SEQUENCE OF STEPS

Levels F-2

These series of lessons were created in collaboration with the Digital Technologies Specialist Teacher from Ngalangangpum School, Western Australia

Unit Overview

These lessons complement a unit of work that helps students identify healthy and unhealthy foods. The focus of the lessons is to introduce students to algorithms and sequences of steps through the use of robotics. Students will use Bee-Bots and provide the Bee-Bots with a sequence of steps to complete a range of tasks. If applicable (depending on skill set and ability), students will be introduced to Spheros. They will learn how to connect and operate the Sphero (joystick only, no coding).

Other Curriculum Targeted Areas

Other curriculum areas can be targeted and assessed within this unit.
Other areas of interest may include:

- Health and Physical Education

Further investigation into these areas is required to ensure they align with the following activities. Activities may need to be modified to ensure content descriptions and achievement standards are met.

Australian Curriculum Alignment

The following sessions have been created using the Australian Curriculum: Digital Technologies Curriculum. Tasks may need to be modified to ensure state Digital Technologies Curriculum content descriptions and achievement standards are met. ACS has support and documents to help align this unit to other Digital Technology Curricular.

Session

'Session' has been used to define the order of tasks to complete the unit. It does not define a set time required to complete the task. Time allocated to complete a session is the teacher's discretion. This allows for flexibility for the teacher to drive the duration of the task and make modifications if necessary. Sessions can be merged into one set period or one session may run over multiple periods.

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Key Preparation

Digital Devices and Technologies

This unit commences with unplugged activities and sequencing everyday events. The unit does move into using robotics (Bee-Bots) to code to solve a selection of activities, scaffolded to develop skills when coding. Towards the end of the unit, students are introduced to more complex robotics (Spheros). This is to introduce and prepare students to operate the Spheros (connecting from software and learning how to operate the joystick). Students will only be using the joystick. The purpose was to introduce students to the robotics to allow them to explore and prepare for using the robotics in later years.

ACS ICT Educators Community

ACS has resources to support the teaching of the Digital Technologies Curriculum from Foundation to Year 10. Access the community and resources by joining for free via: https://www.acs.org.au/ict-educators.html

ACS Resources

Resources have been created to help teachers and students unpack and understand topics found within the Digital Technologies Curriculum. These give brief explanations of the topic and the expectations to teach the topic at the curriculum year level. It is intended the information is presented in a way that will set the foundation for further research.

Key Understandings

Students will:

- solve simple problems.
- Follow instructions to complete everyday tasks.
- Identify the correct sequence when completing everyday task.
- Create a sequence of steps to program a Bee-Bot to solve a simple problem.
- Confidently connect and operate a Sphero.

Key Questions

- What are sequence of steps? What is an algorithm?
- Why is it important to give correct instructions?
- What code do I need to include to make sure my program runs correctly?
- How

Key Vocabulary

Algorithms, sequence, sequence of steps, instructions, diagrams, left, right, turn, move, spaces, up down, Bee-Bot, Spheros, hardware, software, connecting.

SEQUENCE OF STEPS

Levels F-2

Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
1.	Sequence of Steps (unplugged)	**Learning Intention** Students will identify and explain simple steps when completing everyday activities. **Success Criteria** I can follow and explain a sequence of steps.	Discuss and define sequence of steps and 'algorithms'. Students share different experience about following sequences of steps at home and in school. Together create hand/body actions to accompany each step. Together read through the Brushing Teeth and/or Washing Hands sequence of steps. Together create actions to accompany each step.	Students are provided with a sequence of steps to show the actions needed to wash hands or brush teeth. Students are provided with the sequence of steps out of order and they need to put them back into the correct order. Students can choose one or complete both.
Session Resources	• ACS Teacher Resource: F-2 Sequence of Steps • Brushing Teeth - sequence of steps activity sheet • Washing Hands - sequence of steps activity sheet			
2.	Sequence of steps (Bee-Bots)	**Learning Intention** Students will follow instructions to program a Bee-Bot. **Success Criteria** I can follow instructions to move and program the Bee-Bots.	Introduce students to the sequence of steps activity sheet that explains how to use and program a Bee-Bot. Demonstrate and follow the instructions.	Complete the cut and paste of how to use the Bee-Bots sequence of steps. Students free play with the Bee-Bots, following the instructions to learn to program the Bee-Bot.
Session Resource	• Using the Bee-Bot - sequence of steps activity sheet			

Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
3.	Sequence of steps (Bee-Bots)	**Learning Intention** Students will follow instructions to program a Bee-Bot. **Success Criteria** I can follow instructions to move and program the Bee-Bots.	Introduce students to the sequence of steps activity sheet that explains how to use and program a Bee-Bot. Demonstrate and follow the instructions.	Complete the cut and paste of how to use the Bee-Bots sequence of steps. Students free play with the Bee-Bots, following the instructions to learn to program the Bee-Bot.
Session Resource	• Using the Bee-Bot - sequence of steps activity sheet			
4.	Sequence of steps (Bee-Bots)	**Learning Intention** Students will create a sequence of steps by programming the Bee-Bot. **Success Criteria** I can create instructions and program my Bee-Bot to complete simple tasks.	Students to demonstrate how to use the Bee-bots and share knowledge and instructions with the class.	Students are given the option to complete a range of different activities: • Bee-Bot climbs the ladder. (have ladder style makings on the floor and students program the Bee-Bot to climb the ladder). • Bee-Bot locates a name (have student's names on the floor and students program the Bee-Bot to find the name, use a grid map). • Connect 4 (two different colours counters and students play to have counters in a row).
Session Resource	• Bee-Bot instruction mat and supplies to complete the hands-on session.			

Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
5.	Sequence of steps (Bee-Bots)	**Learning Intention** Students will create a sequence of steps by programming the Bee-Bot. **Success Criteria** I can create instructions and program my Bee-Bot to complete simple tasks.	Recap on how to use the Bee-bots to complete one of the activities from the previous session.	Students are given the option to complete a range of different activities: • Students create a maze, program the Bee-Bot to go through the maze. Level of difficulty will depend on students' ability. • Snakes and ladders. Students create a boarder and play snakes and ladders style game.
Session Resource	• Bee-Bot instruction mat and supplies to complete the hands-on session.			
6.	Hardware and Software	**Learning Intention** Students will identify the hardware and software used to connect and control a Sphero. **Success Criteria** I can connect he Sphero and learn to control it by using the joystick.	Introduce students to the Sphero. Discuss the difference between the hardware and software that is used to connect and enable to Sphero to operate. Make a list of hardware and software that is used.	Students learn to connect the Sphero to the app/software. Students spend time getting to know how to use the Sphero and learn how to control the Sphero with the joystick. If applicable, students complete any tutorials found within the app.
Session Resource	• Spheros, hardware and software			

Session Number	Session Topic Focus	Learning Intention and Success Criteria	Introduction/Teacher Instruction	Whole Class Activity
7.	Operating Robotics	**Learning Intention** Students will identify **Success Criteria** I can create instructions and program my Bee-Bot to complete simple tasks.	Recap on the different features of the Sphero and recap on how to connect and control the Sphero.	Students are given the option to complete a range of different activities: • Long jump - Create a long jump event by creating the longest roll. • Bullseye - Code the Sphero to roll onto the bullseye – players win points. • Sumo Wrestling - Create a sumo suit and try to knock your opponent out of the ring.
Session Resources	• Sphero Long jump • Sphero Bullseye • Sphero Sumo Wrestling			

Assessment – Victorian Digital Technologies Curriculum			
Content Description	**Session Number**	**Assessment Piece**	**Assessment Statement**
Identify and explore digital systems (hardware and software components) for a purpose (VCDTDS013)	6	Identification of hardware and software used to control a Sphero.	Students identified the hardware and software that is used to connect and operate the Sphero.
Recognise and explore patterns in data and represent data as pictures, symbols and diagrams (VCDTDI014)	N/A		
Collect, explore and sort data, and use digital systems to present the data creatively (VCDTDI015)	N/A		
Follow, describe and represent a sequence of steps and decisions (algorithms) needed to solve simple problems (VCDTCD017)	1 - 5	Sequence of steps recorded in correct order. Bee-Bot programming activities (unplugged and with bots).	Students followed and described a simple sequence of events to solve everyday task such as brushing teeth, classroom expectations and washing hands. Students followed instructions to learn how to take photos on an iPad. Students followed instructions to use Bee-Bots in the classroom to program and solve simple problems.
Explore how people safely use common information systems to meet information, communication and recreation needs (VCDTCD018)			
Independently and with others create and organise ideas and information using information systems, and share these with known people in safe online environments (VCDTDI016)			

