



Coding and Robotics Overview Booklet



Term 1 Volume R



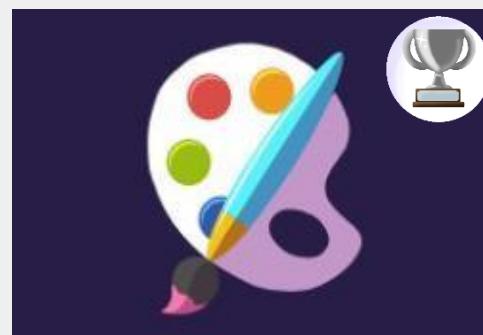
1. Shape

Learners create a picture of themselves at home using repeating shapes.



2. Size

Learners arrange graphics from smallest in size to largest in size and vice versa.



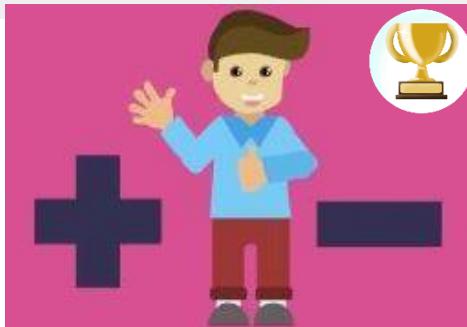
3. More Fun With Shape and Colour

Learners match, sort and sequence using a series of shapes of different colours.



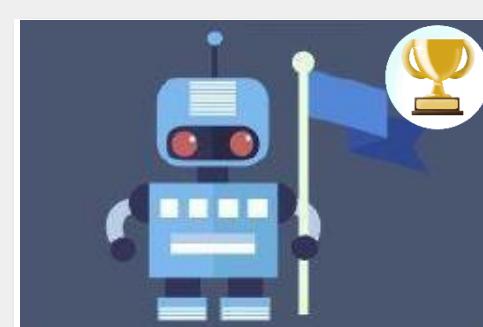
4. Device Matching

Learners match pictures of devices to its label by using the readout aloud function or with the teacher's help.



5. My Routine

Learners tick or number the routines they do each day before arriving at school.



6. My Robot

Learners create a futuristic robot using shapes.



7. Safety File Card

Learners make a file card with their full name, phone number and parent's first names



8. My Mouse

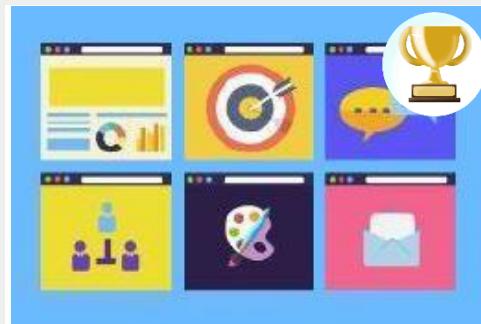
Learners identify left and right click buttons on a caricature mouse.

Term 1 Volume R



9. Ladybug Spots

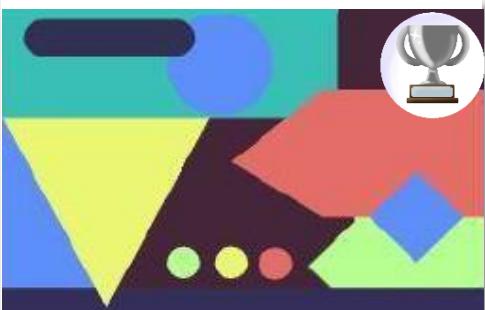
Guide Miss Ladybug to the berries by moving your mouse. Drag and drop dots onto Miss Ladybug and her friends to colour them in.



10. Application Matching

Match icons and names of applications to their purposes by using the readout-aloud function.

Term 1 Volume 1



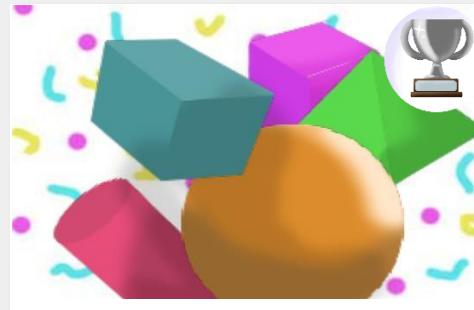
1. Shape and Pattern

Identify and complete picture and shape patterns and create your own patterns



2. Correcting Patterns

Correct the patterns that are incorrect



3. Copying Patterns

Copy the pattern using Word



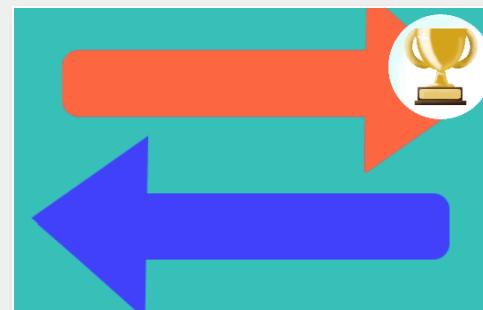
4. Mask Making

Use shapes and patterns to create your own robot mask.



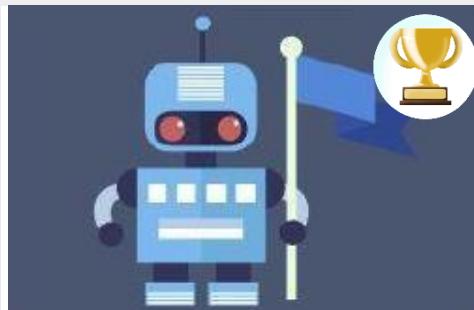
5. Forward and Back

Use a template in Word with coding blocks available and drag the blocks into locking positions to create a forward 2 and backward 2 set of code.



6. Left and Right

Use a template in Word with coding blocks available and drag the blocks into locking positions to create a forward, left, right back sequence.



7. Robot Pickup

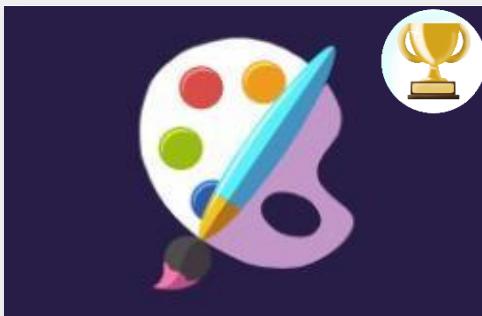
Put in the commands (L, R, forward, back) to make the robot pick up toys left on a grid.



8. Connection Symbols

Draw lines to match the symbols with the words in the columns

Term 1 Volume 1



9. Paint 3D

Open Paint 3D and starting a new project.



10. My Friends

Create a picture of yourself and a friend using drawing tools.



11. My Home

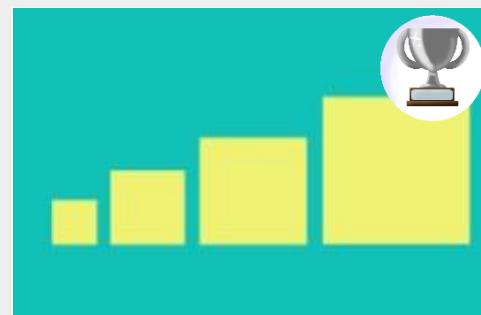
Create a picture of your home using drawing and shape tools.

Term 1 Volume 2



1. Beaded Bracelet

In Word use the shape tool to draw patterns, recolour the shapes and order the shapes to create a plan for a beaded bracelet.



2. Pattern Making

Form groups and take it in turns make patterns using shapes, words, pictures and colours.



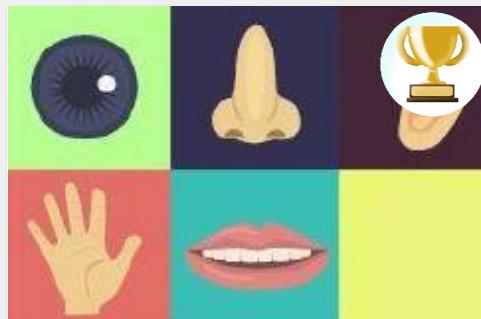
3. Digital Communication

Discuss digital communication and the different methods of communications.



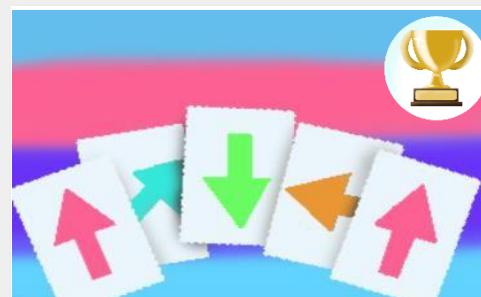
4. Digital Communication Methods

Draw lines in this word template to match the digital communication examples with its purpose in the columns.



5. My Character

Open a new Scratch project and click on the Costumes tab next to the Coding tab.



6. Character Movement

Work on the previous saved project



7. Let's go Diving

Learn how to use Scratch to do coding.



8. Toy Car

Build toy cars using card boards, plastic bottles or any other sustainable materials.

Term 1 Volume 2



9. Toy Car 2

Continue to build toy cars using card boards, plastic bottles or any other sustainable materials.



10. Special Keys

Identify the function of 10 special keys on the keyboard.



11. Computer Keyboard

Reconstruct the keys of a blank computer keyboard



12. My Favorite Song

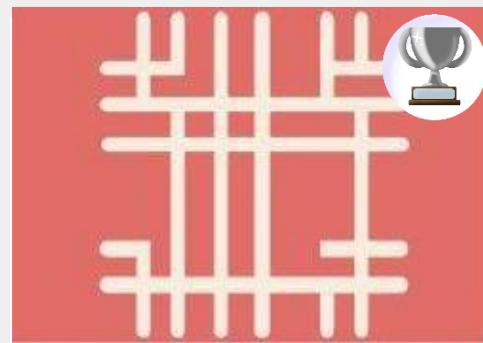
Using an online tool try and recreate your favourite song.

Term 1 Volume 3

2	10	4	21	8	
11	3	20	1	22	23
18	14	0	12	16	7
17	5	19	9	15	13

1. Number Square

Create various patterns on a number chart.



2. Character and Maze

Start a new Scratch project and draw your own sprite/character.



3. Maze Navigator

Work on the previous Scratch project and practice coding to make sprites move in a maze.



4. Basic Circuit

Using a drawing program such as Paint 3D or on paper draw a circuit diagram.



5. Shape Building

Practice building 2D and 3D shapes using recycled cardboard or coloured paper.



6. Structure Building

Practice building 2D and 3D structures using recycled cardboard.



7. Structure Presentation

With your completed tower or bridge take it in turns to have a presentation to show your work.



8. Network Components

Using a Word template and the internet fill in a table about components that makeup a network.

