3rd and 4th class

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Contents

Designed by: Carmel Horgan

Meet the Vist

Hi! I'm Hallie the Holstein-Friesian!
My coat is black and white and my breed comes from the Netherlands.
Cows like me can be found in over 150 countries because we are the most popular type of cow used for dairy.

Hello! My name is Monty and I'm a Montbéliarde. My breed is from France and my coat is red and white. I like warm weather and my milk is great for making cheese.

Hiya! I'm Josie the Jersey cow!
I am from an island between France and the UK called Jersey.
I have a black nose and my coat is light brown. My breed may be one of the smallest dairy cows but we are great at making milk.

Designed by: Carmel Horgan

amilk Gang!

VistaMilk

Hey! I'm Flick and I'm a Fleckvieh. (The 'h' is silent.) My coat is almost the same as my friend Monty's but sometimes cows like me have red spots around their eyes. My breed is from Austria.

Hi! I'm Brona the Brown Swiss! My family is from Switzerland, the land of cheese, and we have a mix of brown and light brown on our coats. Like my friend Josie, I also have a black nose.

Hello! My name is Nora and I'm a Norwegian Red. My coat is red with patches of white and my breed are found in Norway. As you can see with my friends, some cow breeds are named after the colour of their coat or where they're from.

Designed by: Carmel Horgan

Lesson Plan: Circuits

VistaMilk

Date:	Class level: 3rd/4th Class	Subject: Science	Lesson topic: Circuits
Strand(s): Energy and Forces	Strand unit(s): Electricity; Light	Lesson duration: 30 mins to 1 hour	

Identify the Skills/Concepts: Observing; Exploring; Planning; Making; Evaluating

Organisational Strategies for Teaching and Learning: Whole class followed by individual work

Learning outcomes:

The children will be enabled to...
- Discuss electricity as a form of energy
- Investigate current electricity through simple circuits
- Create and test their own circuit

Assessment Strategies: Teacher observation; peer assessment; self-assessment

Resources/Materials:

- Cardboard cow-out from workbook
- Tape
- Scissors
- Tinfoil
- Battery
- Light bulb

Introduction:

- The lesson can begin with a discussion about electricity and circuits prompted by teacher questioning
- Then the teacher can explain that the class are going to be using electricity when they make their own circuit today. The children can work individually or in pairs/groups if required

Key questions:

- What is energy?
- What is electricity?
- What is electricity used for?
- Where does electricity come from?
- What is a circuit?

Development:

- Put the bulb through the hole in the cut-out (from the workbook) and tape it down without covering the wires.
- Tape the battery to the back of the cut out without covering the ends of the battery.
- Fold two pieces of tinfoil and place them touching both of the wires of the bulb and both ends of the battery. (see illustration in workbook)

Key questions:

- Has everyone followed the instructions carefully?
- What is flowing through our circuits?
- What will happen if we detach one piece of tinfoil?

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Designed by: Carmel Horgan

Lesson Plan: Circuits

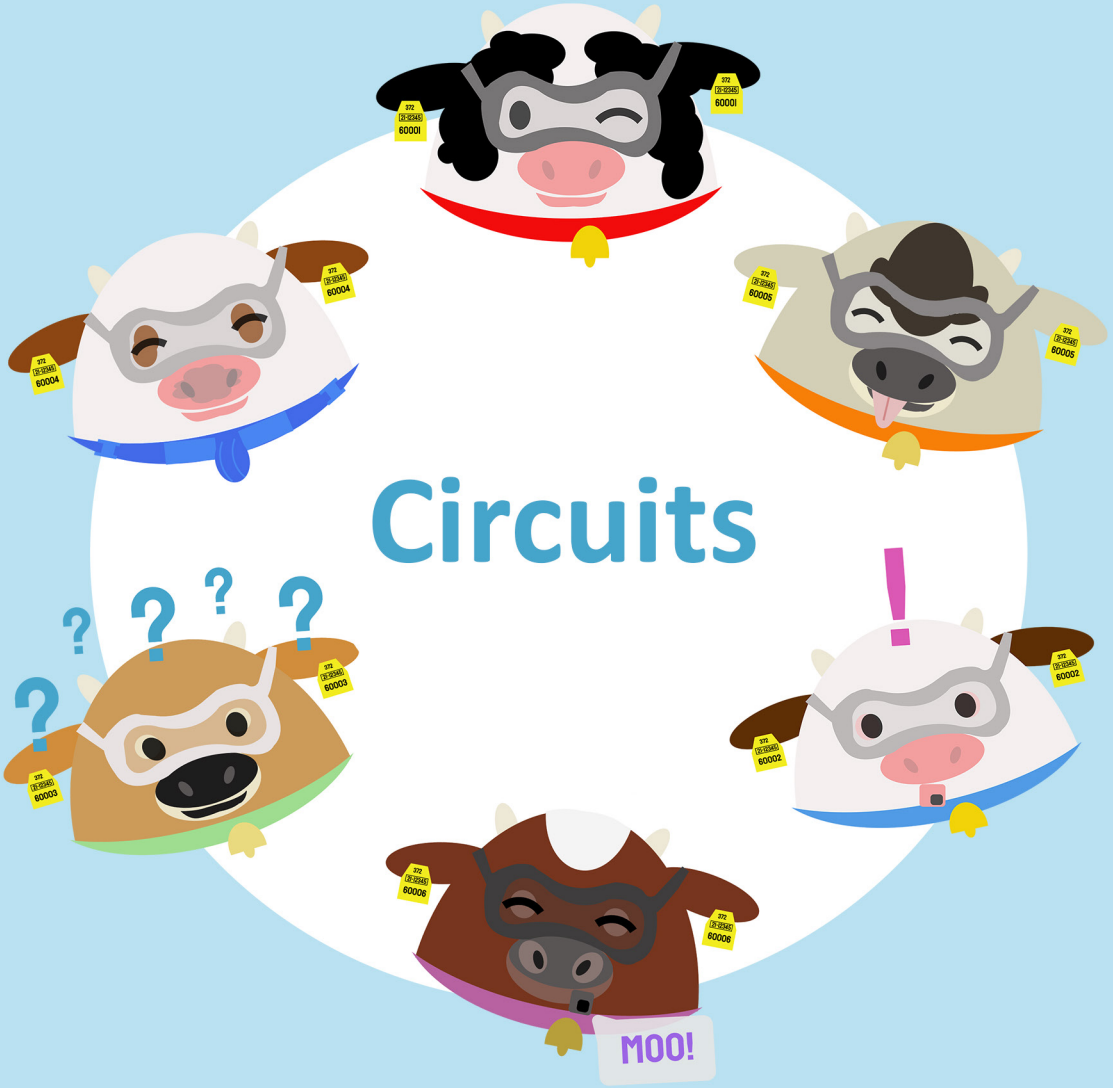
VistaMilk

Conclusion:

- To conclude the class can discuss what they achieved and where this applies in the real world.

Key Questions:

- What did we create?
- Would it work if we remove the battery?
- Where might we find circuits in our classroom?
- Could our battery be used to power the whole school? Why not?
- Are you happy with your circuit. Why/Why not?



Written by: Eoin O' Shea
Designed by: Carmel Horgan

Lesson Plan: Morse Code

VistaMilk

Date:	Class level: 3rd/4th Class	Subject: Science	Lesson topic: Morse Code
Strand(s): Energy and Forces	Strand unit(s): Light; Communication	Lesson duration: 20 mins to 1 hour	

Identify the Skills/Concepts: Analysing; Recording and communicating;

Organisational Strategies for Teaching and Learning: Whole class followed by pair work

Learning outcomes

The children will be enabled to…
- Discuss why and how morse code relates to computer science
- Solve a morse code problem using a key
- Create a morse code problem

Assessment Strategies: Teacher questioning; teacher observation; peer assessment; self-assessment

Resources/Materials:

- Morse code key
- 2 sheets of paper
- Pencil
- Torch

Introduction:

- The lesson can begin with a brief discussion on how computers communicate. They don't speak English, they speak binary (lots of 1s and 0s). Today the class is going to speak binary but instead of using 1s and 0s we will be using dots and dashes.
- The teacher can then demonstrate that flashing the torch for one second means a dot and flashing it for 3 seconds means a dash.

Key questions:

- Where do we see computers in our lives?
- Why is it important not to rush our morse code?
- How might we keep track of the morse code message?

Development:

- The teacher can then a message in morse code using the torch
- Using the morse code guide, the class can then try to translate the morse code message. Whoever translates the message correctly fastest wins.
- The children can then get into pairs/small groups and have one child be the sender and the other be the receiver
- The sender writes down the message, making sure not to show the receiver, and then uses the torch to send the message.
- The receiver then writes down the message and uses the morse code guide to decode it after.

Key questions:

- Why is it important not to miss a dot and/or dash?
- Is the sender flashing the torch clearly?
- Is the receiver taking down the message before decoding it?

Designed by: Carmel Horgan Written by: Eoin O' Shea

Lesson Plan: Morse Code

VistaMilk

Conclusion:	Key Questions:
• To conclude the children can share the messages they sent/received and how they managed to decode the morse code.	• Were you able to decode the message? • Were you happy with your own message?

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Designed by: Carmel Horgan

Lesson Plan: The Tyndall Effect

VistaMilk

Date:	Class level: 3rd/4th Class	Subject: Science	Lesson topic: The Tyndall Effect
Strand(s): Forces; Materials	Strand unit(s): Light; Materials and Change	Lesson duration: 30 mins to 1 hour	

Identify the Skills/Concepts: Observing; predicting; Investigating and experimenting; Measuring; Recording and Communicating

Organisational Strategies for Teaching and Learning: Whole Class followed by group work

Learning outcomes

The children will be enabled to…

- Discuss that light is a form of energy
- Explore the relationship between light and different solutions
- Plan and carry out a light investigation

Assessment Strategies: Teacher questioning; teacher observation; peer assessment; self-assessment

Resources/Materials:

- Beakers
- Sugar
- Milk
- Flour
- Teaspoon
- Dropper
- Torch

Introduction:

- The lesson will begin with a discussion on what light is prompted with questioning from the teacher
- The teacher can then explain that today the class are going to be investigating how light travels through different liquids. The experiment can be done in groups of 3 – 6.

Key questions:

- What is light?(a form of energy)
- What is energy?
- Where does light come from?
- Does light always look the same?

Development:

- Each group needs 4 beakers, which they fill half way with water
- Add a few drops of milk (using the dropper) into one beaker and stir. The water should become cloudy.
- Add a teaspoon of sugar to the second beaker and stir it until it dissolves
- Add a teaspoon of flour to the third jar and stir.
- Do not add anything to the fourth beaker of water
- Darken the room if possible and shine the torch through each of the liquids (one at a time)
- Observe how the light travels through each liquid. (Look down into the beaker from above)

Key questions:

- Describe how each liquid looks?
- Did everyone follow the instructions carefully?
- What can you see?
- Did you record your observation?
- Was it what you expected?

