	Healthy eating, hygiene, and self-care.
Wendy, the Tadpole	Animal life, animal classes, vertebrates vs invertebrates, and habitats.
Germ Busters	Hygiene, viruses, bacteria, and health.
The Crown Daisy and the Happy Honey Bee	Plant life, photosynthesis, and habitats.
Victoria goes Fishing	Waste management, global warming, and habitat depletion.
Spar Learns about Migration	Weather and climate.
The Harvest and the Bees	Habitats, food chains, resource depletion, urban vs rural living.
Clang, Boom, Bang went the Drums	Sound waves, noise, forces, and states of matter.
Tina and her Turtle Family	Magnets, directional poles, wildlife conservation, and migration.

Water Drop's Big Adventure

BY LARA AGIUS AND GIULIANA FENECH
FOR LIGNIN STORIES

Science Link: *This story can be used to introduce the water cycle and the weather.*

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The day had finally come! It was Water Drop's turn to ride the water cycle roller coaster. She woke up early in the morning and made her way to the top of the waves where she met her friends.

'Good morning, dear sun', the drops shouted happily as the sun began to rise and they began to warm up.

'Ohhhh', they giggled, 'this is so much fun.'

They felt themselves wiggle and wobble. 'Ohhh, I wonder what's coming next', the water drops said.

Water Drop was enjoying every second of this adventure. She felt herself heat up and she knew that the warmer she got, the lighter she became.

The lighter she became, the quicker she could move.

Soon she was ready to jump onto the water cycle roller coaster.

Up! Up! Up!

Water Drop changed into a light airy gas and zoomed up into the sky, high above the sea's surface.

Little Water Drop could see her entire village from so high up in the sky and loved the feeling of racing at top speeds through the air.

The warmer she got, the lighter she got and the higher up she could fly.

Weeeee, Water Drop joined her friends and as they slowly began to cool down, they began to gather together.

The first part of the water cycle roller coaster was finished but the best was yet to come. As little Water Drop and her friends cooled down, they moved in close and slowly made up a soft white cloud. It grew bigger and bigger, softer and whiter as the day went on.

Their friend, the wind, would help blow them in different directions and the little water droplets got to see the beautiful sights of their land.

Together they floated over the deep blue sea from where they came, bright green gardens, over cities and small villages. As they moved from place to place, more and more little water droplets joined their cloud until one day it got too heavy.

As more and more water droplets gathered, the cloud turned from white to grey and soon enough other grey clouds appeared.

Water Drop was happy because she knew it was time to return home.
The air grew cold, the sky darkened and loud claps of thunder could be heard.
The time had come to rain down onto the land.

Water Drop jumped down from the cloud and as she fell towards the earth she wondered where she would end up.
Perhaps she would end up in a little garden and help water a bed of roses, perhaps she would fill up a well and would help the farm animals feel less thirsty. Perhaps she would land in a field and help grow some delicious vegetables or she would land in the street and help clean up the dust and dirt.

The little water droplet was getting closer and closer to the earth and could finally see where she would land.

Plop! Splash! Let the next adventure begin. Water Drop had landed in a small stream where frogs and fish swam freely and little children ran by splashing through nearby puddles. She joined the rest of the water drops and raced down the stream whizzing past beautiful flowers and plants and different animals.

As she finally slowed down, she settled in a little pond and sighed a sigh of relief, feeling tired from her big adventure.

She wondered where the water cycle roller coaster would take her next as she joined the rest of her water droplet friends.

What an exciting adventure, one she would repeat over and over again.

THE WATER CYCLE

Since the very first years of Earth's existence, water has present. No water is ever added or taken away from our atmosphere because it's constantly moving in a water cycle.

Read the definitions below and put the corresponding term in the spaces m, ing each part of the cycle in the diagram.

EVAPORATION: Liquid water is heated by the sun until it rises as water vapour into the atmosphere.

PRECIPITATION: Water falling to the Earth in the form of weather, including rain, sleet, hail, and snow.

CONDENSATION: Water vapour molecules join together, becoming liquid, in the form of clouds.

THE SUN: Creates all of the weather on Earth through the uneven heating of Earth's surface.

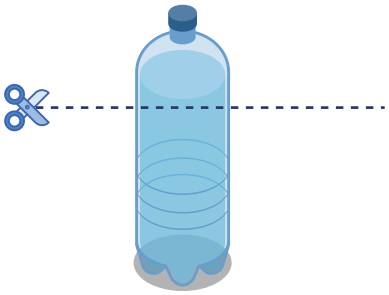
LIQUID WATER: All living things need this to survive and it is an important part of the weather system.

Water Drop's Big Adventure

EXPERIMENTS

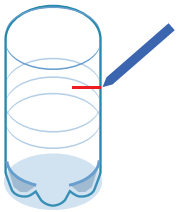
EXPERIMENT 1 - Making a Rain Gauge

1



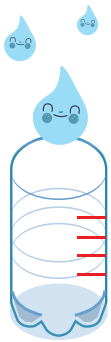
Take any clear plastic bottle and cut off the top giving it a wide opening. You can also reuse any clear glass food jar.

2



Using a ruler and a marker, mark notches in CM along the side of the container.

3



Leave your rain gauge outside in a safe place to collect rain and check in every week or month to see how much rain has fallen in your area.

EXTRA

You can also compare your results to those of your local news and even to those of your region. Does the amount of rain differ from climate to climate? Which country has the most rainfall and which has the least?

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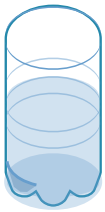
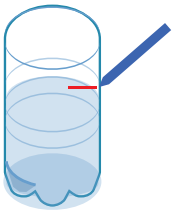
EXPERIMENT 2 - Evaporation

1



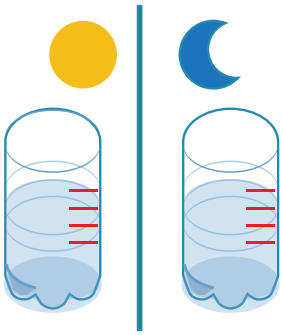
Take a clear container with no lid and fill it up with water.

2



Take a ruler and mark notches in CM on side of the container.

3



Repeat steps 1 and 2. Place one container in a sunny spot in your home and another in a shady spot.

At the end of the week is there any difference between the cups? Which cup has lost more water? Are there other instances you can think of where we are pleased that water evaporates? (Hint: Would you like to wear soggy clothes?)

Marija and the Stars

BY LARA AGIUS AND GIULIANA FENECH
FOR LIGNIN STORIES

Science Link: *This story can be used to introduce the planets and the universe, as well as gravity and magnetic fields.*

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Marija had been waiting for the day when she would finally be able to set up her telescope and look at all the beautiful stars in the night sky.

She waited for the sun to set and carefully packed her bags...apples and carrots in case she got hungry, a big bottle of water, a blanket to keep her warm, a waterproof jacket, and a torch to light the way.

Marija was determined to see the stars and nothing would stop her.

As the sun set, she made her way up a winding narrow path to the top of a small grassy hill. She would come here for family picnics every spring.

Phew! What a climb!

At the top of the hill, Marija carefully unpacked her bags and set up her telescope.

She had read that the glass lenses in her telescope could make small images appear much bigger and had seen pictures of the moon in her book on space. The moon's surface was all bumpy and she wondered if the stars would be the same.

Marija adjusted her little telescope and pointed it towards the sky.

She leaned in and found something very different to what was in her science books. The star she could see…was red! How strange, thought Marija. She began to wonder why the star she could see was red and looked at the chart that came with her telescope.

Marija realised that she had stumbled upon something very special.

It was not a star, it was a planet. Can you guess which one?

Marija had found the planet Mars.

It wasn't very large or very clear but as Marija read on her chart, it was millions of

miles away. She couldn't believe it and staring at the red dot in the night sky, she wondered if a little girl on Mars, was looking down at her.

Marija began to visit her little spot on the grassy hill nearly every night. Slowly, she mapped out all the planets and soon enough she could point out all the star constellations, without even looking at her chart.

Marija read all about the planets and even made up a little sentence to help her remember their order 'My (Mercury) very (Venus) educated (Earth) mother (Mars) just (Jupiter) saw (Saturn) unseen (Uranus) nebulas (Neptune).'

Sometimes Marija would bring her little brother with her and teach him all about the stars and the different planets. Her biggest wish soon was to grow up and become an astronomer and watch the night sky forever. Maybe she would even discover a new planet or work on the space station!

Marija worked very hard for many years to make her dream come true.

Every night she would spend her time looking at planets and stars, exploring the different parts of the universe.

She saw thousands and thousands of memorable things but her favourite remained the planet Mars...that little red dot that started it all.

