

Northern Powergrid Electricity Learning Day

www.northernpowergrid.com/education



By the end of the lesson you will:

- Work in a team to explore solutions to real world problems provided.
- Gain an understanding of potential job roles in utilities.
- Be able to justify decisions made when facing a design problem.



Who is Northern Powergrid?



We keep your power flowing!



You may not know who we are, but we keep the lights on, the kettles boiling and the phones charged for 8 million people across the Northeast, Yorkshire and northern Lincolnshire!

Put simply, we make sure the electricity you buy from your energy supplier gets to you safely, whenever you need it. And, if your power ever gets interrupted, for whatever reason, be it extreme weather or emergency maintenance, we'll be there immediately to fix it - giving 100% day and night, rain and shine, Sundays, Mondays and Christmas days.

Our always-prepared team of energy experts live in your communities, proud to play an essential role in keeping the power flowing to all the homes and businesses they serve!



Lesson 1: Warning Signs!

You will learn about:

- *Keeping Safe*
- *Key facts and features of electricity*



The Dangers of Electricity

<http://www.bbc.co.uk/education/clips/z32w2hv>



Warning Signs: Scenarios



Scenario 1: SAFE or UNSAFE?

Charging a phone in bed
at night.



Scenario 2: SAFE or UNSAFE?

Making toast and the toast gets jammed - your friend suggests using a knife to get it out.



Scenario 3: SAFE or UNSAFE?

You are playing football and the ball gets kicked into a substation – you decide not to go in after it.

Scenario 4: SAFE or UNSAFE?

You are playing with your kite in the park and forget to look out for overhead wires.