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Lesson Plan: The Tyndall Effect

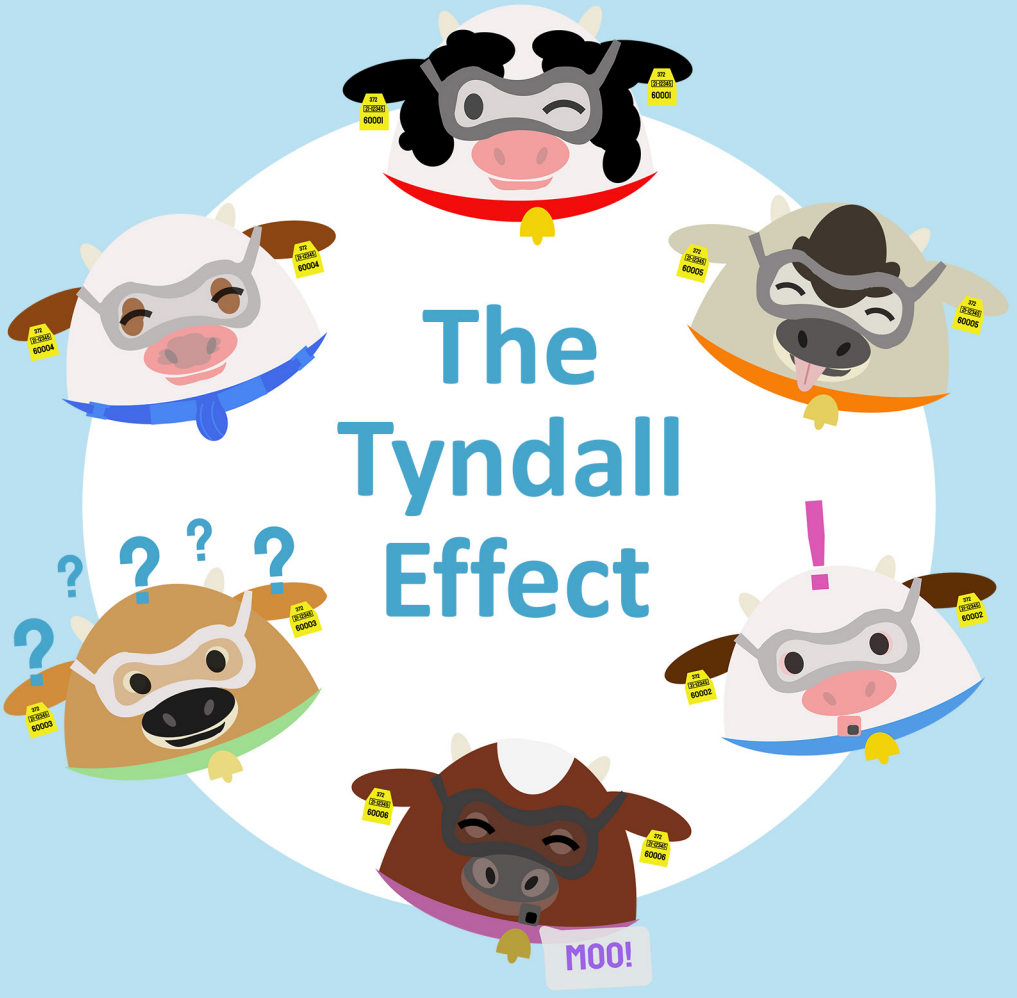
VistaMilk

Conclusion:

- To conclude each group can share their results and any conclusions they drew from them.
- The lesson can finish with a discussion as to why the light travelled differently through the different liquids.

Key Questions:

- What were your results?
- Did this experiment tell us anything about the liquids?
- Can you explain your results?



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Lesson Plan: Earth Observation

VistaMilk

Date:	Class level: 3rd/4th Class	Subject: Science	Lesson topic: Earth Observation
Strand(s): Environmental awareness and care	Strand unit(s): Electricity; Light	Lesson duration: 20 mins to 1 hour	

Identify the Skills/Concepts: Exploring; Making; Evaluating; Estimating and Measuring; Analysing

Organisational Strategies for Teaching and Learning: Whole class followed by individual and pair work

Learning outcomes

The children will be enabled to…
- Explore and become familiar with some human and natural features of the locality
- Develop a sense of the relative size of these features
- Create their own map based off an original
- Establish and use cardinal compass points

Assessment Strategies: Teacher observation; teacher questioning; peer assessment; self-assessment

Resources/Materials:

- Map of school/village
- Pencil
- Tracing paper
- Colouring pencils

Introduction:

- The lesson can begin with a class discussion around the printed map of the school village.

Key questions:

- What features do you see?
- What is the biggest/smallest feature?
- How do we know this map is accurate?

Development:

- The children will then create their own map by tracing the original. The children should leave a small space at the top to title their map once they finish it
- Each child will place the tracing paper over the original map and trace the boundary of the school and other nearby features
- They can then colour these features as they like
- The whole class can then have a discussion on how to draw a compass on their map. The teacher can model this process.
- The children can then present their maps to the rest of their table and take questions from the other children.

Key questions:

- Is your tracing paper staying in the same place until you are completely finished?
- Are the features similar in size to the original map?
- What was the hardest/easiest feature to draw?
- If we can find North how might that help us draw a compass?
- Did you notice anything about someone else's map?

Written by: Eoin O' Shea
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Lesson Plan: Earth Observation

VistaMilk

Conclusion:

- To conclude the teacher can ask the children about the positions of the various features (North, South, East or West)
- Finally the children can compare their map to the original and share anything they did really well or anything they might change slightly next time.

Key Questions:

- What is on the [direction] side of your map?
- Where is the [feature] on your map?
- What are you happy with/would change next time?

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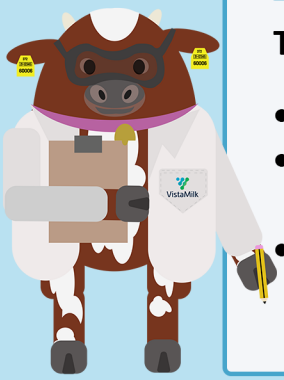
Learning Outcomes

Circuits



The children will be enabled to…

- Discuss that electricity is a form of energy.
- Investigate current electricity through simple circuits.
- Create and test their own circuit.

Morse Code

The children will be enabled to…

- Discuss why and how morse code was used in the past.
- Introduce how morse code relates to computer science.
- Solve a morse code problem using a key.
- Create a morse code problem.

The Tyndall Effect

The children will be enabled to…

- Discuss that light is a form of energy.
- Explore the relationship between light and different solutions.
- Plan and carry out a light investigation.

Earth Observation

The children will be enabled to…

- Explore and become familiar with some human and natural features of the locality.
- Develop a sense of the relative size of these features.
- Create their own map based off an original.
- Establish and use cardinal compass points.

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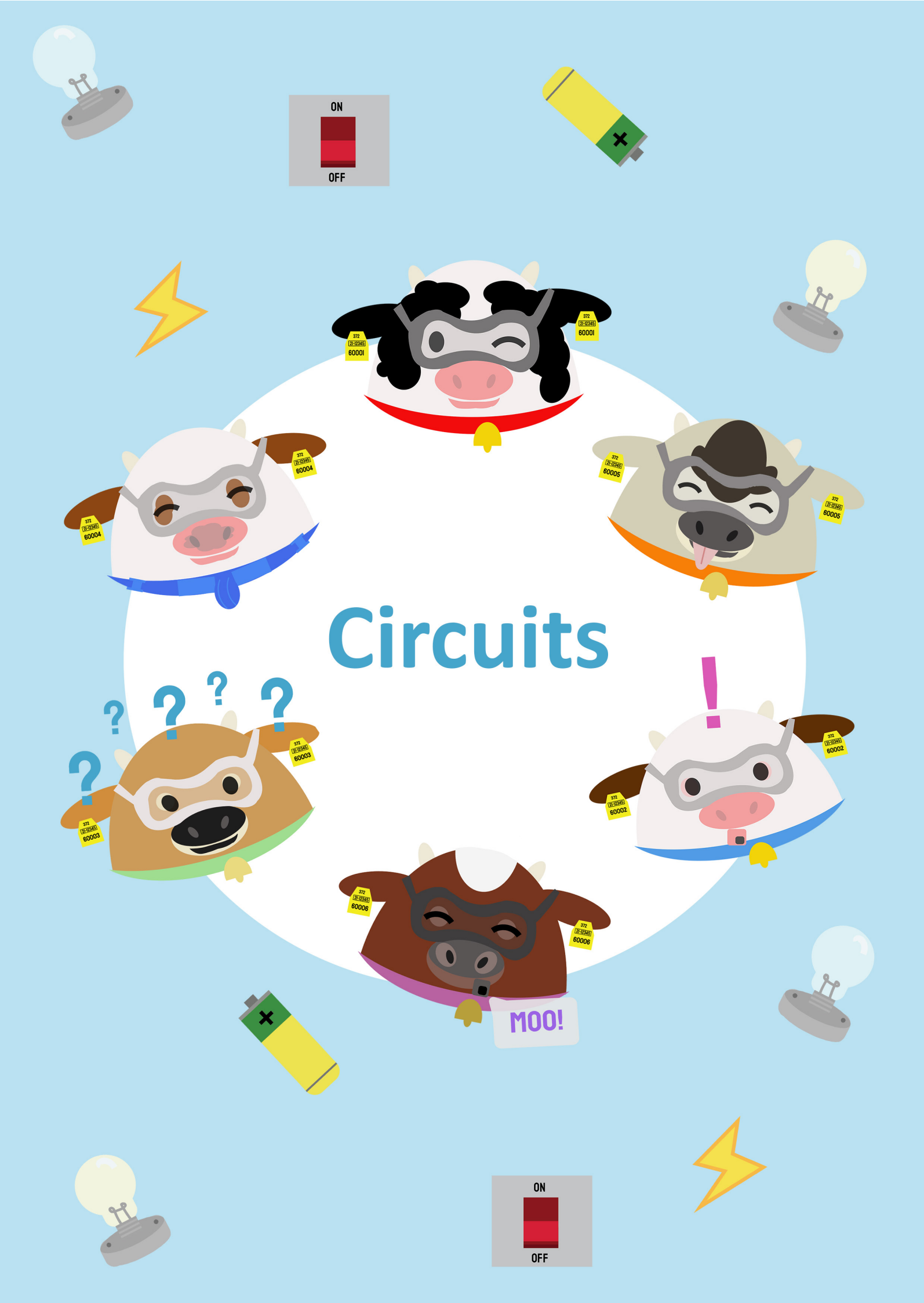

ON
OFF
Circuits
MOO!
ON
OFF

Meet the Researcher...

Hi! My name is Fiona!

I'm a final year PhD student at Tyndall National Institute.
I am from Ireland.

I work on electrochemical sensors. Sensors are little devices that sense things in the environment around them such as light, touch, temperature, gases or chemicals. Electrochemical sensors combine chemistry and electricity. An example of a sensor includes light up runners that light up when you walk – this is a touch sensor.