MARIJA AND THE STARS - BY LARA AGIUS AND GIULIANA FENECH FOR LIGNIN STORIES.

EXPLORE OUR SOLAR SYSTEM

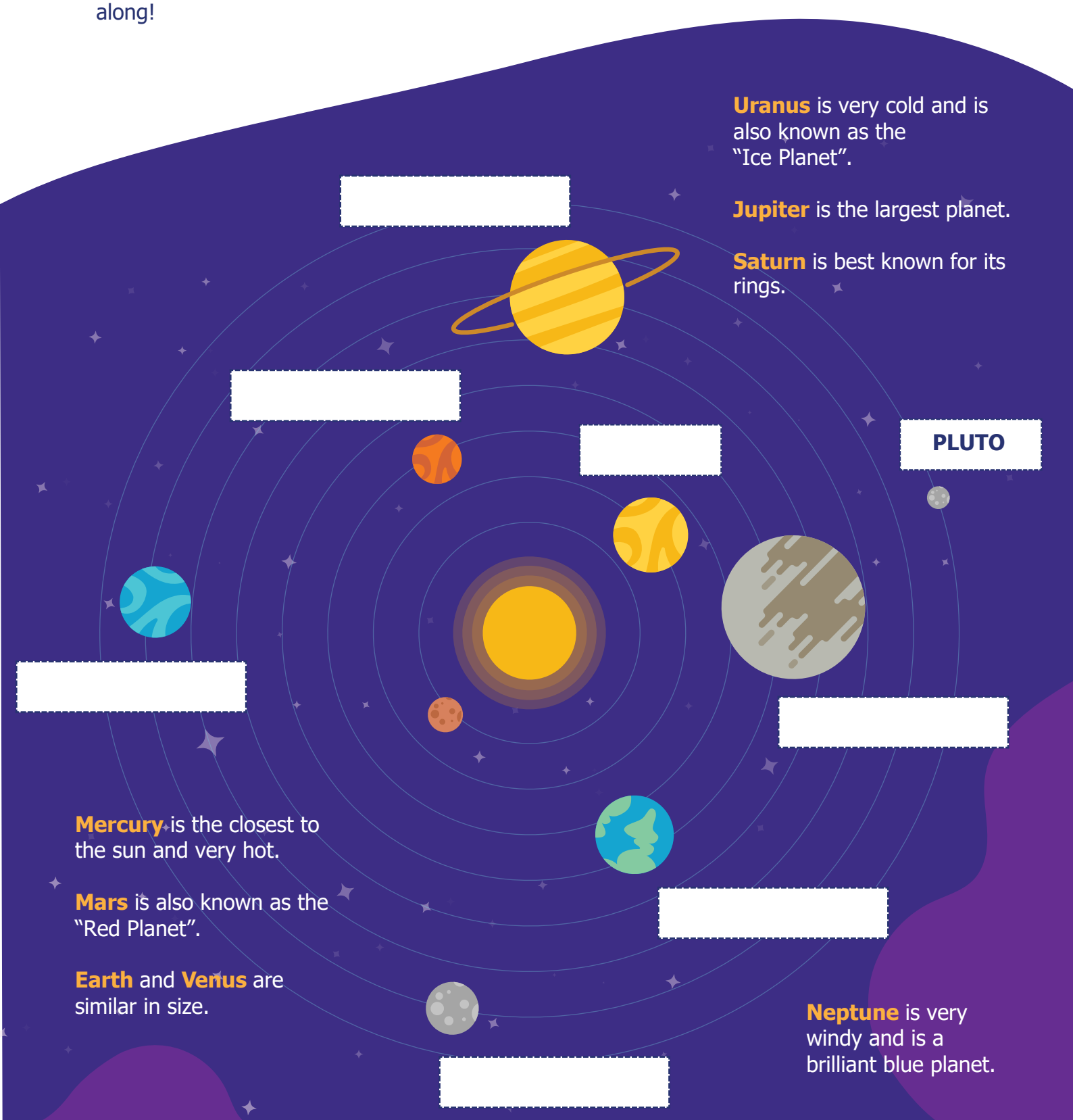
Our solar system contains 9 planets. The asteroid belt separates the inner and outer planets.

Directions: Label the 9 planets (one has been done for you). Follow the hints as you go along!

Uranus is very cold and is also known as the "Ice Planet".

Jupiter is the largest planet.

Saturn is best known for its rings.



Mercury is the closest to the sun and very hot.

Mars is also known as the "Red Planet".

Earth and **Venus** are similar in size.

Neptune is very windy and is a brilliant blue planet.

Marija and the Stars

EXPERIMENT

Mapping the Phases of the Moon

1

Trace the outline of a circular bowl onto scrap paper.

2

Repeat this step until you have 3 circles on 3 papers.

3

Using an eraser and 1 of the papers, erase half of the circle and draw a line down the middle. This will be your half-moon.

4

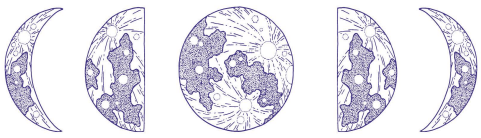
On another paper erase ⅔ of the circle and connect the two ends of the line. This will be your quarter moon.

5

Get creative! Colour in the sky and decorate your moons with white paint.

6

Finally, pin your moon phase maps to your bedroom board so that every night, before bed, you can look up at the sky and match the map to the moon.



EXTRA

You can also track what you see in the night sky!
Are there any planets you can see?

Hint: Look for little stars with different colours.

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Statika's Scary Storm

BY LARA AGIUS AND GIULIANA FENECH
FOR LIGNIN STORIES

Science Link: *: This story can be used to explore electricity, weather and energy.*

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That day the sun forgot to wake up and the sky was black.

It seemed like the winds had come together to blow down all the houses and trees.

The rain clouds were full of water and ready to burst. A perfect storm was brewing and only one thing was needed to complete it...lightning.

A little electron, named Statika, had been woken up by her friends, who were loudly chatting about the news. They finally had a chance to show off the exciting light show that they had been working on for months. They finally had a chance to be lightning!

The electrons had spent days designing and planning out the patterns that they would form in the sky. To form lightning they had to create a special type of electricity called static electricity and to do this they had to break apart the negative charges and positive charges.

Statika listened carefully as the older electrons explained that this would happen when the surface of cold air met the surface of warm air. Sometimes electrons would move from one surface to the other but in this show they would stay still and shine their light, which is why their show was made up of static electricity. Because static means still!

Statika was especially excited because this would be her first performance.

You see, Statika was a very lucky electron. Her cousins Leqqa and Berqa lived in a large house and spent their day running through wires, making all sorts of useful machines work; the fridge in the kitchen, the lightbulb in the office, and the television in the living room.

Statika enjoyed listening to the stories they told about their adventures but she really wished she had a story of her own to tell too.

Today was the day she had been dreaming of for ages. Suddenly, she heard the winds begin to blow a lot harder and she saw the giant grey clouds slowly letting go of the rain. The lightning show was about to start.

Statika and her electron friends lined up and began to charge, waiting for the other electrons to join them. The electrons lined up on two sides.

'Ready, Steady, Go!' shouted Statika.

Together the little electrons formed beautiful jagged lines.

Sometimes they made little zigzags and squiggles and some electrons made shapes that looked like a tree branch. The electrons lit up the sky so much that for a split second, while they were racing through the air, it looked as bright as morning. Statika was delighted. This was even better than she imagined.

WHAT IS LIGHTNING

The flash you see when lightning strikes is a discharge of static electricity between a cloud and the ground. Moving air in a cloud causes ice and water droplets to rub together and build up an electrical charge. The whole cloud builds up with electric charge, with the positive charges at the top of the cloud and the negative charges at the bottom.

Since opposite charges attract, the negative charge at the bottom of the cloud moves away from the positive charge at the ground in the form of a bolt. At the same time, positive electrical charges build up in objects on the ground. In less than a second, the charge reaching down from the clouds meets up with the charge coming up from the ground and lightning flashes.

FIND THE WORDS LISTED BELOW

STATIC CHARGE POSITIVE NEGATIVE
VOLTS BOLT DISCHARGE

N E G A T I V E M D I P A
H S W N W B T W R V Y B H
J L G L D I R Y Y I W S E
C E A D I S C H A R G E P
T S T F K I S B O R B L O
F I L O A V T U T D Q R S
B U O S P A Q C N K S X I
N G B R G L E H E O T U T
S T L O V N F A R K Z O I
D O B U I L C R T R R D V
M N A Y V J X G S E Z U E
A G B R Y Z V E I O N J B
C Z R S T A T I C I H L R

To find out how far away a storm is, count the seconds between a flash of lightning and a thunder clap. It is thought that every five seconds equals a distance of one mile.

