

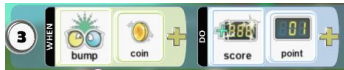

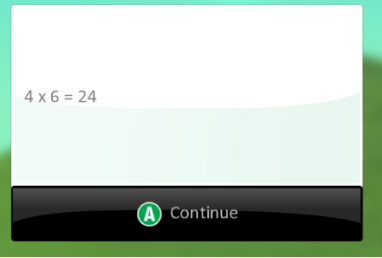


<p>Timing</p> <p>5 sessions of approximately 45 minutes</p>	<p>Children will</p> <ul style="list-style-type: none"> • create a terrain in Kodu and program an object to move on the terrain • talk through the algorithm needed to make an object move around their terrain • program an object to solve multiplication questions and collect points • create a game for others to practice their multiplication and times tables skills
<p>e-safety links </p> <p>I can talk about why I need to ask a trusted adult before downloading files and games from the Internet</p>	<p>Objectives</p> <p>Programming</p> <ul style="list-style-type: none"> • I can use a variety of tools to create a program. • I know that I need to keep testing my program while I am putting it together. • I can recognise an error in a program and debug it. • I can recognise that an algorithm will help me sequence more complex programs. • I can use logical thinking to solve an open-ended problem by breaking it up into smaller parts.
<p>Links to other learning</p> <p>Maths: children can consolidate their times table knowledge by creating a game to test their multiplication skills</p>	
<p>Resources</p> <p>Kodu</p> <p>RAG poster for self-assessment</p>	<p>Preparation</p> <ul style="list-style-type: none"> • Download Kodu from http://www.kodugamelab.com/ and ensure computers have necessary .NET framework applications installed. Kodu can also be used as an app on iPad. Refer to Year 3 Programming 2 planning for more information on Kodu. • You may also wish to look at the Kodu planning resources from Siobhan Morgan at Minehead Middle School • Display RAG poster to support self-assessment

	Expectations	Activity	Success Criteria
1	<p>e-Safety</p> <p>I can talk about why I need to ask a trusted adult before downloading files and games from the Internet.</p> <p>Programming</p> <p>I can use a variety of tools to create a program.</p>	<p>Exploring arrays in Kodu</p> <ul style="list-style-type: none"> This session may be a reminder if children used Kodu in Year 3 Programming 2 or it may be an introduction if children are meeting it for the first time. Explain to children that we are going to explore using Kodu, a games-making tool that can be downloaded from the Internet. Briefly discuss with children what they know about downloading games and content from the Internet – is it always safe to do so? What are the risks (viruses; loss of data)? How can you make sure it is safe? (check that it is from a reputable site e.g. Microsoft; always ask an adult). Children work in pairs or individually. This activity should take 20 minutes, but children will be inclined to ‘play’ with different terrains, so focus needs to be maintained. <p>Adding, deleting and changing the terrain:</p> <ul style="list-style-type: none"> Demonstrate how to open a new world by loading the application and selecting ‘New World’ Show the children how to scroll out of the world and in by using the mouse wheel. Demonstrate how to add new land in Kodu by selecting the paint brush Click on the terrain to the top left of the paint brush icon to change the land. Challenge children to create a world of arrays with different terrain for each table up to 12 x 12. Each piece of land creates a 10 x 10 array, so use the delete function to create the array. Make sure children save their world for the next lesson. By default this will save the local computer so children will need to work on the same computer for all the sessions. 	<p>Gold: Can I select a different type of ground for each of the 10 arrays and place a different object on each?</p> <p>Silver: Can I select a different type of ground for each of the 10 arrays?</p> <p>Bronze: Can select a different type of ground to the default and use it to create land?</p>