Term 1 Volume 3



9. Network Directions

Using Word type out a set of instructions of how to get from home to school using networking terms.



10. Lousy Litter

Create a spreadsheet and graph after doing a litter survey.



11. Fill Tools Drawing

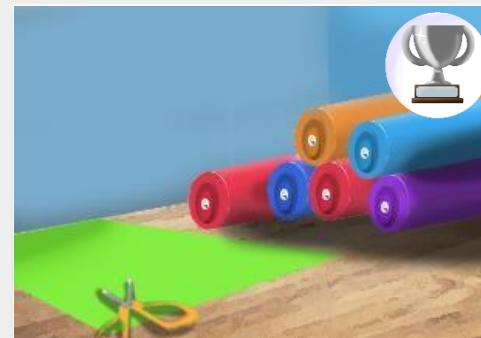
Using fill tools in Excel, draw the South African flag, a robot or any other picture.

Term 1 Volume 4



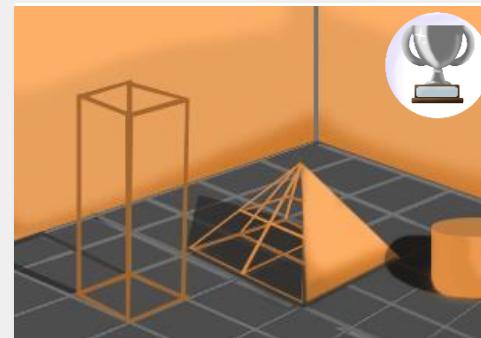
1. Input Output

Sort and identify various input and output devices.



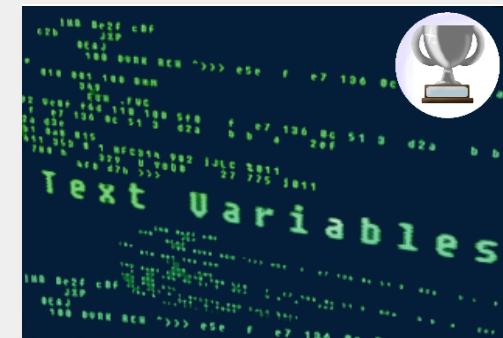
2. Textile Talk

Research relevant information about 5 different textiles: cotton, wool, silk, nylon and polyester. Tabulate the information.



3. Introducing CAD

Have a discussion about CAD. Demonstration and use of CAD software takes place.



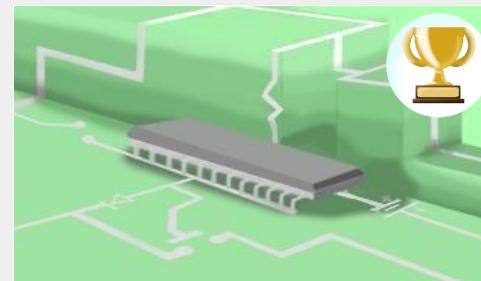
4. Text Variables

Have a discussion about capturing text variables. Create a program for capturing two text variables.



5. Number Variables

Have a discussion about capturing number variables. Create a program for capturing two text variables and one number variable.



6. Microcontrollers

Have a discussion about Microcontrollers, what are they and what do they do?



7. Microcontroller Programming

Program a microcontroller to switch on and off an LED/buzzer.



8. Microcontroller Programming 2

Continue programming a microcontroller this time making an LED flash on and off or making a buzzer sound automatically.

Term 1 Volume 5



1. Internet Safety Guide

Distinguish appropriate screen names as well as appropriate chats.



2. Sacred Soil

Format a passage about soil using more advanced formatting skills.



3. CAD Shapes

Using CAD software draw shapes according to specifications.



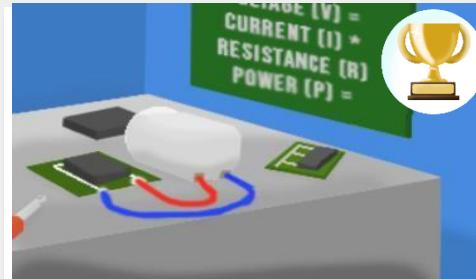
4. Talking Sprite

Using Scratch place coding blocks to make a sprite detect the mouse pointer and talk.



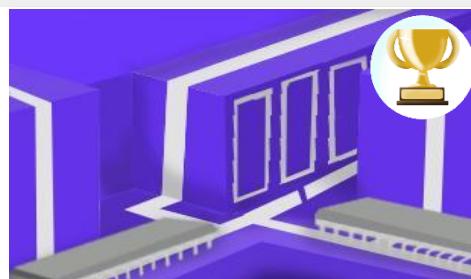
5. Number Guessing Game

Write code to make a number guessing game. Play a number guessing game in class.



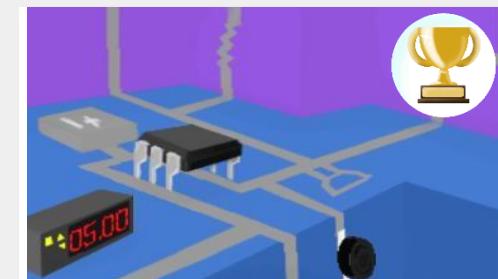
6. Microcontroller with Button

Draw a circuit diagram and plan to programme a microcontroller to communicate with a button and other components.



7. Microcontroller with Keyboard

Draw a circuit diagram and plan to programme a microcontroller to communicate with a key or keys of a keyboard and other components.



8. Microcontroller with Keyboard2

Draw a circuit diagram and plan to program a microcontroller to communicate with keys of a keyboard and other components.

Term 1 Volume 6



1. Internet of Things

Discusses Internet of Things (IOT).
Have a debate wired vs wireless.



2. The Body

Create a table explaining the structure of systems of the body and their function.



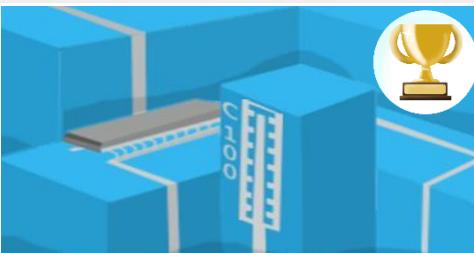
3. AND OR Operators

Discuss AND OR Operators.
Write a program that asks for a number within a certain range.



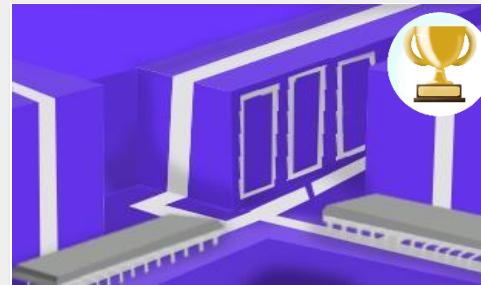
4. IF THEN ELSE

Discuss IF THEN ELSE statements. Write a program that asks for test scores.



5. Temperature Warning

Write a problem statement and investigate possible solutions to be warned about the classroom temperature. Programme a microcontroller.



6. Light Intensity

Program a microcontroller to monitor light intensity.



7. Humidity Level

Program a microcontroller to monitor the humidity.

Term 1 Volume 7



1. Introducing AR

Have a discussion about AR. An AR app is demonstrated.



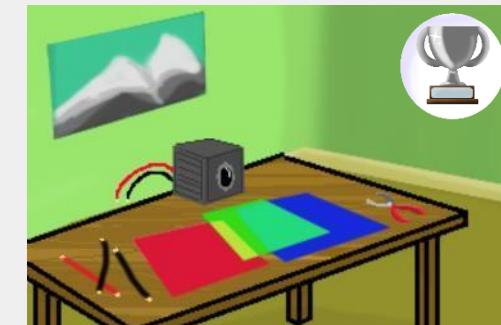
2. Block vs. Line Coding

Compare block-based coding to its line-based counterpart.



3. Coding Flowchart Output

Determine the output by studying a coding flow chart.



4. Colour Sensing

With the use of a webcam detect colour in Scratch.



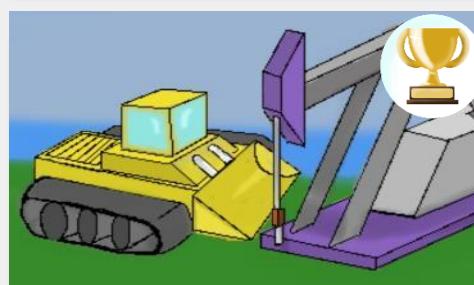
5. Market Day

Draw up a spreadsheet which shows the costing for a Market Day Activity and your profit, or loss, after the Market Day.



6. Introducing HTML

Create a basic webpage using the elements and tags of HTML.



7. Mechanical Linkages

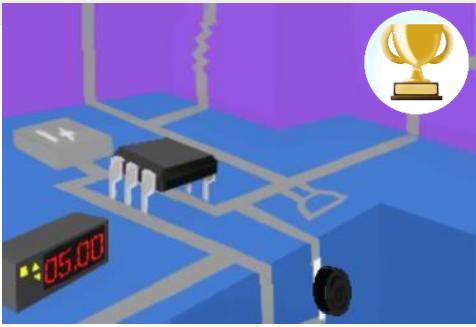
Recreate a provided mechanical linkage drawing using FreeCAD.



8. Potentiometer and Buzzer

Program a microcontroller with a buzzer and potentiometer. The potentiometer is used to adjust the tone of the buzzer.

Term 1 Volume 7



9. Potentiometer and LED

Program a microcontroller with an LED and potentiometer. The potentiometer is used to adjust the brightness of the LED.

Term 2 Volume R



1. Basic Movement Pattern

Learners follow instructions given by the teacher to perform a basic physical movement that can create a pattern.



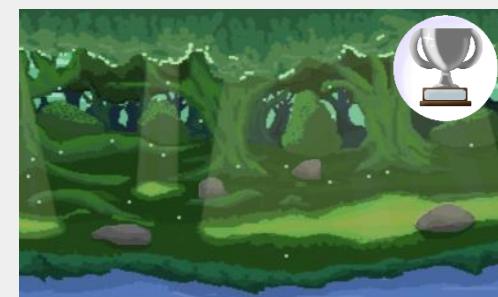
2. More Movement Patterns

Learners follow instructions given by the teacher to perform the basic physical movements that can create patterns.



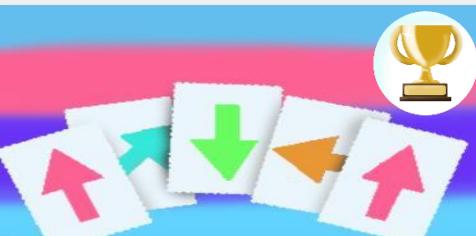
3. Friend's Pattern

Learners form groups of two with their classmates. Each learner come up with a basic pattern using a drawing program such as Paint 3D.