Assessment – Victorian Digital Technologies Curriculum			
Content Description	**Session Number**	**Assessment Piece**	**Assessment Statement**
Identify and explore digital systems (hardware and software components) for a purpose (VCDTDS013)	6	Identification of hardware and software used to control a Sphero.	Students identified the hardware and software that is used to connect and operate the Sphero.
Recognise and explore patterns in data and represent data as pictures, symbols and diagrams (VCDTDI014)	N/A		
Collect, explore and sort data, and use digital systems to present the data creatively (VCDTDI015)	N/A		
Follow, describe and represent a sequence of steps and decisions (algorithms) needed to solve simple problems (VCDTCD017)	1 - 5	Sequence of steps recorded in correct order. Bee-Bot programming activities (unplugged and with bots).	Students followed and described a simple sequence of events to solve everyday task such as brushing teeth, classroom expectations and washing hands. Students followed instructions to learn how to take photos on an iPad. Students followed instructions to use Bee-Bots in the classroom to program and solve simple problems.
Explore how people safely use common information systems to meet information, communication and recreation needs (VCDTCD018)	N/A		
Independently and with others create and organise ideas and information using information systems, and share these with known people in safe online environments (VCDTDI016)	N/A		

Assessment – New South Wales Science and Technology Syllabus			
Outcomes and Objectives	**Session Number**	**Assessment Piece**	**Assessment Statement**
observes, questions and collects data to communicate and compare ideas (ST1-1WS-S)	N/A		
collect, sort, organise and present data to communicate information (ACTDIP003)	N/A		
Identifies digital systems and explores how instructions are used to control digital devices (ST-e7DI-T)	1-7	Sequence of steps recorded in correct order. Bee-Bot programming activities (unplugged and with bots).	Students followed and described a simple sequence of events to solve everyday task such as brushing teeth, classroom expectations and washing hands. Students followed instructions to learn how to take photos on an iPad. Students followed instructions to use Bee-Bots in the classroom to program and solve simple problems.

Assessment - Western Australian Digital Technologies Curriculum			
Pre-Primary Syllabus	**Session Number**	**Assessment Piece**	**Assessment Statement**
Digital systems (hardware and software) are used at home, in the school and in the community (ACTDIK001)	6	Identification of hardware and software used to control a Sphero.	Students identified the hardware and software that is used to connect and operate the Sphero.
Data can have patterns and can be represented as pictures and symbols (ACTDIK002)	N/A		
Collect and use data of any kind (ACTDIP003)	N/A		
Use data to complete a task (ACTDIP003)	N/A		
Engage with information known people have shared in an online environment, and model strategies to stay safe online (ACTDIP006)	N/A		
Explore needs for design (WATPPS01)	N/A		
Generate and record design ideas through describing, drawing, modelling and/or a sequence of written or spoken steps (WATPPS02)	1-7	Sequence of steps recorded in correct order. Bee-Bot programming activities (unplugged and with bots).	Students followed and described a simple sequence of events to solve everyday task such as brushing teeth, classroom expectations and washing hands. Students followed instructions to learn how to take photos on an iPad. Students followed instructions to use Bee-Bots in the classroom to program and solve simple problems.
Use given components and equipment to safely make simple solutions (WATPPS03)	4-7	Use of technology and robotics	Students used a selection of robotics and technology to program a sequence a of steps to complete a task.
Use personal preferences to evaluate the success of simple solutions (WATPPS04)	N/A		
Work independently, or with others when required, for solutions (WATPPS05)	4-7	Use of technology and robotics	Students worked in small groups to create a sequence of steps by programming the Bee-Bots.
Assessment - Western Australian Digital Technologies Curriculum			

