



**Y4 and Y6 Science
Knowledge and Skills Organisers
Electricity**



Our Science Knowledge and Skills organisers are primarily a planning guide for the teachers. They include the statutory statements (**Subject Knowledge to be covered**) and the non statutory guidance (in blue). They offer suggestions (in red) for how these statements might be taught **working scientifically** – which is a requirement of the National Curriculum.

The Knowledge and Skills Organisers map out how and when these areas are taught and help to build a clear, progressive scientific statement of intent for our children as they progress through the school.

We have added additional ideas and guidance for the teachers, which they can choose to use and interpret i.e. how the local area might be used, key questions and ideas which might be pursued, outdoor learning opportunities and cross curricular links as these are features we recognise are important in terms of our holistic curriculum provision.

Parental/ carer support:

By mapping out our curriculum in this way we hope that these documents also help parents and carers support the learning of their child/ren by

- Showing the knowledge being covered
- Offering some suggestions which might also be investigated at home
- Sharing key vocabulary, which can be discussed to ensure your child's understanding
- Suggestions of places to visit

Outdoor Learning:

Walk around school and local area to locate sources of electricity and its uses.

Local Links

Science museum
GSK workshop
Local secondary schools
Hertford theatre hydro electricity
STEM ambassadors for help or workshops
Gden Trust workshops

Key Vocabulary for topic

Simple series circuit
Electricity Component
Insulators Loop
Conductors Bulb
Lamp Buzzer
(Voltage) Motor
(Current) Cell
Switch
Positive Negative

Subject specific vocabulary

Resources Phizzi electricity boxes enough for whole class plus lesson plans

NOT to be separated

Science skills (Working Scientifically) to be covered

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers e.g Children might work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.

Year 4- Electricity

Possible Questions

What is a switch? How will it change your circuit? How would you make one?
Name the basic components of a simple series circuit.
Will your components work in this circuit?
Why/Why not?
Is this material a conductor of electricity?
With these materials and components can you design and make....?

Subject Knowledge to be covered:

- identify common appliances that run on electricity
- construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- recognise some common conductors and insulators, and associate metals with being good conductors

Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6. They SHOULD be encouraged to draw straight lines and use symbols if possible

Note: pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage. Pupils should be taught about precautions for working safely with electricity.

Cross -Curricular links

DT/History – burglar alarm for an Egyptian pyramid.
Lesson plan found in Phizzi electricity resource boxes
DT – LED light up cards
Buzzer game
Yes/No game

Science skills (**Working Scientifically**) to be covered

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- **using test results to make predictions to set up further comparative and fair tests**
- **reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations**
- **e.g systematically identifying the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit.**
- identifying scientific evidence that has been used to support or refute ideas or arguments

Outdoor Learning:

Walk around school and local area to locate sources of electricity and its uses.

Local Links

Science museum
GSK workshop
Local secondary schools
Hertford theatre hydro electricity
Ogden Trust workshops
STEM ambassadors – help or lead workshops

Key Vocabulary for topic

Overlapping usage of Year 4 vocabulary including the introduction of new terms such as: Voltage and Current.

Subject specific vocabulary

See science folder 2019-20

Resources

Phizzi electricity boxes- resources for class of 30 plus lesson plans
Well resourced- check batteries

Possible Questions

What will happen to your circuit if you add more cells?
How will your circuit be affected if you add another component?
How could you use a switch to control your circuit?
Design and investigate....
What would you need to....?

Subject Knowledge to be covered:

associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit

compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches

use recognised symbols when representing a simple circuit in a diagram

pupils should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. They should learn how to represent a simple circuit in a diagram using recognised symbols.

Note: pupils are expected to learn only about series circuits, not parallel circuits. Pupils should be taught to take the necessary precautions for working safely with electricity.

Cross -Curricular links

Literacy – **biography of scientists**

D & T – Making vacuum cleaners (STEM)

Lighthouses Buzzer game

LED torches Yes/No Quiz game

Solar powered vehicle. (

Computing – step counter (fitbit) using microbit – Herfordshire University

PSHE - How to conserve electricity around school - renewable energy production

History- Time lines of inventions – found on Ogden Trust website

Year 6 – Electricity Topic: