Coding with Cubetto - Unit 1

Reception, Ages 4 to 5, UK National Curriculum

Subjects covered:

Personal and Social Health

Literacy

Expressive Arts and Design

Maths

Resources provided:

Face Template

Holiday Story Template

Left and right foot Template

Materials required:

6x Cubettos

6x Boards

6x Sets of Blocks

6x Standard Maps

Introduction

The Cubetto Playset is a Montessori inspired coding toy that allows children ages 3 to 6 to program a friendly wooden robot without screens and is powered by a programming language you can touch.

New technology can sometimes be overwhelming to understand and adopt. The activities contained in this guide were created by educators for educators.

We want to make it simple for you to integrate the Cubetto Playset and its tangible programming language into your teaching.

Development and learning in other key areas

Beyond coding

The collaborative nature of Cubetto makes it an extremely versatile tool for the classroom. Cubetto fosters learning in key development areas that go beyond programming.

Communication

Children practice listening through a range of stories and narratives in relation to Cubetto, accurately anticipating key events and responding with comments, questions or actions. They also develop their own narratives and explanations.

Dexterity

Children develop coordination in large and small movements around the playset. They negotiate the placement of obstacles around the world map and place blocks on our tangible interface.

Social-Emotional

Children become confident by trying new, open-ended activities that remove “wrong” outcomes, and easily encourage group work. The open nature of the maps allows them to choose the resources they need for their play session.

Mathematics

Children add and subtract blocks to a sequence. They solve problems, including doubling and halving to get Cubetto from A to B. They discuss size, shapes and patterns, distance, position, and time to solve problems.

Logical reasoning

The blocks allow children to create and debug simple programs with their hands. They use technology purposefully to create, organise, store, manipulate and retrieve meaningful sequences.

Introducing the Playset

Introducing Cubetto

Introduce Cubetto as a friendly robot that children can program. Children should be told that Cubetto cannot think for himself, and can only move as programmed by the child, just like any other machine. If in a group setting, sit children in a circle, and allow them to pass Cubetto around to one another, saying hello or acknowledging the presence of the object.

Doing so forms a bond with Cubetto, in the same way they would with a stuffed animal, or a toy, and solving problems through narratives later on is more engaging.

Introducing the Board

Introduce the Board as a remote control that children can use to send instructions to Cubetto.

Without the Board, there is no way of sending Cubetto his instructions.

It is important for children to understand Cubetto is only able to move with a human's command. This is not only empowering, but also key to understanding computing.

Encourage children to also explain what other objects in their homes and lives function within a similar paradigm. A television needs a human to change its channels for example, or a washing machine needs a human to select its settings.

These examples, like Cubetto, are machines that need human programming to do their job.

Introducing the Blocks

Introduce the Instruction Blocks as the directions Cubetto follows when inserted in the Board and sent by pressing the action button.

Different Blocks represent different instructions, and an unambiguous, distinct command. These Blocks are what make up Cubetto's hands on coding language, and are key in the learning of computational thinking.

When each block is inserted in the Board, a child should be encouraged to predict what Cubetto will execute before pressing the "Go" button.

This is key in understanding concepts like program design, and it helps develop abstraction.

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Unit 1 Overview

Reception

By the end of the unit pupils will be able to:

- Understand what an algorithm is and that programs execute by precise instructions.

- Pupils will also be able to create a simple algorithm and use logical reasoning to predict the behaviour of simple programs.

	Lesson 1	Lesson 2	Lesson 3	Lesson 4
NC Computing Objectives	To control a digital device	To explore a digital device	To understand that programs execute by precise instructions	To understand what an algorithm is
Outcomes	• I can talk about Cubetto's parts • I understand how my face changes when happy/sad	• I can make Cubetto move • I can take turns	• I can put pictures in the right order • I can tell a simple story	• I can say what an algorithm is • I can use and name left/right turns
EYFS Focus	Social & Emotional Devnt (ELG 7)	Social & Emotional Devnt (ELG 7)	Literacy (ELG 1)	Literacy (ELG 1)
Computational Thinking	Tinkering	Tinkering	Algorithms, Collaborating	Algorithms, Collaborating
Main Activities	Cubetto's Feelings 1. Meet the Board, blocks and Cubetto, create a list of questions about them. 2. Open up Cubetto and explore its insides. Talk about what you can see. 3. Find out what Cubetto can and can't do, and what surprises you. 4. Role play times when you are happy, sad, cross, surprised or worried. 5. Use a mirror to pull faces (happy, sad, cross, surprised and worried). 6. Try out ways of making Cubetto move and sticking faces on it. 7. Use puppets to take turns talking about what Cubetto can do.		Cubetto's Holiday 1. Discover Cubetto's world and explore where it could go on holiday. 2. Work together to put three pictures in order to tell a story. 3. Play consequences to make Cubetto move. 4. Draw around your right and left hands to make signs for Cubetto. 5. Use the left and right turn blocks to make Cubetto dance. 6. Cut out foot templates to make a walking route around the class. 7. Role play Cubetto's holiday story.	
Challenge	Can you talk about how Cubetto moves?	Can you make Cubetto slow down or go faster?	Can you make Cubetto dance forever?	Can you create an exercise routine using forward, left and right?
Resources	Face templates (with faces drawn on), 2p coins / play screwdrivers, Mirrors, Pens and sticky tack, Role play props and puppets, Bean bags, money box & building blocks		Foot and hand templates, Ordered pictures, Verbal statements about block functions, Photos, Observation	
Assessment	Face templates, Observation of role play and mirror activities, Verbal statements, Photos		Holiday story example, Left and right foot templates, Paper and pens, Scissors, Role play props, Simple story examples	