<p>2</p>	<p>Programming</p> <p>I know that I need to keep testing my program while I am putting it together.</p> <p>I can recognise an error in a program and debug it.</p>	<p>Creating a program to move an object round a perimeter</p> <ul style="list-style-type: none"> • Ask children to open their worlds by launching the application and selecting 'Load World'. • Making objects move (programming) <ol style="list-style-type: none"> 1. Go to the 12 x 12 array created in the last session. Select the object on that world by clicking on the Kodu icon and then clicking on it. Right-click the mouse button and change the Kodu's size to as small as it will go. 2. Move it in to the corner of the square/terrain. 3. Tell children that you are going to get the object to move around the perimeter of the shape. Explain meaning of perimeter. 4. Make sure Kodu icon is still selected and right click on the object. Select 'Program' 5. Click on the + sign next to when and select 'Keyboard'. Click on + sign now next to 'keyboard' on the tile. Select 'Arrows'. 6. Click on + sign next to 'Do'. Select 'Move'. 7. Click on + sign next to 'Move' tile and choose forward. Repeat and select 'slowly' 8. Press Esc 9. Press 'Play' (second icon in from left) and let children explore making the object move around the perimeter of the square. Emphasise that they need to try to control the object enough to go around the perimeter. They will find that their object travels too fast, so they need to go back and alter their program....by adding two more 'slowly' tiles to make it slow down. 10. Ask children to repeat process for each of their other objects on the other arrays. 	<p>Gold: Can I create a simple program to make an object move around a given area and correct an error in the program to make the object slow down?</p> <p>Silver: Can I create a simple algorithm to make an object move around a given area and recognise that the algorithm can be altered to make the object more controllable?</p> <p>Bronze: Can I create a simple program to make an object move around a given area?</p>
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	<p>Helpful hint</p> <p>When programming the object, right click on a tile and select 'cut tile' to delete an action you have previously programmed.</p>	
<p>3</p> <p>Programming</p> <p>I can recognise that an algorithm will help me sequence more complex programs.</p>	<p>Creating a more complex program</p> <ul style="list-style-type: none"> Ask the children to open a new world by clicking on 'New World'. They will program objects to perform particular tasks. <ol style="list-style-type: none"> Ask the children to create a piece of land using the 'Ground Tool' used in session 1. It doesn't matter what size. Ask them to insert a Rover and a coin by clicking on the Kodu icon and on the land. Talk through the algorithm for the program to make it move (from previous session). Demonstrate to the children how to program the Rover again by right clicking on it and using the same programming as last week to make it move.  <ol style="list-style-type: none"> Ask the children what the algorithm would be so that when the Rover bumps into the coin it scores a point. Tell the children to try to program the algorithm. Celebrate successes and then look together at successful programming e.g.  <ol style="list-style-type: none"> Now challenge children to make it so that as well as scoring a point when bumping into the coin, the Rover says a multiplication table as well. Children experiment, then show them... 	<p>Gold: Can I tell you the algorithm and create a simple program to score points when the correct object is touched, and lose one when the incorrect answer is touched?</p> <p>Silver: Can I create a program to score a point when an object is touched and to ask a question at the same time?</p> <p>Bronze: Can I create a simple program to score points when an object is touched?</p>

	<div style="text-align: center;">   </div> <p>What is the algorithm they have programmed to achieve this?</p> <p>7. Ask the children to insert and program other objects, such that when they are bumped into a point is awarded (or taken off), and a times table fact is displayed. (Could focus on one particular table)</p>	
<p>Programming</p> <p>I can recognise that an algorithm will help me sequence more complex programs.</p> <p>I can recognise an error in a program and debug it.</p>	<p>Creating a Maths game in Kodu</p> <ul style="list-style-type: none"> Ask the children to open a new world by clicking on 'New World'. Programing objects to perform particular tasks <ol style="list-style-type: none"> Ask the children to quickly insert a new bit of land and insert a Rover and two apples. Tell them that they are going to create a simple Maths game today that will help children learn times tables' facts. Click on the Rover, go to 'Program' and ask the children to quickly insert the program for making the Rover move. (see above) Talk through the algorithm for the Maths game: <ol style="list-style-type: none"> Rover will ask a Maths question Apples will have different answers Player will find the apple with the correct answer. Ask them to talk in pairs to RAG each line in the algorithm. Which commands will need to give to the Rover. Steer towards the following programming and 	<p>Gold: Can I talk through the algorithm for a times table game where the incorrect answer results in the end of the game? Can I detect and correct any errors in my program?</p> <p>Silver: Can I talk through an algorithm for simple times table game, where the Rover asks a question and has to pick the apple with the correct answer? Can I detect and correct any errors in my program?</p> <p>Bronze: Can I detect an error in my program to ensure the question asked by the Rover isn't continually repeated?</p>