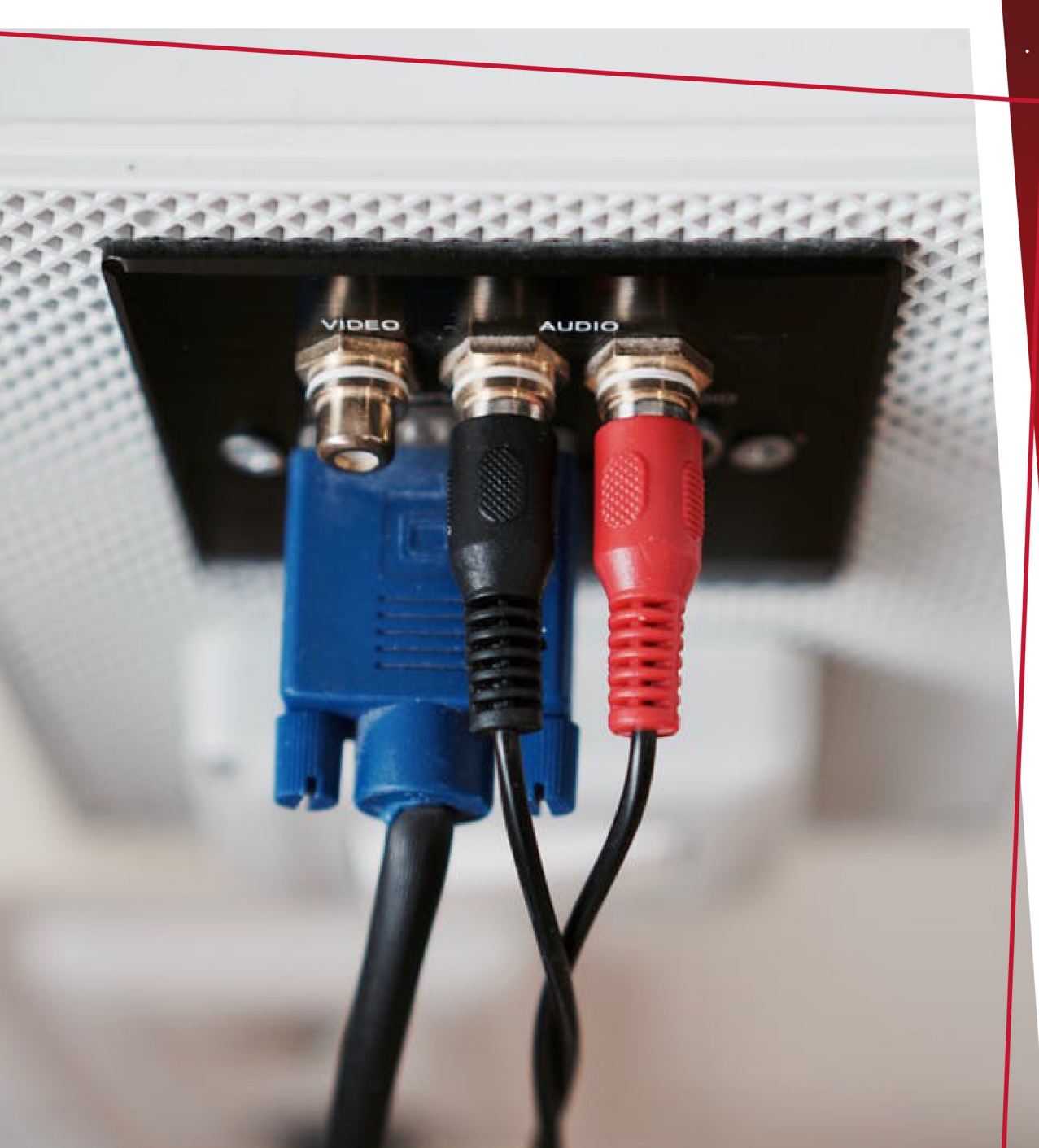


Scenario 5: SAFE or UNSAFE?

Turning off/on a light switch with wet hands.

Scenario 6: SAFE or UNSAFE?

After charging your phone/tablet you pull on the wire to disconnect.



Scenario 7: SAFE or UNSAFE?

You notice that an electrical wire has become bare. You stop using the appliance and inform an adult.

Scenario 8: SAFE or UNSAFE?

A younger sibling wants to use steel pylons as a climbing frame.



Scenario 9: SAFE or UNSAFE?

You are out playing and you come across a train track so you decide to play somewhere else.



Scenario 10: SAFE or UNSAFE?

There is an electrical box on your street. You are tired so you sit on it for a rest.

UNSAFE

When charging,
phones can overheat
and cause a fire.

UNSAFE

Metal objects and appliances can conduct electricity. Never poke at an electrical appliance as it can cause electrocution.



SAFE

Finding somewhere else to play is a good idea! Entering a substation is deadly.

Keep out! If you lose a ball or other item in a substation, call the telephone number given on the substation or call 105 - the national Power Cut helpline. A Northern Powergrid engineer will return your item quickly and safely.

UNSAFE

You need to find an open space free from overhead obstructions.