I helped develop the circuits activities. The activities highlight how circuits are created and how electricity flows through them to power lights. The electrochemical sensors I work on are part of a larger circuit. Recent advances in circuits have allowed the creation of portable handheld devices with sensors in them that can be used to detect diseases in cows. The sensor I'm working on will be able to tell from a cow's breath if it is sick or not.

Key Words

Battery - a source of power that stores electric energy.

Buzzer - an electric device that makes a buzzing sound.

Circuit - an electric current flows through it when closed.

Conductor - something that allows electricity to flow through it.

Electricity - a type of energy.

Insulator - something that does not allow electricity to flow through it.

Switch - something that turns on and off.

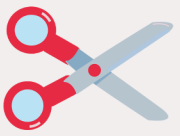
Wire - a metal thread that carries electrical currents.

Designed by: Carmel Horgan

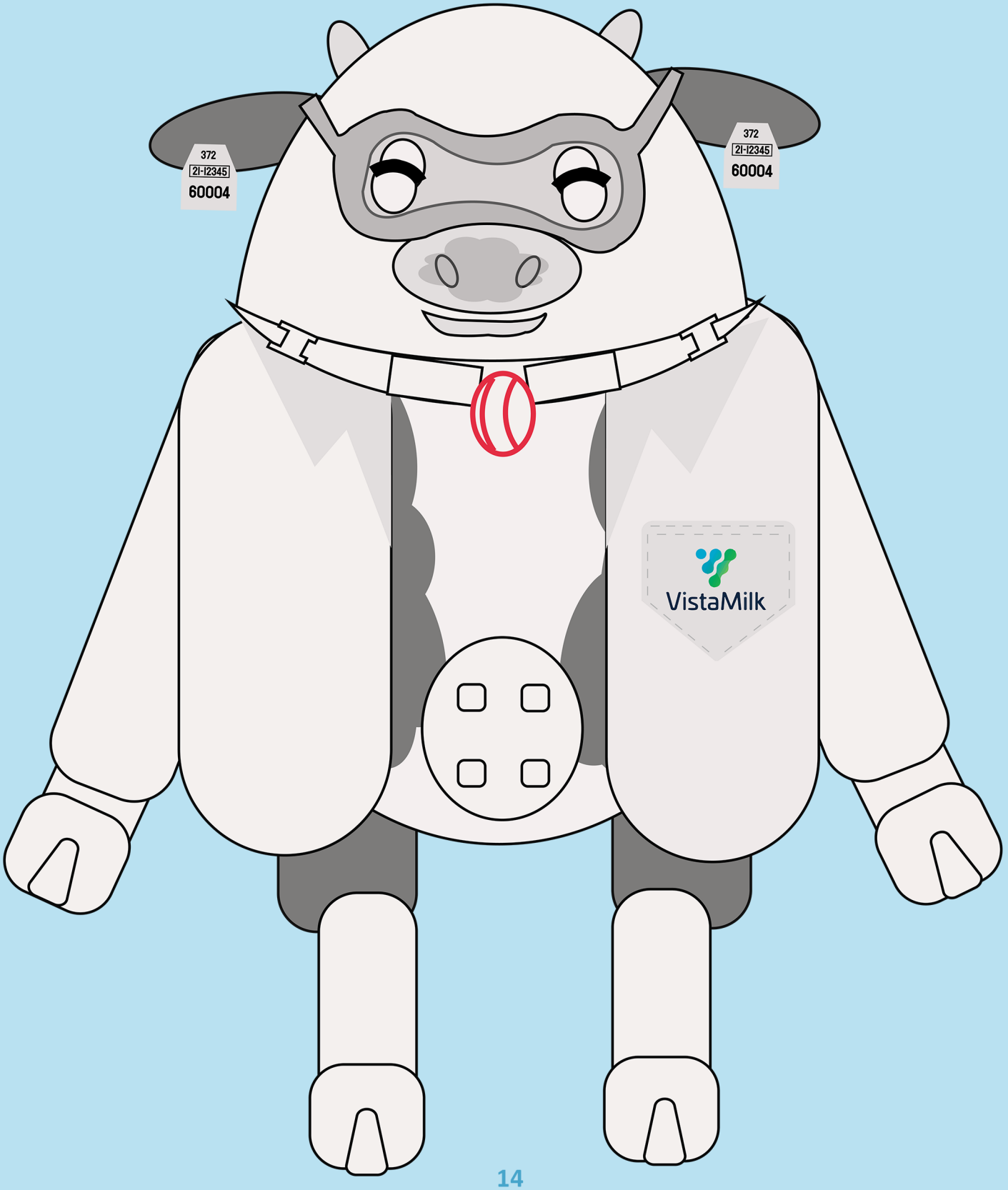
Circuits

+ -

1. Colour Flick the Fleckvieh and cut her out.



2. Cut out the red circle on her collar. This will be a hole for the bulb in the activity on the next page.



+ Circuits -

WHAT YOU NEED:


Cardboard cut-out


Tape

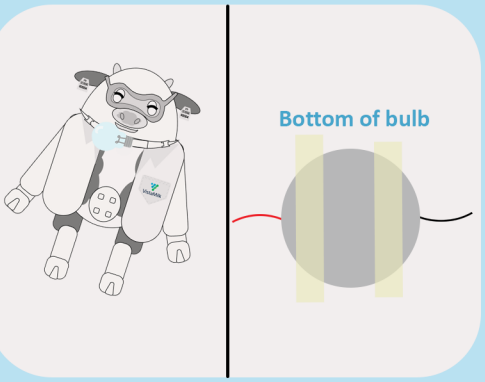

Scissors

Tinfoil

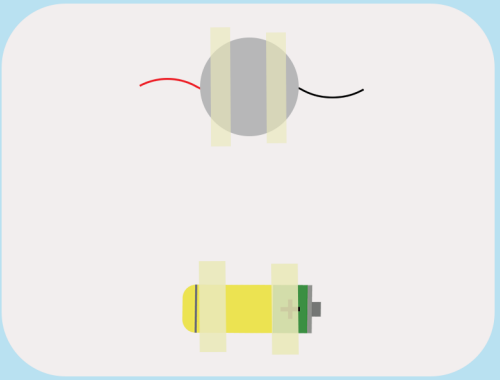

Battery


Light bulb

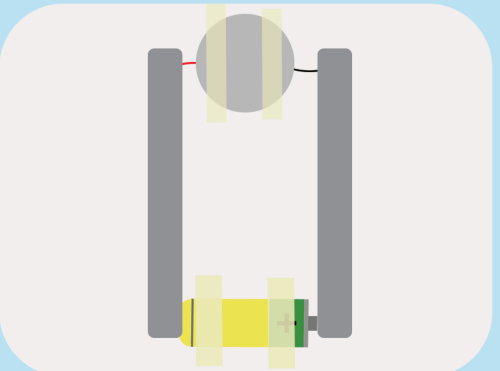
TO DO:



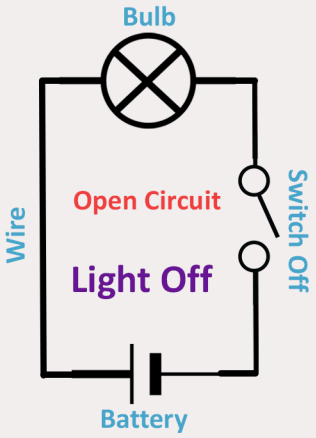
1. Put the bulb through the hole in the cut-out and secure it with tape without covering wires.

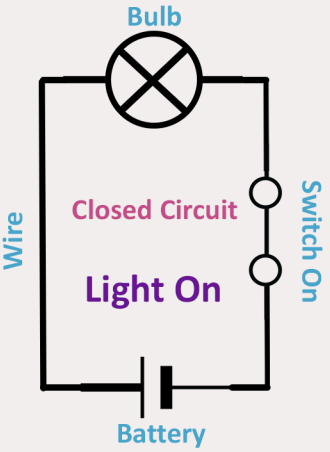


2. Tape the battery to the back of the cut-out. Be sure not to cover the ends.



3. Fold two pieces of tinfoil. Put the tinfoil touching both the wires of the bulb and the ends of the battery.





These are the symbols used to show when a circuit is open and closed.
Your tinfoil in this activity acts as both the wire and a switch.

What happened to the bulb when you put the tinfoil on the wires and the battery?

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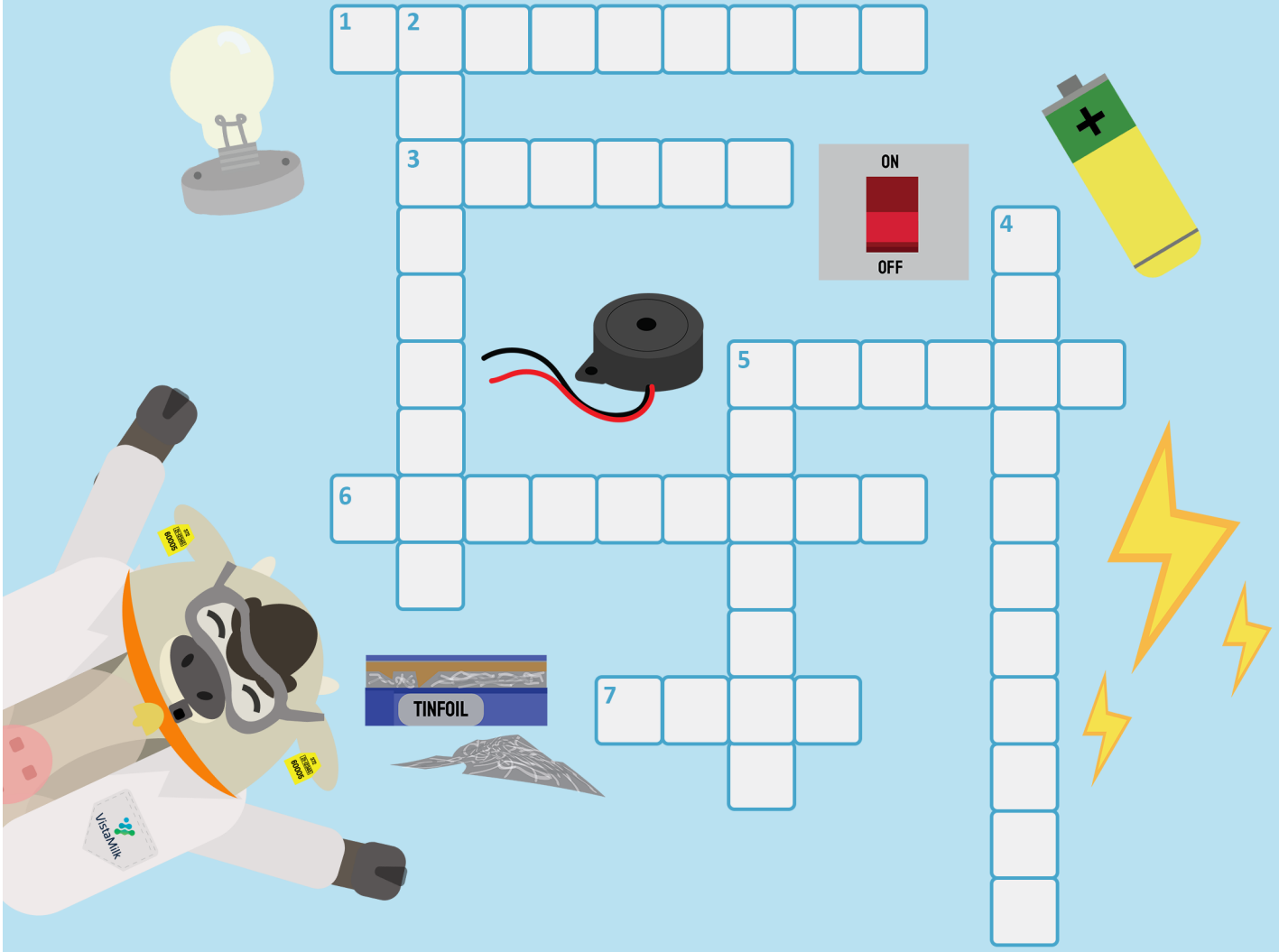
Puzzle Pieces

Circuits

VistaMilk

Use the clues to complete the crossword!