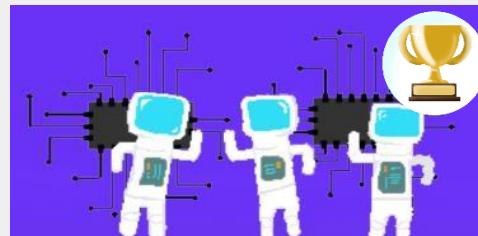
4. Tree Planting

Using a provided template, learners arrange pictures of how to plant a tree in the correct sequence.



5. Code Card Movement

The teacher choices a few movements from the provided code cards. The learners are shown the code cards and must copy the movements by following the instructions.



6. Dancing Robots

The teacher comes up with a simple dance comprising of four moments. Using visual and verbal instructions.



7. Pattern Password

Using a drawing program or on paper learners insert a username. Using shape, line or drawing tools learners create a pattern password.



8. Educational Game

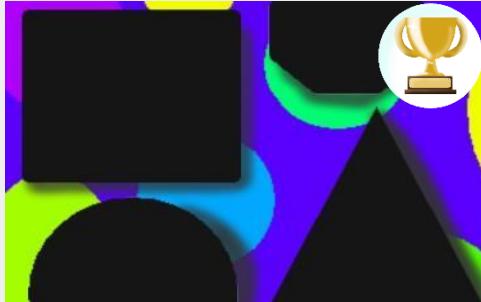
This lesson is used to remind learners how to switch a device on and off, open and close applications and how to interact with the interface of an application.

Term 2 Volume R



9. Stop Sign

Build a stop sign and arrange the letters S-T-O-P.



10. Shadow Shapes

Sort various shapes by identifying them by their shadow outline.

Term 2 Volume 1



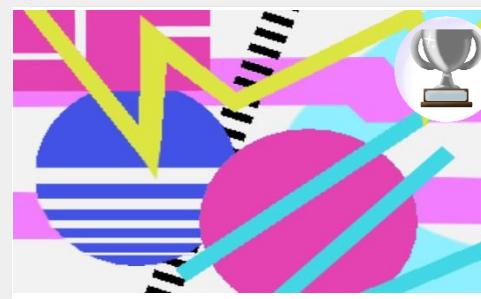
1. Pattern Explanation

Learners are provided with a set of patterns with increasing complexity.



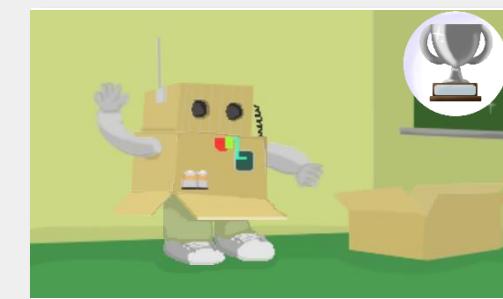
2. My Pattern

Learners are provided with two complete pattern sequences sets. Using a similar design learners design the third pattern sequence.



3. Incorrect Sequence

Learners are provided with a set of pattern sequences. The one sequence is incorrect, learner need to identify it.



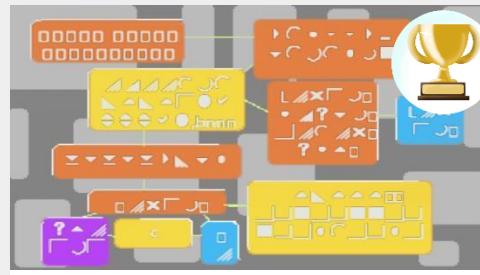
4. My Robot

Learners are provided with a cardboard box used to make a robot body.



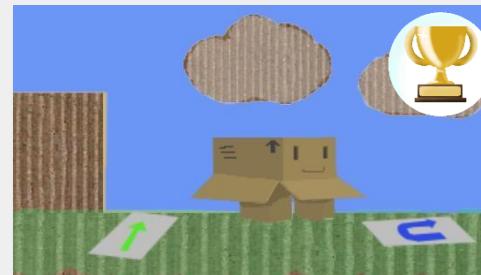
5. Coding Loop

Have a class discussion about coding loops and what they are used for.



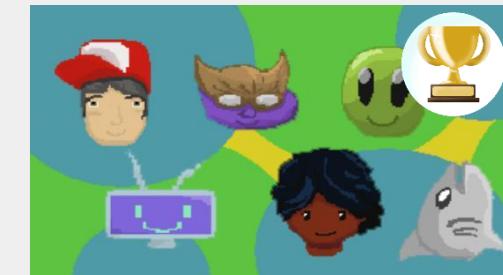
6. Basic Block Coding

Have a class discussion about the available coding blocks in Scratch at a basic level.



7. My Robot Toy Collector

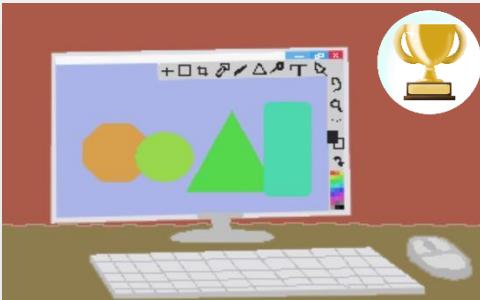
Learners continue building their robot toy.



8. My Avatar

Have a class discussion about digital safety and online identity. Without adding any personal information learner come up with their own avatar.

Term 2 Volume 1



9. Shape Drawing

Learners open a drawing program such as Paint 3D. Using shape tools, draw shapes to make a drawing.



10. Saving Files

Learners open a drawing program such as Paint 3D. Using shape tools, draw different shapes. Learners are introduced to saving files to their portfolio.



11. Opening Files

Learners open the provided template. Continue working on the saved file by adding additional shapes or adding lines to complete shapes.

Term 2 Volume 2



1. Broken Bracelet

Study the available shapes, think of what the original pattern may have been and put the beaded bracelet back together.



2. Walking Shapes

Using instructions provided by the teacher, learners walk forward and turn right. Learners are given time to think about shapes that they can make with the provided instructions.



3. My Day

Learners write a mock email to a family member or friend telling them about their day.



4. Online Safety

Have a class discussion about online safety. What can you share online and what you should not.



5. Coding Background

Learners open a new Scratch project and change the background.



6. Basic Coding Movement

Have a class discussion about event triggers in Scratch to ensure learners understand what they are and what they can be used for.



7. More Coding Movement

Leaners open a new Scratch project and change the background..



8. Toy Car

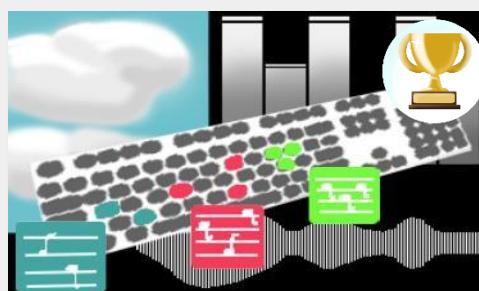
Learners build a toy car out of recycled materials and basic fasteners

Term 2 Volume 2



9. Toy Car Continued

Learners modify their toy cars to include the propulsion method discussed during the week 6 lesson.



10. Keyboard Sounds

Leaners spend time looking at the different keys of a keyboard on a computer or other device, have a class discussion about what the key do.



11. Introducing Typing

Using the provided template, learners open a word processing application such as Microsoft Word and retype the short paragraph.



12. More Typing

Learners are introduced to proof reading, spelling and grammar checking tools.

Term 2 Volume 3



1. Algorithm Grid

Learners are provided with a 4 x 4 grid with different sets symbols. Within each set of symbols are like symbols that can be joined by drawing lines to create different shapes.



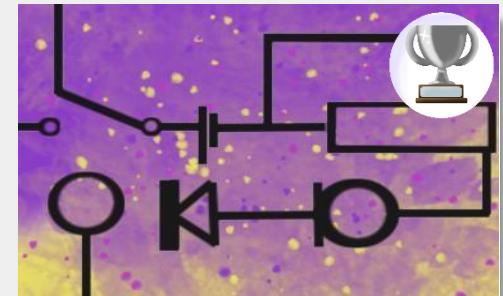
2. Animated Characters

Leaners open a new Scratch project and select three or more sprites that are part of the same set but have different positions.



3. My Algorithm

Learners open a new Scratch project and create their own sprite by using paint tools.



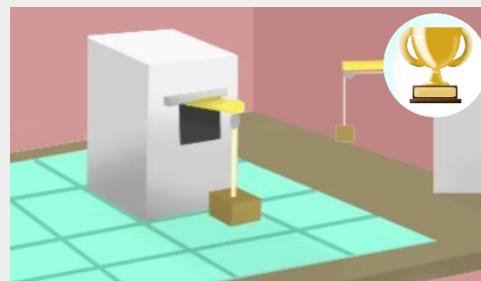
4. Basic Circuit

Have a class discussion about components that can make up a basic circuit.



5. Introducing Pulleys

Have a class discussion about basic pulleys and how they can be used.



6. Lifting Pulleys

Using a built structure from term 1, learners add a pulley system based on what they learnt during the week 5 activity to lift the structure up.



7. Structure Presentation

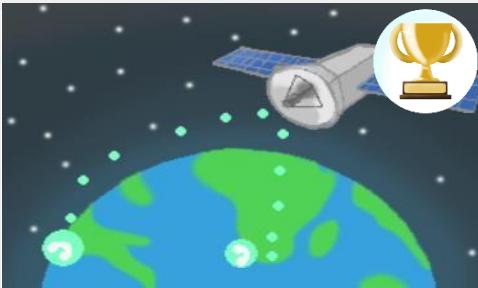
Learners present the structures they build to the class and answer questions from the teacher and class about their structure.



8. Basic Network Components

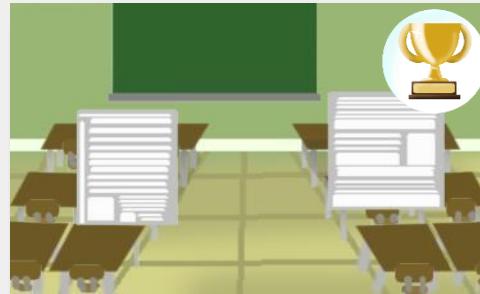
Have a class discussion where the teacher introduces network components that make up a network,

Term 2 Volume 3



9. Long Distance Communication

Have a class discussion about digital communication methods and how they connect to each other via the internet.



10. Class List

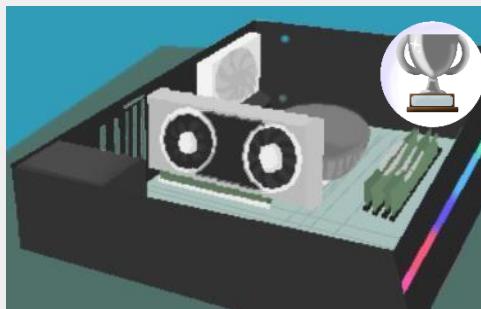
Learners open a spreadsheet application. The teacher provides the learners with a class list that includes name, surname and age. Using the open worksheet learners copy the class list.



