VikingLink

Nessa

and the Interconnector

Hello!

I'm Nessa!

I live in Lincolnshire.

I am ten years old and I love animals. I'm mad about them. For my last birthday I got the coolest telescope that helps me get really close-up to some of the animals and birds that live near me.

Wordsearch

Lincolnshire is rich in wildlife. I've made a "Word-Search" here of 14 of my favourites. Hopefully you won't need a telescope to find them!

BADGER · SQUIRREL · HARE · GODWIT
DORMOUSE · VOLE · DRAGONFLY
FOX · BUZZARD · BITTERN · NEWT
TOAD · BUTTERFLY · SPIDER

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

Can you spot 6 carrots hidden in these two pages?

The other night I was lying in bed researching the different species found in Lincolnshire - I was reading about brown hares when I fell asleep. I had a wonderful dream about some of my very favourite animals!

Some facts about my favourites

Billie Badger:

- I have large claws which are just perfect for digging.
- I use my claws to dig underground burrows called a sett. I share the sett with other badgers and we keep it very clean.
- I am quite shy but also brave.
- I am an omnivore which means I can eat both plants and animals.

Conker Squirrel:

- I am a rodent - so I am related to animals like rats, mice and hamsters.
- I have big eyes which help me detect and avoid predators.
- I eat mostly nuts, fruits and seeds.
- My babies are born blind.

Harv Hare:

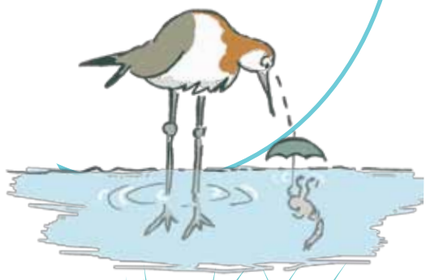
- Don't confuse me with rabbits - I am bigger and faster!
- In Lincolnshire you are most likely to spot brown hares. They love big open fields.
- Hares have been recorded running at over 70 kmh.
- My shelter is called a form - it's a shallow depression which protects me from the wind and rain.

Willow Water Vole:

- I live in a burrow which can have entrances on land and in water. This comes in very handy when predators are about.
- I am under threat from some species that have been brought into this country such as mink.
- I love eating and can consume up to 80% of my own body weight every day. I eat plants so I am a herbivore.

Blake Black Tailed Godwit:

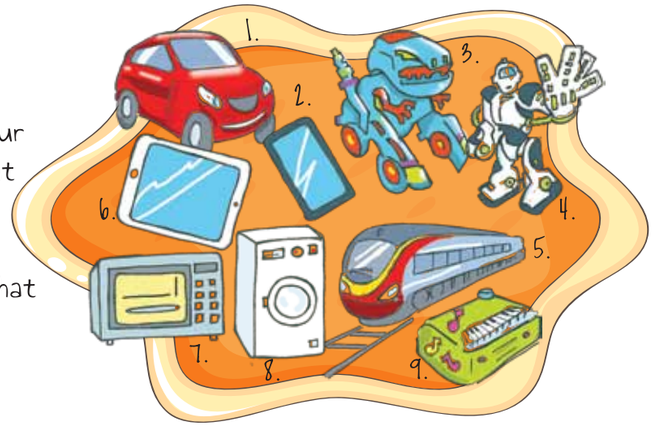
- Godwits breed in Iceland.
- I come to visit the U.K. in winter.
- I have long legs and a long bill.
- I like being on the edge of the sea-shore where I find my food like shellfish, worms and shrimps.



Energy

I love learning about science in school, especially animals.

However other science is great too. Our topic this half-term has been all about "Energy". For part of it we've been learning about electricity. We did a survey to see what things we have that use electricity. Here are some of the things that my class came up with.



Can you name them?

1. ..... 3. ..... 5. ..... 7. .....

2. ..... 4. ..... 6. ..... 8. .....