	Lesson 5	Lesson 6	Lesson 7	Lesson 8
NC Computing Objectives	To use logical reasoning to predict behaviour of simple programs	To use logical reasoning to predict behaviour of simple programs	To create a simple program	To create a simple program
Outcomes	• I can predict what an algorithm will do • I can make a model out of recycled items	• I can predict what an algorithm will do • I can make new parts for a game	• I can write a simple algorithm • I can count to five (or ten)	• I can say what the function block does • I can put numbers in order
EYFS Focus	Expressive Arts & Design (ELG 16)	Expressive Arts & Design (ELG 16)	Maths (ELG 11)	Maths (ELG 11)
Computational Thinking	Logic, Persevering	Logic, Persevering	Algorithms, Creating	Algorithms, Creating
Main Activities	Cubetto's Quest 1. Predict where Cubetto will move and test out your prediction. 2. Make a model to put on Cubetto's map using recycled materials. 3. Work out where Cubetto's treasure is hidden! 4. Make new parts to turn the map into a Snakes and Ladders game. 5. Design and draw a new world on a grid for Cubetto to explore. 6. Work with a partner to play Snakes and Ladders. 7. Role play searching for and finding hidden treasure.		Cubetto's Patterns 1. Watch Cubetto move and work out which number is being drawn. 2. Order numbers of different objects from smallest to biggest. 3. Work in a pair to write an algorithm to draw the number 7. 4. Stick numbers on all of Cubetto's sides and count them. 5. Explore the function block (blue) to work out how it can help you. 6. Make numbers using the coloured blocks. 7. Count objects around the classroom on a clipboard.	
Challenge	Can you write an algorithm to find Cubetto's hidden treasure?	Can you make Cubetto move around your model on the map?	Can you find other objects that have six sides like Cubetto?	Can you use more than one function block?
Resources	Recycled materials, Sticky tape, scissors, pens & paints, Example algorithms (treasure 'clues'), Snakes and Ladders templates, Dice numbered 1-4, Grid on paper		Large sheet of paper (A1 or roll of wallpaper), Adhesive numbers to stick on Cubetto, Clipboard and pens, Masking tape, Different objects	
Assessment	Algorithm predictions, Models and new game parts created, Photos, Verbal statements, Observation		Created algorithms, Verbal statements about function block, Photos, Observation of ordered numbers	

Lesson 1: Cubetto's Feelings (1 of 2)

EYFS Focus: Personal, Social & Emotional Devnt (ELG 7)

NC Objectives

To control a digital device

Outcomes

- I can talk about Cubetto's parts
- I understand how my face changes when happy/sad

Resources Needed

- Play screwdrivers / coins
- Mirrors
- Pens
- Sticky tack
- Role play props
- Puppets

Prep Needed

- Check batteries
- Draw different faces onto the templates (leave blank for more able pupils)
- Cut out face templates.
- Source photos of faces showing different feelings

Resources Provided

- Face templates

Key Vocabulary

- Board
- Cubetto
- Blocks
- Feelings
- Happy, sad, surprised, worried

Computational thinking approach

Tinkering

Teacher-led Introduction (introducing Board, Blocks and Cubetto – not the map just yet)

1. Ask the class to close their eyes. Hold up the Board and tell them to open their eyes. Ask: What do you think this is? What is it for? What is it made from? Have you seen anything like this before?
2. Hand the Board and Blocks round the class, encouraging children to pass them on so that everyone can see.
3. Introduce the Board as a kind of remote control. Ask: What do you think it controls? How does it work? What are the holes for?
4. Hold up Cubetto and introduce it to the class. Explain that Cubetto and the Board work together (try not to give more away!).
5. Ask: What would you like to find out about Cubetto? Collect all the questions about the Board and Cubetto to refer back.
6. Emphasise that the class need to treat Cubetto with respect and be kind to it, just as they are with each other.
7. Explain today the class will be thinking about feelings: what makes us feel certain things and how our face shows our feelings.
8. Ask: How did you feel when you saw Cubetto and the Interface Board? Can you show me how your face looked?
9. Hand out the mirrors and ask pupils to show you what surprised looks like. Repeat for sad, happy and worried.
10. Encourage pupils to look at what their eyes are doing, their eyebrows and their mouths.

Lesson 1: Cubetto's Feelings (2 of 2)

Activity 1: Opening up Cubetto

1. Look at Cubetto from the outside and discuss what it looks like.
2. Try to work out how to open Cubetto. What can you use?
3. Open up Cubetto using the screwdrivers or coins. What can you see? Can you name any of its parts?

Activity 2: Cubetto's surprise

1. Explore what Cubetto does and how it works.
2. Look at the different Blocks. Put one in the Board and press the Action button. Can Cubetto move on its own without you doing anything? Clarify that it can't.
3. Can you make Cubetto move one square?
4. What surprised you?

Activity 3: Role play

1. Think of a time when you felt happy, cross, worried or surprised, for example losing a toy, getting a present etc.
2. Role play on your own or in a group what happened.

Activity 4: Pulling faces

1. Look at the face templates (more able can draw on the faces).
2. Discuss what each one looks like / how you know which feeling is shown.
3. Use the mirror to pull the different faces, one at a time.
4. Turn to a friend and pull a happy/sad face. Can they guess?