11. My Tuck-shop List

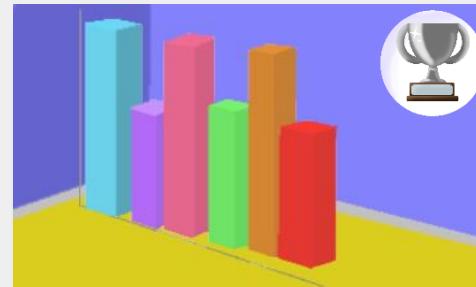
Learners open a spreadsheet application. Using the open worksheet learners input their favourite items to buy at the school tuck-shop.

Term 2 Volume 4



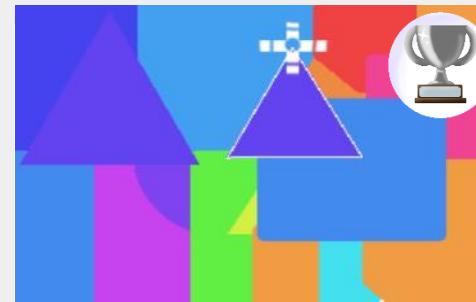
1. Input Output Processing

Have a class discussion about basic components that make up digital devices, focus on input, output, storage and processing.



2. Spreadsheet Tools

Learners make use of basic formatting tools to neaten the spreadsheet and basic addition and subtraction formula to calculate totals. The totals are plotted on a bar chart.



3. 2D Shape Tools

Have a class discussion to revise drawing tools in CAD software such as FreeCAD



4. Add and Subtract Coding

Have a class discussion about how number variables can be added together or subtracted to create basic sums by use of coding.



5. Multiply and Divide Coding

Have a class discussion about how number variables can be multiplied or divided to create basic sums by use of coding.



6. Microcontroller Time Delay

Learners program a microcontroller with an LED or buzzer.



7. RGB LED Microcontroller

Learners program a microcontroller with an RGB LED.



8. Light Pattern

Learners are provided with pattern examples; they choose a pattern that they like. Using the chosen pattern, learners convert the pattern into a light pattern by use of LEDs.

Term 2 Volume 5



1. Consequences of Online Crimes

Using what they have learnt, learners write paragraphs about the consequences of online crimes



2. Spreadsheet Formulas

Using a spreadsheet application such as Microsoft Excel learners make use of the AutoSum formula to calculate the sum of the numbers.



3. More CAD Tools

Have a class discussion where the teacher opens a CAD application such as FreeCAD and demonstrates the use of dimension and curve tools.



4. Typing Game

Learners are required to make you of the Python coding language in PyCharm or equivalent coding application to create a word guessing game.



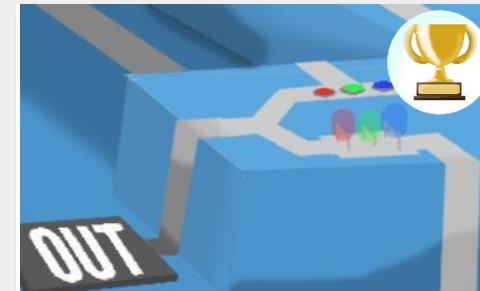
5. Guess the Number

Learners continue with the repeat until coding loop and Python coding language this time creating a number guessing game.



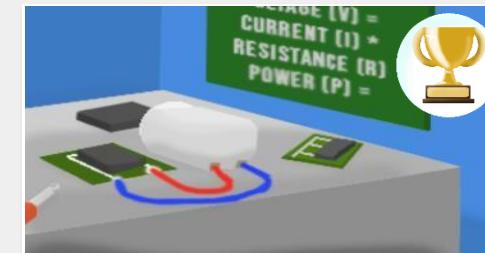
6. Multiple Inputs Microcontroller

Learners program a microcontroller with two buttons, an RGB LED or buzzer and other components.



7. Multiple Outputs Microcontroller

Learners plan an output sequence that will be controlled with the buttons, the output sequence will control the LEDs.



8. DC Motor Microcontroller

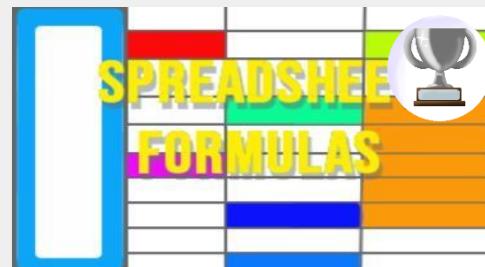
Learners connect a DC motor and other components to a microcontroller.

Term 2 Volume 6



1. IOT Data

Learners complete a worksheet to match commands to enable the use of different IOT devices.



2. Spreadsheet Formulas

Learners are introduced to advanced formulas in a spreadsheet application such as Microsoft Excel.



3. 3D Cut Tool CAD

Have a class discussion to introduce learners to the 3D cut tool in CAD software



4. Nested Loops

Learners make use of nested repeating loops in Scratch with coding blocks to make a character move around a stage



5. Python Maths

Learners make use of the Python programming language in PyCharm or equivalent to create a program using loops to count from 1 to 12.



6. Motion Alarm

Learners program a microcontroller with a buzzer, motion sensor and other components to create a basic alarm



7. DC Motor Code

Learners program a microcontroller with a DC motor and other components.



8. DC Motor Sensor

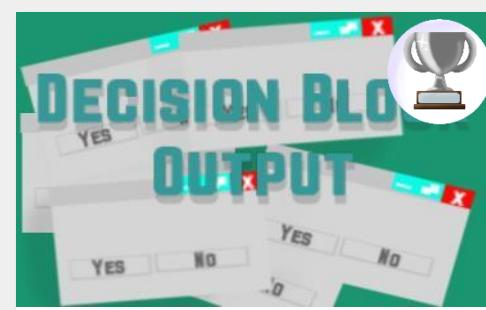
Learners program a microcontroller with a DC motor, the choose of either a thermal, light or humidity sensor depending on what is available and other components.

Term 2 Volume 7



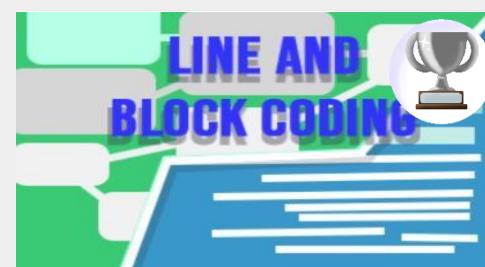
1. Introducing VR

Have a class discussion where the teacher introduces the learners to Virtual Reality (VR).



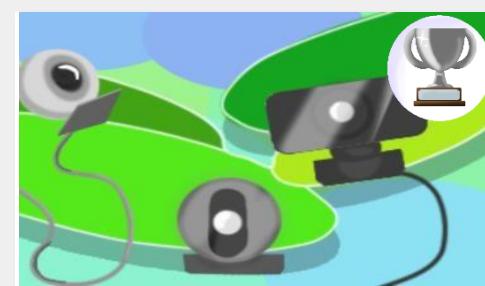
2. Decision Block Output

Learners are provided with a coding flowchart with a decision block where a choice needs to be made



3. Line and Block Coding

Have a class discussion to remind learners about the difference between line based and block based coding



4. Camera Coding

Learners make use of the video sensing extension in Scratch.



5. Spreadsheet Errors

Have a class discussion to introduce learners to errors that can occur in Excel or equivalent application while completing formulas or inserting data and how to solve them.



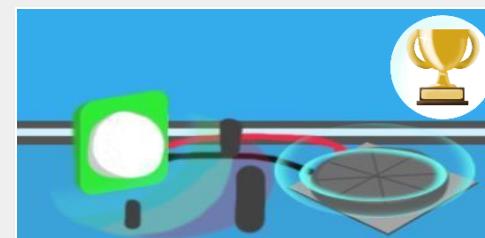
6. Webpage Formatting

Have a class discussion to remind learners about the basic Hypertext Mark-up Language (HTML) tags that make up a website.



7. Mechanical Pulley's Drawings

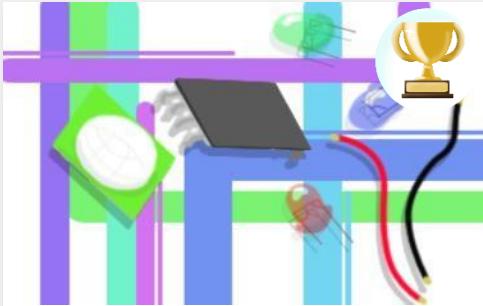
Learners are provided with mechanical pulley's drawings containing dimensions, learners recreate these drawings in FreeCAD or equivalent



8. Proximity Alarm Buzzer

Learners program a microcontroller with a buzzer, an ultrasonic proximity sensor and other components.

Term 2 Volume 7



9. Proximity Alarm

LED

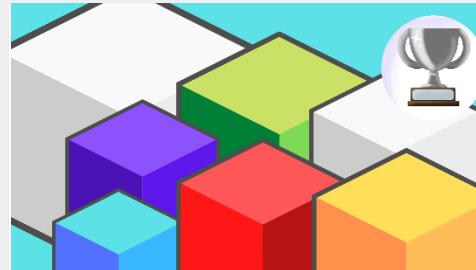
Learners program a microcontroller with an LED, an ultrasonic proximity sensor and other components.

Term 3 Volume R



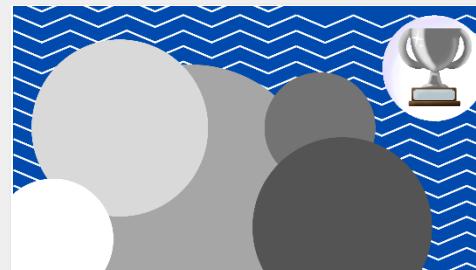
1. Follow The Leader

Learners follow their teacher to complete patterns using physical movements with a minimum of two physical movements and three repetitions.



2. Pattern Objects

Using building blocks or other suitable objects, drawing lines and using shapes, learners are shown examples of patterns made with the physical and visual objects.



3. Pattern Replication

Learners create a basic pattern with a minimum of three steps repeating twice.



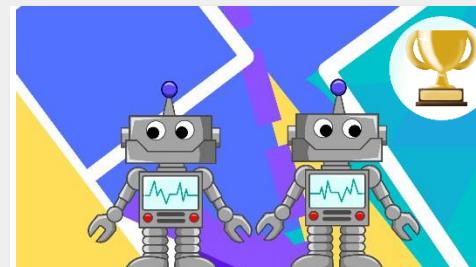
4. Code Card Maze

Have a class discussion to remind the class about code cards. Learners complete maze activities where they create their own algorithm using given code cards.