Statika's Scary Storm

EXPERIMENT

How to make a Cloud Balloon Storm

1

Take some cellulose paper (or any very thin and light paper) and cut out some small circle shapes. Mark little minus signs (-) on them. These will be your electrons.

2

Put on some white socks and find a nearby carpet.

3

Rub your feet on the carpet for about a minute. This will create a static charge.

4

Spread out your electrons on a flat surface and hover your sock covered feet above them.

5

Just like in the story the electrons stick together.

6

As the static charge disperses the little electrons will fall to the floor just like the electrons in the lightning.

EXTRA

Decorate a white pair of socks by painting them to look like storm clouds.

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Too Much Cake, Too Little Time.

BY LARA AGIUS AND GIULIANA FENECH FOR LIGNIN STORIES

Science Link: *This story can be used to discuss healthy eating, hygiene, and self-care.*

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Co-funded by the Erasmus+ Programme of the European Union

It was Anna's eight birthday and her father spent the day baking a delicious chocolate cake. Anna had already unwrapped the presents, played a few games, and ate some delicious food. She was now excitedly waiting for her favourite part...the birthday cake.

As everyone sang "Happy Birthday", Anna dug the knife into the cake and happily accepted the large piece that her mother handed to her. MMMM chocolate cake was her favourite!

Anna ate it all up very quickly. She even licked the plate clean.

The chocolate fudge cake was the best she had ever tasted and she asked her mother if she could give Buttons, her cat, a piece.

"Chocolate fudge cake isn't good for Buttons", said her mother. "But it isn't bad for me!", said Anna. Her mother explained that different animals need different foods and chocolate fudge cake was not bad for her in small amounts but if she ate a lot of cake, it would be bad for her too.

"But the cake is so good! May I have one more piece?", Anna begged. "No", her mother told her that she would have to wait till the next day to have another slice.

But when Anna went to bed that night she could not get the cake out of her head! When everyone had gone to sleep, she tip-toed to the kitchen and quietly opened the fridge door. "Just one more bite", she thought, " this is so good!".

One bite became two and two became three! She sat on the floor, fridge door open, eating the chocolate fudge cake one spoonful at a time. Soon enough, she had eaten the entire cake.

Anna felt very satisfied but something was not quite right. Her stomach was grumbling and rumbling, and it began to hurt a little. She went to bed and tried to sleep,hoping that when she woke up in the morning it would be better.

Anna lay on her bed, groaning and clutching her stomach. "Oh no", said her mother when she came in to say good morning, "we had better call Dr Stella".

"Other than an upset stomach, is anything else hurting?", asked Dr Stella. Anna shook her head. "And did you eat anything different yesterday? Anything that you usually do not eat?" asked the doctor.

Anna knew she could not keep her secret for much longer and so she admitted to the doctor and her parents that she had snuck down to the kitchen and eaten the rest of the cake.

Dr Stella began to laugh.

She explained to Anna that her stomach was hurting because that was way too much cake.

They had a long conversation about the kinds of food that make us feel well and those that taste good but do not have a good affect on our body.

Dr Stella showed Anna pictures of foods that contain too much sugar and explained how they would make her teeth decay. She would gain weight and feel very tired.

If Anna wanted to be healthy and live a long life, she had to eat fruit and vegetables, even though she liked cake best.

From that day on, Anna always remembered that one slice of cake was enough!

FUN FITNESS FOR KIDS!

WHAT'S YOUR NAME?

Spell out your full name and do the activities for each letter! Get creative and spell out your friends name too.

A *16 Jumping Jacks*

B *2 Min. Jumping Rope*

C *20 Arm Circles*

D *15 High Kness*

E *10 Pushups*

F *12 Squats*

G *10 Frog Hops*

H *2 Min. Jogging in Place*

I *Hop on One Foot 5 Times*

J *Crawl like a Crab for 10 Seconds*

K *3 Somersaults*

L *Bend Down & Touch Toes 20 Times*

M *3 Cartwheels*

N *15 Side Way Lunges*

O *10 Jump Squats*

P *Balance on Right Foot for 15 Counts*

Q *20 High Knees*

R *15 Frog Hops*

S *20 Jumping Jacks*

T *Toy Soldier March for 15 Counts*

U *30 Arm Circles*

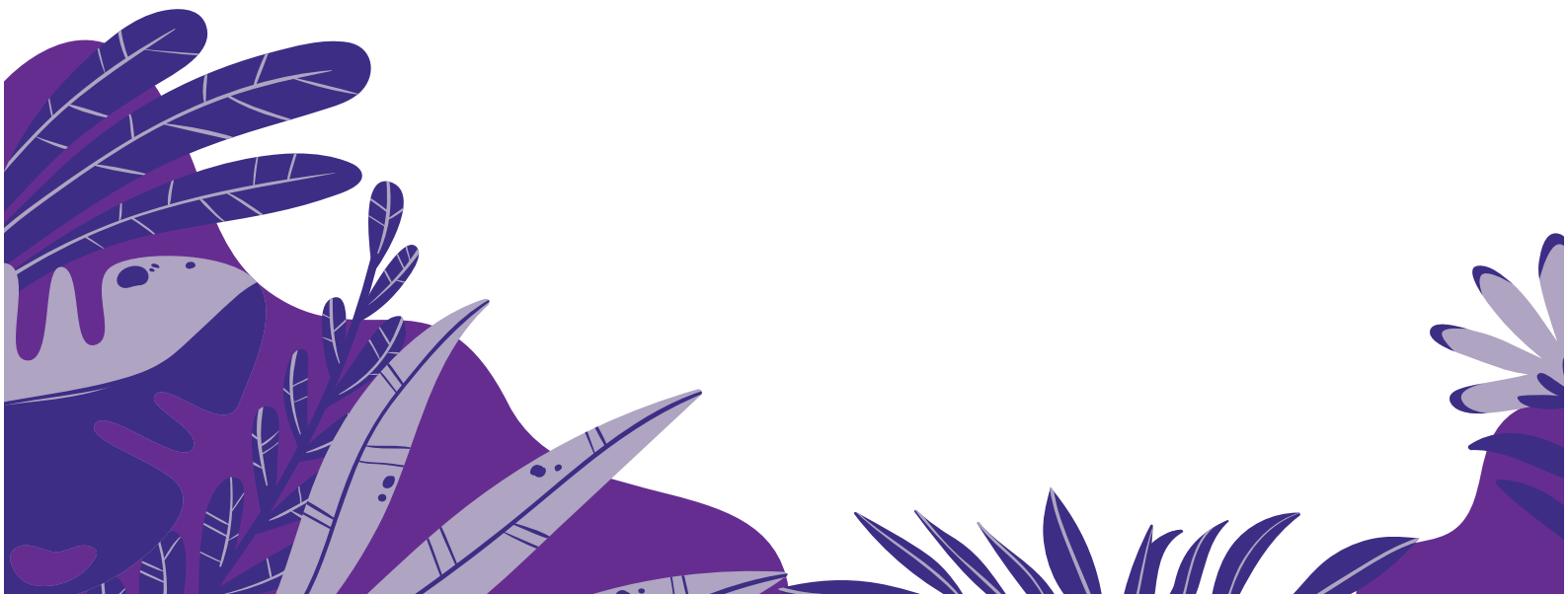
V *8 Pushups*

W *1 Min. Jog in place*

X *Touching the Clouds for 10 Counts*

Y *Balance on Left Foot for 15 Counts*

Z *1 Min. Jogging in Place*



Too Much Cake, Too Little Time.

EXPERIMENT

Creating a Sugar Quiz

1

Gather some foods from your cupboard. Check their labels to see how much sugar is in each. *(This could be listed under carbohydrates section).*

2

After you gather the information from different foods, put together 3 empty glasses, some sugar, and a set of scales.

3

In one glass, weigh out the amount of sugar of the food item you looked at. In the other two glasses put as much or as little sugar as you like.

4

Now test your friends and family! How many times did they guess which glass had the real amount of sugar? Were there any foods that surprised them?

TIPS

Don't just look at sugary foods like fizzy drinks and sweets btu also include cereal,sauces and, frozen foods. The results may surprise you.

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Wendy
the Tadpole

BY LARA AGIUS AND GIULIANA FENECH FOR LIGNIN STORIES.

Science Link: This story can be used to introduce the topics of animal life, animal classes, vertebrates vs invertebrates, and habitats.

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In a small stream, far away from the busy streets of the city, an exciting thing was happening as a few hundred eggs were getting ready to hatch.