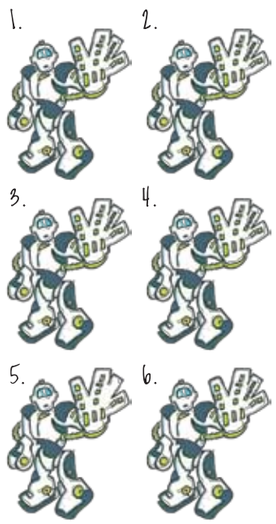
9. .....

One thing I particularly love doing is sitting down with friends and watching anything on T.V. to do with wildlife. Only the other day there was a brilliant programme all about, "Animals in Lincolnshire". At the end the presenter recommended some great "Apps" that let you interact with the animals we had seen. You could choose a species and find out so much more.

To be honest I didn't really think about it but this is only possible because electricity powers our T.V. and charges my iPad. I'm happiest outside but, when this isn't possible, it's great to sit back and absorb all the information you can interact with thanks to the power at your fingertips.

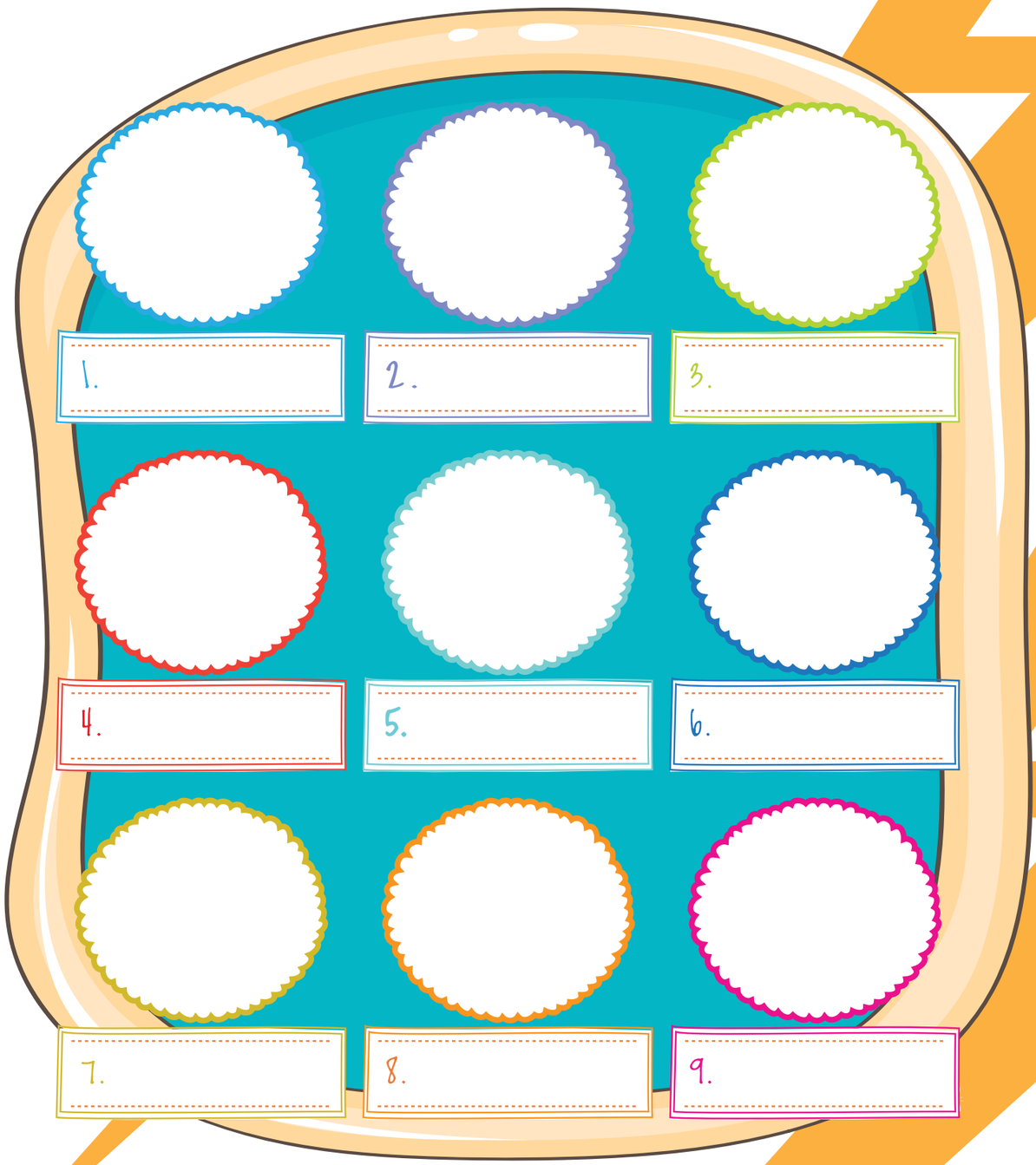
'Hare' oil treatment.
Works wonders on split ends