Activity 5: Taking turns with Cubetto

1. In groups of three or four, take turns sticking a face on Cubetto and saying why it feels that way e.g. Cubetto found treasure, then putting a block in the board to try and make it move.
2. Why is it important to take turns? When else do you have to?

Activity 6: Puppet play

1. Work in pairs; both have a puppet.
2. Puppets take it in turns to tell their partner one thing that Cubetto can do. What can't Cubetto do?

Challenge

Can you talk about how Cubetto moves?

Plenary and Assessment

1. Ask: What is Cubetto? What can Cubetto do? What do the Blocks do? Can Cubetto move without you doing something?
2. Look at the list of questions created at the beginning of the lesson. What have we learnt? What do we still want to find out?
3. Pupils share and discuss what happened in their role play and pulling faces activities. What feelings did we talk about today?
4. Show a photo of a face showing a particular emotion discussed today. Ask: How does this person feel? How do you know? What does their face tell you? What do you think might have happened to them?

Lesson 2: Cubetto's Feelings (1 of 2)

EYFS Focus: Personal, Social & Emotional Devnt (ELG 7)

NC Objectives

To explore a digital device

Outcomes

- I can make Cubetto move
- I can take turns in a small group

Resources Needed

- Bean bags, money box & building blocks
- Play screwdrivers
- Pens
- Sticky tack
- Role play props
- Puppets
- Mirrors

Prep Needed

- Check batteries
- Set up three tasks in a line on the carpet: beanbags & bucket, money box & coins, and building blocks
- Draw different faces onto the templates
- Cut out face templates
- Source photos of faces showing different feelings

Resources Provided

- Face template

Key Vocabulary

- Taking turns
- Board
- Blocks
- Cubetto
- Feelings

Computational thinking approach

Tinkering

Teacher-led Introduction

1. Show the three tasks at the front of the class and allow time for children to look and discuss each one.
2. Introduce the first task: to get the beanbags into the bucket. Ask: How could we do this?
3. Ask for three volunteers to come to the front. Ask: How can we make sure they all have a go?
4. Explain that it is really important to take turns and ask: What would happen if we didn't take turns to do this?
5. Ask the three volunteers to take turns to throw the beanbags into the bucket.
6. Repeat with new volunteers for putting the coins in the money box and building a tower with the blocks. Emphasise what would happen if they didn't take turns.
7. Ask: When else in school do we take turns? When do we take turns when playing with Cubetto? Why is this important?
8. Model putting one block in at a time to the Board, then asking another person to do the same.

Lesson 2: Cubetto's Feelings (2 of 2)

Activity 1: Opening up Cubetto

1. Look at Cubetto from the outside and discuss what it looks like.
2. Try to work out how to open Cubetto. What can you use?
3. Open up Cubetto using the screwdrivers or coins. What can you see? Can you name any of its parts?

Activity 2: Cubetto's surprise

1. Explore what Cubetto does and how it works.
2. Look at the different Blocks. Put one in the Board and press the Action button. Can Cubetto move on its own without you doing anything?
3. Can you make Cubetto move one square?
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Activity 3: Role play

1. Think of a time when you felt happy, cross, worried or surprised, for example losing a toy, getting a present etc.
2. Role play on your own or in a group what happened.

Activity 4: Pulling faces

1. Look at the face templates (more able can draw on the faces).
2. Discuss what each one looks like / how you know which feeling is shown.
3. Use the mirror to pull the different faces, one at a time.
4. Turn to a friend and pull a happy/sad face. Can they guess?

Activity 5: Taking turns with Cubetto

1. In groups of three or four, take turns sticking a face on Cubetto and saying why it feels that way (e.g. Cubetto found treasure, then putting a block in the board to try and make it move.)
2. Why is it important to take turns? When else do you have to?

Activity 6: Puppet play

1. Work in pairs; both have a puppet.
2. Puppets take it in turns to tell their partner one thing that Cubetto can do. What can't Cubetto do?

Challenge

Can you make Cubetto slow down or go faster?

Plenary and Assessment

1. Ask: When did we take turns today? What was it like waiting for your turn? How did it feel when it was your turn?
2. Ask volunteers to show the class how they took turns using Cubetto. For example, one sticks a face on Cubetto, another puts a block in the board and a third presses the Action button.
3. Make a list of the things that they do at school, outside and at home that they take turns doing e.g. queuing at supermarket.
4. Ask: How does Cubetto move? Are all the blocks the same? What is special about them? Can it move without you doing something?

Lesson 3: Cubetto's Holiday (1 of 2)

EYFS Focus: Literacy (ELG 1)

NC Objectives

To understand that programs execute by precise instructions

Outcomes

- I can put pictures in the right order
- I can tell a simple story

Resources Needed

- Paper and pens
- Scissors
- Role play props
- Simple story examples told in three pictures

Prep Needed

- Check batteries
- Prepare three-part holiday stories for Cubetto (make it flexible so that you can decide where the starting point (home) is

Resources Provided

- Holiday story template
- Left and right foot templates

Key Vocabulary

- Map
- Then
- Order

Computational thinking concept

Algorithms

Computational thinking approach

Collaborating

Teacher-led Introduction

1. Ask the class to close their eyes. Hold up the map & tell the children to open them. Ask: What can you see?
2. Introduce the map as Cubetto's world that he travels around. Ask: Where do you think Cubetto lives? Encourage pupils to justify
3. Agree on a square where the children think Cubetto lives. Ask: So, where will Cubetto go on holiday? Why? What's it like there?
4. Show the example three-part holiday story in order and ask the children to tell you the story.
5. Model using the word then to tell one part of the story after the other e.g. Cubetto went on a boat then to the mountains.
6. Explain that telling a story in order is very important, just like using the Blocks to make Cubetto move.
7. Write the numbers 1, 2, 3 on the board and ask pupils to say them out loud.
8. Ask: Which picture in the story goes under number one? Ask for volunteers to move the story pictures under the right number.

