YEAR 4 SPHERO PROGRAMMABLE HARDWARE (SESSION 1 OF 4)

CURRICULUM MILESTONES

I can create a program that uses loop commands to achieve a particular outcome

I can recognise that the order of commands may produce a different outcome

I can identify a way to refactor (improve) my code

EQUIPMENT YOU WILL NEED

Sphero mini (or other variant) programmable hardware. Best choice is to use iPads with the Sphero Edu app. Chromebooks or laptops can work though this is often more fiddly and less reliable.

You will need 1 iPad (or alternative) to control each Sphero.

ESSENTIAL PREPARATION

You will not need devices or Spheros for this session, though if you have time you might want to look at loops within the Sphero app as a class at the end of the lesson.

HOW WILL THIS LESSON PROGRESS?

Loops Unplugged. You can access this lesson sequence using the link: https://edu.sphero.com/cwists/preview/51799x
You might want to assign the lesson to children if you have set up your education account - see the first session here if you need more information on setting this up. You can just send children the lesson link through a learning platform or, in some ways even simpler, just display the steps of the lesson through your classroom screen.

It is best to talk through individual steps with children and structure your lesson around these steps. Stopping children to focus back on you / the classroom screen is a good way to keep the tasks on-track and elicit learning through further discussion and questioning. Consider your groupings of children carefully and utilise as much space as you can. Using a full classroom is often fine, and desks together can often be used as an alternative to having all children using floor space. Halls and outdoor areas can be worthwhile spaces to use if they allow for more space.

TIPS FOR TEACHING DELIVERY

This session is 'unplugged' so there is no need to use any IT equipment whatsoever. It acts as a precursor to the following session, and should prepare children for understanding and implementing the concept of loops within programming. You may wish to use the dice template in step 3 if you do not have any normal dice to hand.
Step 2 will need some significant discussion around how loops appear generally in life, and perhaps how they appear in computer programs. Children may well offer examples from video games, though real-world examples are perhaps more interesting. Examples: *Go to bed at 8:30pm; wake up at 7am; eat breakfast; go to school. Loop this action until day = weekend*. Children will enjoy writing down / offering further examples.
Step 4 can be taken further by children inventing their own rules for the dice game. Rules need to include a loop until something else happens, i.e. Loop: stick out your tongue until (condition) you roll a number 3 or higher.
Step 5 is a little bit leftfield but could be adjusted to talk about how introducing computer systems for organising our lives can carry a number of negative downsides. Systems that automate processes are not always open to human empathy and understanding of individual circumstances.

YEAR 4 SPHERO PROGRAMMABLE HARDWARE (SESSION 2 OF 4)

CURRICULUM MILESTONES

I can create a program that uses loop commands to achieve a particular outcome

I can recognise that the order of commands may produce a different outcome

I can identify a way to refactor (improve) my code

EQUIPMENT YOU WILL NEED

Sphero mini (or other variant) programmable hardware. Best choice is to use iPads with the Sphero Edu app. Chromebooks or laptops can work though this is often more fiddly and less reliable.

You will need 1 iPad (or alternative) to control each Sphero.

ESSENTIAL PREPARATION

Make sure to plug the Spheros into mains power in plenty of time so they are fully charged. Children enjoy helping with such processes.

Cross-curricular: This session is linked to angles learning in maths. Children would benefit from having learnt around concepts beforehand or studying co-currently.

HOW WILL THIS LESSON PROGRESS?

Blocks 1: Loops. You can access this lesson sequence using the link: https://edu.sphero.com/cwists/preview/1671x
You might want to assign the lesson to children if you have set up your education account - see the first session here if you need more information on setting this up. You can just send children the lesson link through a learning platform or, in some ways even simpler, just display the steps of the lesson through your classroom screen.

It is best to talk through individual steps with children and structure your lesson around these steps. Stopping children to focus back on you / the classroom screen is a good way to keep the tasks on-track and elicit learning through further discussion and questioning. Consider your groupings of children carefully and utilise as much space as you can. Using a full classroom is often fine, and desks together can often be used as an alternative to having all children using floor space. Halls and outdoor areas can be worthwhile spaces to use if they allow for more space.

TIPS FOR TEACHING DELIVERY

Step 1 can be looked at and discussed together as a class from the front. A great place to elicit questions from children regarding the different block categories.
The videos in steps 2, 3 may well be best viewed together as a class (on a classroom screen / interactive board) before children set to completing the tasks. This allows questions to be asked and children to understand the task fully before they undertake each step. There is no harm in children having access to the videos so that they can rewatch, though you may find that school filtering doesn't allow video to be played from YouTube on pupil devices. You may find that playing videos once again while children are engaged in the task is a great way for them to be reminded of how to complete each step.