Can you spot the odd robot out?



Electricity and us

Can you help Nessa and her friends in their research by listing or drawing activities where some electrical gadgets support the things that you enjoy; for example, cooking, floodlit football games.



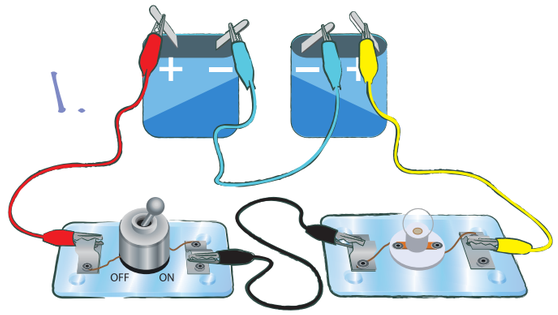
Circuits

There was so much to learn about electricity in our "Energy" Topic.

We made circuits using batteries, wires, lamps, motors, buzzers and switches. Here are some examples that aren't powering the lamp, and one that is.

Tick the boxes and write down any reasons why the lamp isn't on.

1.

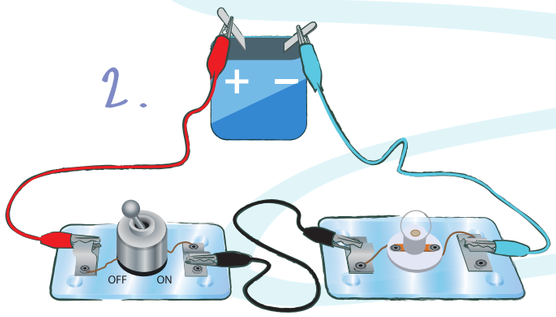


Will this circuit work? Yes ☐ No ☐
If not, why?

.....

.....

2.



Will this circuit work when it is switched on? Yes ☐ No ☐

.....

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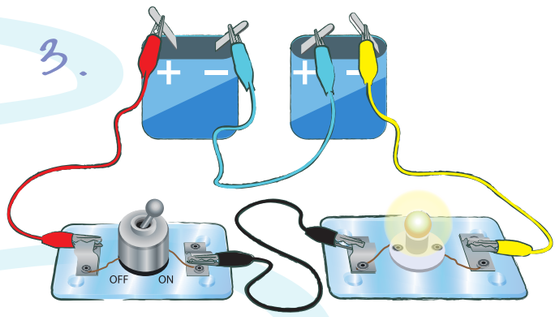
3.

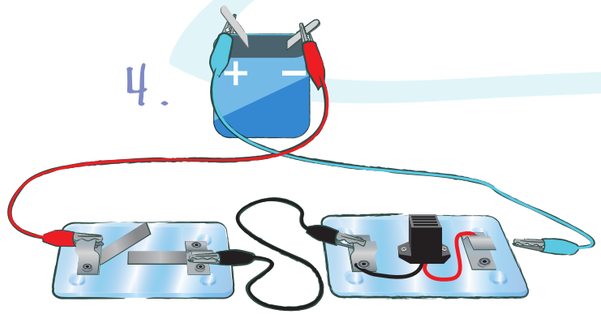


Will this circuit work? Yes ☐ No ☐
If not, why?

.....

.....

4.

