OVERVIEW:

Lesson Plan 1

SUPER CODERS

Grades:	**3-5**
Group Size:	**Pairs**
Setup Time:	**5 minutes**
Total Time:	**180 minutes**
Activities:	**3**

LESSON PLAN OUTLINE

- Activity 1: Variables – 45 minutes
  - 3 tasks
  - Introduce variables and use variables in loops.
- Activity 2: Conditional Statements – 90 minutes
  - 3 tasks
  - Create conditional programs.
  - Use events to control KUBO.
  - Randomize KUBO's movement.
- Activity 3: KUBO's New Skills – 45 minutes
  - 3 tasks
  - Use Set Speed and Turn TagTiles® to adjust KUBO's movements.

OUTCOMES

- By the end of this section, students should be able to:
  - Demonstrate and understand how KUBO Coding++ TagTiles® work.
  - Use Variable and Operator TagTiles within functions.
  - Create conditional programs.
  - Create events using the Coding++ TagTiles.

ASSESSMENT

Students can show mastery of the content by:

- Demonstrating and showing understanding of how Coding++ tiles work.
- Using events, variables, and conditions to create functions with the Coding++ tiles.
- Using random events to vary KUBO's movements.
- Varying KUBO's speed and direction using the Set Speed tiles and Turn tiles.

PREREQUISITE KNOWLEDGE

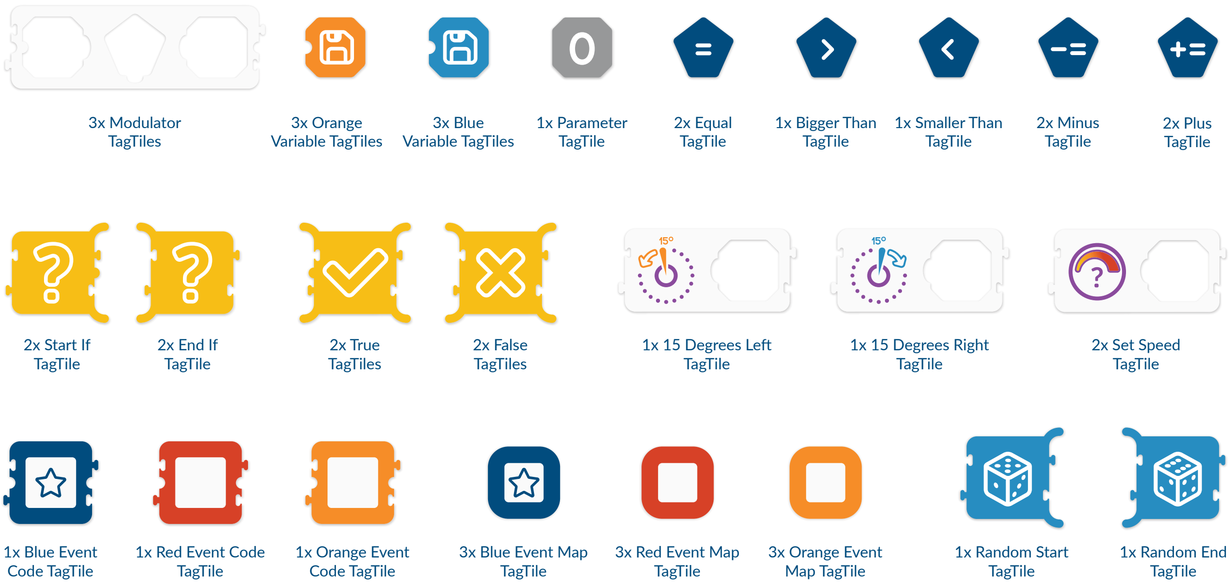
- KUBO Coding++ Lesson 1 or Coding License Lessons 1-4
  - Students should have prior experience working with KUBO before using the new tiles. The Coding++ set is meant to be used with the original Coding set.
  - If it has been a while since students have worked with KUBO, you might want to review vocabulary and lessons from Coding++ Lesson Plan 1.