SEQUENCE OF STEPS

Levels F-2

Year 1 Syllabus	Session Number	Assessment Piece	Assessment Statement
Digital systems (hardware and software) are used in everyday life and have specific features (ACTDIK001)	6	Identification of hardware and software used to control a Sphero.	Students identified the hardware and software that is used to connect and operate the Sphero.
Data can have patterns and can be represented as pictures, symbols and diagrams (ACTDIK002)	N/A		
Present data of any kind using a variety of digital tools (ACTDIP003)	N/A		
Use data to solve a simple task/problem (ACTDIP003)	N/A		
Share and publish information with known people in an online environment, modelling strategies to stay safe online (ACTDIP006)	N/A		
Explore opportunities for design (WATPPS06)	N/A		
Develop and communicate design ideas through describing, drawing, modelling and/or a sequence of written or spoken steps (WATPPS07)	1-5	Sequence of steps recorded in correct order. Bee-Bot programming activities (unplugged and with bots).	Students followed and described a simple sequence of events to solve everyday task such as brushing teeth, classroom expectations and washing hands. Students followed instructions to learn how to take photos on an iPad. Students followed instructions to use Bee-Bots in the classroom to program and solve simple problems.
Use given components and equipment to safely make solutions (WATPPS08)	4-7	Use of technology and robotics	Students used a selection of robotics and technology to program a sequence a of steps to complete a task.
Use personal preferences to evaluate the success of design processes (WATPPS09)	N/A		
Work independently, or with others when required, to create and safely share sequenced steps for solutions (WATPPS10)	4-7	Use of technology and robotics	Students worked in small groups to create a sequence of steps by programming the Bee-Bots.

Assessment - Western Australian Digital Technologies Curriculum			
Year 2 Syllabus	**Session Number**	**Assessment Piece**	**Assessment Statement**
Digital systems (hardware and software) are used for an identified purpose (ACTDIK001)	N/A		
Data can have patterns and can be represented and used to make simple conclusions (ACTDIK002)	N/A		
Present data using a variety of digital tools (ACTDIP003)	N/A		
Use data to solve similar tasks/problems (ACTDIP003)	N/A		
Share and publish information in a safe online environment, with known people (ACTDIP006)	N/A		
Explore design to meet needs or opportunities (WATPPS11)	N/A		
Develop, communicate and discuss design ideas through describing, drawing, modelling and/or a sequence of steps (WATPPS12)	1-5	Sequence of steps recorded in correct order. Bee-Bot programming activities (unplugged and with bots).	Students followed and described a simple sequence of events to solve everyday task such as brushing teeth, classroom expectations and washing hands. Students followed instructions to use Bee-Bots in the classroom to program and solve simple problems.
Use components and given equipment to safely make solutions (WATPPS13)	4-7	Use of technology and robotics	Students used a selection of robotics and technology to program a sequence a of steps to complete a task.
Use simple criteria to evaluate the success of design processes and solutions (WATPPS14)	N/A		
Work independently, or collaboratively when required, to organise information and ideas to create and safely share sequenced steps for solutions (WATPPS15)	4-7	Use of technology and robotics	Students worked in small groups to create a sequence of steps by programming the Bee-Bots.

SEQUENCE OF STEPS: GET READY TO LEARN

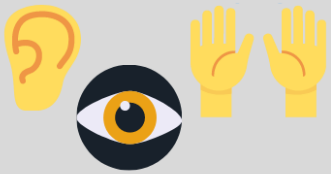
STEP 1
Line up outside the classroom

STEP 2
Enter 2 students at a time

STEP 3
Put your water bottle and hat away

STEP 4
Sit on the mat

STEP 5
Show you are ready to learn



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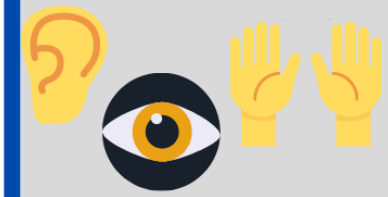
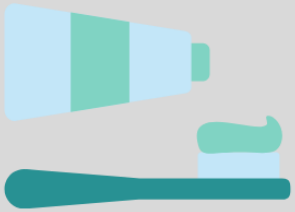