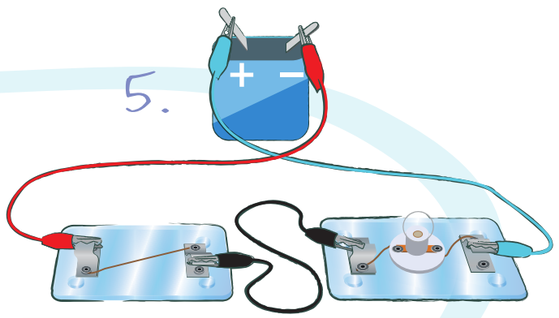


Will this circuit work when it is switched on? Yes ☐ No ☐

.....

.....

5.



Will this circuit work when it is switched on? Yes ☐ No ☐

.....

.....

PUZZLES!

Nessa and her friends love playing racing cars.

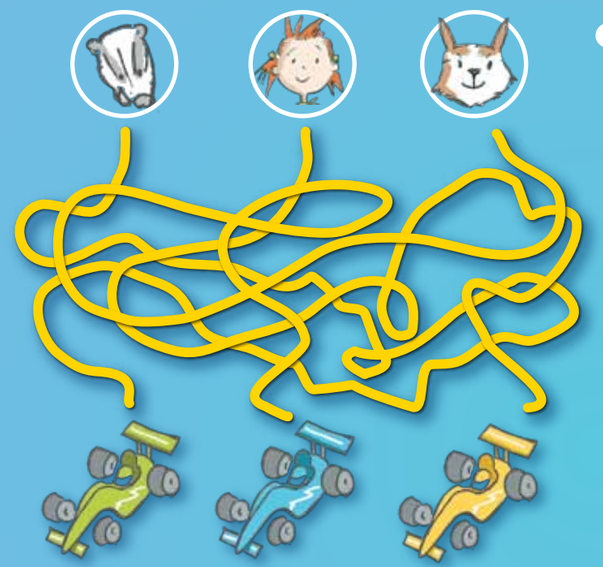
This is a really good example of an electric circuit.

Which colour car is each of the friends below driving?

Billie .....

Nessa .....

Conker .....



Only two of these batteries are identical. Name the matching pair. ..... & .....

Write down the anagrams of some of the words you see on these two pages.

PALM .....

CHWITS .....

TROOM .....

ZUBREZ .....

RIWE .....

BLUB .....

RISEBEATT .....

TURCICI .....

RICCLETEYIT .....

FUN FACT!

Electricity travels at 10,173,800 kmh!

REMEMBER!

NEVER PLAY WITH MAINS ELECTRICITY

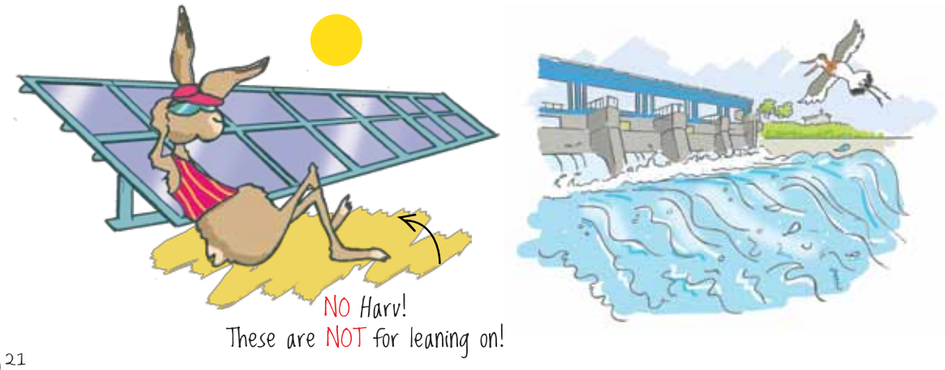
NEVER PUT CELLS OR BATTERIES IN YOUR MOUTH

Where does electricity come from?

We all liked our topic on "Energy" and it was great making circuits.