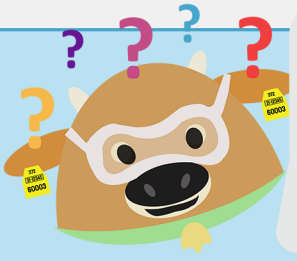


Across

1. Converts electricity into light and is usually made from glass
3. Something that turns on and off
5. Makes a buzzing noise and is used for signalling
6. Allows electricity to flow through it (tinfoil or copper tape)
7. A metal thread that carries electrical currents

Down

2. Does not allow electricity to flow through it e.g. rubber
4. A type of energy
5. A power source



Did you know?

Cows don't use their teeth when getting grass from the ground, instead they curl their tongue around a clump of grass and pull it with their tongue to put it in their mouths.

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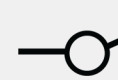
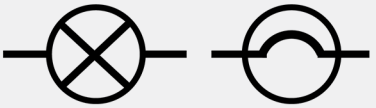
Puzzle Pieces

Circuits

VistaMilk

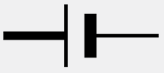


Switch Off symbol



Bulb symbols

Switch On symbol



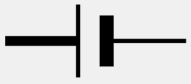
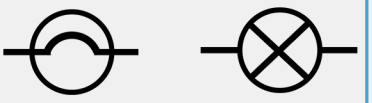
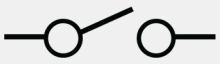
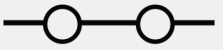
Battery symbol

Bonus symbols:

Motor symbol

Buzzer symbol

Can you name these circuit symbols?

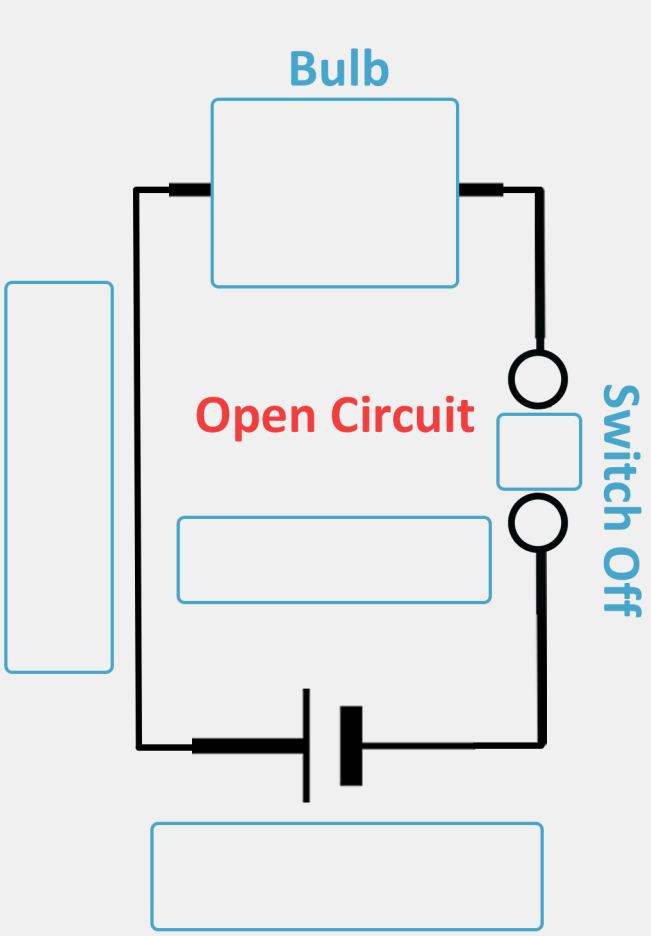
Symbols	Name	Symbols	Name
			
			
			

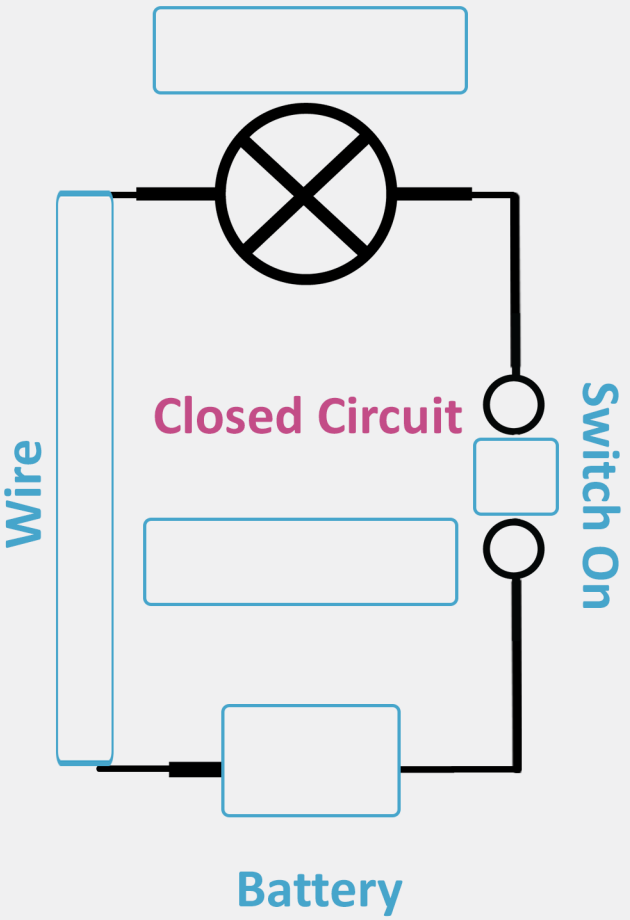
Puzzle Pieces

Circuits

VistaMilk

Draw and write the symbols and words missing in the circuits!





Did you know?

Cows have a great sense of smell and can detect odours from up to six miles away!


A
Y
Morse
Code
MOO!
Z
B

Meet the Researcher...

Hi! My name is Thach!

I am a VistaMilk researcher based in University College Dublin.
I am from Vietnam.

My expertise is computer science and machine learning. Machines don't really speak or write in English like us; they use binary code, a language made from 1s and 0s.
When a sensor records the movement of a cow, it stores this information (data) in binary code. When the data is sent to a computer, it is also sent in binary code. Only when humans
open the data (with a software), it is translated to our familiar language, English.

To demonstrate this fundamental idea of communication technology, we will learn Morse code. Morse code is a binary code that can be transmitted in various ways: light, sound, or electric signal. We will use light in this activity, since it's easy and more fun. In this activity, we will learn how machines communicate.

Key Words

Code - signals used to communicate.

Communication - a way to swap information.

Message - a form of communication.

Information - facts learned or given about a certain thing.

Designed by: Carmel Horgan

Morse Code Alphabet

Use your flashlight and the guide below to create your words from morse code.

● = Light on for one second ▬ = Light on for three seconds

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

Designed by: Carmel Horgan

Morse Code

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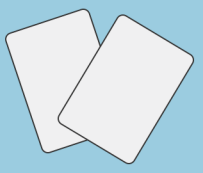
WHAT YOU NEED:

Morse Code guide

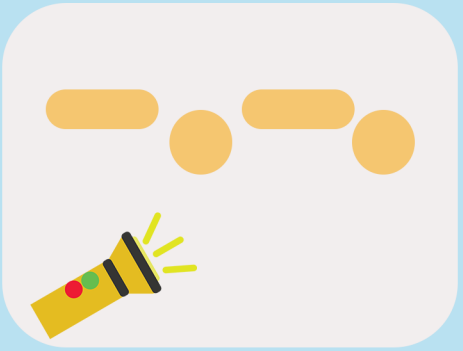


2 sheets of paper

Pencil

Torch

ACTIVITY ONE:

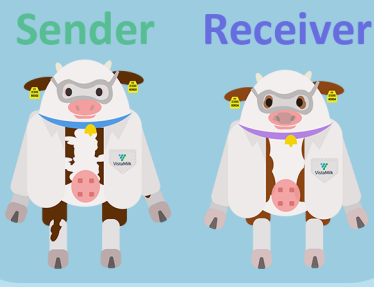


1. Ask your teacher to send a message with Morse code using the torch.

2. Using the Morse code guide, try to translate the Morse code message.

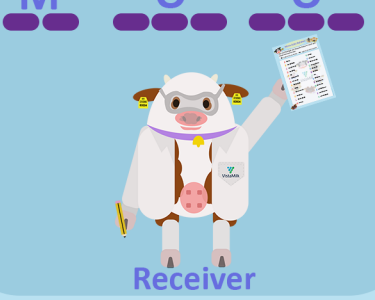
3. Whoever translates the message correctly the fastest, wins!

ACTIVITY TWO:



1. Get into pairs or a small group and have one person/group be senders and the other person/group be receivers.

2. The sender uses the torch to send a message.



3. The receiver decodes the message using the Morse Code guide.

How many words can your team/pair correctly guess?