Lesson 3: Cubetto's Holiday (2 of 2)

Activity 1: Holiday Stories

1. Look at the three pictures that tell a holiday story.
2. Work together to put the pictures in the right order.
3. Can you number them: 1, 2, 3?

Activity 2: Dancing

1. Work out which blocks make Cubetto turn. Which colours?
2. Put different turn blocks in the board.
3. Can you make Cubetto dance? – He is on holiday!

Activity 3: Consequences

1. At the top of a piece of paper draw Cubetto (a simple square).
2. Fold the paper down to hide it and pass to a friend who then draws where Cubetto goes on holiday.
3. Fold the paper over again and finally draw how the holiday ends.
4. Open up your story and tell it to each other in order, using the word then after each stage.

Activity 4: Holding Hands

1. Draw round your hand on a piece of paper and cut it out.
2. Draw round your other hand and cut this out too.
3. Which is your left hand? Which is your right hand? Label them.
4. Stick each hand to the right and left side of Cubetto to remind it which way it is turning.

Activity 5: Footprints

1. Cut out two sets of right and left foot templates. Which foot is right and which is left?
2. Work with a partner to put sets of footprints around the room in order to show a walking route.

Activity 6: Role play

1. Role play one of Cubetto's holiday stories using props.
2. What happens to Cubetto? Where does Cubetto go and what does it do?

Challenge

Can you make Cubetto dance forever?

Plenary and Assessment

1. Show one of the stories on the Board in mixed up order. Ask: Which picture goes first? Ask for volunteers to try.
2. Ask the class to read out what order they go in together: 1, 2, 3.
3. Ask volunteers to share their Consequences story with the class using the word then.
4. Ask: Why is it important to tell a story in the right order? What else do we do in the right order? (E.g. putting on clothes.)

Lesson 4: Cubetto's Holiday (1 of 2)

EYFS Focus: Literacy (ELG 1)

NC Objectives

To understand what an algorithm is

Outcomes

- I can say what an algorithm is
- I can use and name left/right turns

Resources Needed

- Paper and pens
- Scissors
- Role play props
- Simple story examples told in three pictures

Prep Needed

- Check batteries
- Prepare three-part holiday stories for Cubetto (make it flexible so that you can decide where the starting point (home) is

Resources Provided

- Left and right foot templates

Key Vocabulary

- Order
- Left
- Right
- Forward
- Algorithm

Computational thinking concept

Algorithms

Computational thinking approach

Collaborating

Teacher-led Introduction

1. Ask: What is important when we tell a story? Clarify that it needs to be told in order and show picture example from Lesson 3.
2. Ask pupils to share when they do something in order (e.g. getting dressed for PE, cooking, school timetable.)
3. Show the Board: What do you think the curved line means? Explain that it shows the order that you need to put the blocks in.
4. Ask: What happens if we miss out a block? If children don't know, don't correct them and leave this to be explored
5. Explain that Cubetto's blocks have to be put in the right order or it won't move.
6. Ask all the children to stand up and play 'Cubetto Says' by asking pupils to turn left/right or step forward.
7. When have mastered the left and right turn, play the game again replace, "Cubetto says" with showing a block. Mix the Blocks with another (wrong) object. Example: if you show a yellow block, children turn left. If you show a coin, children don't move.
8. Explain that each coloured block is special and can only do one thing: green = forward, red = right, yellow = left.
9. Introduce the word algorithm for we put a set of instructions in order for Cubetto.

Lesson 4: Cubetto's Holiday (2 of 2)

Activity 1: Holiday Stories

1. Look at the three pictures that tell a holiday story.
2. Work together to put the pictures in the right order.
3. Can you number them: 1, 2, 3?

Activity 2: Dancing

1. Work out which Blocks make Cubetto turn. Which colours?
2. Put different turn Blocks in the Board.
3. Can you make Cubetto dance? – He is on holiday!
4. What happens if you miss out a block in the Queue?

Activity 3: Consequences

1. At the top of a piece of paper draw Cubetto (a simple square).
2. Fold the paper to hide and pass to a friend who draws left or right arrow.
3. Fold the paper over again and draw another arrow.
4. Open up your story and act out the different turns in order.

Activity 4: Holding Hands

1. Draw round your hand on a piece of paper and cut it out.
2. Draw round your other hand and cut this out too.
3. Which is your left hand? Which is your right hand? Label them.
4. Stick each hand to the right and left side of Cubetto to remind it which way it is turning.

Activity 5: Footprints

1. Cut out two sets of foot templates. Which foot is right and which is left?
2. Work with a partner to put sets of footprints around the room in order to show a walking route.

Activity 6: Role play

1. Role play one of Cubetto's holiday stories using props.
2. What happens to Cubetto? Where does Cubetto go and what does it do?

Challenge

Can you create an exercise routine using forward, left and right?

Plenary and Assessment

1. Ask: What is an algorithm? Set of instructions in the right order. What happens if you miss out a block on the board?
2. Show an example algorithm on the Board missing a block. Ask: Is this still an algorithm? Why/why not?
3. Ask pupils to share their holding hands stuck on Cubetto and point out which is left and which is right. Repeat for footprints.
4. Ask pupils to take turns leading a game of Cubetto Says asking the class to turn left or right.
5. Ask: Can one block mean left and right? Emphasise that each block has its own special instructions for Cubetto.