TEACHER PREPARATION

- Have devices available for students to follow along with the slides on *www.kubo.education* or project the slides for the entire class.
  - www.kubo.education > Classroom Activities > The Coding License
- Make copies of worksheets for each student.
- Make sure all KUBOs have been fully charged before beginning.
- Find an appropriate place to do the activities. KUBO can be used on a table or the floor, but the surface must be level and clean. If you're using KUBO on a tabletop, make sure KUBO doesn't fall off the table.
- Help students find the TagTiles and activity map they will need. You might want to consider hanging up one activity map in front of the whole class to use for discussions and demonstrations.
- It's helpful to show students how to properly handle and store KUBO and the tiles. Stress the importance of taking care of both KUBO and the tiles.
- Let students know it's OK to make mistakes as long as they figure out how to debug and fix the problem.
- If KUBO turns immediately after starting a route, it might help to remove the Play Function tile as soon as KUBO passes over it. This will ensure that KUBO moves correctly.
- When students create routes and functions, it is important for them to understand that KUBO has the same capabilities humans do. For example, KUBO can't drive through walls, fences, water, fire, and so forth.
- You might find it helpful to review with students what they have already learned before going on to teach the new material.
- KUBO's lights can be many colors. When KUBO is not doing anything, you should see blue. When KUBO is recording/memorizing, you should see purple. When KUBO is executing/performing, you should see green. If something is wrong, KUBO will turn red. Removing KUBO's head will clear the error. Removing KUBO's head has no effect on memory. KUBO will turn yellow if the battery is low. You might want to demonstrate these colors to the class and give them tips on how to troubleshoot.
- Become familiar with the new tiles. Refer to the graphic here.

KUBO CODING++

TagTile® overview



MANAGEMENT

- It is recommended the students be put in groups of two and share one KUBO kit.
- You might find it helpful to create roles for students or number them (Partner 1/Partner 2) so that each student gets a turn being in charge of KUBO.
- Have students detach KUBO's head from the body and put the tiles away in between activities or anytime you are giving instructions.
- You might also find it helpful to give students who are new to KUBO some time to free play and discover on their own so they will be more focused when receiving instruction.
- Circulate through the room and provide help as necessary. However, to encourage student-centered active learning, instruct students to follow the "ask three, then me" rule, in which they consult each other before they consult you.
- Many of the questions posed can be answered orally or written down. You will need to let students know how you would like them to be answered.
- Many of the questions will have multiple correct answers. However, some of the answers will be more specific than others. You need to decide on how specific you will require answers to be and any terminology you will want students to include in their answers. Examples:
    - Question: How do you know when KUBO is confused?
    - Possible answers:
        - The eyes change color. (Less specific)
        - The eyes turn red. (More specific)
    - Question: Did you have to make any changes to the tiles? Why?
    - Possible answers:
        - Yes, because KUBO didn't go in the right direction.
        - Yes, when we were troubleshooting the code for KUBO, the robot did not move as expected, so we had to debug the program.
- Extension activities are not included in the 45-minute time frame. Additional time will need to be allotted for these activities unless you use them only for groups that finish the activities or tasks early.

CROSS-CURRICULUM CONNECTIONS

- The following cross-curriculum connections can be done as additional learning opportunities with the students and connect to different subjects.
    - Social Studies:
        - Discuss different places the students might have visited or wish to visit. Encourage them to include those places on the maps they design and highlight places of interest to visit with KUBO. (Nonfictional places could include Paris, London, Grand Canyon, or Nile River; fictional places could include Narnia, the Sherwood Forest, a base on Mars, or their own creation such as Roboville.)
    - ELA:
        - Have students create stories in different genres for KUBO to use the various tiles. These could be incorporated into the maps students design. Genres could include mystery, science fiction, historical fiction, or adventure.
    - Math/Science:
        - Discuss with the students how to calculate KUBO's speed when using a Set Speed tile. Then, have them calculate the speed to compare each of the values.
        - Have students try to make KUBO turn at different angles to trace different geometric paths such as triangles, hexagons, and octagons.