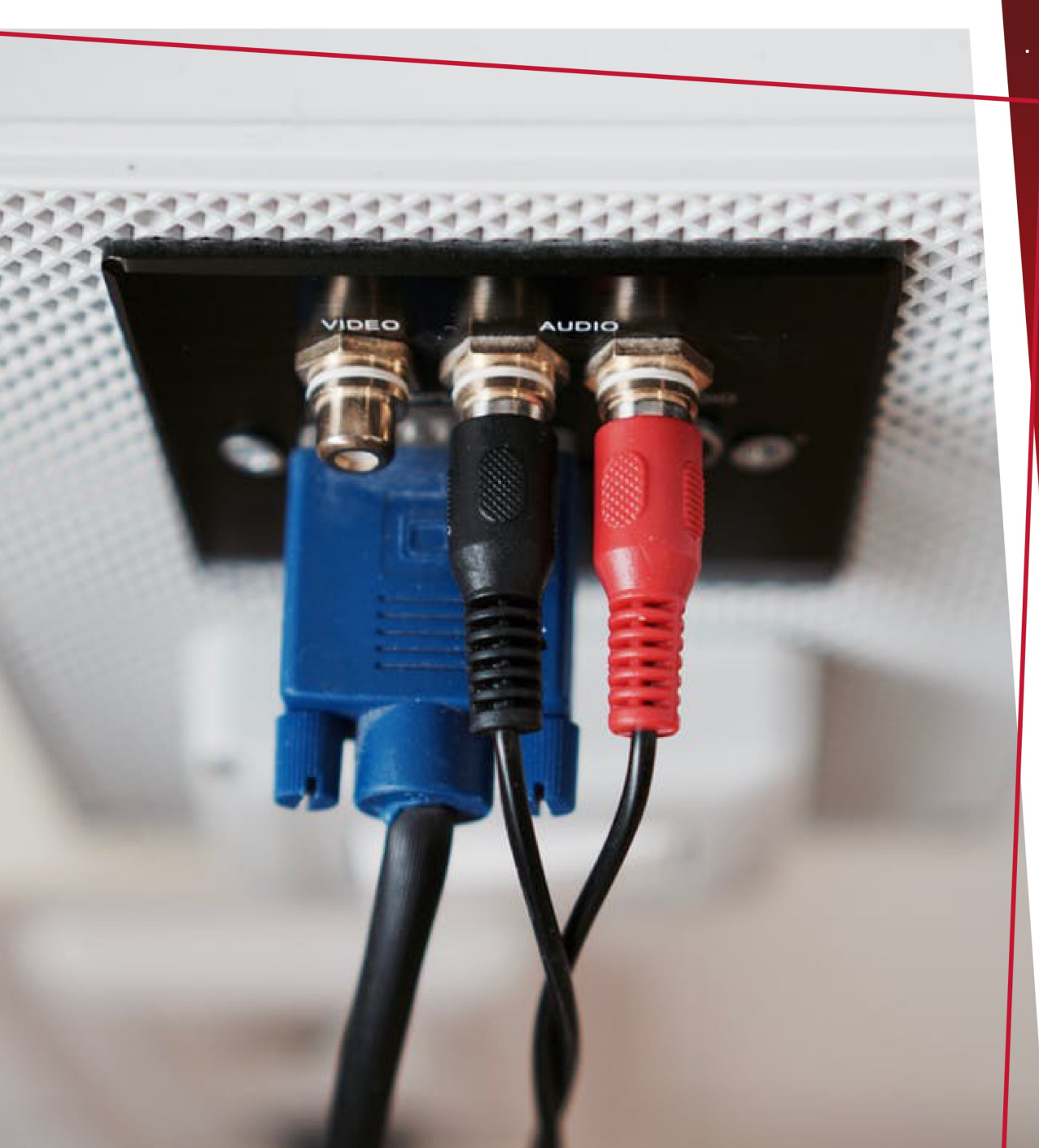


UNSAFE

Water is a conductor of electricity. This action could lead to electrocution.

UNSAFE

Always turn off at the wall and take the plug out as electricity can jump.



SAFE

Electrical leads are covered with a plastic coating for your safety and to avoid unnecessary accidents.

UNSAFE

No one should ever use pylons as a climbing frame. A playground is a much safer place for such an activity.