Lesson 5: Cubetto's Quest (1 of 2)

EYFS Focus: Expressive Arts & Design (ELG 16)

NC Objectives

To use logical reasoning to predict behaviour of simple programs

Outcomes

- I can predict what an algorithm will do
- I can make a model out of recycled items

Resources Needed

- Recycled materials
- Sticky tape/glue
- Scissors
- Pens and paint
- Treasure 'clues'
- Snake/ladder templates
- Dice numbered 1-4
- Grid on paper

Prep Needed

- Check batteries
- Source images of recycled models
- Prepare algorithms of 3-4 blocks as treasure hunt 'clues'
- Print snake and ladder templates onto card

Resources Provided

- N/A

Key Vocabulary

- Algorithm
- Recycled
- Materials
- Treasure

Computational thinking concept

Logic

Computational thinking approach

Persevering

Teacher-led Introduction

1. Sit the children in a circle with the map and some of the recycled materials in the middle.
2. Ask pupils to choose one of the squares with a picture in on the map (e.g. the boat.)
3. Ask: What recycled materials can you see? How could you make a boat out of these materials? What does recycled mean?
4. Allow time for a few pupils to come to the middle one at a time to choose an item and explain what part they would use it for (e.g. bottle top for a porthole.)
5. Show images of models made using recycled items to inspire children. Ask them to describe what materials they can see and how they are used.
6. Ask: How would you stick the bottle top to the cardboard? Repeat for other items and discuss when sticky tape or glue is best.
7. Discuss how the children need to share the items and only take a few each at a time. Pupils also need to ask for help if something needs cutting with scissors.

Lesson 5: Cubetto's Quest (2 of 2)

Activity 1: Model Making

1. Choose one of the picture squares on the map that you want to create. It might be the castle, city, boat or mountains.
2. Look at the recycled materials on the table and choose three to start with.
3. Use the glue/sticky tape, pens and paints to make your model.

Activity 2: Hidden Treasure

1. Look at the treasure hunt clue.
2. How will it make Cubetto move? Predict carefully.
3. Where will Cubetto move to? Where is the hidden treasure?
4. Discuss if your prediction was right.

Activity 3: Snakes and Ladders

1. Choose a snake or ladder and colour it in.
2. Cut out the shape.
3. Stick your shape onto the map using sticky tape.

Activity 4: New World

1. On a 3 x 3 grid, draw a new world (map) for Cubetto.
2. You might want to choose a theme (e.g. your favourite film, book, a country you've been on holiday to or your local area.)
3. What new squares are there for Cubetto explore?

Activity 5: Play the game (teacher-led)

1. Find a partner who also has a Cubetto and a Board.
2. Put the snakes and ladders on the map.
3. The first person rolls the dice and writes an algorithm to move Cubetto that number of squares. Repeat, taking it in turns.
4. If you land on a snake, go down one. If a ladder, go up one.

Activity 6: Role play

1. Role play searching for hidden treasure and then finding it after it's been buried for years! Where did you look for it? What did it feel like to finally find it? What did you do with the treasure?

Challenge

Can you write an algorithm to find Cubetto's hidden treasure?

Plenary and Assessment

1. Ask pupils to bring their models to sit in a circle and lay out the map in the middle.
2. Ask pupils, one by one, to show their model to the class and place it on the map, then return to their place.
3. When everyone's models are on the map, select a couple to use as examples. Ask: What different materials can you see? Why do you think they chose this item for that shape? How is it stuck together? What did they use to decorate it?
4. Explain that using recycled materials is really good for the environment because we are throwing fewer things away and re-using.

Lesson 6: Cubetto's Quest (1 of 2)

EYFS Focus: Expressive Arts & Design (ELG 16)

NC Objectives

To use logical reasoning to predict behaviour of simple programs

Outcomes

- I can predict what an algorithm will do
- I can make new parts for a game

Resources Needed

- Recycled materials
- Sticky tape/glue
- Scissors
- Pens and paint
- Treasure 'clues'
- Snake/ladder templates
- Dice num'd 1-4
- Grid on paper

Prep Needed

- Check batteries
- Prepare an algorithm that would draw the number 1
- Prepare algorithms of 3-4 blocks as treasure hunt 'clues'
- Print nake and ladder templates onto card

Resources Provided

- N/A

Key Vocabulary

- Algorithm
- Predicting
- Recycled
- Treasure

Computational thinking concept

Logic

Computational thinking approach

Persevering

Teacher-led Introduction

1. Sit the children in a circle with Cubetto on the map in the middle and the prepared algorithm on the Board.
2. Show the board to the children and ask: What do you think will happen if I press the Action button? How and where will Cubetto move? Collect pupils' ideas.
3. Ask for a volunteer to press Action and tell the class to watch Cubetto move.
4. Ask: Were you right? Did Cubetto move how you thought it would?
5. Explain that trying to work out what will happen is called predicting.
6. Move two of the Blocks around on the Board and ask: How do you think Cubetto will move now?
7. Ask for another volunteer to press Action and discuss their predictions.

Lesson 6: Cubetto's Quest (2 of 2)

Activity 1: Model Making

1. Choose one of the picture squares on the map that you want to create. It might be the castle, city, boat or mountains.
2. Look at the recycled materials on the table and choose three to start with.
3. Use the glue/sticky tape, pens and paints to make your model.