SEQUENCE OF STEPS: BRUSHING YOUR TEETH

STEP 1
Get toothpaste and toothbrush ready

STEP 2
Put the toothpaste onto the brush



STEP 3
Brush the top row of teeth

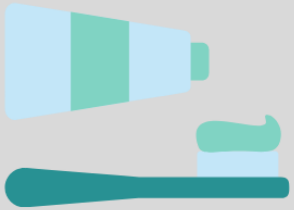
STEP 4
Brush the bottom row of teeth

STEP 5
Wash your mouth out with water and smile

SEQUENCE OF STEPS: BRUSHING YOUR TEETH

STEP 1
Get toothpaste and toothbrush ready

STEP 2
Put the toothpaste onto the brush



STEP 3
Brush the top row of teeth

STEP 4
Brush the bottom row of teeth

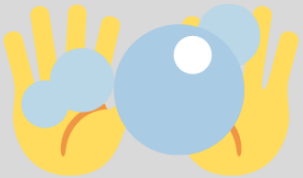
STEP 5
Wash your mouth out with water and smile

SEQUENCE OF STEPS: WASHING YOUR HANDS

STEP 1
Turn on the tap and wet your hands

STEP 2
Pump the soap and put on your hands

STEP 3
Move the soap around your hands



STEP 4
Wash the sop off your hands

STEP 5
Dry your hands

SEQUENCE OF STEPS: WASHING YOUR HANDS

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Turn on the tap and wet your hands

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Pump the soap and put on your hands

STEP 3
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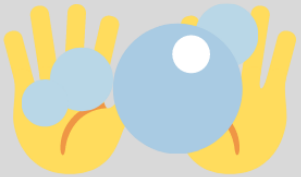
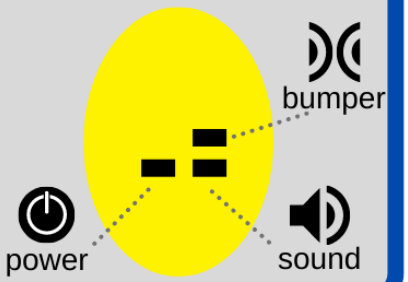


STEP 4
Wash the sop off your hands

STEP 5
Dry your hands

SEQUENCE OF STEPS: USING A BEE-BOT

STEP 1
Turn the 3 switches **on**



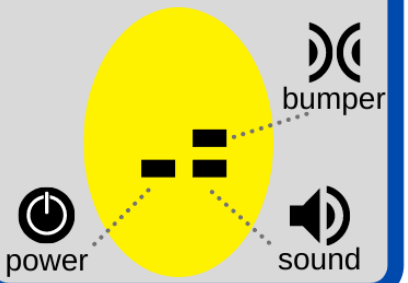
STEP 2
- GO go forward
- GO rotate right
- GO reverse
- GO rotate left

STEP 3
Press X and GO to clear the code

X GO

STEP 4
Waiting until the Bee-Bot eyes flash before next command

STEP 5
Turn the 3 switches **off**



SEQUENCE OF STEPS: USING A BEE-BOT

STEP 4
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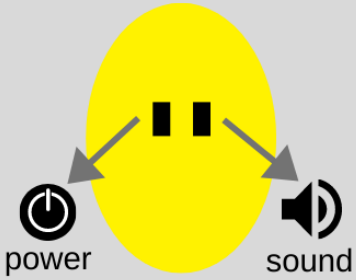
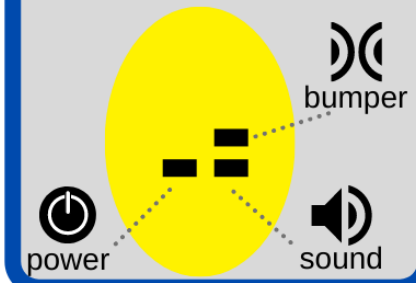
STEP 3
Press X and GO to clear the code