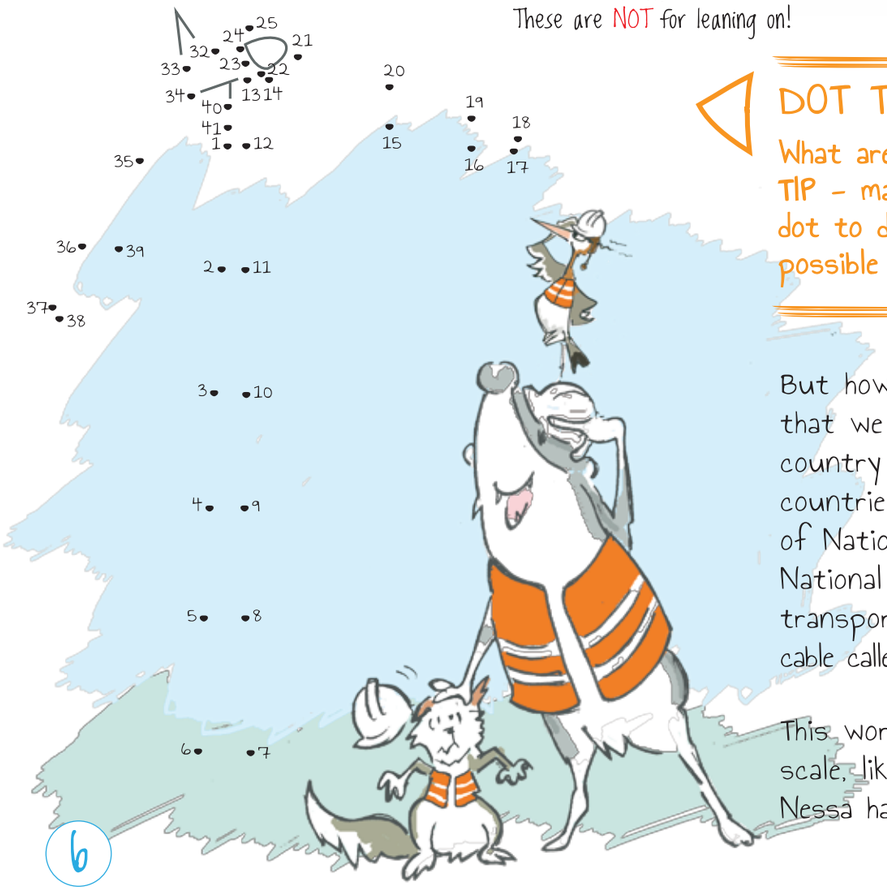
We used batteries because it would be very dangerous to use "Mains Electricity". However our teacher helped us find out about how electricity gets to our houses, schools, hospitals, shops and lots of other places.

Electricity comes from many different sources - power stations can burn fuels like gas or coal to generate electricity. However these days more of the electricity we use in the U.K. comes from what we call **renewables**. **Renewables** are fuels from natural resources such as wind, water and sunshine. Our teacher suggested we do some research on **renewables.**



DOT TO DOT

What are the guys looking at?
TIP - make your lines from dot to dot as straight as possible for the best effect.



But how does the electricity that we use travel around the country and even from other countries? Well that's the job of National Grid. One way National Grid does this is to transport electricity via a large cable called an **interconnector**.

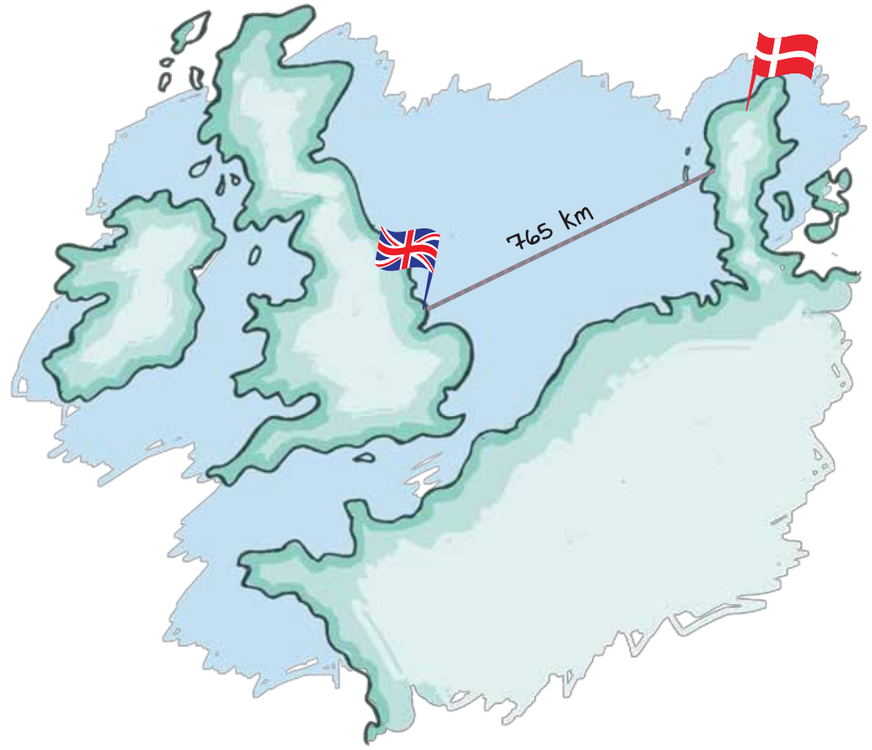
This works, on a much bigger scale, like the circuits that Nessa has been making in school.

National Grid

Renewable energy is sometimes called "clean energy" or "green energy" because it doesn't pollute the air or the water.

However, we can't store up **renewable** energy like coal or gas. If the wind doesn't blow or the sun is hidden behind clouds there isn't enough power for everyone from renewables.

So National Grid have decided to build a long **interconnector** that links Donnington in Lincolnshire, first to the coast at Sandilands and then, under the sea, to Denmark. This means that we can send our spare electricity to Denmark and they can share their spare energy with us. The **interconnector** will be over **765 km** long but remember electricity just whizzes along!



Mark on the map with the appropriate letter where you think these cities are.

A Amsterdam
B Belfast
C Brussels
D Cardiff
E Copenhagen
F Dublin
G Edinburgh
H London
I Paris

FUN FACT!

Did you know? The sea area near the route of the interconnector is called Dogger Bank. Around 8,000 years ago, it was dry land, and home to humans and animals including the woolly rhinoceros and mammoths!

So, what are interconnectors?

Well, just as Nessa had been learning that electricity can travel through wires in simple circuits she also began to understand that the interconnector linking Denmark and the U.K. works in the same way. It's just that the wires or cables are thicker and that the electricity is much, much more powerful!

Building the link between the Denmark and the U.K. is a huge engineering challenge. The cables not only have to cross many kilometres of land they also have to travel under the sea.

Alternating Current (AC) electricity is used to transfer power from generators to customers such as factories and houses. The voltage is stepped down (reduced) until the electricity arrives to the customers. **AC** electricity can transport power over long distances but because of high losses will eventually reach a maximum distance limitation. National Grid is the motorway of electricity and has the job of transporting power from the generators over these long distances to the customers.

Direct Current (DC) electricity can transfer power over even longer distances than **AC** due to lower losses. Converter stations are used to convert **AC** electricity to **DC** electricity so that power can be delivered from the generators to customers over this longer distances; for example from the UK and Denmark.

We are very proud of our projects that form great links between countries. The one from Denmark to the U.K. is a great example.

The Danish flag is called the Danneborg and is the oldest flag in the world!

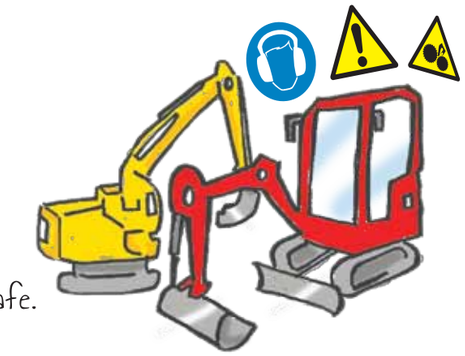
FUN FACT!

The link will provide electricity for millions of people.

List 5 things in your bedroom that need electricity to work.

1. .....
2. .....
3. .....
4. .....
5. .....

Laying the cables



Laying the cables is a complicated job.

We need to dig deep trenches to lay the cables.
We need some very big machines to help us.
Operating these machines is a skilled job and
we have to be very careful to keep everyone safe.