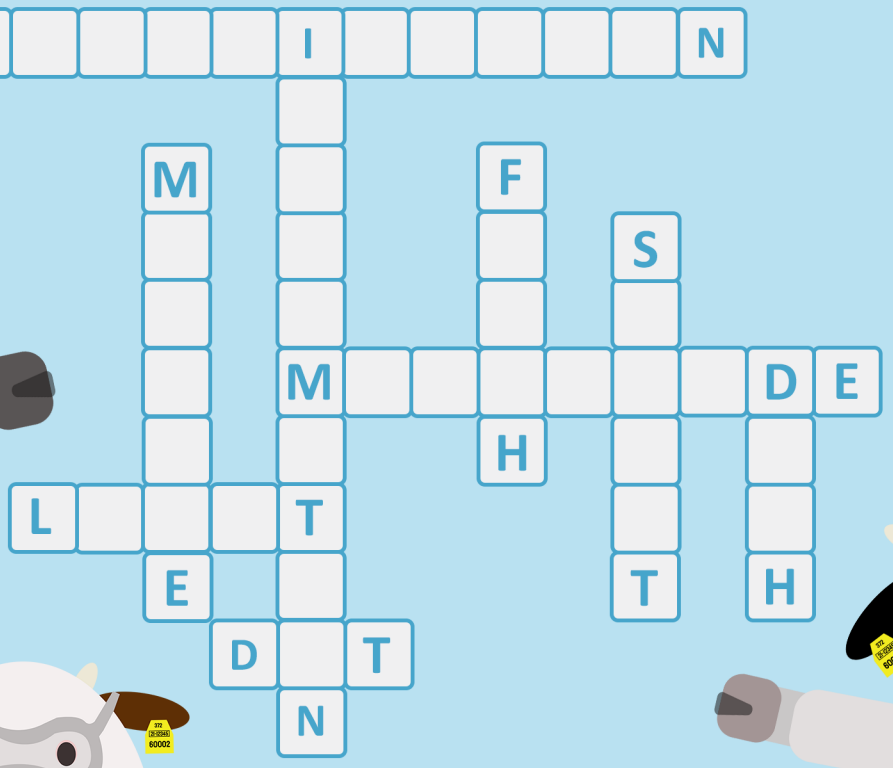
Designed by: Carmel Horgan

Puzzle Pieces

Morse Code

VistaMilk

Fill in the crossword using the box of words below!



Code	Dot	Light	Secret
Communication	Flash	Message	
Dash	Information	Morse Code	

The words below are scrambled and are in morse code!
Decode and unscramble them!

Morse Code	Scrambled Word	Unscrambled Word
-.-. --- .... .-. -	cohrT	Torch
- -.. ---		
... . -.. .-		
. -.-. .-. . ... -		
. ... -- .- --.		

Designed by: Carmel Horgan

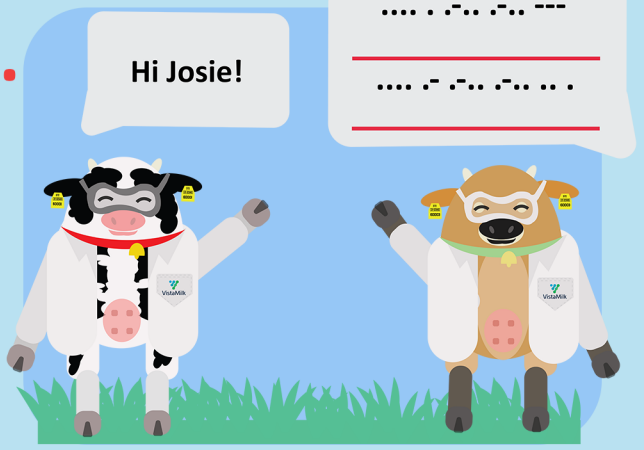
Puzzle Pieces

Morse Code

VistaMilk

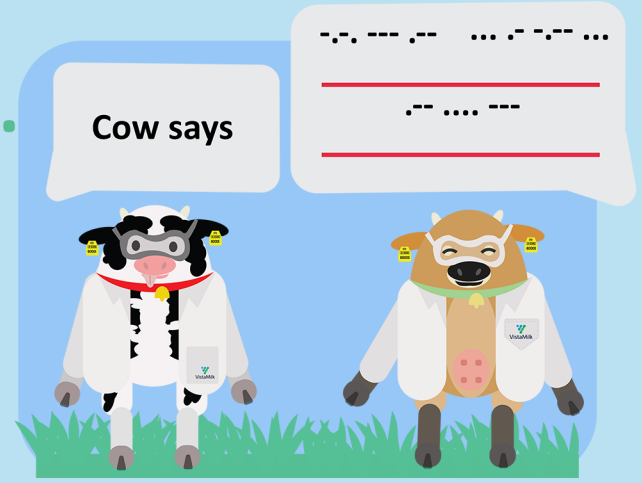
Read the comic and decode the morse code! What are the cows saying?

1.

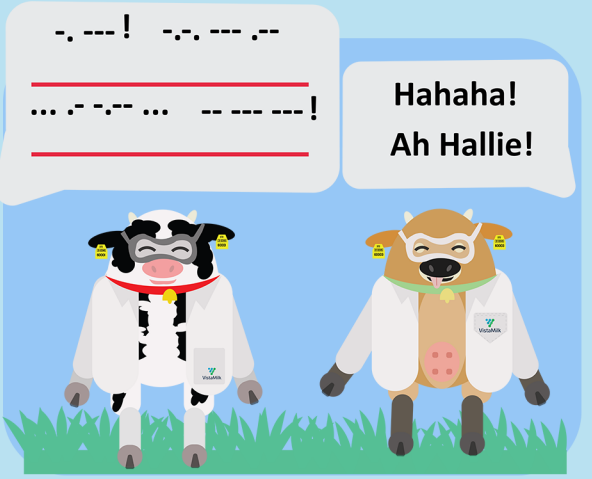


2.

3.



4.

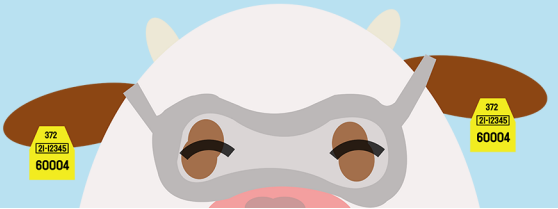


Try create your own Morse code comic for your friends to decode!

1.

2.

3.



Designed by: Carmel Horgan


SUGAR
MILK
The Tyndall Effect
MOO!
MILK
SUGAR

Meet the Researcher...

Hi! My name is Alida!

I am a PhD student at Vistamilk SFI research centre, based at Tyndall National Institute. I come from Italy.

I am a chemist; do you know what chemists do? They research many fascinating things in different areas and in my case, I work with nanotechnologies to analyse food; for my project, I am developing a sensor to analyse the presence of possible remaining antibiotics in cow's milk.

The Tyndall effect is an experiment based on John Tyndall's work; he was an Irish physicist who studied the scattering of light in air or other gases and in liquids. Looking at the behaviour of light in different liquids, we can see the differences in a solution, a suspension and a colloid. This activity came into my mind from using two liquids in my research project: milk and gold nanoparticles. Gold nanoparticles are important in the development of sensors for my project; they are the part of the test that allows the presence or absence of the molecule of interest to be seen. As a result, this sensor will help the farmers check if the milk of their cows has remaining antibiotics, which is very important for food safety.

Key Words

Colloid - a mixture of at least two substances that can be separated.

Particles - a very small amount of a substance.

Nanoparticles - tiny particles.

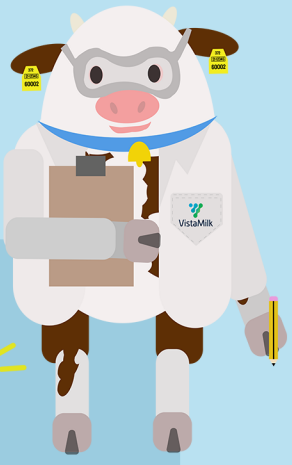
Nanotechnology - work with small substances to create microscopic devices.

Solution - name given when something has dissolved in a liquid.

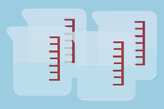
Suspension - name given to a mixture when something is in a liquid but is not fully dissolved.

Designed by: Carmel Horgan

THE TYNDALL EFFECT



WHAT YOU NEED:


4 Glasses


Water

Sugar

Milk

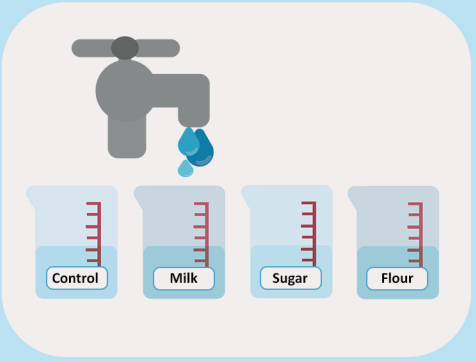
Flour


Teaspoon

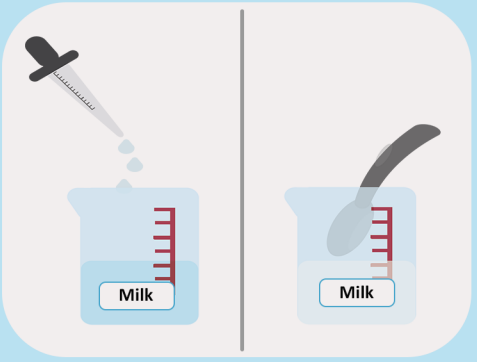

Dropper


Torch

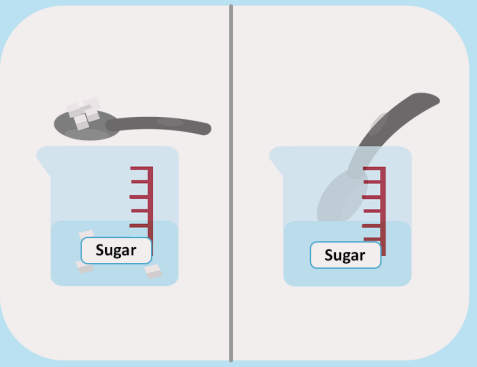
TO DO:



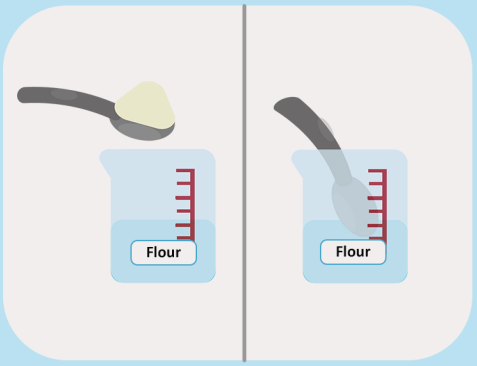
1. Fill the four jars halfway with water. Label them control, milk, sugar and flour.



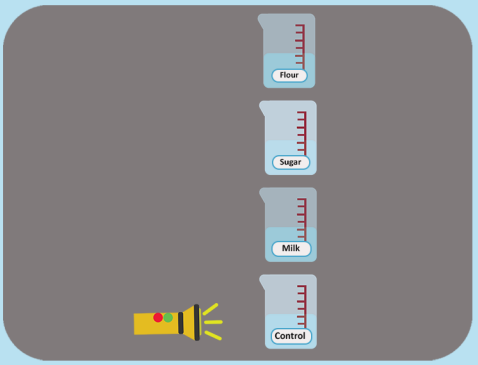
2. Add five drops of milk in the milk labelled jar and stir so that it will become cloudy.