ACTIVITY 1:

Variables

OUTCOME

- Predict correct arrangements of Variable tiles.
- Arrange Variable and Operator tiles in a Modulator tile.
- Create functions using Loop and Variable tiles.

TIME

- 45 minutes

MATERIALS

- Task 1:
  - KUBO
  - Coding++ TagTiles
  - Pencils
  - Worksheet 1.1
- Task 2:
  - KUBO
  - Coding++ TagTiles
  - Coding TagTiles
  - Pencils
  - Worksheet 1.2
  - *Blank activity map*
- Task 3:
  - KUBO
  - Coding++ TagTiles
  - Coding TagTiles
  - Pencils
  - *Blank activity map*

TEACHER NOTES

Task 1:

- This task introduces students to the new Variable tiles and organizes them in a function. You could also introduce the tiles to the entire class prior to this task or review the tiles with the class following this task.
- Students hypothesize what tile arrangements KUBO will be able to understand in the Modulator tile.

ACTIVITY 1:

Variables

- Students place KUBO on the different Coding++ Variable tiles and observe what KUBO does. They record their observations on Worksheet 1.1.
- Students should take turns trying out the new tiles.
- The time frame for this task will vary depending on how much exploration time you give students.
- If you run out of time for students to test out each of the new tiles, please allow them to do so at a later time since not all tiles in a given category do the same thing.
- If the students do not understand what variables are, it would be appropriate to review or teach them before proceeding.
- Students should discover the following:
    - The shape of the Variable, Operator, and Parameter tiles prevent placing any of the tiles in an order that will not work.
    - When KUBO reads a variable being set equal to a numerical value, KUBO will count it by flashing and making a chirping sound to show the value for the variable.
    - When KUBO adds or subtracts a value from a variable that already has a value, KUBO will count to the new value for the variable.
    - When KUBO reads a comparison of variables or numerical values, he simply reads it and then stops. This is normal behavior.

Task 2:

- Utilizing variables within loops allows students to vary the number of times a loop occurs without having to record the entire function multiple times. They can simply redefine the value of the variable and execute the function with the loop.
- A blank activity map would work for this task. This will allow you to refer to coordinate grids for discussing movements.
- To ensure both students have equal time working with KUBO, have them switch off creating and executing functions and changing variable values.
- The time frame for this task will vary depending on how much exploration time you give students.
- During this task, KUBO has to repeat a Go Forward and Go Right sequence four times in order to make a complete lap. It would be good for students to figure this out on their own.

Task 3:

- Make sure students understand the necessary math computational processes to determine the number times to repeat a process.
- The time frame for this task will vary depending on how much exploration time you give students.
- Make sure that both students get a chance to build functions and redefine variables.
- Students can experiment with different values to specify the number of laps they want KUBO to complete. If time permits, teams could race against each other in a KUBO Fitness 5K.

ACTIVITY 1:

Variables

VOCABULARY

- If it has been a while since students have worked with KUBO, you might want to review vocabulary from Coding+ Lesson Plan 1 or Coding License Lesson Plans 1-4.
- Review Vocabulary
  - **Debug**: to fix or tweak
  - **Function**: a route that can be memorized by KUBO with the use of the Record and Play Function tiles
  - **KUBO**: a screenless coding robot
  - **Movement TagTile**: a directional arrow tile that KUBO follows
  - **Parameter TagTile**: a TagTile used to tell KUBO how many times to repeat a loop as well as represent a numerical value for KUBO
  - **Reset**: to clear an error; when KUBO turns red, to remove the head and place it back on the body
- New Vocabulary
  - **Coding++ TagTile**: a tile in the KUBO Coding++ Set; this set contains the following:
    - **Conditional TagTile**: a tile that has KUBO evaluate a statement and perform different operations when the statement is true or false
    - **Event Code TagTile**: a tile that KUBO reads in a function to record a specific operation for KUBO to complete when that event is encountered
    - **Event Map TagTile**: a tile that KUBO reads on a map that causes KUBO to complete an event that was recorded earlier
    - **Modulator TagTile**: a tile that accepts the Variable, Operator, and Parameter tiles to assign and compare values of variables for KUBO
    - **Operator TagTiles**: the tiles that tells KUBO to perform a math operation on a variable
    - **Random TagTiles**: the tiles that randomize movements for KUBO from a defined set of choices; each choice has an equal chance of being chosen
    - **Set Speed TagTile**: a tile that changes KUBO's speed based on a numerical value
    - **Turn TagTile**: a tile that changes the direction KUBO is moving by 15-degree increments
    - **Variable TagTile**: a tile that can be assigned different numerical values