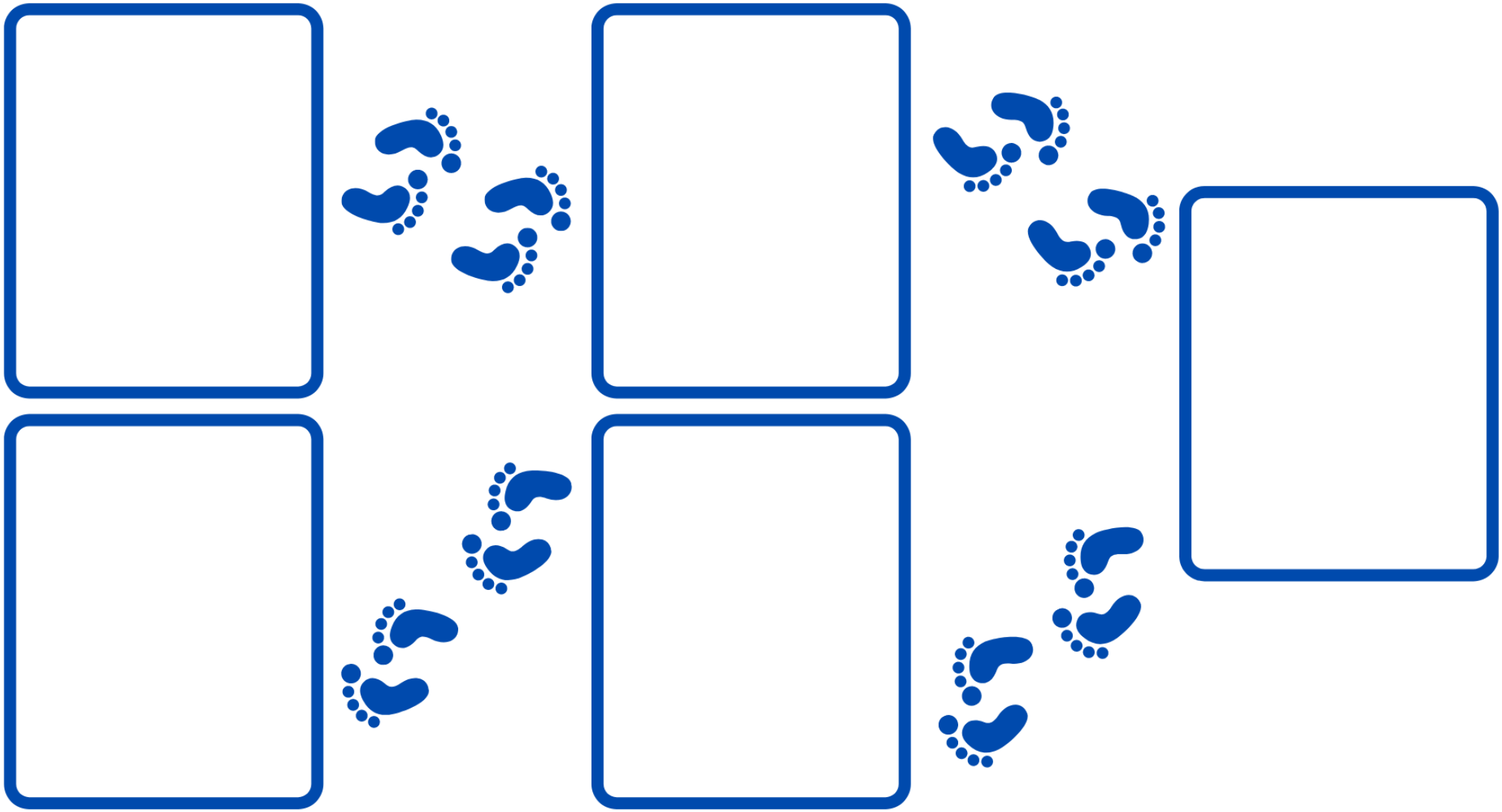
X GO

STEP 1
Turn the 3 switches **on**



STEP 5
Turn the 3 switches **off**



STEP 2
- GO go forward
- GO rotate right
- GO reverse
- GO rotate left

SEQUENCE OF STEPS: PUT IN ORDER