5. Container Swapping

Have a class discussion to introduce the class to swapping up to three or more times.



6. Dancing Robots Continued

The teacher creates a dance routine with a minimum of eight movements repeating twice.



7. Introducing Digital Security

Have a class discussion to introduce the class to digital security.



8. Digital Size Sorting

Shapes and pictures get sorted by size, smallest to biggest then biggest to smallest on a digital device

Term 3 Volume R



9. Digital Colour Sorting

Shapes and pictures get sorted by like colour on a digital device



10. Digital Object Sorting

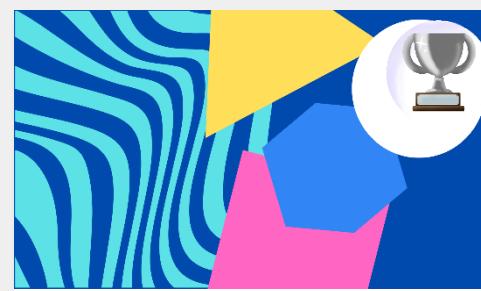
Objects get sorted by whether they roll or slide on a digital device

Term 3 Volume 1



1. More Patterns Explanation

Learners are provided with sets of patterns with four different pictures, shape or symbols and two repetitions.



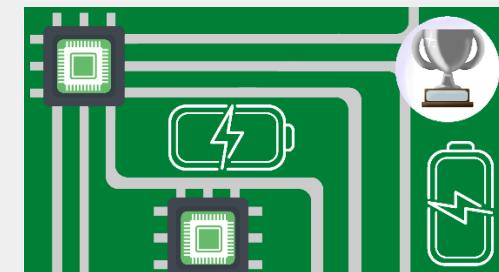
2. More Pattern Sets

Learners are provided with two sets of patterns with four different pictures, shape or symbols and two repetitions



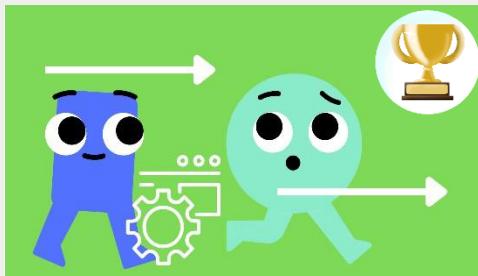
3. Odd Pattern

Learners are provided with sets of matching patterns with four different pictures, shape or symbols and two repetitions.



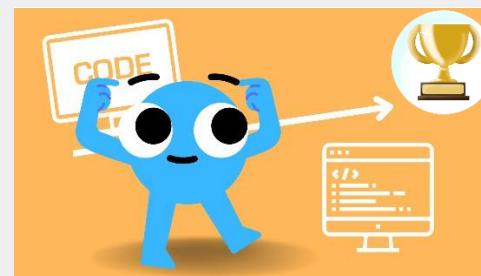
4. Basic Circuit Discussion

Have a class discussion to introduce the class to basic circuits containing the following components: battery, wires, switch, buzzer or LED and breadboard.



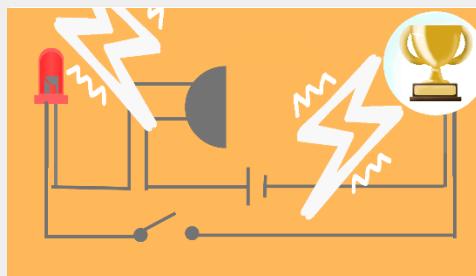
5. Moving Shapes Input

Have a class discussion to introduce the class to coding input events at a basic level.



6. Coding Input Event

Have a class to discussion introduce the class to input events in a block based coding environment such has Scratch.



7. Basic Circuit Building

Build a circuit containing the following components: battery, wires, switch, buzzer or LED and breadboard.



8. My Digital Footprint

Have a class discussion to introduce digital footprint to the class. What is internet search history and how can it be checked?

Term 3 Volume 1



9. Digital Drawing

The teacher should think of a suitable topic that can be drawn which relates to what the class is currently learning about.



10. Digital Patterns

Make use of a drawing application on a computer or smart device to create your own pattern sets.



11. Digital Dream House

Think about your future dream house. What does it look like?

Term 3 Volume 2



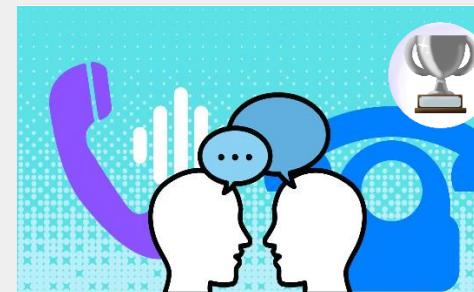
1. Introducing Number Patterns

Have a class discussion to introduce the class to number patterns, explain how number systems can create patterns by using different sets of multiples.



2. My Number Patterns

Using what you have learnt during the previous week's lesson, create your own number patterns.



3. Introducing Voice Communication

Have a class discussion to introduce the class to voice communication using a smart device.



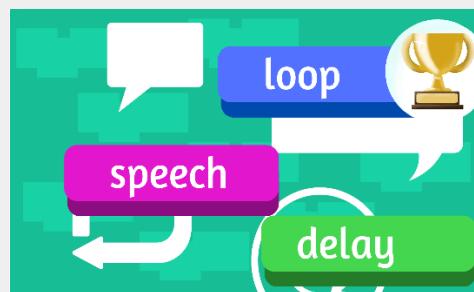
4. Using Voice Communication

Each learner is given a method of possible voice communication on a smart device.



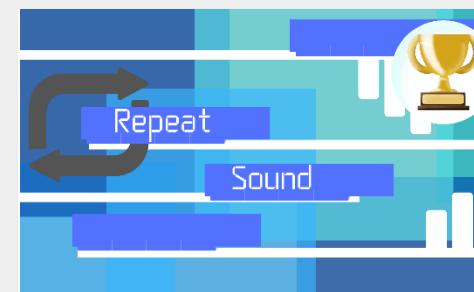
5. Introducing Pen Blocks

Have a class discussion to introduce the class to pen blocks used in Scratch within the Pen Extension.



6. Pattern Coding

Have a class discussion to introduce the class to new coding blocks used on Scratch



7. More Pattern Coding

Have a class discussion to introduce the class to new coding blocks used on Scratch: Repeat (loops), Sound blocks



8. Toy Airplane

Using recycled materials and basic fasteners, start building the chassis a toy airplane.

Term 3 Volume 2



9. Toy Airplane

Continued

Continue building your toy airplane from the Week 6 Robotics Skills lesson. Build the propeller and attach it to an elastic motor.



10. Full Stop and Question Mark

Have a class discussion to introduce the class to the use of the full stop and question mark on a physical or virtual keyboard.



11. Exclamation Mark

Have a class discussion to introduce the class to the use of the exclamation mark on a physical or virtual keyboard.



12. Comma

Have a class discussion to introduce the class to the use of the comma on a physical or virtual keyboard.

Term 3 Volume 3



1. Symbol Pattern

Errors

Learners are provided with three grids. Each grid contains sets of symbols which create patterns.



2. Colour Sensing

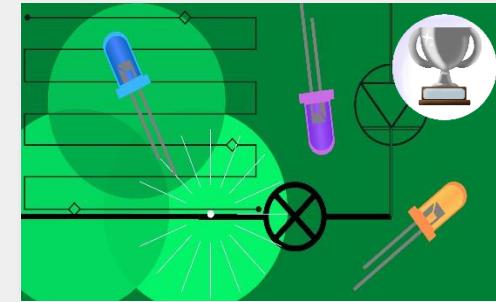
Code

Have a class discussion to introduce the class to event driven programming using sensory triggers where colour sensing is used.



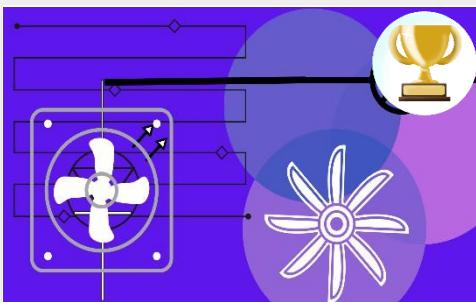
3. Keyboard and Mouse Code

Have a class discussion to introduce the class to event driven programming using keyboard and mouse triggers.



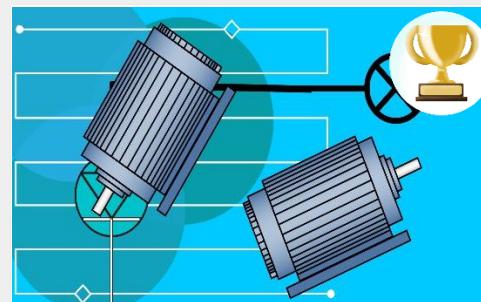
4. Series and Parallel Circuits

Have a class discussion to introduce the class to series and parallel circuits.



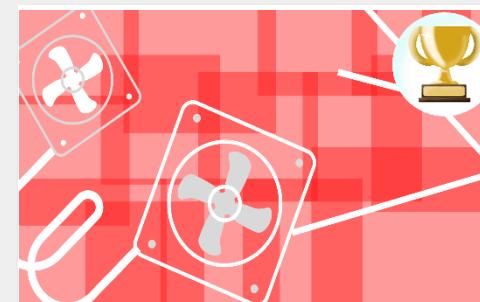
5. Basic Fan

Have a class discussion to introduce the class to polarity changes on a DC motor and the use of gears.



6. DC Motor Polarity

Continue with polarity changes on a DC motor and the use of gears. Build a circuit on a breadboard which contains a switch, wires, 1.5v battery and a DC motor.



7. Fan Presentation

Present the fan you built during the previous lesson.



8. The Internet

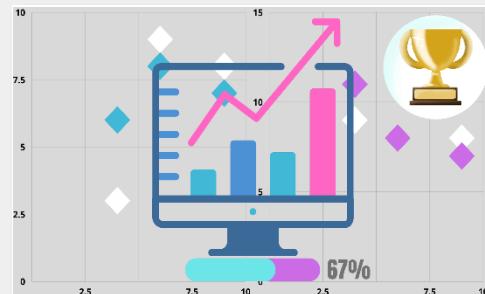
Have a class discussion to introduce the class to the internet. Explain what the internet is and how it works.

Term 3 Volume 3



9. Websites and Online Safety

Have class discussion to introduce the class to websites, give some examples of useful and safe websites.



10. Pictogram Spreadsheet

Have a class discussion to introduce the class to capturing pictogram data in a spreadsheet.