Activity 2: Hidden Treasure

1. Look at the treasure hunt clue.
2. How will it make Cubetto move? Predict carefully.
3. Where will Cubetto move to? Where is the hidden treasure?
4. Discuss if your prediction was right.

Activity 3: Snakes and Ladders

1. Choose a snake or ladder and colour it in.
2. Cut out the shape.
3. Stick your shape onto the map using sticky tape.

Activity 4: New World

1. On a 3 x 3 grid, draw a new world (map) for Cubetto.
2. You might want to choose a theme (e.g. your favourite film, book, a country you've been on holiday to or your local area.)
3. What new squares are there for Cubetto explore?

Activity 5: Play the game (teacher-led)

1. Find a partner who also has a Cubetto and a Board.
2. Put the snakes and ladders on the map.
3. The first person rolls the dice and writes an algorithm to move Cubetto that number of squares. Repeat, taking it in turns.
4. If you land on a snake, go down one. If a ladder, go up one.

Activity 6: Role play

1. Role play searching for hidden treasure and then finding it after it's been buried for years! Where did you look for it? What did it feel like to finally find it? What did you do with the treasure?

Challenge

Can you make Cubetto move around your model on the map?

Plenary and Assessment

1. In a circle, ask: What does predicting mean? What did we predict today?
2. Ask pupils to share how they worked out the treasure hunt clues and whether their prediction was correct.
3. Ask for pupils to share how they played Snakes and Ladders and to share the shapes they made for the map.
4. Ask for a volunteer to throw the dice in the middle of the circle. Ask: What algorithm would I need to write to make Cubetto move that number? Discuss and try out different Blocks until successful.
5. Explain that often, people who work with computers have to be very patient and keep trying to get things right before it works.

Lesson 7: Cubetto's Counting (1 of 2)

EYFS Focus: Maths (ELG 11)

NC Objectives

To create a simple program

Outcomes

- I can write a simple algorithm
- I can count to five (or ten)

Resources Needed

- Large sheet of paper (A1 or roll of wallpaper)
- Clipboards
- Thick pens
- Masking tape
- Numbers of different objects

Prep Needed

- Check batteries
- Stick a pen to the back of Cubetto using masking tape so that when it moves, it draws
- Prepare an algorithm that draws a simple number one
- Make numbers 1-10 moveable on IWB

Resources Provided

- N/A

Key Vocabulary

- Number
- 1 – 10
- Order
- Algorithm

Computational thinking concept

Algorithms

Computational thinking approach

Creating

Teacher-led Introduction

1. Sit the children in a circle with Cubetto in the middle on a large piece of paper.
2. Show the prepared Board to the pupils and ask: Can you predict where this will make Cubetto move?
3. Explain that Cubetto is carrying a pen today so that we can draw!
4. Ask for a volunteer to press the Action button and ask: What number has Cubetto drawn?
5. Count to five (or 10) together with the pupils.
6. Show the numbers one to five (or 10) on the Board and ask pupils to put them in order.
7. Ask: How many green squares are on the map? Count together. Ask: How many yellow? How many blue?

Lesson 7: Cubetto's Counting (2 of 2)

Activity 1: Drawing numbers (teacher-led)

1. Find a partner.
2. Draw the number 7 on a piece of paper (using straight lines).
3. Write an algorithm to make Cubetto draw this number. What turn do you need? How many Blocks did you use?

Activity 2: Ordering Numbers

1. Look at the different numbers of coins/blocks/toys.
2. Can you count how many there are of each object?
3. Can you put them in order from 1 - 5?
4. Show your order to a friend to check.

Activity 3: Cubetto's sides

1. Find the numbers 1 – 6 and lay them out in order.
2. Take one number and stick it to one of Cubetto's sides.
3. Repeat for the other numbers until all sides have a number.
4. How many sides does Cubetto have?

Activity 4: Block numbers

1. Use the different coloured Blocks to make the number one.
2. How many Blocks did you use?
3. Can you make the number two? Did you need more or less Blocks? Repeat for other numbers.

Activity 5: Counting the classroom

1. Put a piece of paper on your clipboard.
2. Walk around the classroom counting different objects, for example the windows, plants, tables.
3. Write down the different numbers you have found in the class.

Activity 6: Blue block

1. Do you know what the function block does?
2. Put the blue block in the Board and press Action. What happens?
3. Keep the blue block in and add a green block to the function line. What happens now? Explore and discuss.

Challenge

Can you find other objects that have six sides like Cubetto?

Plenary and Assessment

1. Ask: What numbers did Cubetto draw today?
2. Ask pupils to come to the front to show their number drawings. Which number was the easiest? Which was harder?
3. Show a series of numbered objects mixed up.
4. Ask for volunteers to come to the front to put them in order and then count together.
5. Ask pupils to share their classroom counting with the class. Ask pupils to predict before each one.