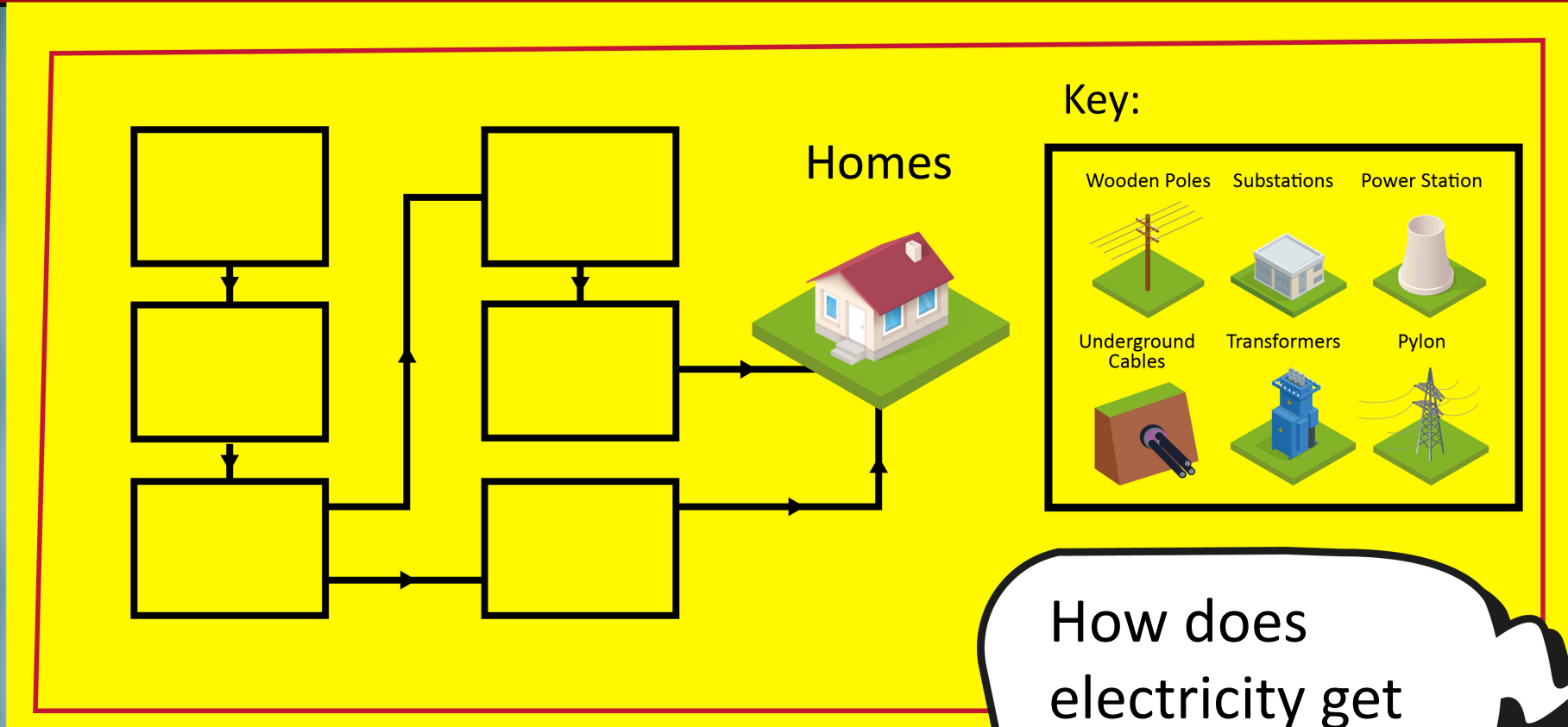
SAFE

Train tracks are a major hazard. There are safer and more interesting places to play.