YEAR 4 SPHERO PROGRAMMABLE HARDWARE (SESSION 3 OF 4)

CURRICULUM MILESTONES

I can create a program that uses loop commands to achieve a particular outcome

I can recognise that the order of commands may produce a different outcome

I can identify a way to refactor (improve) my code

EQUIPMENT YOU WILL NEED

Sphero mini (or other variant) programmable hardware. Best choice is to use iPads with the Sphero Edu app. Chromebooks or laptops can work though this is often more fiddly and less reliable.

You will need 1 iPad (or alternative) to control each Sphero.

ESSENTIAL PREPARATION

Make sure to plug the Spheros into mains power in plenty of time so they are fully charged. Children enjoy helping with such processes.

Cross-curricular: This session is linked to angles learning in maths. Children would benefit from having learnt around concepts beforehand or studying co-currently.

HOW WILL THIS LESSON PROGRESS?

Super-Sphero Shapes. You can access this lesson sequence using the link: https://edu.sphero.com/cwists/preview/56827x
You might want to assign the lesson to children if you have set up your education account - see the first session here if you need more information on setting this up. You can just send children the lesson link through a learning platform or, in some ways even simpler, just display the steps of the lesson through your classroom screen.

It is best to talk through individual steps with children and structure your lesson around these steps. Stopping children to focus back on you / the classroom screen is a good way to keep the tasks on-track and elicit learning through further discussion and questioning. Consider your groupings of children carefully and utilise as much space as you can. Using a full classroom is often fine, and desks together can often be used as an alternative to having all children using floor space. Halls and outdoor areas can be worthwhile spaces to use if they allow for more space.

TIPS FOR TEACHING DELIVERY

This task is clearly linked to the mathematical concept of angles – it may be wise to consider children's abilities in this area beforehand. It would be possible to come back to this session if you feel children need some further maths input beforehand, or if you would rather tackle it after the relevant maths topic. The activity takes the loops concept from the previous session further, as children create different shapes and begin to understand the internal angles of different shapes.
You do not need to stick rigidly to the shapes that are shown in the steps. For some children you might want to start with (and possibly stick with) squares, for a simpler approach.
For a challenge, some children could be asked to explore further multi-sided shapes and feed back to the teacher on their understanding of angles on the inside of 2D shapes. What patterns are there as the number of sides increases etc?

YEAR 4 SPHERO PROGRAMMABLE HARDWARE (SESSION 4 OF 4)

CURRICULUM MILESTONES

I can create a program that uses loop commands to achieve a particular outcome

I can recognise that the order of commands may produce a different outcome

I can identify a way to refactor (improve) my code

EQUIPMENT YOU WILL NEED

Sphero mini (or other variant) programmable hardware. Best choice is to use iPads with the Sphero Edu app. Chromebooks or laptops can work though this is often more fiddly and less reliable.

You will need 1 iPad (or alternative) to control each Sphero.

ESSENTIAL PREPARATION

Make sure to plug the Spheros into mains power in plenty of time so they are fully charged. Children enjoy helping with such processes.

You will need masking tape (sufficient quantity for each group) or another way to make the floor maps (such as printing).

HOW WILL THIS LESSON PROGRESS?

Around the World in 60 minutes. Access this lesson sequence using the link: https://edu.sphero.com/cwists/cwistings/1143293/21024 You might want to assign the lesson to children if you have set up your education account - see the first session here if you need more information on setting this up. You can just send children the lesson link through a learning platform or, in some ways even simpler, just display the steps of the lesson through your classroom screen.

It is best to talk through individual steps with children and structure your lesson around these steps. Stopping children to focus back on you / the classroom screen is a good way to keep the tasks on-track and elicit learning through further discussion and questioning. Consider your groupings of children carefully and utilise as much space as you can. Using a full classroom is often fine, and desks together can often be used as an alternative to having all children using floor space. Halls and outdoor areas can be worthwhile spaces to use if they allow for more space.

TIPS FOR TEACHING DELIVERY

This session is likely to take up a whole afternoon of learning – it is probably best to tackle in this way, since the maps on the floor aspect – whether achieved with tape or otherwise – will be hard to retain for another session on another day. Note that Step 2 shows two different styles of maps that could be used – the outline one may be most useful for using masking tape (and it really doesn't matter if the dimensions are a little different to those in the picture).
You will need to print off the Around the World cards at Step 1 for each group of children. Some of these are harder than others - they do also provide good talking points that you might want to take further in class discussions (stopping children in their games but also once all games have finished).
Step 3. It may be better to change the objective from "first team to make it to all continents" to "first team to carefully and accurately make their way between all continents". Better for children to be less hurried so that they look and think carefully at their code.