Lesson 8: Cubetto's Counting (1 of 2)

EYFS Focus: Maths (ELG 11)

NC Objectives

To create a simple program

Outcomes

- I can say what the function block does
- I can put numbers in order

Resources Needed

- Filled backpack
- Large sheet of paper (A1 or roll of wallpaper)
- Thick pens
- Masking tape
- Numbers of different objects
- Clipboards

Prep Needed

- Check batteries
- Stick a pen to the back of Cubetto using masking tape so that when it moves, it draws
- Prepare an algorithm that draws a simple number one
- Make numbers 1-10 moveable on IWB

Resources Provided

- List of questions created in Lesson 1

Key Vocabulary

- Backpack
- Function block
- Number
- 1 – 10
- Order
- Algorithm

Computational thinking concept

Algorithms

Computational thinking approach

Creating

Teacher-led Introduction

1. Show the backpack and pass it around, emphasising that pupils need to share and pass it on quickly. Ask: What is inside?
2. Ask: What does a backpack do? Why is it useful? Model putting the backpack on.
3. Empty the backpack onto the floor and put it behind you.
4. Ask one pupil to come to the front and try to carry all the things without using the bag. Ask: What happens?
5. Explain that a backpack is helpful for carrying lots of things inside that we otherwise couldn't carry in our hands. Ask: What other things do we use to carry items around? Purse, lunch box, tray.
6. Hold up the function (blue) block and explain that the function block is just like a backpack: it can carry up to four items inside it.
7. Show the Board and ask: Where do you think the Blocks go in the backpack on here? Point out the function line.
8. Model placing one blue block in the Board and ask: What do you predict this algorithm will do? Try out for children to see.
9. Place two green Blocks in the function line and ask the class to predict then test it out.

Lesson 8: Cubetto's Counting (2 of 2)

Activity 1: Drawing numbers (teacher-led)

1. Find a partner.
2. Draw the number 7 on a piece of paper (using straight lines).
3. Write an algorithm to make Cubetto draw this number. What turn do you need? How many Blocks did you use?

Activity 2: Ordering Numbers

1. Look at the different numbers of coins/blocks/toys.
2. Can you count how many there are of each object?
3. Can you put them in order from 1 - 5?
4. Show your order to a friend to check.

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1. Use the different coloured Blocks to make the number one.
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3. Can you make the number two? Did you need more or less Blocks? Repeat for other numbers.

Activity 5: Counting the classroom

1. Put a piece of paper on your clipboard.
2. Walk around the classroom counting different objects, for example the windows, plants, tables.
3. Write down the different numbers you have found in the class.

Activity 6: Blue block

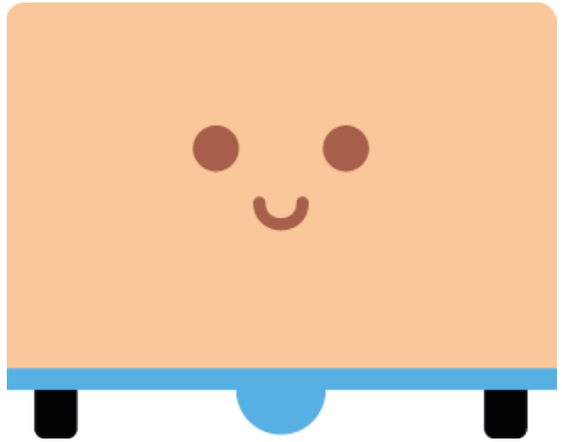
1. Put the function block in the Board & Action. What happens?
2. Keep the blue block in and add a green to the function line.
3. Write an algorithm using the function block. Can you use even fewer Blocks?