First, one little egg cracked open and then the next and the next until soon all of the little creatures inside were making their way down to the stream, letting the gentle waves guide them to a large pond.

All of the little eggs had hatched. All except one.

While her brothers and sisters made their way down to the pond, little Wendy was still slowly escaping her egg.

She was so happy to finally be free but suddenly she realised that none of the others were around because they had already reached the pond.

Wendy was healthy, a very good swimmer and born knowing how to find food but there was one small problem. She wasn't sure exactly what she was. Looking around her Wendy saw a school of fish swimming by. They were very strong swimmers and looked very much like Wendy.

A fish! That's what I am, she thought. A fantastic fish who would spend her entire day swimming around the pond and feasting on algae. But as the days went on Wendy realised that she could breathe above water. The fish couldn't do that. Maybe she wasn't a fish.

As she was swimming around, Wendy looked up and saw a little mosquito settling on top of the water. The mosquitos lived close to the water and could skate on the surface very well.

A mosquito! That's what I am, she thought. A marvellous mosquito who could spend the day skating on top of the water. But as Wendy continued to grow she realised she didn't want to be a mosquito... she wanted to eat them!

As Wendy grew larger and larger, she noticed that two little legs were forming. Legs! How exciting. As she admired her legs, she noticed something moving close to the water's edge, it was a little lizard.

A lizard! That's what I am, thought Wendy. But then she thought about how the lizards never swam in the pond. Wendy loved swimming too much to be a lizard. Maybe she wasn't a lizard … but what else could she be? As Wendy grew bigger and stronger, her tail grew shorter and her legs grew longer.

One day, Wendy saw a little girl running around the stream. She enjoyed playing in the water and just like Wendy she had two arms and two legs.

A human! That's what I am, thought Wendy. But when she tried to stand up like the little girl, she couldn't do it.

Wendy began to feel sad. What if she never found out what she was meant to be? What if Wendy was the only one of her kind?

Wendy grew bigger and bigger and soon enough her tail had disappeared and her black skin turned into a beautiful green colour with pretty patterns. She was different to all the other creatures at the pond. The only other colourful creature that she could see was a small red robin who was busy building her nest.

A bird! That's what I am, thought Wendy. Wendy tried to fly up high to see what the little robin had in her nest and suddenly found that she could jump super high!

Jumping? Well, she could not fly like the birds but she was the best jumper she had ever seen. As she hopped towards the water, Wendy saw something that made her incredibly happy. Across the stream, she saw a little frog hopping towards her.

'A frog! That's what I am!', yelled Wendy. She was finally happy to know exactly what she was; a frog. And so, she spent the rest of her life jumping from place to place and swimming in the stream.

Wendy was happy to be herself because in her little part of the stream there was no one else who could jump as high or swim as fast. What a wonderful thing to be; a frog.

Wendy the Tadpole

EXPERIMENT

Making a Species Log Book

1

Find a notebook and title it 'Species Log Book'.

2

Looking around your home, what type of beings do you find? Are there any insects? What birds fly overhead?

3

In your log book, note down what class you think the species belong to, what they look like, how they move, get around, and even what they eat.

4

Take your log book with you as you explore other areas. What type of animals do you find at the beach, in gardens and in woodland areas?

creative SDGs

Co-funded by the Erasmus+ Programme of the European Union

Germ Busters

BY LARA AGIUS AND GIULIANA FENECH
FOR LIGNIN STORIES.

Science Link: This story can be used to discuss hygiene, viruses, bacteria, and health.

creative SDGs

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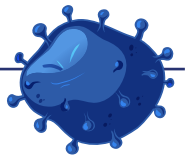

The big school sports day was just around the corner and everyone was super excited, especially Penny and her classmates. They had spent the entire month marking down the days until it arrived.

The class decided to name themselves The Locomotives, picking green as their class colour. Everything was set for a fantastic sports day until … they heard that germs were going around.

It wasn't an ant or a spider. It wasn't a fly or a grasshopper. It was the kind of germ that made you really ill.

All of The Locomotives tried their best to avoid getting sick but it seemed like everyone around them was sneezing and sniffling.

'No', they cried, 'We cannot afford to be sick just before the big sports day!'

They had to come up with a solution to keep the icky germs at bay.

'Well, mummy has a special spray that she uses when bugs come into the house! It smells a bit bad but it always works. We can spray the school and kick out all the germs then no one else will get sick', said Victoria enthusiastically.

'Victoria, the germs that make you sick are so small that we can't see them! I think we should make ourselves a giant bubble each and stay inside of it' Greta suggested. 'That way the germs can't get in.'

A very excited Marija got up next. 'I know! We can all wear superhero capes? Superheroes never get sick.'

All the students began arguing over the best way to keep from getting sick. Suddenly, Penny stood up and shouted, 'None of those things will stop us from getting sick!'

'Then what can we do to keep from getting sick?' wailed Victoria.

'Keeping clean is a good first step. Germs, bacteria, and viruses are all around us but there are some simple things you can do to help fight them off. Wash your hands before and after you eat or touch your face, cover your mouth and nose when you sneeze and cough. Eat healthy food that makes you stronger.' explained Miss Tessie.

'Is it really that simple Miss Tessie? Is that all we need to do?' asked Penny.

'Keeping yourself clean is only half the battle. Sometimes, even though we try our best to keep up great hygiene, bacteria and viruses can slip through. Still, our body helps us with this problem because inside of us we have an army of little helpers that help fight off any viruses or bacteria that slip through. We call this system our immune system and the best way to keep it working well is to eat healthy food and exercise.'

All the students followed Miss Tessie's advice and sure enough the Locomotives stayed healthy.

When sports day finally arrived, Miss Tessie's students were full of energy and determination.

They were so happy to be well that they decided to change their team name to Germ Busters.

They had a lovely day playing with their friends. Miss Tessie had been right all along.

The Germ Busters managed to stay healthy by doing a few simple things. Who knew that it could be that easy?

Three cheers for the Germ Busters!

DAILY HYGIENE CHECKLIST

- [ ] Brush my teeth in the morning.
- [ ] Wear clothes that smell good.
- [ ] Make sure my shoes don't smell.
- [ ] Use deodorant.
- [ ] Wash my body and clean everywhere.
- [ ] Make sure that my hair is neat.
- [ ] Cover my mouth when I cough or sneeze.
- [ ] Wipe well after using the bathroom.
- [ ] Brush my teeth before bed.
- [ ] Wash my hands before eating.
- [ ] Keep my nails trimmed.
- [ ] Use a tissue to blow my nose.

HYGIENE IS VERY IMPORTANT!
Make sure that you're keeping yourself clean and healthy every day.

GERM Busters

EXPERIMENT

How well do you wash your hands?

1

Empty some poster paints or washable paints into a plate.

2

Dip your hands in the paint.

3

With your eyes closed, wash your hands with water for as long as you normally wash them. Did you manage to get all the paint off?

4

Repeat the experiment keeping your eyes closed but this time add soap.

5

Repeat the experiment yet again with soap but this time count to 20.

Were there any areas you repeatedly missed?

The Crown Daisy and the Happy Honey Bee

BY LARA AGIUS AND GIULIANA FENECH
FOR LIGNIN STORIES.

Science Link: This story links to the topics of plant life, photosynthesis, and habitats. You can use this story to discuss different types of plants and their flowering nature.

creative SDGs

Co-funded by the Erasmus+ Programme of the European Union

On the balcony of a big house in a country village, there was a little plant waiting patiently for the day she would bloom.

Every morning, the little plant would wake up to see if she had bloomed overnight but the day had not yet come. Every morning, the little plant would observe and admire all the other plants that Anna and her mother had planted in the balcony garden.

Among these plants, there was the prickly pear that had grown so large it had taken over an entire side of the balcony.

The prickly pear cactus would produce fruit once a year. The little plant would watch as Anna and her mother picked the delicious fruit and enjoyed tasting its sweet flavour.

How large the prickly pear cactus is! thought the little plant.

The prickly pear was able to store water for months and didn't even need anyone to water her. And those spikes, thought the little plant, Wow! She can protect herself from any animals or creatures who try to hurt her. I wonder if I will be able to do that when I bloom, thought the little plant.

Will I make fruit when I bloom? wondered the little plant. I would be able to gift people delicious food and then they would be so pleased!

Sometimes the little plant would look at the giant Aleppo pine tree that had been in the garden long before she had been planted. The Aleppo pine tree was so large that in summer it would cast a shadow over the whole balcony, protecting Anna and all the other balcony plants from the sun. In winter, the large branches would keep little birds and insects safe from the cold and when the pine tree would drop its pine cones, the little plant would watch as Anna collected them and made beautiful art.