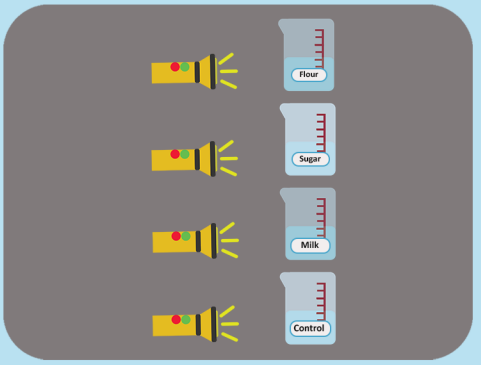
3.Add a teaspoon of sugar in sugar labelled jar and stir to dissolve it completely.



4. Add a teaspoon of flour in the flour labelled jar and stir it.



5.Darken the room and shine the torch through each of the jars.



6. Observe how light travels through each liquid.

What happened to each of the mixtures when you shone the torch on them?

Puzzle Pieces

The Tyndall Effect

VistaMilk

Find the words in the list in the wordsearch!

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

Colloid
Dropper
Flour
Light
Milk
Nanoparticles
Newton Disc
Precipitation
Rainbow
Solution
Sugar
Suspension
Torch
Water

Can you think of other examples of the words listed below?

Colloid	Suspension	Solution

Did you know?

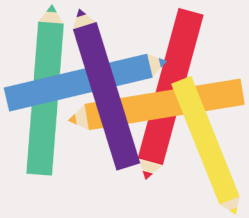
Cows can't see the colours red or green, instead they see these colours in shades of grey and black.
They can also only see the colours blue and yellow.

Designed by: Carmel Horgan

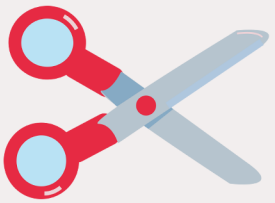
Puzzle Pieces

The Tyndall Effect

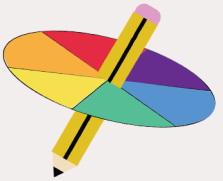
VistaMilk



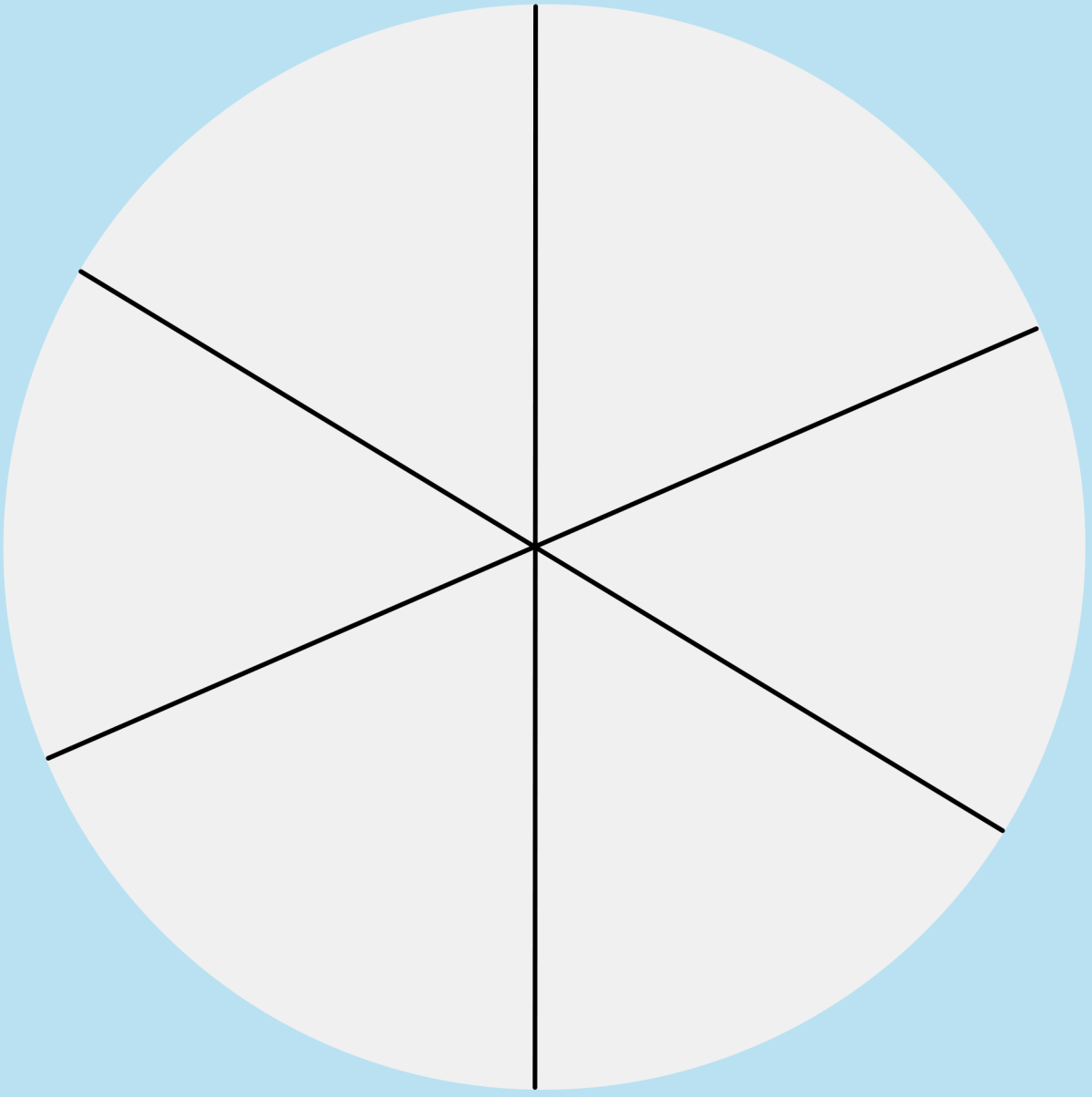
1. Colour in each segment in the circle below one colour each in order of the rainbow.



2. Cut out the circle. Be careful!

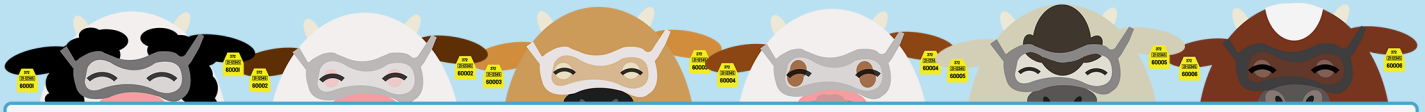


3. Stick a pencil through the middle of the circle and spin! What happens to the colours?



Designed by: Carmel Horgan

Observations



What happened when the light was shone on the milk and water mixture?

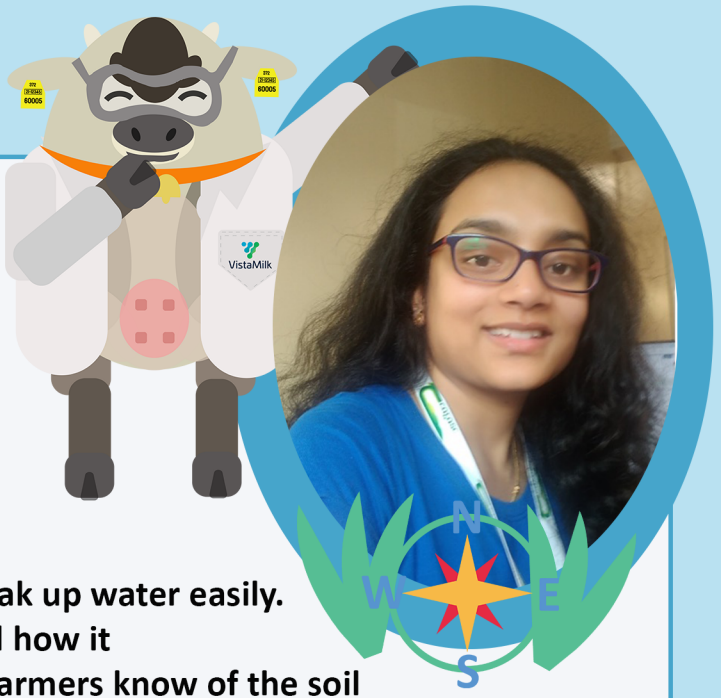
What happened when the light was shone on the sugar and water mixture?

What happened when the light was shone on the flour and water mixture?

What happens to the colours in the Newtons disc when it spins?


VistaMilk
N
W
E
S
372 21-12345 60001
372 21-12345 60004
372 21-12345 60005
372 21-12345 60003
372 21-12345 60002
372 21-12345 60006
MOO!
Earth Observation

Meet the Researcher...



Hi! My name is Rumia!

I am a PhD student at Teagasc and NUI Galway. I am from India.

My research deals with studying soil moisture in Ireland using satellite data. My research is focused on soils that don't soak up water easily. I use satellite data to study soil moisture and how it changes over time. My research aims to let farmers know of the soil moisture status on their farms so that management activities could be planned.

The activity I helped create explores satellite imagery and recreating the image by making a map from the satellite image. Light is what controls the functioning and use of satellites. Light from the sun or from the satellite itself reaches earth, interacts with the atmosphere and the objects on the ground and is reflected back to the sensor. The reflected light is then recorded on the sensor and produced in the form of satellite imagery.

Key Words

Atmosphere - a layer of air surrounding the Earth.

Observation - the act of looking for and recording information.

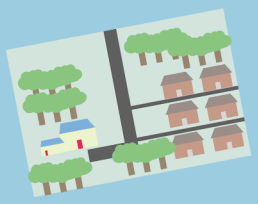
Reflection - when light or sound is returned from a surface.

Satellite - a man-made object that circles the Earth and collects information about the Earth and Space.

Designed by: Carmel Horgan

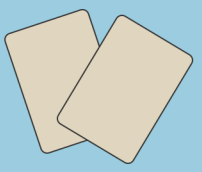
Earth Observation

WHAT YOU NEED:



Map of School/Village

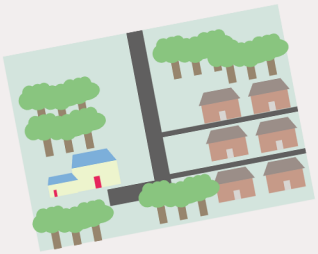
Pencil



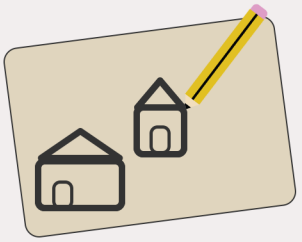
Tracing paper

Colouring pencils

TO DO:

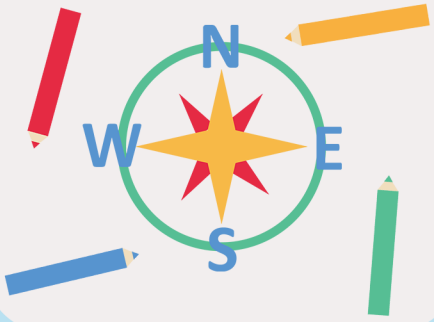


1. Search and print a map of your school/village.

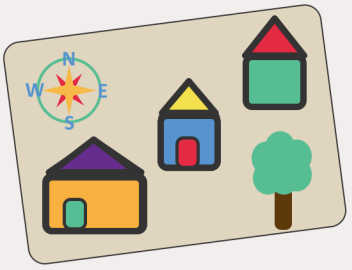


2. Using the tracing paper trace the boundary of your school and other nearby features that you like.

3. Colour what you traced with colours of your choice.



4. Draw a compass on your map to show directions.



5. Name your map whatever you want!

6. Compare your map with your classmates, are they the same or different?

What kind of features can you see in your town's map?