DISCUSSION QUESTIONS

Task 1:

- How do you know KUBO understands the variable code?
- How do you know when KUBO is confused?
- What clues told you how to arrange the tiles?
- Why would you want to use variables in a program?
- Where else do you encounter variables?

ACTIVITY 1:

Variables

Task 2:

- How did you determine the number of times KUBO needed to repeat the pattern to complete a lap?
- Did KUBO move the way you expected?

Task 3:

- How do you get KUBO to store a value for a variable that is larger than 10?
- How can you count with KUBO?
- What other types of activities could KUBO want to repeat that you could use variables and loops to accomplish?

REFLECTION

- What is a variable? Discuss this with your partner and agree on the meaning of this word. Be ready to share your idea with the class.
- How do variables make it easier to program KUBO?

EXTENSION

- If you have the KUBO Coding+ tiles, make a looping function using at least two of the Coding+ tiles with a variable.
- Create a function you know KUBO cannot follow using variables. Have your partner debug the route. Switch roles.

NOTES

ACTIVITY 2:

Conditional Statements

OUTCOME

- Create a function with a conditional statement.
- Use events to adjust functions.

TIME

- 90 minutes

MATERIALS

- Task 1:
  - KUBO
  - KUBO Coding++ TagTiles
  - KUBO Coding TagTiles
  - Colored pencils
  - Blank activity map
- Task 2:
  - KUBO
  - KUBO Coding++ TagTiles
  - KUBO Coding TagTiles
  - Colored pencils
  - Blank activity map
  - Bag for drawing tiles
- Task 3:
  - KUBO
  - KUBO Coding++ TagTiles
  - KUBO Coding TagTiles
  - Colored pencils
  - Blank activity map

TEACHER NOTES

Task 1:

- Students will need to learn the syntax, or sequence, that should be followed for all conditional statements using KUBO.
- You might need to review how to use the Variable tiles and reset KUBO depending on how long it's been since your students completed Activity 1.

ACTIVITY 2:

Conditional Statements

- Ensure that both students work together to create the functions. If time allows, you could have each student create his or her own functions.
- Avoid placing tiles and functions over the gap created when pushing desks or tables together. KUBO needs a flat surface to memorize on.
- Students will reuse the function they create in this task during Task 2. You should make sure students use the same KUBO during both tasks so that they do not have to re-record their function.

Task 2:

- This task might take longer than others because of the complex syntax of a conditional function. To help expedite the process, encourage students to be sure their tiles are lined up correctly in the function and they place KUBO carefully so that KUBO is able to move over the tiles without problems.
- Students might not have enough Movement tiles to complete their functions. If this occurs, encourage them to problem-solve different solutions, such as:
    - Use other tiles in the set such as loops to create their functions.
    - Change the locations on the map of their items of interest.

Task 3:

- During this task, students will incorporate events that they can control during the operation of KUBO to change its behavior. They will need to pay attention to the order of the tiles.
- A function can begin with a conditional statement. However, when using an Event Code tile in the conditional statement, you must place one or more Movement tiles before the conditional statement. This will allow KUBO to move over the Event Map tile while executing the function.
- Remind students that they can use different events and conditional statements along with different functions to create complex movement patterns and change those patterns by using the events.