I wonder if I will protect all the other plants in the balcony and provide a home for all those pretty birds, thought the little plant.

As the days went by, Anna would check on the plant every day making sure she got enough water and sunlight to bloom.

The little girl had a great love for plants. She was kind and patient and never minded waiting for each seed to take its time before it blossomed.

Her patience was always rewarded and on one sunny spring morning the little plant bloomed into a beautiful crown daisy.

All the plants in the balcony, even the prickly pear cactus and the Aleppo pine told the daisy that she looked beautiful and she did! She was the only bright yellow flower in the garden but the little daisy seemed upset because she was not strong, could not make food and could not provide any shelter unlike her other plant friends.

She was the prettiest flower in the entire balcony but she felt upset that she could not help in any way. The little crown daisy began to cry.

Suddenly all the plants in the balcony heard a soft buzzing noise as a small honey bee approached them.

She landed on the little flower and whispered, 'Little crown daisy, you are so pretty and full of pollen. May I take some of your pollen back to my hive to feed my babies and some of your nectar to make delicious honey?' asked the honey bee.

The little crown daisy was overjoyed as the honey bee picked up some pollen on its back legs and flew to her hive to share the good news.

When Anna made her way to the garden balcony to water the plants, she saw that the daisy had bloomed. She watched the different honey bees land on the pretty flower.

The little crown daisy could not store water for months or grow fruit or shelter the birds but she could help the honey bees and make Anna happy. The little crown daisy was important too.

The Crown Daisy and the Happy Honey Bee

EXPERIMENTS

EXPERIMENT 1 - Grow your own vegetables.

1

Cut off the end of an onion where the roots grow.

2

Pass 2 toothpicks (or a large skewer) through the onion horizontally.

3

Place the onion, roots side down, into a cup water.

4

Every day make sure to change the water and watch as little white roots begin to sprout.

5

When the roots are about an inch or so long, plant your onion in a pot with soil. Water every few days.

6

Watch your little onion grow and try this method with other root vegetables.

EXTRA

While onions are delicious for us to eat they cannot help our bees! Either try keeping some flowers in your garden, balcony or roof or make a simple bee syrup by mixing some honey or sugar with water. Make sure to place the sugar solution in a shallow dish as little honey bees are not good at swimming.

creative SDGs

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The Crown Daisy and the Happy Honey Bee

EXPERIMENTS

EXPERIMENT 2 - Making a flower chart.

1

Find a flower and cut the stem off. Any flower will do but remember not to pick protected flowers and not to damage the plant. We only need 1 flower so make sure to leave any others for the buzzing bees to pollinate.

2

With the help of an adult carefully seperate the stem, the petals, the leaves, the seeds in the centre, and shake off any pollen.

3

Place your flower parts between 2 pieces of baking paper. Put in an oven on low heat for 30 minutes.

4

When they are done, the flower pieces will be dry and can be kept forever.

5

Stick your flower pieces to a piece of cardboard. Label the different parts and note what they are used for.

EXTRA

Did you know that some flowers can be made into teas, others are edible and some can even make beautiful dyes?

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Victoria goes Fishing

BY LARA AGIUS AND GIULIANA FENECH FOR LIGNIN STORIES.

Science Link: This story can be used to discuss waste management, global warming, and habitat depletion.

creative SDGs

Co-funded by the Erasmus+ Programme of the European Union

Victoria loved nothing more than going fishing with her grandpa. Every summer, she would spend days and days on his little boat waiting for a fish to bite the bait. She liked fishing because it was still and silent and because her grandpa would tell her stories of his childhood.

When Victoria caught little fish, she would throw them back into the sea so that they could grow a little bit more and lay some eggs. Her grandpa had taught her that if she did that there would always be plenty of fish left in the sea and they could continue to go on more fishing adventures.

One morning, as Victoria and her grandfather sat quietly waiting for the fish to come and bite the bait, she noticed something strange in the water. The sea around their boat was full of rubbish! She saw yogurt cups and plastic bottles floating by. She saw empty sweet packets and juice boxes. She even noticed a particularly bright neon green flip-flop floating by without a partner.

Victoria and her grandfather tried to continue fishing but no fish came by and when she thought she had caught a fish she reeled in a small piece of fishing net instead. Victoria felt sad.

It became clear to her that the water had become too dirty for the fish to live there so they had all left and the beautiful reef below had turned grey. But what could she do to fix it? After all, she was only one little person.

Her grandfather suggested that they try to collect some garbage from the beach so that it wouldn't end up in the water. Within minutes they had filled up a full bag but when they paddled out to sea again the reef was still grey and the fish were nowhere to be seen.

The next day they tried again. This time Victoria picked up two bags of rubbish but it still made no difference.

She felt very sad but being a strong and determined young girl, she did not give up. Soon enough Victoria was spending entire days picking up rubbish from the beach and soon, much to her surprise, other people joined her.

All through summer, Victoria and her new friends cleaned the beach.

The word spread and villagers and townsfolk from nearby places came to lend a hand. Some helped clean up, others sorted out waste and some even took out their boats to collect rubbish that was in the sea.

One day, many months later, Victoria and her grandfather took their little boat out to sea again.

Her heart was beating really fast as she tried to imagine what the sea would look like after so many months of cleaning up.

Grandpa squinted his eyes trying to look into the distance when, suddenly, a huge school of shiny silver fish swam right past their little boat. They seemed to be laughing!

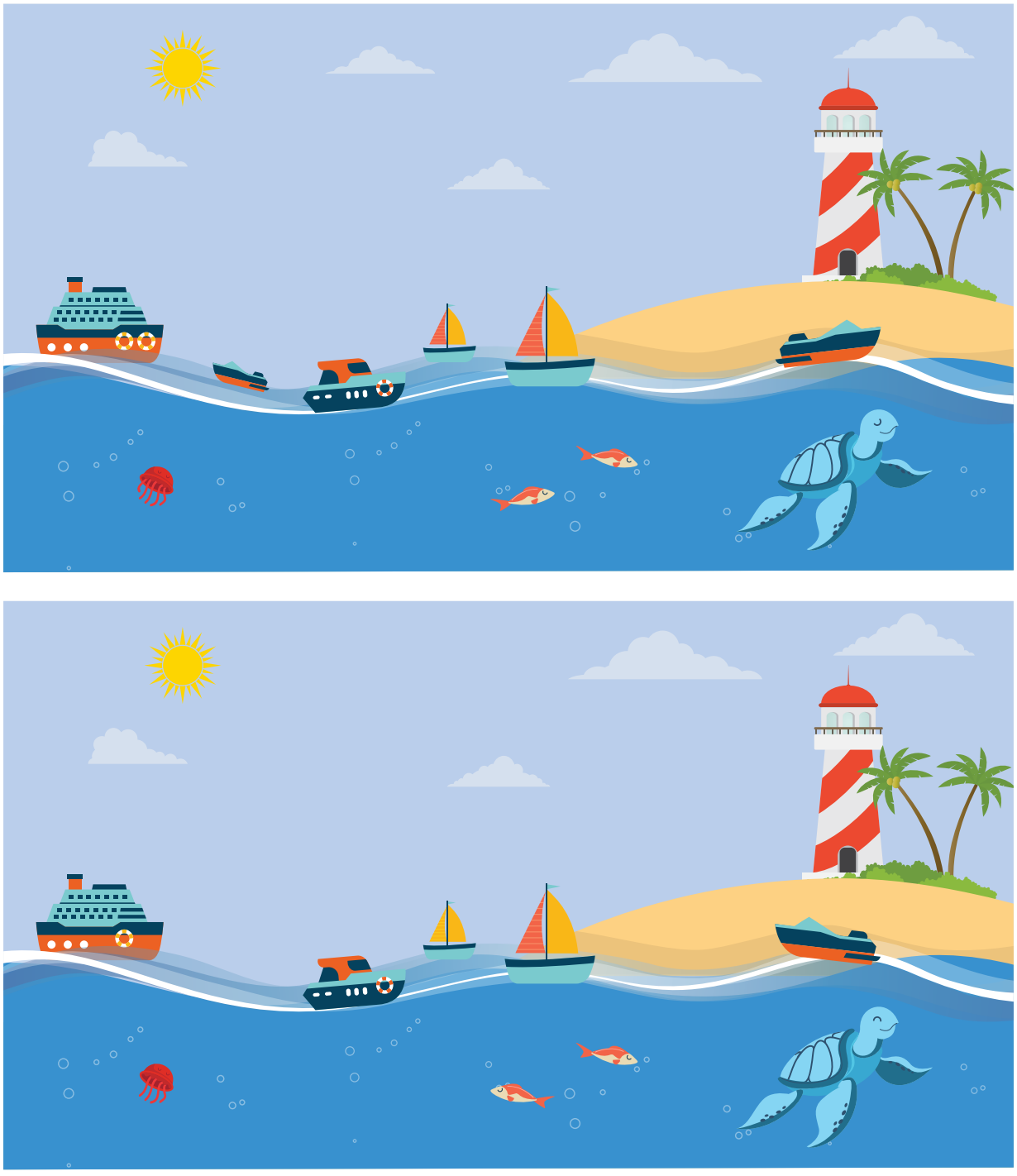
Victoria and grandpa looked at each other and smiled. Hurrah! They had done it.