11. Bar Graph Spreadsheet

Have a class discussion to introduce the class to displaying spreadsheet data in a bar graph.

Term 3 Volume 4



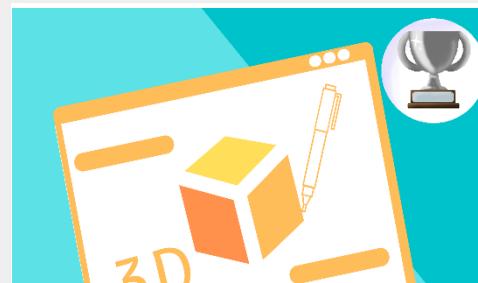
1. History of Communications

Have a class discussion about the history of communications



2. Introducing Presentations

Have a class discussion to remind the class about formatting tools:



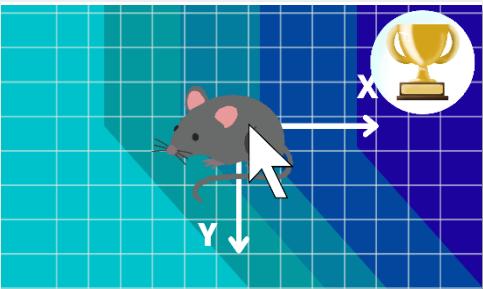
3. My CAD Drawings

Have a class discussion to remind the class about drawing tools used in a CAD application



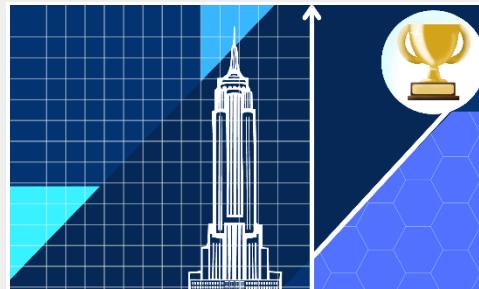
4. Greater and Less Than Coding

Have a class discussion to remind the class about coding concepts.



5. Mouse Game

Have a class discussion to explain to the class how the If then control can be used to control the movement of a character



6. My Skyscraper Plan

Have a class discussion to remind the class about previously learnt robotics skills:



7. My Skyscraper Build

Have a class discussion to further discuss machine fasteners, mention different methods.



8. My Skyscraper Build Presentation

Continue building your skyscraper model, apply any required finishing touches.

Term 3 Volume 5



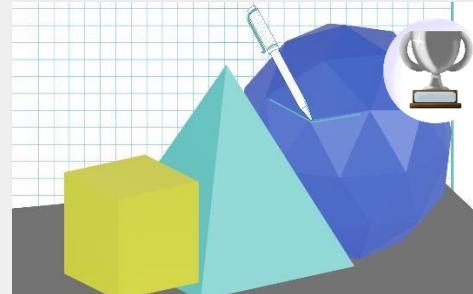
1. Understanding Web Browsers

Have a class discussion to remind the class about websites, advantages and disadvantages of the internet



2. Presentation Skills

Have a class discussion to remind the class about previously learnt presentation skills



3. Trim and Offset CAD Tools

Have a class discussion to remind the class about drawing tools used in a CAD application



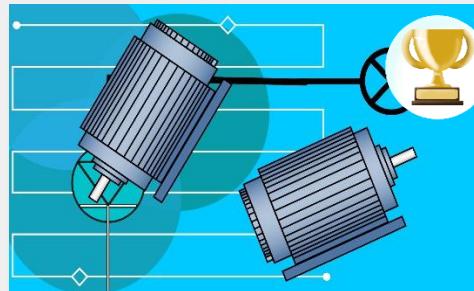
4. Broadcast Coding

Introduce broadcasting, discuss where it can be used in useful ways.



5. Wait Coding

Have a class discussion to introduce the class to the wait control.



6. DC Motor Direction

Introduce changing the direction of a DC motor using a microcontroller.



7. Mechanical Systems

Have a class discussion to introduce the class to mechanical systems pulleys using two pulleys.



8. Mechanical Systems Continued

Have a class discussion to introduce the class to mechanical systems pulleys using three pulleys.

Term 3 Volume 6



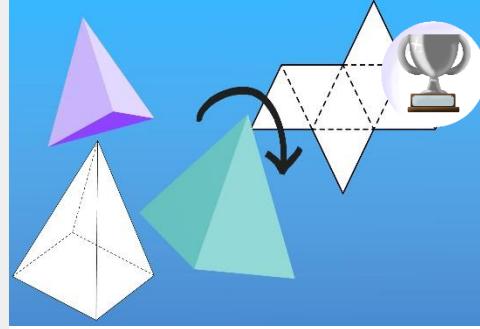
1. Introducing Cloud Computing

Using the internet, research how data is moved between devices and the cloud



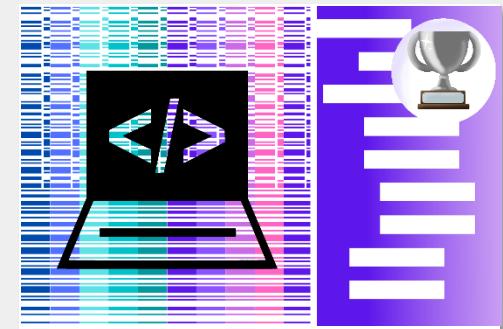
2. More Presentation Skills

Have a class discussion to remind the class about previously learnt presentation skills



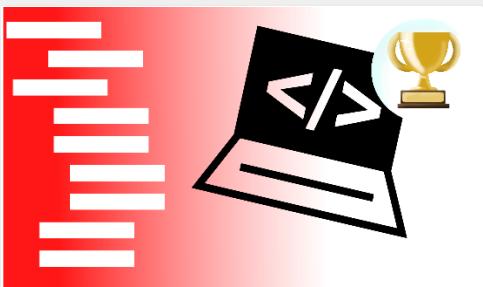
3. Revolve CAD Tool

Have a class discussion to remind the class about previously learnt CAD application concepts:



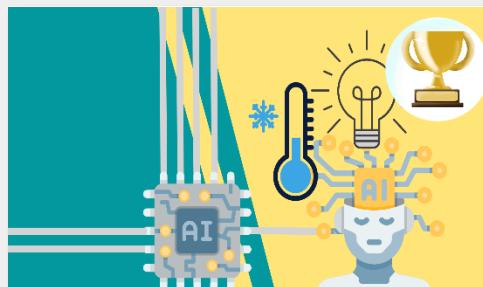
4. Lists Coding

Introduce using lists, how to add items to a list and how delete items from a list.



5. Lists Coding Continued

Continue using lists, add items to a list and delete items from a list.



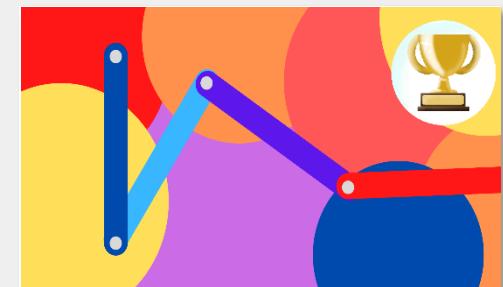
6. Automated System

Have a class discussion to remind the class about previously learnt concepts



7. Mechanical Gears

Have a class discussion to introduce the class to mechanical gear systems using two gears.



8. Mechanical Linkages

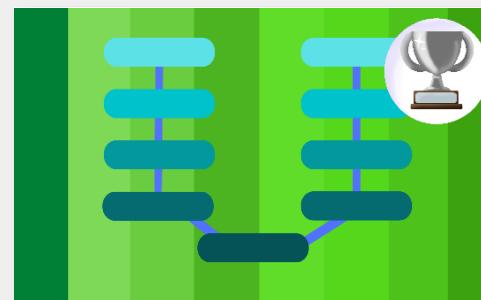
Have a class discussion to introduce the class to mechanical linkage systems using two linkages.

Term 3 Volume 7



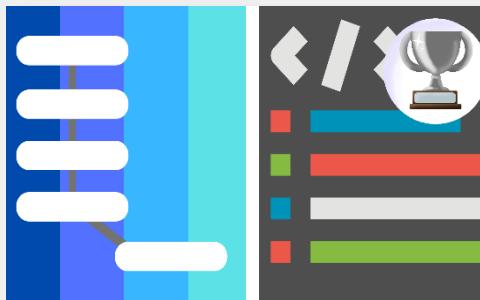
1. Introducing AI

Have a class discussion to introduce Artificial Intelligence



2. Coding from Flowchart

Have a class discussion to remind the class about Block based coding, Input and output, Processing, Flowcharts



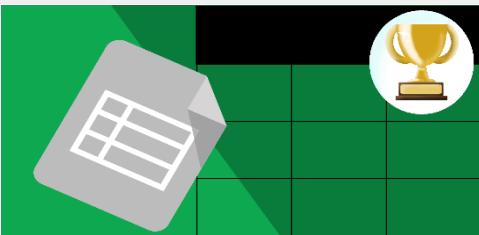
3. Flowchart from Coding

Have class discussion to remind the class about comparing line based coding with its block based counterpart.



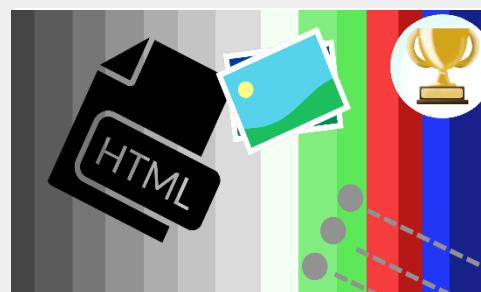
4. Introducing Data Types

Have a class discussion to introduce the class to placing variables within data types, String, Integer, Float and Boolean



5. Advanced Spreadsheet

Open a spreadsheet application such as Excel to a blank workbook. Study the provided data. Add additional sheets and rename them according to the provided data.



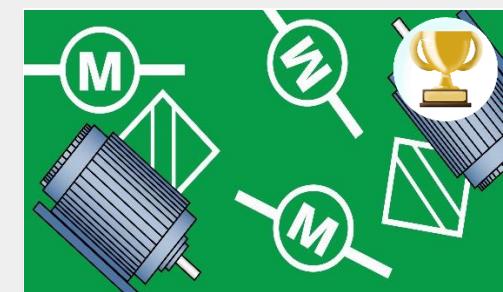
6. Introducing HTML Graphics

Have a class discussion to remind the class about previously learnt Hypertext Markup Language (HTML) concepts



7. Wheels and Axels Drawing

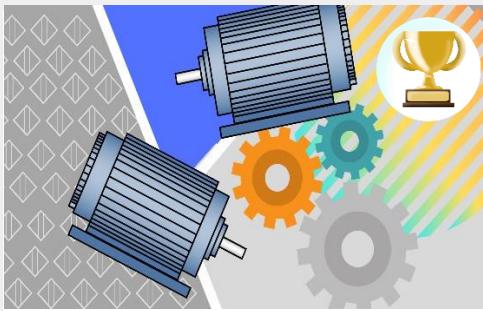
Introduce mechanical components drawings of wheels and axles.