VOCABULARY

- New Vocabulary
    - **Conditional TagTile**: a tile that has KUBO evaluate a statement and perform different operations when the statement is true or false
    - **Conditional function**: a function that performs different actions based on whether a condition is true or false
    - **Syntax**: the rules you have to follow when creating a statement for KUBO to understand

DISCUSSION QUESTIONS

Task 1:

- What places would you like to visit?
- What places do you think KUBO would like to visit?
- Did your function work?
- Do you need to debug your function?

ACTIVITY 2:

Conditional Statements

Task 2:

- What is different about the shape of the Start If, True, and Modulator tiles?
- What do you think the different shapes mean?
- Which item did KUBO visit this time?
- Why did KUBO go to that item?

Task 3:

- What do you think is the difference between the Event Code tiles and the Event Map tiles?
- What is different about the shape of the Event tiles and other tiles?
- What do you make decisions about every day?
- When do you make more than one decision at a time?
- What conditions can affect the decisions that you make?
- How can you have KUBO stop at one of the locations on the map instead of moving on without changing the function?

REFLECTION

- Why is it important to get your syntax right when coding? What happens when you get it wrong?
- Why would conditions and random events be important to operating a robot?

EXTENSION

- KUBO wants to explore other places. Add other items to your map for KUBO to explore and then create conditional functions and use events to get KUBO to visit them. Incorporate Coding+ tiles if you have them.
- Stories have events. All stories have a beginning, middle, and end. Write a story about an adventure KUBO has and then use the Event tiles to tell the story. Then, mix up the order of the events and write a new story for that order.

ACTIVITY 2:

Conditional Statements

NOTES

ACTIVITY 3:

KUBO’s New Skills

OUTCOME

- Use Random TagTiles to randomize KUBO’s actions.
- Vary KUBO’s movements using the Speed Up TagTiles.
- Vary KUBO’s movements using the Turn TagTiles.

TIME

- 45 minutes

MATERIALS

- Task 1:
    - KUBO
    - Coding++ TagTiles
    - Coding TagTiles
    - Colored pencils
    - Worksheet 1.3
    - Blank activity map
- Task 2:
    - KUBO
    - Coding++ TagTiles
    - Coding TagTiles
    - Colored pencils
    - Worksheet 1.4
    - Blank activity map
- Task 3:
    - KUBO
    - Coding++ TagTiles
    - Coding TagTiles
    - Colored pencils
    - Blank activity map

ACTIVITY 3:

KUBO's New Skills

TEACHER NOTES

Task 1:

- Students use the Random tiles to create a function that randomizes KUBO's movement.
- It can take time to test a random function that is created; make sure each student in the group gets equal opportunity to operate KUBO. Students record their observations on Worksheet 1.3.
- The night watch activity can take time to complete. Encourage students to be careful in the initial stages of development to reduce the need to debug their code.

Task 2:

- Students should discover that KUBO speeds up as the numerical value of the Speed Up tile increases.
- Students can work on the two parts of the function for KUBO to move independently and then combine their functions to make a single function. They can use the Event tiles to move KUBO or create subroutines.

Task 3:

- Students might need time to adjust the direction KUBO turns to move from location to location. You might want to have them draw straight lines on their maps so that they can follow them more easily.
- You will want to manage the sharing of maps between student groups to make sure each group gets a new map to work with.

VOCABULARY

- Review Vocabulary
  - **Speed Up TagTile**: a tile that changes KUBO's speed based on a numerical value
  - **Turn TagTile**: a tile that changes the direction KUBO is moving by 15-degree increments

DISCUSSION QUESTIONS

Task 1:

- What does it mean when you say something is random?
- Did you notice any patterns in your observations?
- What do you think would happen if you ran the test 100 times?
- Did KUBO do what you expected?
- When might you want KUBO or any other robot to do random movements?

Task 2:

- What happened when you used the Parameter 5 tile with the Speed Up tile?
- Did you notice any difference when you used the Parameter 10 tile?
- What happened when you used the Parameter 1 tile with the Speed Up tile?