Do you like what your town looks like from space?

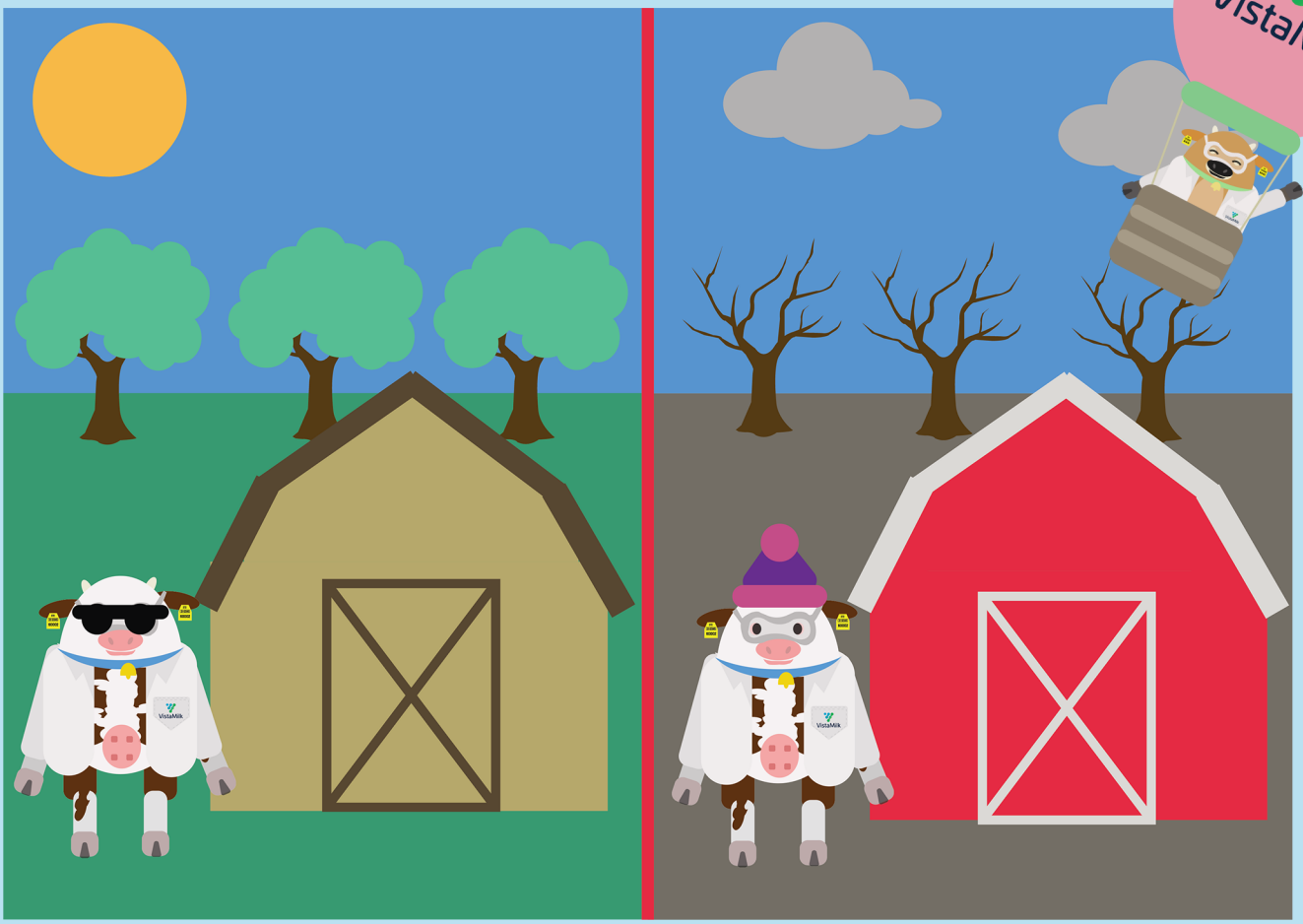
Designed by: Carmel Horgan

Puzzle Pieces

Earth Observation

VistaMilk

Josie the Jersey is in her hot-air balloon, can you help her spot the five differences in the two pictures?



Differences
1.
2.
3.
4.
5.

Designed by: Carmel Horgan

Puzzle Pieces

Earth Observation

VistaMilk

The seasons are mixed up! Can you help Josie the Jersey sort them by colouring the seasonal items?

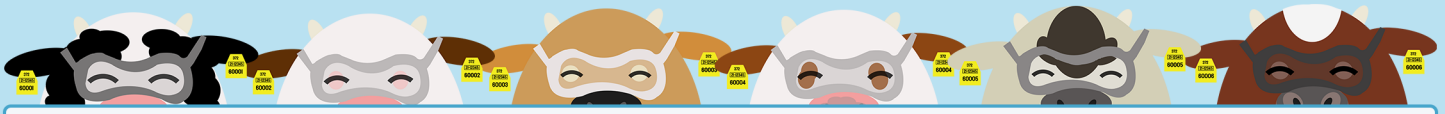
Colours:	Spring = green	Summer = blue
	Autumn = orange	Winter = red

Did you know?

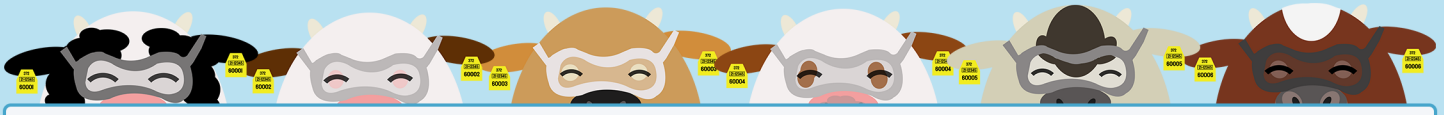
Cows are emotional animals and have best friends and get they stressed if they are separated.

Designed by: Carmel Horgan

Observations



Observations

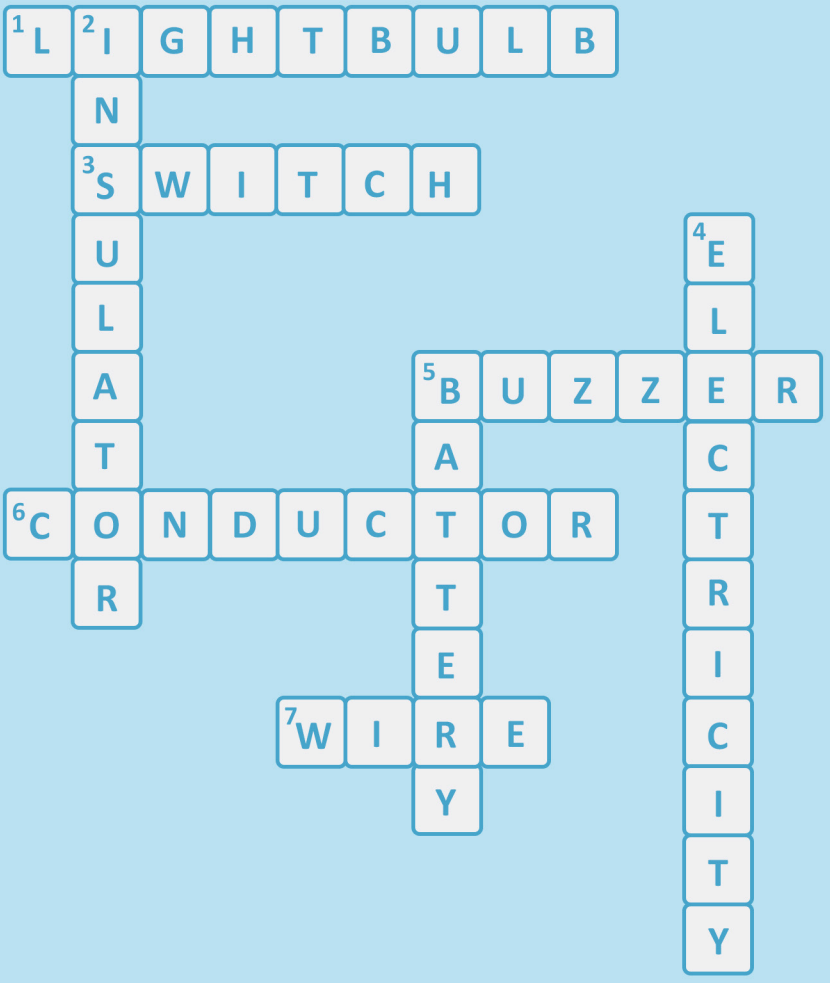


Puzzle Pieces

Circuits Answers

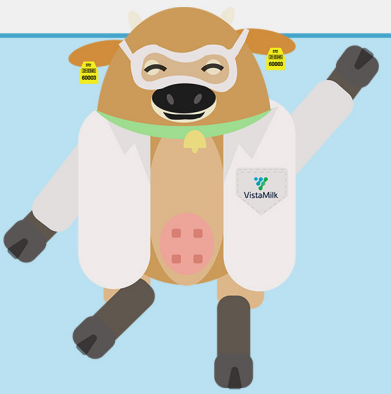
VistaMilk

Activity One:

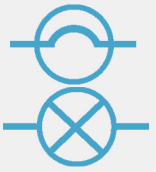


Words

Lightbulb
Switch
Buzzer
Conductor
Wire
Insulator
Electricity
Battery



Activity Two:

Symbols	Name	Symbols	Name
	Battery symbol		Bulb symbols
	Switch Off symbol		Motor symbol
	Buzzer symbol		Switch On symbol