The sea was full of fish again and the reef below had come alive with corals, seaweed, and colourful crabs scurrying along.

Victoria could not believe her eyes. She jumped into the crystal-clear waters for a better look and spent the rest of her day swimming and exploring the wonders of the sea.

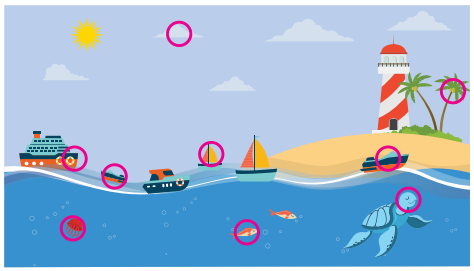
If she could help to restore one beach what else could she do? This was only the beginning!

FIND 9 DIFFERENCES



FIND 9 DIFFERENCES

SOLUTION



Victoria goes Fishing

EXPERIMENT

A Bin Audit.

1

Find a pair of gloves and clear a table.

2

Take out your recycling bin and sort your waste into similar items. For example; bottles on their own, food tubs on their own, etc.

3

Take note of what you use most in your household and double check that is has been cleaned properly. Remember that recycled materials should be cleaned before being disposed of in the bin.

4

On a sheet of paper, write down your most common recycled items and have a think about what you can replace them with. Can you replace water bottles with a reusable glass one? Is there a way to purchase some food items in bulk by using your own containers?

EXTRA

Clear an afternoon and go for a quick walk. Take a bag and a pair of gloves. Pick up any waste you find and see what the most common waste around you is.

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Spar Learns about Migration

BY LARA AGIUS AND GIULIANA FENECH FOR LIGNIN STORIES.

Science Link: This story can be used to discuss the differences between weather and climate.

creative SDGs

Co-funded by the Erasmus+ Programme of the European Union

At the very top of a very tall tree there was a little sparrow called Spar. Spar was waiting for the day when she could finally fly. Oh, how she dreamed of being able to fly above the tree tops and see the beauty of her forest!

One morning, when Spar was practising wing flapping in her little nest a red robin landed on the branch above. Spar had never seen a red robin before but she noticed that this little bird was eating a lot of food and she couldn't help but think that it must be rather greedy!

Before long another bird flew by. This time Spar saw a beautiful kestrel and could not help but notice its large claws and beak. The kestrel was much larger than Spar was and she wondered why it had such sharp talons and such a strong beak.

Spar, perched on her branch, was wondering why she looked different to the other birds when she was startled by a loud sound. It was the sound of northern shoveler ducks that were crossing beneath Spar's tree to get to the nearby beach.

As Spar peered down, she noticed that the ducks had webbed feet. How odd, she thought as she looked at her own feet which looked very different to the ducks, I wonder why their feet look so different.

When Spar's mother returned to the nest Spar was excited to share all she had seen. 'Mother, today I saw a red robin fly by and and he was eating so much food.'

'That is because he is a migrating bird, my love. He moves from country to country looking for warm places and it seems the place he is visiting next is a long way away so he must store some food for the journey', explained Spar's mother.

'But what about the kestrel falcon? Why does it need such sharp talons and such a strong beak?' asked the curious Spar.

'The kestrel falcon uses its sharp talons to grip onto the rocky cliff faces and its strong beak help it catch its moving prey', explained her mother.

'But what about the shoveler ducks? Why are their feet so strange mother?'

'Because they use them to swim, of course. Their webbed feet help them swim quicker and further, my dear.'

'A bird that swims, a bird that stores a lot of food, and a bird that lives within the cliffs. But what are they all doing in our little forest?' asked the very confused Spar.

'They are migrating. You see, Spar, different parts of the world have different climates. Some places have dry deserts and others have icy glaciers. When you learn how to fly you too will migrate, moving from one country to another.'

Little Spar was confused. 'But mum what is a climate, isn't it the same as weather?'

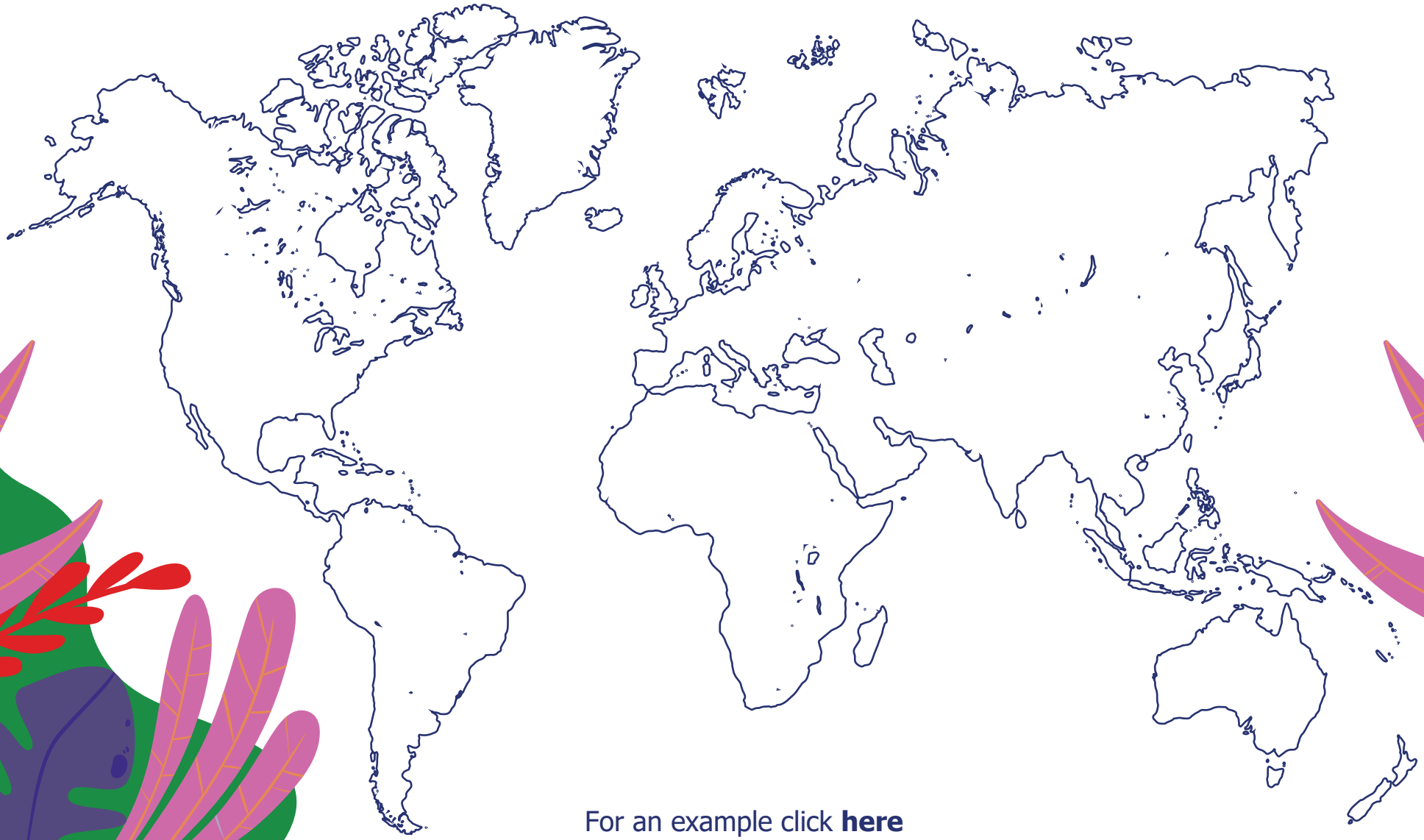
'Oh no', said Spar's mother, 'You see, Spar, weather changes from day to day or season to season. Today could be sunny tomorrow could be rain'.

'The climate, on the other hand, does not change. Think of a desert. Deserts are always dry and hot and have been that way for many years. The weather can change daily but the climate stays the same for at least thirty years. Sometimes even longer. So even if it were to rain today in the desert, it would still be a dry and hot place most of the time.'

