Tomorrows World
Focus: Science, DT and Computing

Fossebrook Primary School

Hook:

Explore programming using Beebots and Spheros

Knowledge:

- Who are some significant people who have effected technology? What did they do?
- How are networks used in everyday life?
- How do we use technology to communicate and collaborate?
- What are the different parts of a network and what do they do?
- How does light travel?
- How can light be reflected / redirected?
- How does light help us see?
- Which symbols show which components?
- What will happen you increase the cells /voltage in a circuit?

Learning Journey:

Introduction: Men and women who have changed the face of technology. Research and present, promoting articulacy.

Look at computer networks, multiple services, WWW, communication and collaboration (think about use of tech during lockdown)

Learning Journey:

Light
Use a fixed laser beam to reflect onto a target on the wall. Exploring how light travels in straight lines but can be redirected using something reflective. Use talc on the table/floor to demonstrate that it is travelling straight. Explore what happens when it hits a barrier (shadow).

Learning Journey:

Light
Light travels from a light source to our eyes enabling us to see. Make periscopes to explore, the light hits the object which is reflected onto mirrors and into the eyes to see. Spy-themed game of hide and seek using periscopes to find each other.

Learning Journey:

Electricity
Recap prior learning making circuits and exploring different components. Explore what happens to the volume of a buzzer or the brightness of a bulb in reflection to the amount/voltage of a cell. Discuss the effects switches etc. have on the effectiveness of a circuit and the effect on brightness / volume. Draw made circuits using appropriate symbols.

Learning Journey:

Explore, design, build and program using (Lego/STEAM/SAM)

Vocabulary:

server	switch
hub	router
bridge	modem
firewall	laser
reflect	bulb
cell/battery	buzzer
circuit	complete/incomplete
symbol	voltage
robotics	program

Characteristic foci:

Creativity / Articulacy

Skills:

use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

Build a circuit using a variety of components

Use relevant symbols to represent components in a circuit

Direct a light using a mirror and articulate that it travels in a straight line and how that can be effected using different objects

Create a shadow and articulate how it is made and why it is that shape

Prove that the brightness of a lamp is effected by the voltage of a cell / the quantity of cells

Design and build a product, controlling it using an app/computer (kit)

Curriculum Coverage:

understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration

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

2) 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

3) use recognised symbols when representing a simple circuit in a diagram.

Light
1) recognise that light appears to travel in straight lines

2) use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye

3) explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes

4) use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

apply their understanding of computing to program, monitor and control their products

Trip / Visitor:

Display Plan:

Display made robots / ipads with podcast / drawn circuits
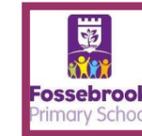
Outcome:

Build a robot / car to program and record a podcast about their learning

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What do they already know?

Year 2
· What is a program?
· What is coding?
· How can you be safe online?
· How do I turn on an iPad?
· How do I find an app on an iPad?

Year 3
· What is an algorithm?
· What is debugging?
· What is programming?
· What is a shadow?
· How is a shadow formed?
· Why do shadows change size?

Year 4
· What is an algorithm?
· What is debugging?
· What is programming?
· What is a sequence?
· What are variables?
· What is a sprite?
· What is coding?
· How is sound made and how do we hear sound?
· What is the pitch of a sound and how do we change the pitch?
· How do sounds change over distance?
· What is electricity?
· Where does electricity come from?
· What are insulators and conductors?
· How do switches work?

How will they remember it?

Mini Quizzes

Recaps at the start of lessons

Podcast of learning

Memorable experiences

KABOOM!

Display learning line

Use of curriculum map in book

Which resources will I need?

Electricity kit

Laser torches

Mirrors

Talc

Robotics programming kit (TBC)

What do I need to know to be able to teach this?

- How does light travel? https://www.bbc.co.uk/bitesize/clips/zyntsbk

- Periscopes https://www.stem.org.uk/elibrary/resource/31673#&gid=undefined&pid=1

- Building circuits https://www.bbc.co.uk/bitesize/topics/zq99q6f/resources/1

- Use of STEAM / Lego

- Susan Wojcicki (female in technology - CEO youtube, supporting founder of Google https://www.forbes.com/profile/susan-wojcicki/#5539ec5f3ae3)

- Bill Gates (Microsoft https://kids.kiddle.co/Bill_Gates)