Getting the cables across the sea is also a huge engineering challenge. They have to be laid under the bed of The North Sea. In some cases this is over 30 metres deep. We need ships with winches, cranes and helicopter pads so the engineers can do their job. Imagine working on one of these amazing boats!

NAME THAT SIGN!

Write the meaning of the safety sign next to its symbol.

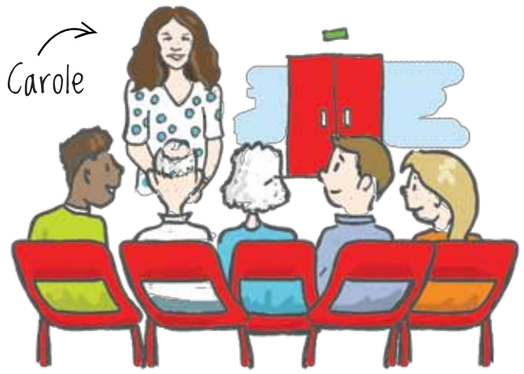
1. .....
2. .....
3. .....
4. .....
5. .....
6. .....
7. .....

The Team Keeping it GREEN!

One afternoon, a person from National Grid came to Nessa's school to talk to the children about the link between Denmark and the U.K. and how the company provides "Green Energy".

They also talked about "**Team-Work**" and how important that is when working on such a big project. Lots of different people doing lots of different jobs.

Here are some of the key members:



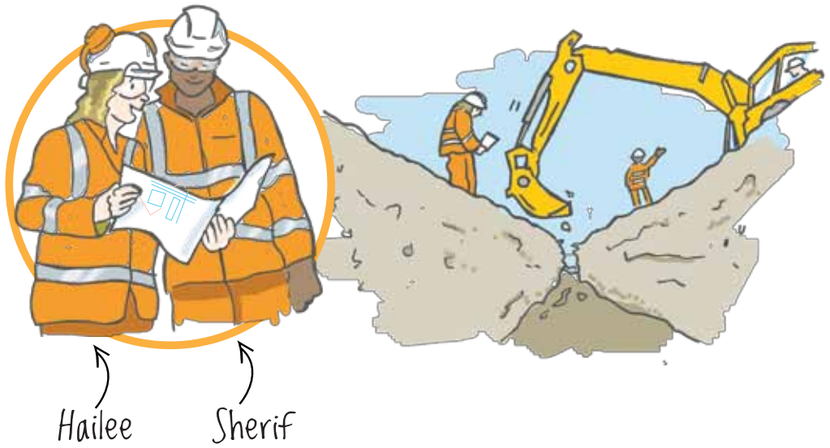
My name is Carole. I work in **Public Relations**. I organise meetings to tell people from different communities about the project. I try and answer all their questions.

What important skills do you think Carole would need?

.....

.....

My name is Sherif, I work with Hailee. We are **engineers**. We spend some of our time in the office planning our work and a lot of time outside making sure that all is going well. We help plan the route of the interconnector including the digging of trenches for the cables.



What important skills do you think Sherif and Hailee would need?

.....

.....

.....

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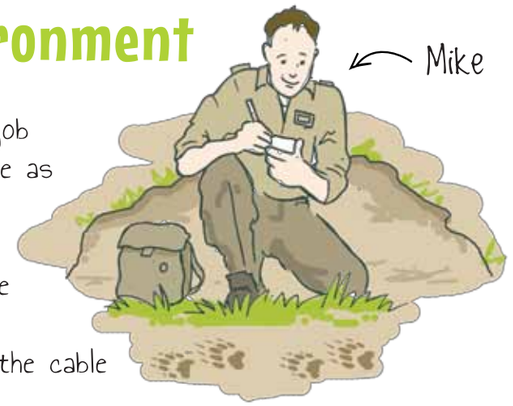
Being aware of the environment



My name is Mike. I am an **ecologist**. It is my job to make sure the impact on wildlife is as little as possible. I am working on the route of the interconnector across Lincolnshire. If I find evidence of important habitats I will make sure that the engineers are aware of this and take appropriate action. This may mean re-routing the cable or helping create alternative habitats.