Little Spar was excited for the day when she could learn how to fly so she would never have to experience a cold rainy day again. She wanted to fly high, in sunny skies, no matter where she went.

COLOUR IN THE DIFFERENT CLIMATE ZONES

Temperate = Green **Mediterranean** = Orange **Arid** = Yellow **Tropical** = Red **Polar** = Blue



For an example click **here**

Spar Learns about Migration

EXPERIMENT

Cross country comparison.

1

Divide a paper into 4 sections. Paint one section as a desert, one as a jungle, one as a polar cap, and one as a moderate climate.

2

Try to think of an animal that exists in a number of climates. For example, bears exist in both moderate climates and polar ones.

3

Can you list what differences there are between the animals? How do they change to adapt to their climate?

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The Harvest and the Bees

BY LARA AGIUS AND GIULIANA FENECH
FOR LIGNIN STORIES.

Science Link: This story focuses on habitats, food chains, and resource depletion. It can also be useful to discuss urban vs rural living.

creative SDGs

Co-funded by the Erasmus+ Programme of the European Union

There once was a swarm of honey bees that lived in the woods for a very long time. Their hive home had been the same for years and all the animals who lived near and around them were happy because there was never too much or too little of anything. Everything was always just right.

In these woods, there was also a cottage where a farmer called Martha used to live. The little creatures adored Martha's beautiful garden because it was full of fresh herbs, fruit, and flowers. The honey bees liked the fruit and flower plants the most because they enjoyed pollinating them each season.

They spread pollen from plant to plant, allowing each plant to grow fruit and flowers.

As the plants grew, tiny insects nibbled on their leaves.

The birds gobbled some of the little insects.

When all the fruit was harvested, the rabbits ate the remaining plants.

And at the end of the harvest, Martha opened the beehive and gathered a little bit of honey to add to her tea.

And so it went, year after year, until suddenly, one morning in the new season the honey bees looked around for the plants and found nothing.

No big plants or small plants. No bushy plants or lean plants. The earth was completely dry and barren.

It was as though no seeds had been sewn. In fact, Martha had planted some seeds but she was beginning to take her garden and harvest for granted. Becoming distracted she thought that the garden may plant itself but of course as the season slowly passed, the little garden remained empty and the creatures became hungry and weak.

They had no choice...since there was no food for them they had to leave their home and venture out into the woods.

First, the insects left because they could not find any leaves to munch on.

The garden, usually filled by newly hatched butterflies, had none.

Then the birds, that woke singing their beautiful song, left too as there were no insects to gobble.

After the birds, the rabbits were forced to leave because their families were going hungry. They had to go in search of food. The little garden in the woods had lost all the beautiful colours of the butterflies, the comforting buzz of the insects, and the sweet song of the birds. Everyone had left.

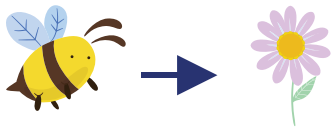
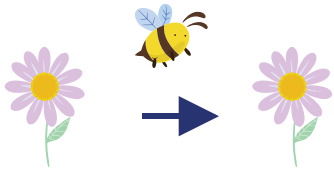
Everyone but the honey bees who would spend the day flying around the woods looking for different flowers to pollinate. At the end of a tiny harvest, Martha went to check on her hive of honey bees and found that they had not made much honey. The poor little bees seemed tired and upset and their population seemed to have gotten smaller. When she tasted the honey from the honey comb it did not taste as sweet.

Martha realised that over the past few years she had not given her garden as much attention as it needed and had planted fewer plants and shrubs. Every time that she harvested the crops, she had taken away the homes of many different animals and had not replaced them.

Feeling sorry and sad, Martha promised the little honey bees that she would plant her little garden again for the next season and it would be bigger than it ever was.

When the next season rolled in, Martha kept her promise and planted more flowers and fruit plants than she ever had before. Slowly, all the creatures returned to their garden. The little animals were happy as the garden came back to life. The honey bees were excited to see that all their friends had returned and they pollinated even more plants than ever before. Martha sat in her little garden, with a cup of honey tea, listening to the singing birds and smelling her sweet flowers. All was good again.

HOW BEES POLLINATE FLOWERS

STEP 1	STEP 2	STEP 3
 A bee flies to a flower.	 The bee collects pollen.	 The bee spreads pollen from flower to flower.

DRAW IT

DRAW A BEEHIVE.

DRAW A POT OF HONEY.

Name and draw 3 flowers that bees pollinate.

The Harvest and the Bees

EXPERIMENT

Building a Bee Haven.

1

Create a container garden for bees to feed off. Using an old wooden or plastic box, add some compost and seeds. Select single flower tops like daisies or marigolds for your garden as these provide more pollen. Place in your balcony, garden or roof top. Water frequently. The flowering plants will provide the bees with some much needed pollen to help them make their delicious honey.

2

For those months where flowers are scarce, make your little bee friends a sugar solution by mixing some sugar/ honey with water and keeping it in a shallow dish. Place the dish outside and refill it frequently.

3

In the hot summer months, put out some water in a shallow dish for the honey bees to drink.

4

Make sure you do not use pesticides on your plants and try to buy honey from local beekeepers.

creative SDGs

Co-funded by the Erasmus+ Programme of the European Union

Clang, Boom, Bang Went the Drums

BY LARA AGIUS AND GIULIANA FENECH
FOR LIGNIN STORIES.

Science Link: This story can be used to discuss sound waves and noise. It can also be used as an introduction to forces and states of matter (the relationship between sound and vibrating gas particles).

creative SDGs

Co-funded by the Erasmus+ Programme of the European Union

Anna woke with a fright. All she could hear was loud clanging and banging coming from the room above her. She knew exactly what it was that had woken her up that morning. It was her younger sister, Katarina, who happened to be playing her drums.

Katarina had been learning to play the drums for a few weeks and she was quickly getting better at them but this meant that, every morning, Anna had to wake up to the sound of loud banging. She loved her sister but summer holidays were a time of rest and relaxation and waking up early was really not on her agenda at all.

As Anna grumpily made her way to the kitchen for breakfast, she was playing out different conversations with her sister in her head. Somehow she had to stop that awful racket first thing in the morning! 'Katarina, your drums are too loud.' 'Katarina, your practice is driving me crazy!' 'Katarina, if you don't stop waking me up every morning with the sound of your drums, I will…'

Suddenly her mother's voice broke through these thoughts with happy news. 'Come on, Anna, snap out of your day dreams and get ready. We are off to the beach today.'

Distracted by the thought of the beach, Anna forgot all about her sister's practice, changed into her swimsuit, and ran to the car.

At the beach, Anna and Katarina swam and played for hours. They dived under the water, trying to hear what the other person was saying but much to their surprise they could not hear each other clearly. Everything sounded a bit muffled and dull.

Suddenly, Anna had an idea, wouldn't it be great if Katarina could practice drums under water?

When they arrived home, she began to think about their game and wondered why she could not hear her sister underwater. She began experimenting to see what could make her sister's drumming a bit quieter.

First, she tried a blanket. The sound was slightly less loud but her sister could still make out everything she said. Then she tried speaking from behind the glass door of their balcony. Very little sound could be heard. She tried to speak from behind a door, through sheets of cardboard, from behind a stone wall. How interesting, thought Anna, the different thickness and material changes how loud the sounds are.

After the experiment, Anna and Katarina collected some blankets, cardboard and carpets and went up to Katarina's room. First, the girls laid a nice fluffy carpet below the drum kit. Then, they closed the windows and covered them with some thick pieces of cardboard. Finally, they folded a blanket up into a thick roll and covered the gap between the door and the floor.

When they were finished, Anna ran down to her room and Katarina began playing the drums. To her surprise, Anna could barely hear Katarina! The carpet, cardboard, and blankets had almost completely stopped the sound from travelling into Anna's room.

The next morning, Katarina woke up early to practice playing her drums. Usually, Anna would come running up the stairs to tell her off but now Anna was sound asleep in her bed.

Their experiment had been a success. Katarina played her drums every morning that summer and Anna got to sleep in her bed and dream for just a little bit longer.

Clang, Boom, Bang Went to the Drums

EXPERIMENT

Guess the phrase.

1

Find a friend or family member who can help you with this experiment.

2

Write some phrases down on pieces of paper. Take a few each and keep them secret.

3

For the first round, try listening to the phrases from behind a door. Repeat what you hear back to your friend and see how much you can understand.

4

For the second round, repeat with new phrases but from behind some glass. Does it sound different to what you heard from behind a wood door?

5

For the last round, wear headphones and to listen to the phrases again. Is it more difficult to listen with the music playing? Other than the sound, what else did you use to understand the phrase?