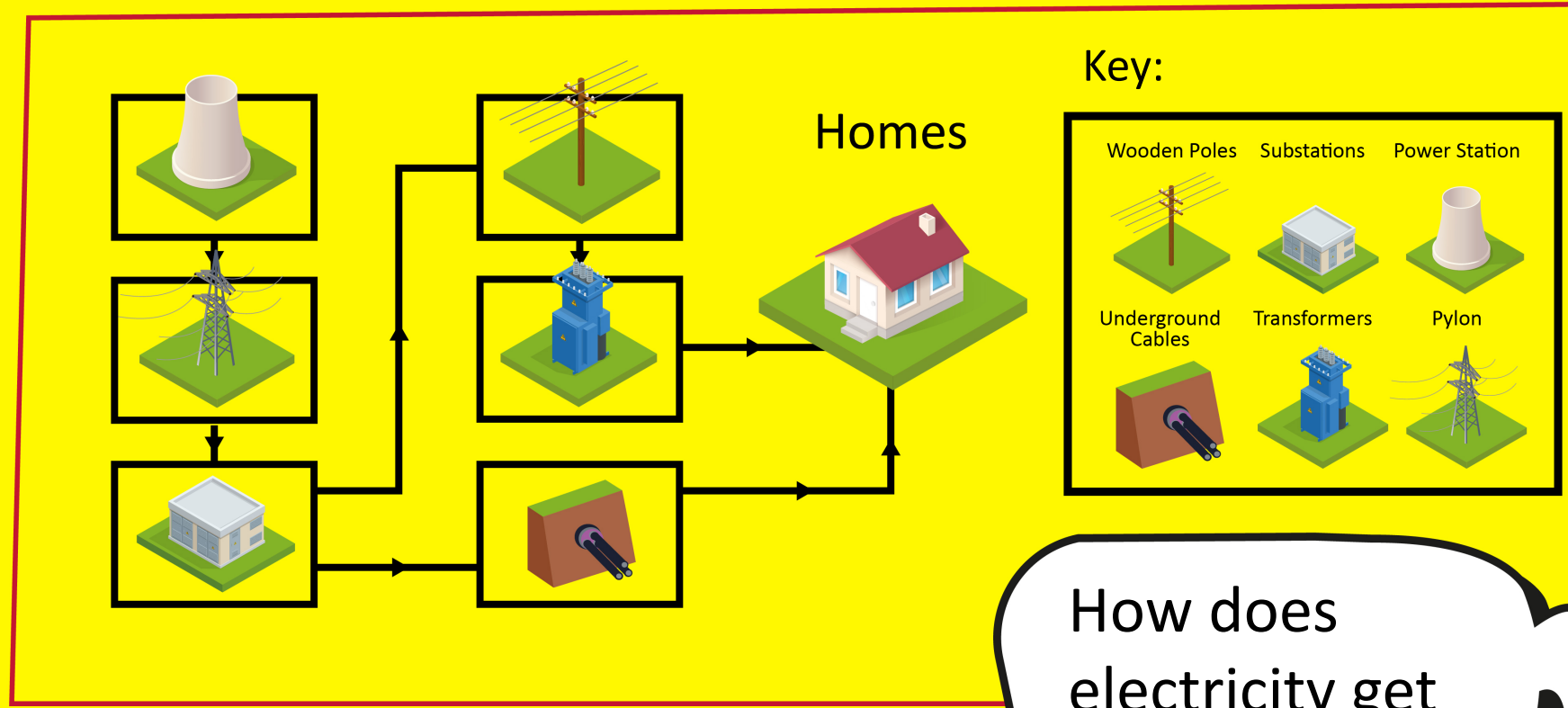
UNSAFE

This box contains electrical wires. It is unsafe to sit on or touch. You should adhere to the warning signs.



How does electricity get to your home?





How does
electricity get
to your home?



Keeping Safe:

Home Safe and Sound

Lesson 2: Keeping Current!

We are going to:

- Compare how electricity consumption has changed over the past 40 years
- Explore energy costs
- Discuss what issues future decision makers face





It costs £0.20 when you leave a light bulb turned on for 24hrs.

How much would it cost if you left it on for:

A WEEK

$£0.20 \times 7$

£1.40

A MONTH

$£1.40 \times 4$

£5.60

A YEAR

$£1.40 \times 52$

£72.80

What appliances would you expect to be used in a home from:



The
1980s

VS

Today

What differences would you expect to see in
an electricity bill from:



The
1980s

VS

Today

Electricity costs are rising: Watch this video

<http://www.bbc.co.uk/newsround/18591410>



How has energy
consumption
changed over
the years?



What issues
might face
future decision
makers?





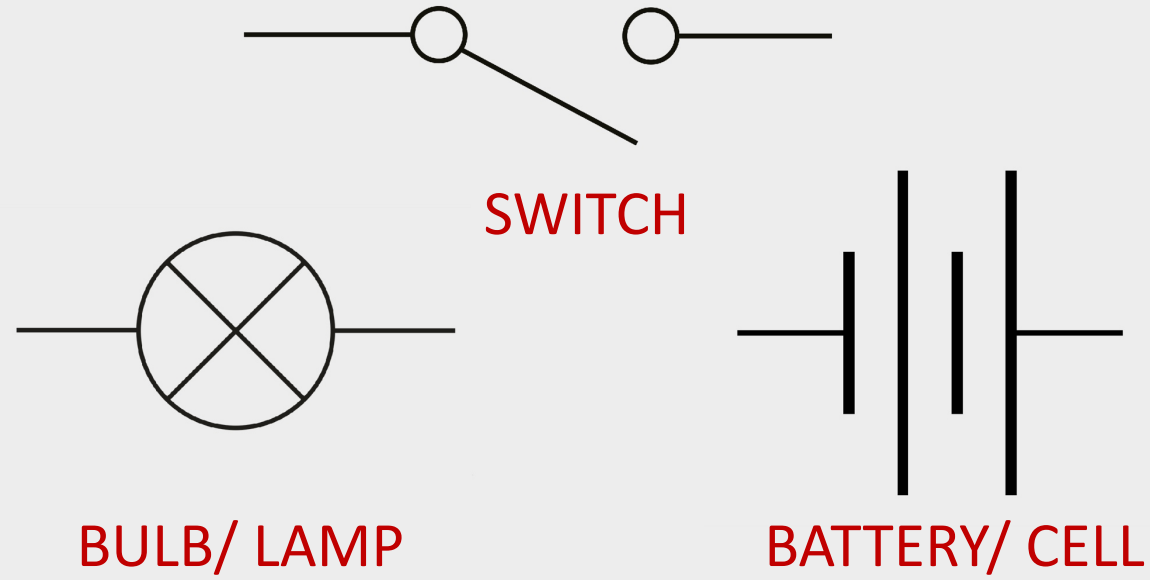
NEWSFLASH!

Lesson 3: My Circuit

We are going to:

- Explore Current Electricity
- Learn more about how a torch works
- Learn about how a change in voltage can impact a circuit





What you've learned today:

- Who Northern Powergrid is and what it does.
- How to stay safe around electricity both in the home and the local community.
- The cost of electricity for an individual household and how it has changed in recent years.
- The issues future generations will face when using electricity.
- How to explore electricity through scientific enquiry.





Well done!