get it to say something like 'Which apple has the answer to 3 x 4?'



Get them to try it. Hopefully they will see that when they 'play', it constantly asks the question. Give them a few minutes to solve the problem (solution is to have him say it only once).




6. Now ask them to program the Rover to pick up the apples. Ask them to work out how and then, if necessary, show them...



7. Now they need to program one apple to give the correct answer and one to not. Give them time to explore for themselves. If needs be, show them the correct programming....you can even add a point for getting the correct one...



You could have the wrong one cause the game to be over by having it 'eat' the Rover!

	 <p>8. If time, ask the children to make the game more complex, by adding more apples and exploring what a wrong answer can do to the Rover. Can the children describe the algorithm for this?</p>	
<p>5</p> <p>Programming</p> <p>I can use logical thinking to solve an open-ended problem by breaking it up into smaller parts.</p>	<p>Creating my own Maths game</p> <ul style="list-style-type: none"> • Tell the children that, now they have created simple programs to ask mathematical questions and to bump into objects to get the answer to them, you would like them to use these skills to create a more complicated game to help children to learn a particular times table. • Ask them to draw a design and to think through the algorithm they will use. • What are the different things they will need to program? It could be such that the Rover goes around and collects the correct multiples from a particular table and 'delivers' them to a particular place, or it could be similar to that already started, bumping into the correct answers, but the incorrect ones have a penalty attached. Guide the children to plan the algorithm for their game. • Ask children to RAG their design / algorithm before they begin to program. This will help you to identify children who will need further support or any concepts that you will need to revisit with the whole class. • Here is an example, programming the Rover to ask the objects to tell him a number in the 6 x table. Correct answers score a point, incorrect lose 2 points. 	<p>Gold: Can I plan an engaging game that helps teach a particular times table to other children?</p> <p>Silver: Can I plan a times tables game where the incorrect answer results in the end of the game?</p> <p>Bronze: Can I plan a simple times tables game, where the Rover asks a question and has to pick the apple with the correct answer?</p>

1. Insert a Rover, an iceberg (or another object) and a football (or another object).
2. Program the Rover as follows...

n.b. Rover says 'Tell me a number in the 6 times table'



3. Program the iceberg to answer correctly by saying 36, for example, and the following code...



4. Program the football to answer incorrectly by saying 46, for example, and the following code...

5.



- You could give the children this to start with and ask them to create the full game. Depending on how well your cohort took to the initial build up activities, you may wish to spend longer developing the game into the finished form.
- Challenge e.g. Help them to develop a game whereby there is a Rover, two apples and a tree. The Rover asks a maths question and has to find the apple with the correct answer. He picks it up and takes it back to the tree, scoring a point.

Program Rover



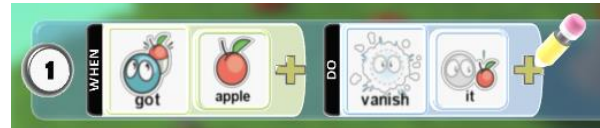
Apple – correct answer



Apple – incorrect answer



Tree



- Encourage children to take their games even further, perhaps out of school, working out how to develop a larger game that teaches all the times tables.