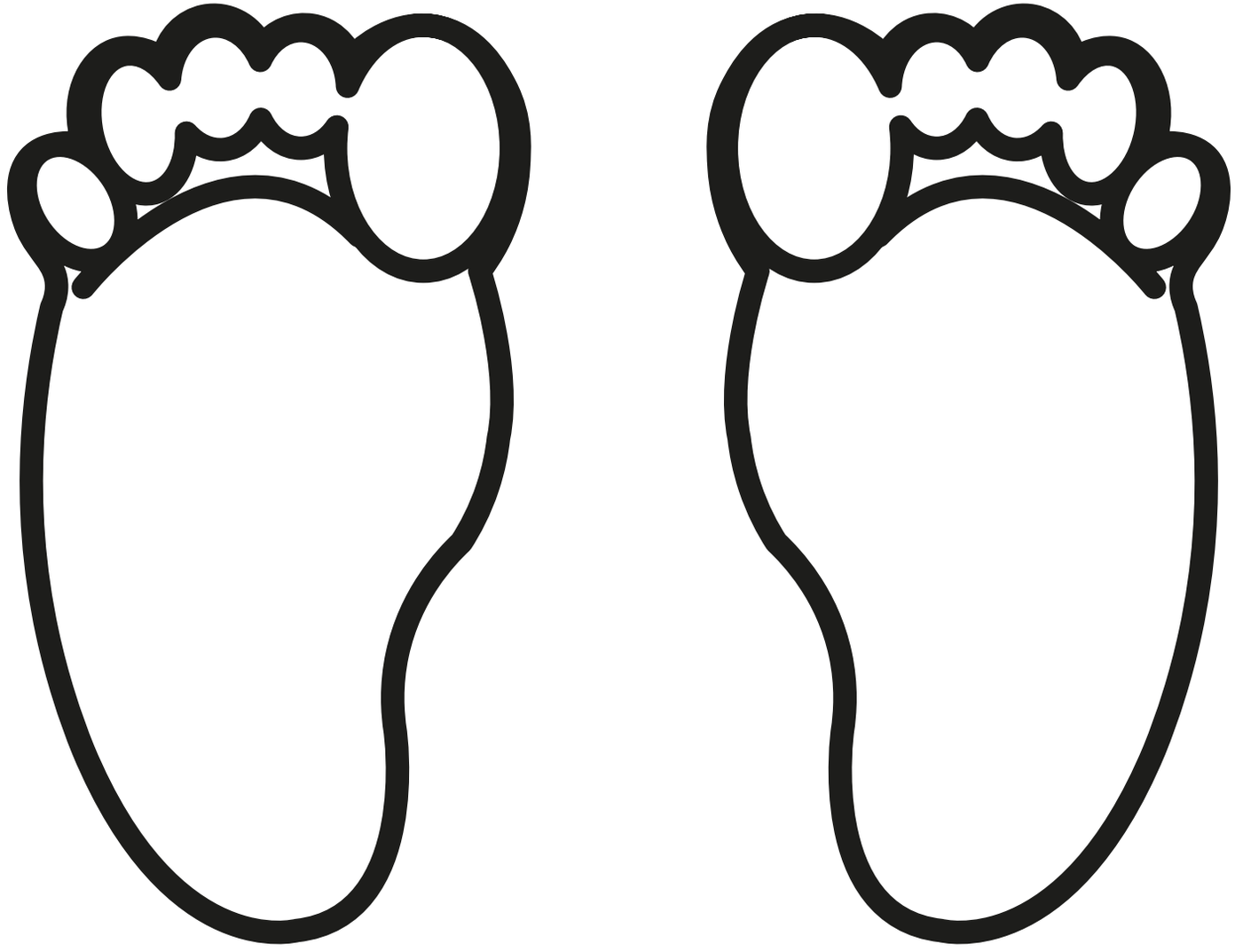
Challenge

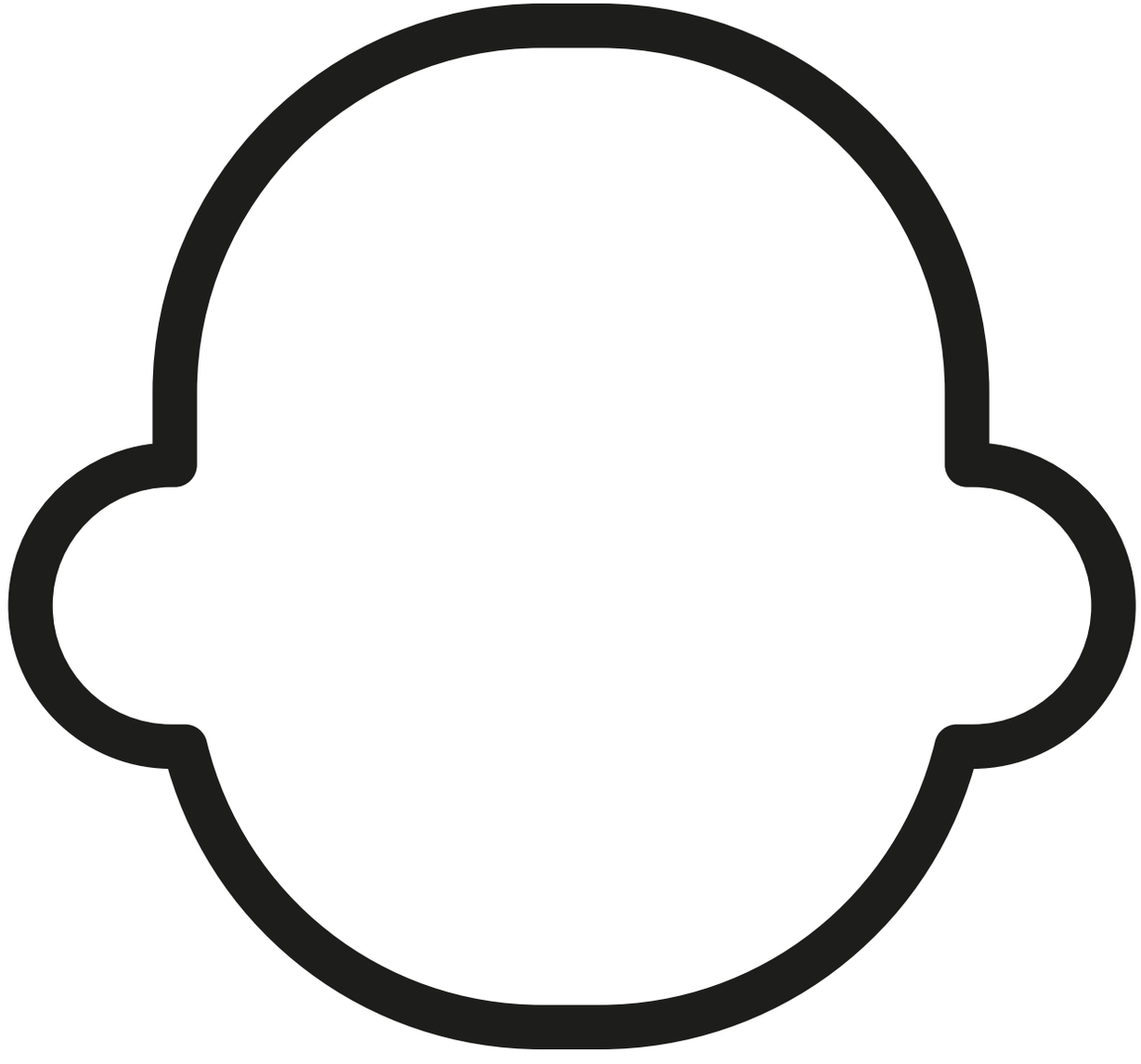
Can you find other objects that have six sides like Cubetto?

Plenary and Assessment

1. Ask: What numbers did Cubetto draw today?
2. Ask pupils to come to the front to show their number drawings. Which number was the easiest? Which was harder?
3. Show a series of numbered objects mixed up.
4. Ask for volunteers to come to the front to put them in order and then count together.
5. Ask pupils to share their classroom counting with the class. Ask pupils to predict before each one.







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