ACTIVITY 3:

KUBO’s New Skills

Task 3:

- Did your function work the first time?
- Did you have to adjust your function? Why?
- Did your new function work the first time?
- Did you have to adjust your new function? Why?
- Was it more difficult making KUBO move in a straight line or having him turn?
- Which tiles would be helpful in doing this activity?
- What parts of KUBO’s path will be more difficult to account for when using angles for movement?

REFLECTION

- When would you want a robot to speed up? When would you want one to slow down?
- What are the advantages to being able to move in a straight line with KUBO? What are the disadvantages?

EXTENSION

- Put KUBO in a story where KUBO needs to move slowly and sneak past a monster or speed up to run from the monster or change directions to throw it off. Now, code those parts of the story using as many tiles from the Coding++, Coding+, and Coding sets as you have available.
- Create two more items of interest on your map. Create a function using the Random TagTiles and any function tiles you have available from the Coding and Coding+ TagTile sets to move KUBO randomly around the map. Try to get KUBO to visit all four locations.

NOTES

Standards Addressed

US ISTE CURRICULUM STANDARDS

	KUBO CODING				KUBO CODING+			KUBO CODING++	
Learning Outcome	**LP 1: Routes**	**LP 2: Functions**	**LP 3: Subroutines**	**LP 4: Loops**	**LP 1: Refresher course**	**LP 2: Advancing programming**	**LP 3: Challenge master**	**LP 1: Variables, Conditions, and Events**	**Project Pack**
1a Students articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.	●	●	●	●	●	●	●	●	●
1b Students build networks and customize their learning environments in ways that support the learning process.	●	●	●	●	●	●	●	●	●
1c Students use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.	●	●	●	●	●	●	●	●	●
1d Students understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.	●	●	●	●	●	●	●	●	●
2a Students cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.									
2b Students engage in positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices.									
2c Students demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.									
2d Students manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.									
3a Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.									●
3b Students evaluate the accuracy, perspective, credibility, and relevance of information, media, data, or other resources.									●
3c Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.									●
3d Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions.					●	●	●		●
4a Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.	●	●	●	●	●	●	●	●	●
4b Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.	●	●	●	●	●	●	●	●	●

Standards Addressed

US ISTE CURRICULUM STANDARDS

	KUBO CODING				KUBO CODING+			KUBO CODING++	
Learning Outcome	LP 1: Routes	LP 2: Functions	LP 3: Subroutines	LP 4: Loops	LP 1: Refresher course	LP 2: Advancing programming	LP 3: Challenge master	LP 1: Variables, Conditions, and Events	Project Pack
4c Students develop, test and refine prototypes as part of a cyclical design process.	●	●	●	●	●	●	●	●	●
4d Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.	●	●	●	●	●	●	●	●	●
5a Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.	●	●	●	●	●	●	●	●	●
5b Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.	●	●	●	●	●	●	●	●	●
5c Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.	●	●	●	●	●	●	●	●	●
5d Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.	●	●	●	●	●	●	●	●	●
6a Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.	●	●	●	●	●	●	●	●	●
6b Students create original works or responsibly repurpose or remix digital resources into new creations.	●	●	●	●	●	●	●	●	●
6c Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.	●	●	●	●	●	●	●	●	●
6d Students publish or present content that customizes the message and medium for their intended audiences.	●	●	●	●	●	●	●	●	●
7a Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.									●
7b Students use collaborative technologies to work with others, including peers, experts, or community members, to examine issues and problems from multiple viewpoints.									●
7c Students contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.					●	●	●		●
7d Students explore local and global issues and use collaborative technologies to work with others to investigate solutions.							●		●