8. DC Motor Sensor

Program a microcontroller with an ultrasonic proximity sensor, DC motor and other components.

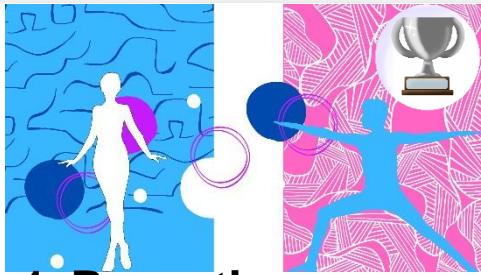
Term 3 Volume 7



9. Motor Sensor Continued

Program a microcontroller with an ultrasonic proximity sensor, two DC motors and other components.

Term 4 Volume R



1. Repeating Physical Patterns

The teacher decides on three easy to follow physical movements with three repetitions to create patterns.



2. More Pattern Objects

The teacher uses a combination of three physical objects to create two examples of patterns with three repetitions.



3. More Pattern Replication

Learners create a basic pattern with a minimum of three steps repeating three times.



4. Maze Solution

Learners are provided with three solutions to a maze, only one solution is correct. Determine the correct solution and navigate the maze.



5. Maze Code Sequence

Learners are provided with a code sequence for navigating a maze, the sequence has some errors. Solve the errors and navigate the maze.



6. Robot Fruit Picker

Imagine that you have built a robot for picking up fruit. Plan the path the robot must follow.



7. Good Password Practice

Have a class discussion about good password practices



8. Keyboard Game

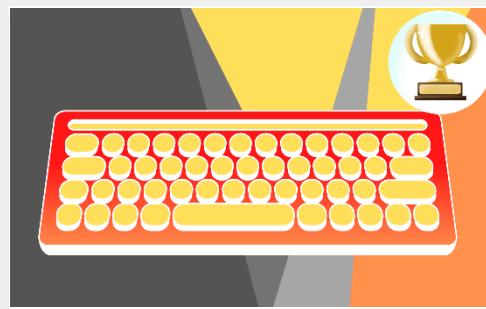
Have a class discussion to introduce the class to a virtual keyboard on a touch screen and a physical keyboard on a computer.

Term 4 Volume R



9. Typing Practice

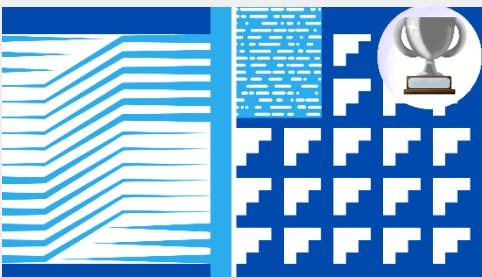
Open a typing application such as RapidTyping.



10. Keyboard Game Continued

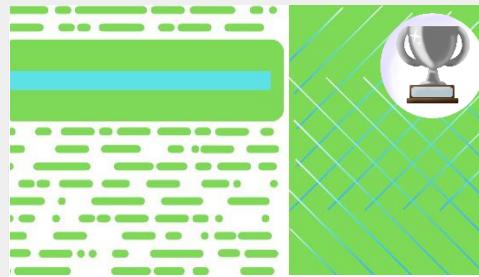
Improve your hand and eye coordination by following the link to a kid safe games website to practice using the keyboard.

Term 4 Volume 1



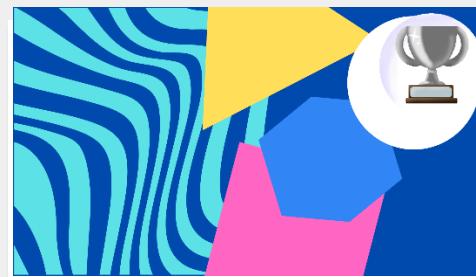
1. Explaining Patterns

Learners are provided with sets patterns with five items repeating three times.



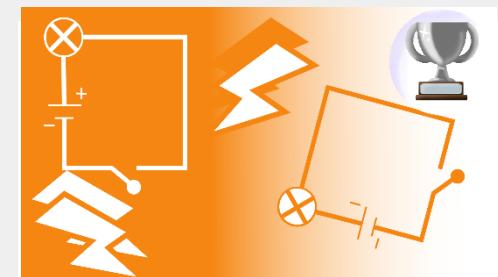
2. Correcting Pattern Sequence

Learners are provided with matching pattern sequences with five items repeating three times.



3. Continuing Pattern Sequences

Learners are provided with two pattern sequences with five items repeating three times.



4. Electric Components Revision

Have a class discussion to revise the electric components that make up a basic circuit.



5. Solving Maze

Code Sequence

Learners are provided with a code sequence for navigating a maze with some errors within the sequence correct order to solve the sequence and navigate the maze.



6. Code in Pairs

Working in groups, open Scratch to a new project and select a sprite. Add coding blocks to the sprite to perform some actions.



7. Collector Robot

Use code card instructions to program a previously built robot toy to move



8. Animal Tracks

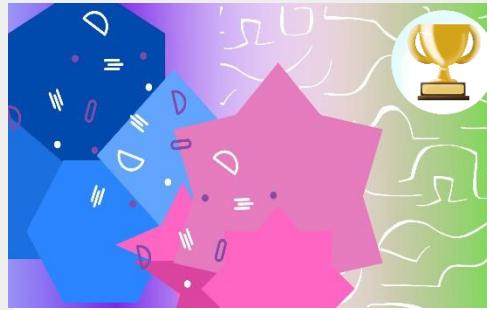
Learners are provided with pictures of animal tracks on a path. Label the tracks with animal they belong to.

Term 4 Volume 1



9. Explaining Patterns

Have a class discussion to introduce the class to combining different 2D shapes to create a picture.



10. Combined Shapes Colour

Remind the class how to open previously saved work from their portfolio.



11. Combined Shapes Picture

Open a drawing application such as Paint 3D. Using what you have learnt during the previous two weeks, combine different 2D shapes to create your own picture.

Term 4 Volume 2



1. Secret Message

Learners are provided with a list of numbers with corresponding letters and a secret message.



2. My Secret Message

Learners create their own set of numbers with corresponding letters and a secret message.



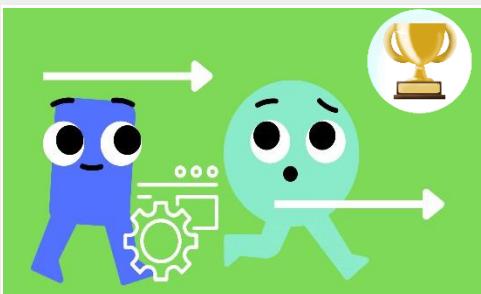
3. E-Communication Video

Have a class discussion to introduce the class to making videos using a camera or smart device.



4. Video Instructions

Working in groups of two, create a short step by step instructions video



5. Introducing Multiple Characters

Have a class discussion to introduce the class to adding multiple characters within a Scratch project



6. Loops and Event Triggers

Open Scratch then open the project you saved during the Week 3 lesson, File, Load from your computer and locate the file in your portfolio.



7. Sound and Colours

Using your creativity and previously learnt Scratch skills, add more coding blocks to one of your sprites to include the use of sound and pen blocks.



8. Introducing Electric Fan

Have a class discussion to introduce the class to a basic circuit for powering a DC motor for an electric fan.

Term 4 Volume 2



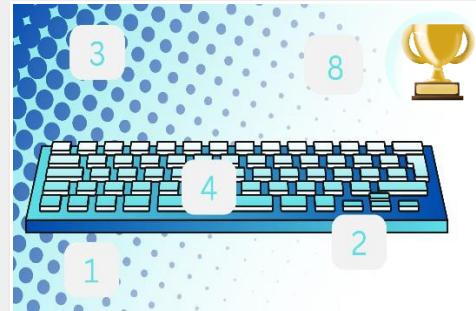
9. Electric Fan Propulsion

Modify your previously built toy car or airplane to replace the elastic motor with a DC motor.



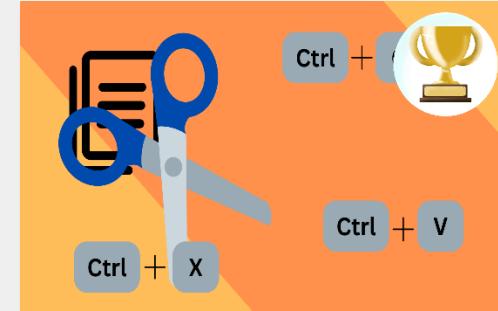
10. Digital Crossword

Have a brief class discussion about how to do crosswords digitally.



11. Introducing Numeric Keys

Have a class discussion to introduce the class to numeric keys on virtual keyboard on a touch screen and a physical keyboard on a computer.



12. Cut, Copy and Paste

Have a class discussion to introduce the class to cut, copy and paste.

Term 4 Volume 3



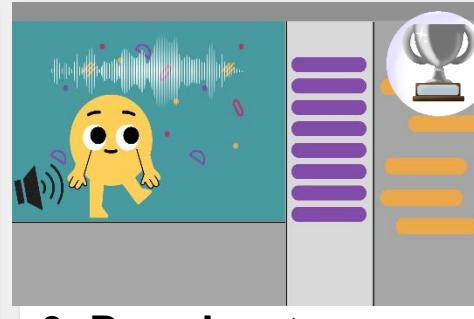
1. My Symbol Puzzle

Learners challenge themselves to create patterns puzzles using symbols.



2. Broadcast Movements

Have a class discussion to introduce the class to broadcasting in Scratch.



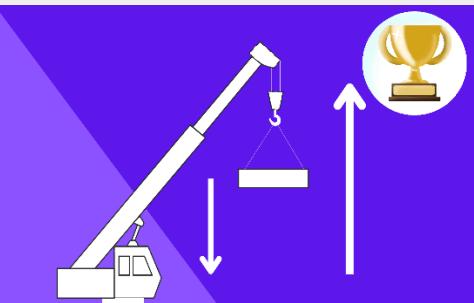
3. Broadcast Sounds

Have a class discussion to introduce the class to sound in Scratch.



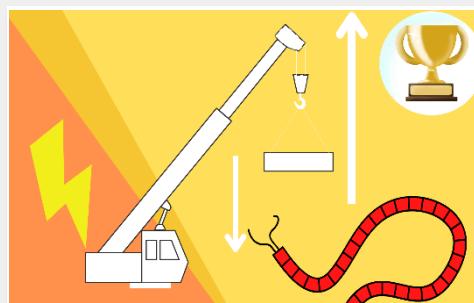
4. Crane Structure Building

Learners are provided with recycled cardboard. Build the structure part of your crane.