What important skills do you think Mike would need?

.....

.....

.....

My name is Amrit. I am an **archaeologist**. I work with my team checking any possible impact on historic sites. We sometimes need to examine particular areas to check if there is any evidence of old settlements where people used to live and work. These sites will need protection from the route of cables.

What important skills do you think Amrit would need?

.....

.....

.....

The Team

Team-Work is very limportant!

Name some more of the many occupations involved in building the Viking Link.

1. .....
2. .....
3. .....
4. .....

Nessa Knows!

Q1 Which two countries can share energy thanks to The Viking Link?

- A. The U.K. and Holland ☐
- B. The U.K. and France ☐
- C. The U.K. and Denmark ☐

Q2 Which sea does the interconnector cross, under the water?

- A. The North Sea ☐
- B. The Irish Sea ☐
- C. The English Channel ☐

Q3 The energy produced by wind turbines is sometimes called what?

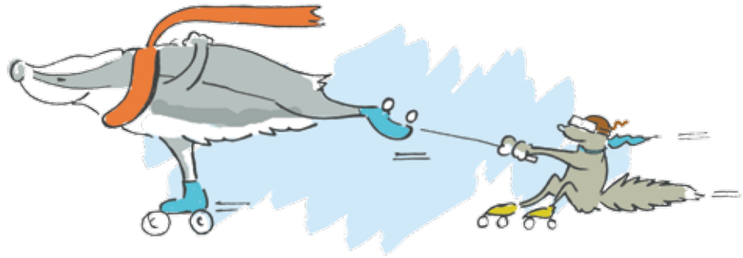
- A. Red Energy ☐
- B. Blue Energy ☐
- C. Green Energy ☐

Q4 Hailee and Sherif help plan the construction of The Viking Link. What are their jobs?

- A. They are farmers ☐
- B. They are engineers ☐
- C. They are accountants ☐

Q5 Amrit is an archaeologist. She is very interested in what?

- A. Evidence of historic sites ☐
- B. Planets ☐
- C. Crops ☐



Q6 Who is responsible for the transmission of electricity in the U.K.?

- A. National Energy Company ☐
- B. National Grid ☐
- C. National Connector ☐

Q7 Viking Link is connected to which county in the U.K.?

- A. Lincolnshire ☐
- B. Essex ☐
- C. Yorkshire ☐

Q8 When electricity arrives in the U.K. via Viking Link it is?

- A. Imported ☐
- B. Exported ☐

Q9 Approximately how long will Viking Link be?

- A. 350 km ☐
- B. 500 km ☐
- C. 765 km ☐

Q10 Nessa would like to be an ecologist helping Viking Link because she loves what?

- A. Diggers ☐
- B. Ships ☐
- C. Wildlife ☐

Get drawing!

Create a wildlife cartoon character of your own, or maybe invent a machine that creates energy in an unusual way!

Answers

Inside front cover and P.1

Wordsearch

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

Hidden Carrots

By Billie's binoculars
In Harv's ear
By Harv's carrot
By binoculars on the bed
In the badger's burrow
In the watervole's rubber ring

P.2

Electric Items

1. Car
2. Mobile phone
3. Toy dinosaur
4. Robot
5. Train
6. Tablet
7. Microwave
8. Washing machine
9. Music keyboard

Odd One Out

5

P.4

Circuits

1. No
2. Yes
3. Yes
4. No
5. Yes

P.5

Puzzles

Tangled Wires

Billie = Green
Nessa = Yellow
Conker = Blue

Anagrams

Lamp
Switch
Motor
Buzzer
Wire
Bulb
Batteries
Circuit
Electricity

Matching Pair

F & N

P.6

Dot to Dot

Wind Turbine

P.7

European Cities

P.9

Name That Sign

1. Wear ear protection
2. Danger forklift trucks
3. Green energy
4. Wear eye protection
5. Danger of electrocution
6. Wear head protection
7. Fire extinguisher

P.12

The Big Quiz

1. C
2. A
3. C
4. B
5. A
6. B
7. A
8. A
9. C
10. C

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