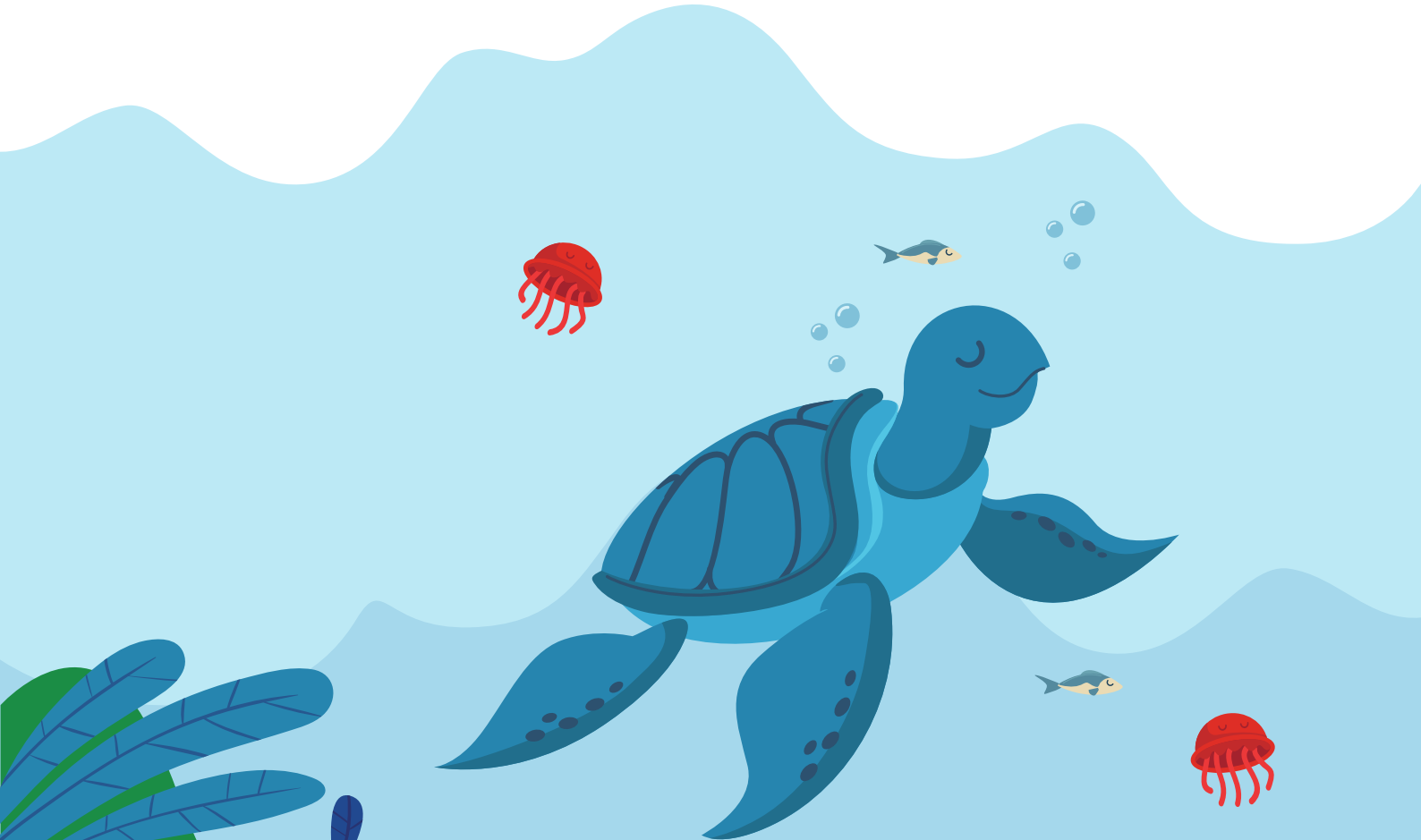
EXTRA

Play the 'guess the phrase' game in different places. Try it underwater, try it standing far away from your friend, try it in the wind. Notice how the sound changes and how little or how far it travels with these distractions.

Tina and her Turtle Family

BY LARA AGIUS AND GIULIANA FENECH
FOR LIGNIN STORIES.

Science Link: This story can be used to introduce the topic of magnets and directional poles. It can also be used to discuss wildlife conservation and migration.



creative SDGs

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She was tired. Tina had been swimming slowly towards the shore all day and all night because it was time to lay her eggs. The mother turtle finally arrived at the beach right before the sun set. She dug a hole and carefully laid her eggs inside, covering them with sand to keep them safe. Once she doubled-checked that all was well, Tina made her way back to the water. Her children would know what to do next.

After a while, the little turtle eggs began to hatch and the baby turtles dug their way up through the sand, leaving the safety of their egg behind. They ran towards the shore, excited to have their first swim. As the water touched their fins, they leapt forward in delight about to start their very first adventure.

The baby turtles were already incredible swimmers, zooming past the crabs and corals living on the reef, the giant whales, and some delicious jellyfish, which they ate.

As they swam on and on, the turtles saw white gulls flying above them. They were migrating to a different country and forming lots of shapes in the sky. Every now and then, the gulls swept down to eat small fish that swam too close to the surface. The baby turtle wondered how the gulls had learnt to do that and how they knew where to go. Over time, the tiny turtles that hatched on the shore had become strong, large adults who swam with ease through the blue seas until it was their turn to lay eggs. The summer was coming to an end and the water was cooling down when all the turtles began to swim back towards the shore where they were born.

But how did they know where to go?

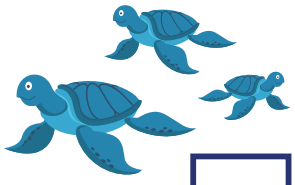
Just like the whales and the gulls, the turtles used the magnetic fields of the earth to find their way back home. No matter where they ended up, no matter how far away it was the turtles, the whales, and the gulls could find their way back home using magnetic fields. It was as if the animals had a map and compass with them to always show them the way.

It was finally the turtles' turn to test their skills and sure enough they managed to find their way back to the beach where they were born. The tide helped push them to shore and the turtles found a safe spot to lay their eggs in the sand.

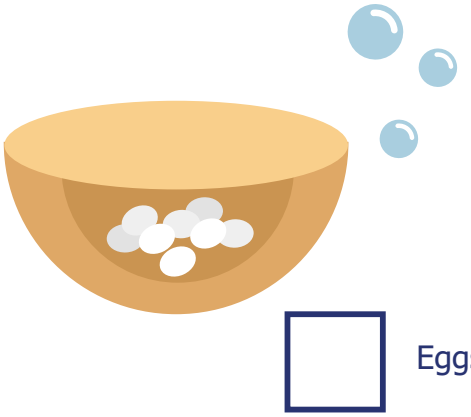
After they had dug their holes and covered their eggs in sand to keep them safe, the new mama turtles did exactly what Tina had done. They patted their little ones goodbye and headed off to the next adventure at sea. Tina lived a long and happy life, enjoying her family grow more and more each year.

THE LIFE CYCLE OF A TURTLE

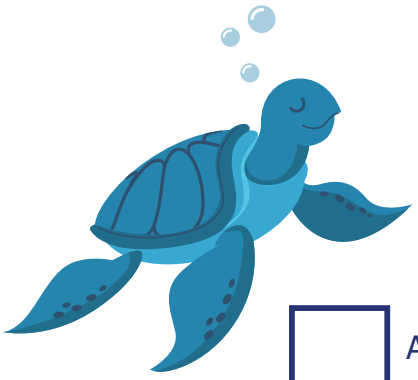
Below is the life cycle of a turtle. Number each step of the cycle in order, using numbers 1 - 5.



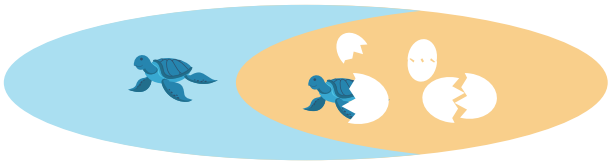
Juvenile ☐



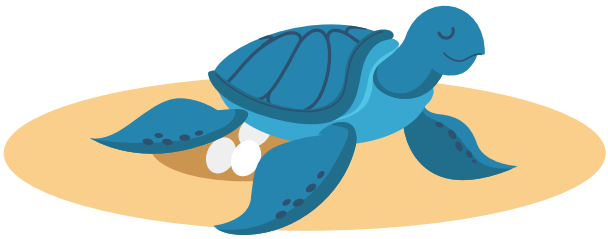
☐ Eggs



☐ Adult Turtle



☐ Hatchling



☐ Spawn