5. Crane Lifting System

Learners are provided with a minimum of two gears, pulleys and linkages.



6. Crane Electrical System

Learners are provided with a DC motor, switch, wires, batteries and breadboard. Build an electrical system.



7. Crane Presentation

Present the crane you built and show that it is functional by lifting items such as building blocks.



8. Introducing Search Engines

Have a class discussion to introduce the class to search engines, mention examples of search engines.

Term 4 Volume 3



9. Finding Images and Videos

Learners are provided with a list of five image topics and one video topic to search for.



10. Reducing Litter

Learners are provided with the results of a survey of the amount of litter found in a local park during a community clean-up project.



11. Reducing Litter Continued

Have a class discussion about how to copy data and graphs from a spreadsheet application and paste it in a word processing application.

Term 4 Volume 4



1. Risks of E-communication and Devices

Have a class discussion about the advantages of the Internet



2. Slides with Pictures

Have a class discussion to introduce the class to adding pictures to slides within a presentation application such as PowerPoint.



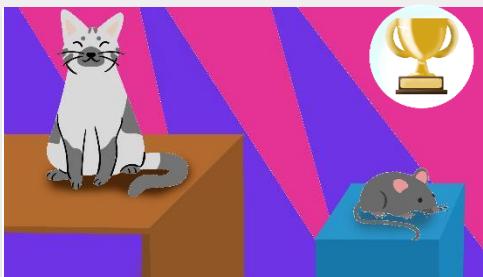
3. Video Editing

Have a class discussion to introduce the class to using a video editing application such as the one that comes with your device or DaVinci Resolve,



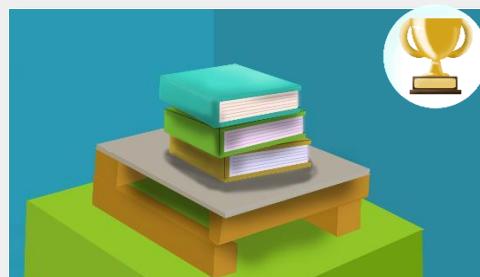
4. Multiple Input Variables

Open a coding application such as PyCharm and using Python as the coding language create a program that asks for two number variables as inputs.



5. Catch the Mouse

Open Scratch to a new project. Delete the default sprite then select or draw cat and mouse sprites. Add coding blocks to the mouse to make it move around the stage randomly.



6. Structural Integrity Challenge

Using the internet, research structural integrity while keeping in mind what you have previously learnt about structures



7. Green Roof Project

You have been tasked with building a new shopping centre with a focus on being environmentally friendly.



8. Green Roof Project Continued

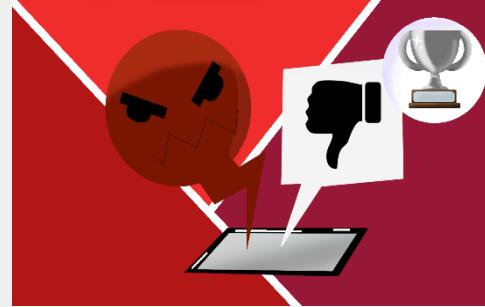
Build a model of the shopping centre using recycled material and mechanical fastening methods.

Term 4 Volume 5



1. Digital Citizenship

Have a class discussion to introduce the class to digital citizenship



2. Cyber Bullying Presentation

Open a presentation application such as PowerPoint to a blank presentation. Using what you learnt about cyber bullying.



3. Video Editing

Have a class discussion to introduce the class to adding text, transitions and sound effects within a video editing application.



4. Ball Bouncing Game

Open Scratch to a new project. Draw a sprite and select a ball, delete the default sprite. Add coding blocks to the ball to make it move around the stage.



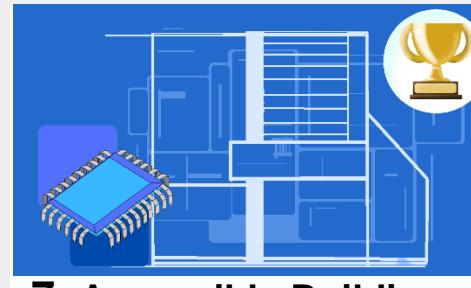
5. Ball Bouncing Game Continued

Open Scratch then open the project from the Week 4 lesson. Create a variable for keeping score.



6. Accessible Building Plan

You are an architect and have tasked with designing a new apartment building with a minimum of ten floors.



7. Accessible Building Electrical

You need to power the pulley system. Decide which electrical components will be required. Code and test the microcontroller to be used with the electrical components.



8. Accessible Building Model

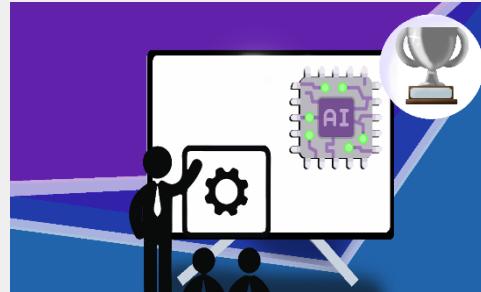
Build a model of the apartment building based off your plan from the Week 6 lesson using recycled materials.

Term 4 Volume 6



1. Introducing Automation

Have a class discussion to introduce the class to what automation is and how automation is supported by use of Internet of Things (IOT).



2. Automation and IOT Presentation

Open a presentation application such as PowerPoint to a blank presentation. Using what you learnt about how automation



3. More Video Editing Skills

Have a class discussion to introduce the class to trimming and merging video clips within a video editing application.



4. Quiz Game

Have a class discussion to introduce the class to new Python coding skills, using two lists, determining how many items exist in a list



5. Quiz Game Continued

Open your stated quiz game from the Week 4 lesson. Add additional code to determine if the answers to the questions are correct.



6. Smart Home Design

You are an architect and have tasked with designing a new smart home.



7. Smart Home Electrical

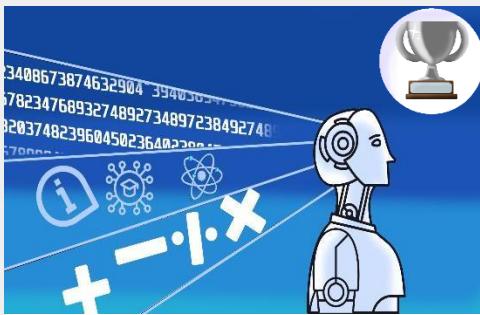
Using the internet, research the features of smart homes



8. Smart Home Model

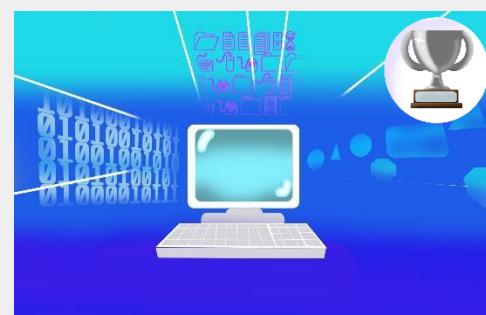
Build a model of the smart home based off your plan from the Week 6 lesson using recycled materials.

Term 4 Volume 7



1. Introducing AloT

Have a class discussion about the basics of machine learning and about Artificial Intelligence of the Internet of Things (AloT).



2. Machine Learning Library

Have a class discussion to introduce the class to machine learning methods and machine learning library at a basic level.



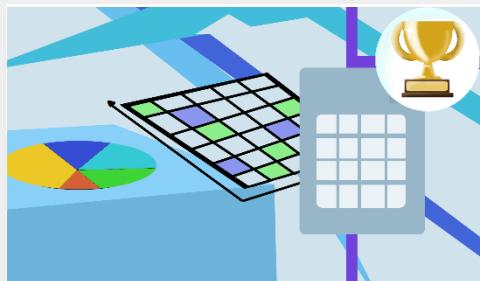
3. Database Program Design

Design a Python program that will call the information from your Week 2 database and display it.



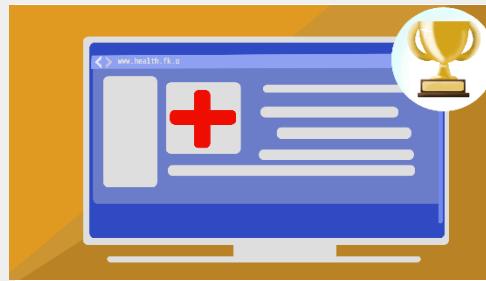
4. Database Program Code

Open a coding application such as PyCharm and connect it to your Week 2 database. Use your design from the Week 3 lesson to code the program.



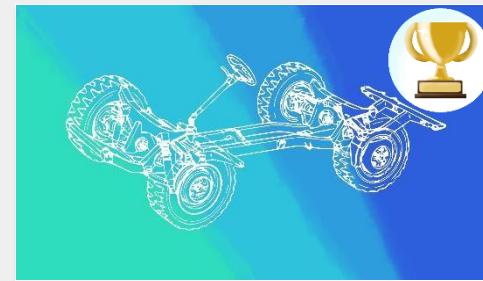
5. More Advanced Spreadsheets

Have a class discussion to introduce the class to cell formatting skills within a spreadsheet application such as Excel



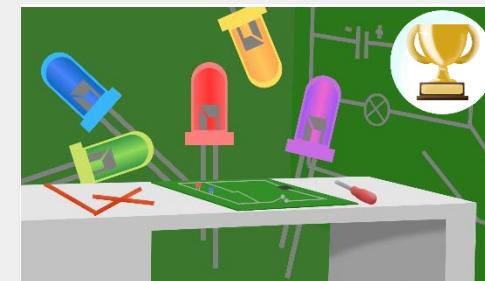
6. Information Website

Have a class discussion to introduce the class to health and safety when using technology.



7. Chassis Drawings

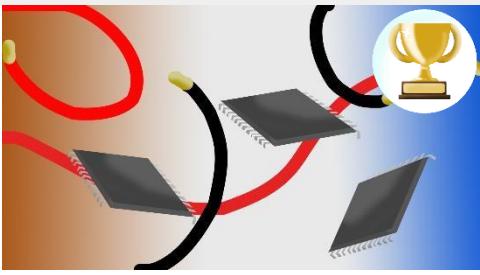
Have a class discussion to introduce the class to drawings of chassis. Learners are provided with chassis drawings containing dimensions.



8. My Electronics Project

You have been given a potentiometer, buzzer, three LEDs, an ultrasonic proximity sensor, a DC motor and wires.

Term 4 Volume 7



9. My Electronics Project Continued

Continue working on your project from Week 7. Connect the components to a microcontroller and program it based on your project idea.

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