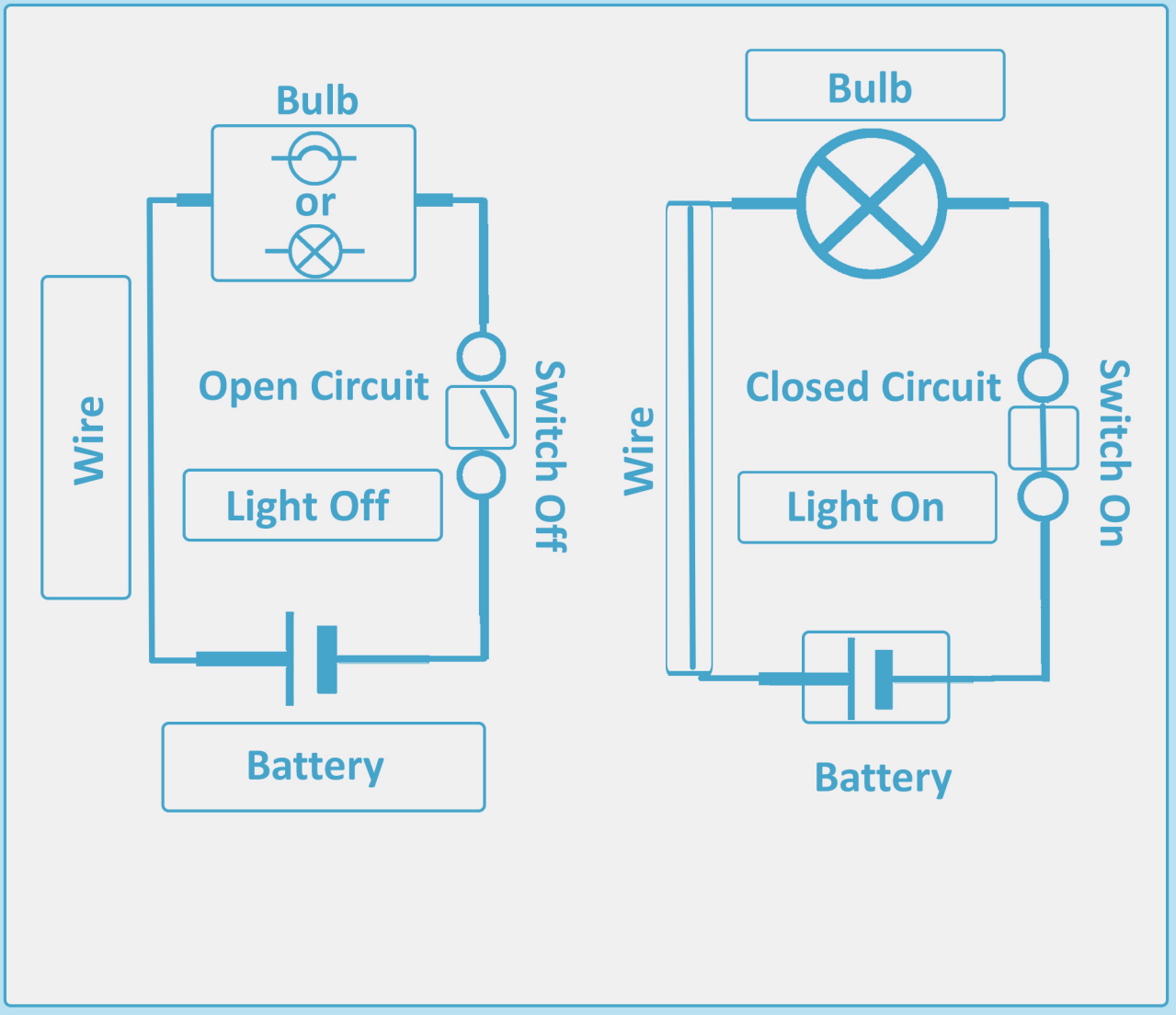
Designed by: Carmel Horgan

Puzzle Pieces

Circuits Answers

VistaMilk

Activity Three:



Designed by: Carmel Horgan

Puzzle Pieces

Morse Code Answers

VistaMilk

Activity One:

Words

Code
Communication
Dash
Dot
Flash
Information
Light
Message
Morse Code
Secret

Activity Two:

Morse Code	Scrambled Word	Unscrambled Word
-.-. --- .... .-. -	cohrT	Torch
- -.. ---	tDo	Dot
... . -.. .-	shDa	Dash
. -.-. .-. . ... -	ecreSt	Secret
. ... -- .- --.	esMagse	Message

Designed by: Carmel Horgan

Puzzle Pieces

Morse Code Answers

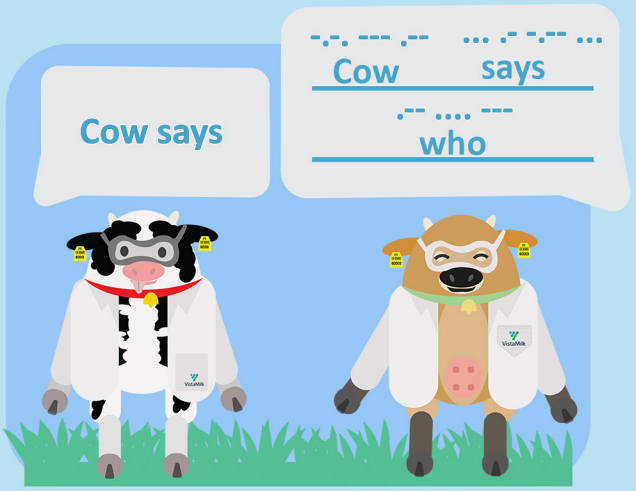
VistaMilk

Activity Three:

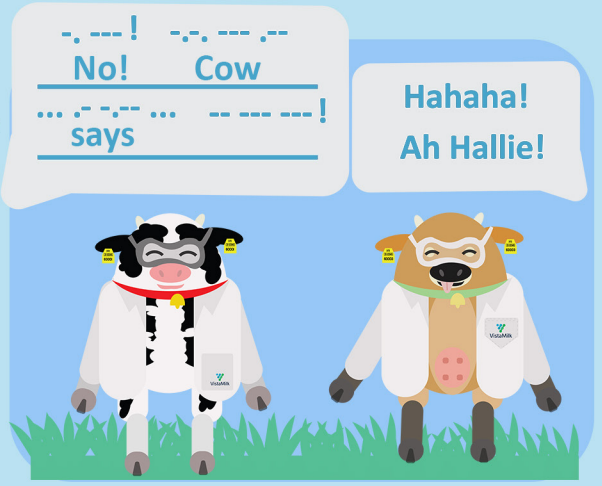
1.

2.

3.



4.



Designed by: Carmel Horgan

Puzzle Pieces

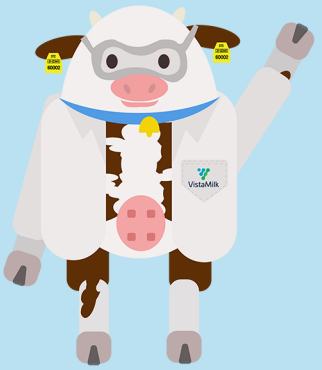
The Tyndall Effect Answers

VistaMilk

Activity One:

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

Colloid
Dropper
Flour
Light
Milk
Nanoparticles
Newton Disc
Precipitation
Rainbow
Solution
Sugar
Suspension
Torch
Water



Activity Two:

Colloid	Suspension	Solution
Milk	Hot Chocolate	Sugar and Water
Cream	Flour and Water	Tea
Mayonnaise	Muddy Water	Coffee
Butter	Peanut Butter	Vinegar
Jelly		Mouthwash
		Hand Sanitizer

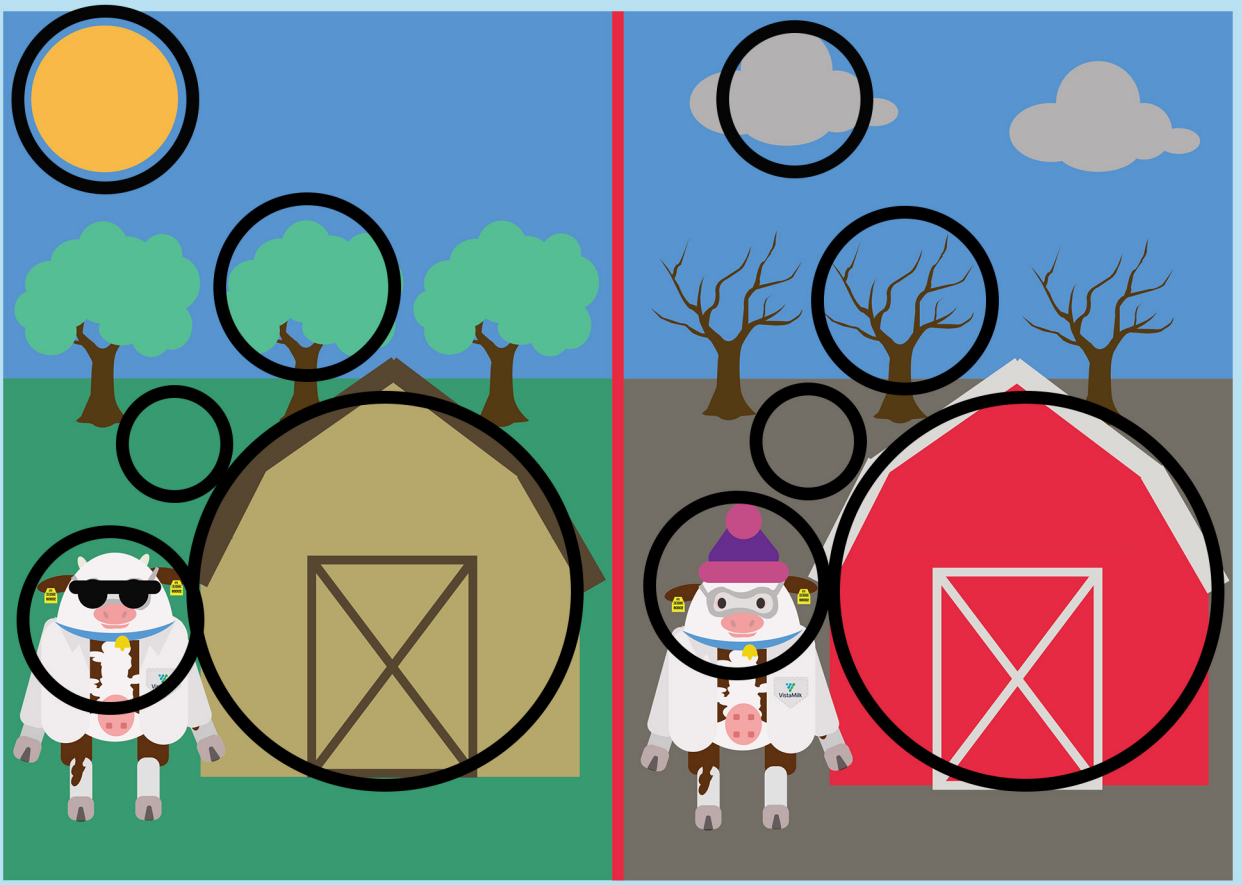
Designed by: Carmel Horgan

Puzzle Pieces

Earth Observation Answers

VistaMilk

Activity One:



Differences	
1.	Sun/Clouds
2.	Trees
3.	Ground
4.	Sheds
5.	Cows' clothes

Designed by: Carmel Horgan

Puzzle Pieces

Earth Observation Answers

VistaMilk

Activity Two:

Colours: Spring = green Summer = blue
Autumn = orange Winter = red

Designed by: Carmel Horgan

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