Standards Addressed

UK NATIONAL CURRICULUM COMPUTER SCIENCE STANDARDS

		KUBO CODING					KUBO CODING+			KUBO CODING++	
	Learning Outcome	**Curriculum Aspect**	**LP 1: Routes**	**LP 2: Functions**	**LP 3: Subroutines**	**LP 4: Loops**	**LP 1: Refresher course**	**LP 2: Advancing programming**	**LP 3: Challenge master**	**LP 1: Variables, Conditions, and Events**	**Project Pack**
AIMS	**The national curriculum for computing aims to ensure that all pupils:**										
	can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation	CS	●	●	●	●	●	●	●	●	●
	can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems	CS	●	●	●	●	●	●	●	●	●
	can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems	IT	●	●	●	●	●	●	●	●	●
	are responsible, competent, confident and creative users of information and communication technology	DL	●	●	●	●	●	●	●	●	●
KEY STAGE 1	Understand what algorithms are	CS	●	●			●	●	●	●	●
	Understand that algorithms are implemented as programs on digital devices	CS	●	●				●	●	●	●
	Understand that programs execute by following precise and unambiguous instructions	CS	●	●			●	●	●	●	●
	Create simple programs	CS	●	●			●	●	●	●	●
	Debug simple programs	CS	●	●			●	●	●	●	●
	Use logical reasoning	CS	●	●			●	●	●	●	●
	Predict the behaviour of simple programs	CS	●	●			●	●	●	●	●
	Use technology purposefully to create, organise, store, manipulate and retrieve digital content	IT	●	●			●	●	●	●	●
	Recognise common uses of information technology beyond school	DL									

Standards Addressed

UK NATIONAL CURRICULUM COMPUTER SCIENCE STANDARDS

		KUBO CODING					KUBO CODING+			KUBO CODING++	
	Learning Outcome	**Curriculum Aspect**	**LP 1: Routes**	**LP 2: Functions**	**LP 3: Subroutines**	**LP 4: Loops**	**LP 1: Refresher course**	**LP 2: Advancing programming**	**LP 3: Challenge master**	**LP 1: Variables, Conditions, and Events**	**Project Pack**
KEY STAGE 1	Use technology safely and respectfully	**DL**	●	●			●	●	●	●	●
	Keep personal information private	**DL**									
	Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	**DL**									
KEY STAGE 2	Design programs that accomplish specific goals	**CS**	●	●	●	●	●	●	●	●	●
	Write programs that accomplish specific goals	**CS**	●	●	●	●	●	●	●	●	●
	Debug programs that accomplish specific goals	**CS**	●	●	●	●	●	●	●	●	●
	Control or simulate physical systems	**CS**	●	●	●	●	●	●	●	●	●
	Solve problems by decomposing them into smaller parts	**CS**			●	●	●	●	●	●	●
	Use sequence in programs	**CS**	●	●	●	●	●	●	●	●	●
	Use selection in programs	**CS**								●	●
	Use repetition in programs	**CS**				●	●	●	●	●	●
	Work with variables	**CS**								●	●
	Work with inputs	**CS**	●	●	●	●	●	●	●	●	●

Standards Addressed

UK NATIONAL CURRICULUM COMPUTER SCIENCE STANDARDS

			KUBO CODING				KUBO CODING+			KUBO CODING++	
	Learning Outcome	Curriculum Aspect	LP 1: Routes	LP 2: Functions	LP 3: Subroutines	LP 4: Loops	LP 1: Refresher course	LP 2: Advancing programming	LP 3: Challenge master	LP 1: Variables, Conditions, and Events	Project Pack
KEY STAGE 2	Work with outputs	CS	●	●	●	●	●	●	●	●	●
	Use logical reasoning to explain how some simple algorithms work	CS	●	●	●	●	●	●	●	●	●
	Use logical reasoning to detect and correct errors in algorithms and programs	CS	●	●	●	●	●	●	●	●	●
	Understand computer networks including the internet	CS									
	Understand they can provide multiple services, such as the world wide web	CS									
	Understand the opportunities they offer for communication and collaboration	DL									
	Use search technologies effectively	IT									
	Appreciate how results are selected and ranked	CS	●	●	●	●	●	●	●	●	●
	Be descerning in evaluating digital content	DL									
	Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	IT									
	Use technology safely, respectfully and responsibly	DL	●	●	●	●	●	●	●	●	●
	Recognise acceptable/unacceptable behaviour	DL									
	Identify a range of ways to report concerns about content and contact	DL									