Year 2 Programming 1 Scratch Jr Making my Moves (Core) Tablets or Laptops

Timing	Children will
4 sessions of approximately 40 minutes	• use blue programming blocks in Scratch Jnr App to make cat move around stage. • use images of the blocks to give movement instructions to each other • use trigger blocks to start a sequence. • investigate speed block and create an animal race. • add pink hide, show and tell blocks to sequences. • self-assess their confidence to make something happen. • create a scene where a wizard says a magic word and disappears.
e-safety links I can talk about why it is important to be kind and polite online and in real life.	**Objectives Programming** • I can tell you the order I need to do things to make something happen and talk about this as an algorithm. • I can program a robot or software to do a particular task. • I can give instructions to my friend and physically follow their instructions • I can look at my friend's program and tell you what will happen. • I can use programming software to make objects move. • I can watch a program execute and spot where it goes wrong so that I can debug it.

Links to other learning
Mathematics: developing logical thinking to support problem solving
English:
• Give well-structured explanations of their programming.
• Maintain attention and participate actively in collaborative conversations together with using spoken language to develop understanding through speculating, hypothesising, imagining and exploring ideas; through activities within the programming

Resources	Preparation
Scratch Jr on Android tablets or iPad Desktop version KS1 Self-assessment poster	• Print out two sets of large block images to support learning for whole class. Plan a display with one set of the blocks which will be labelled during the sessions. • Prepare smaller versions for setting sequences for each other. These can also be used to support planning of programs by small groups or pairs. Laminated versions of the blocks will make these re-usable. • Print out debug stickers. • Download Year 2 Scratch Jr PowerPoint presentation to be used alongside this planning. • See http://www.scratchjr.org for other planning and support materials. • Display KS1 Self-assessment poster • Make a Scratch Jnr project for slides 5 and 6 Dog and Penguin racing! (see screen shots on slides)

	Expectations	Activity	Success Criteria
1	**Programming** I can use programming software to make objects move.	**Simon Says** • Play Simon Says with the class using the blue block cards and the yellow green flag card o Hold up the green flag card when 'Simon says'. Children only do the action or movement if you 'run / execute' the program. o Let volunteers be Simon o Discuss how this activity is dependent on properly being able to give and follow instructions. o Remind children how providing clear instructions is critical to computer programming. **Guided exploration of Scratch Jr** *(Use of the App on devices is interspersed with physical movement activities with the block cards. You may want to follow the suggestions for physical movement as one section of the learning if you need to move to a different space to allow enough room.)* • Ask the children to open Scratch Jnr App and click on the house icon. Click on the plus sign for a new project. • What can you make the cat do using the blue blocks? Slide 1 • Encourage the children to drag each block down to the script area. Tapping on a block will make something happen. Set the rule that the children must keep each block by itself - Slide 2 and tap on the block. • Encourage the children to tell each other what they discover. • Ask the children for labels for the large blue	Gold: Can I use a sequence to make the cat visit each corner of the stage? Silver: Can I make the cat move to each corner of the stage? Bronze: Can I make the cat move?

blocks you have printed out.

- Start a display and add the labels suggested by the children.
- **Number and jumping physical game**
  - o Each child to stand in a space. Hold up blocks, reading out the instruction. Children to move, following the instruction. (You may need to move to a larger space such as a hall or playground).
  - o What happens if you change the numbers at the bottom of each block?
  - o Call out a number as you hold up each block. How will they change their jumps for different numbers?
- Children return to the device they were using. Can they make the cat do a small jump? Can they make the cat do a high jump?
- Some children may have discovered the blocks will fit together to make a sequence. When the children are ready encourage them to build a sequence using what they have learned. Tapping on any block in the sequence will make it run.
- It may benefit the understanding of some children to continue to work with individual blocks or to keep returning to try out individual blocks once they begin to create a sequence.
- **Paired sequences**
  - o Ask children to work in pairs to make a sequence with the block cards.
  - o Put children into a group of four. Each pair follows the sequence created by the other pair.
- Children return to devices. What number do you need to use to make the cat move all the way across the stage? Children will need to drag the cat to one side of the stage.

- Once the children have tried different numbers, get the children to add the grid to the stage (at the top of the screen). The children will be able to count the number of square the cat needs to move. Some will recognise they can use the numbers at the bottom of the grid to work this out.

What do you think the blue square on the cat's nose shows? (This is the centre of the cat. *You may want to draw attention to the coordinates for the cat.*)

Challenge: Can you get the cat to visit each corner of the stage?

- Challenge the most confident children to create one sequence to make this happen.

- **Reset physical game**

  o Ask children to stand in starting position. Give instructions to the class using the block cards. Add in the reset block.

  o Give the children a sequence of instructions. Hold up the reset block. Do they return to their starting point.

- Make sure the children can use the reset block to send their character back to the starting position. Alternatively, they can use the reset block at the top of the screen.

2	**Programming** I can use programming software to make objects move.	**Use a block to start a sequence** - Ask the children to make the cat move forwards and backwards. - Now introduce the yellow trigger blocks (slide 4). Ask the children what they think the yellow green flag block and yellow start on tap block do. Where to do you think they go in the sequence? - Children should recognise they can only go at the beginning due to the round	Gold: Can I add a second sprite to the stage and program a sequence for each sprite? Silver: Can I make two sprites move on the stage at the same time and then when I tap each of them? Bronze: Can I make two sprites move

side. .

- Get the children to add a green flag trigger block to the beginning of their sequence.

- Encourage children to use the green flag at the top of the screen to run the sequence as well as tapping on the sequence in the script area. Do they recognise both start the sequence?

- Ask the children to change to the tap trigger block. Make sure the children recognise that the tap block works when you tap on the character on the stage.

- Add these two yellow trigger blocks to your display. Ask the children to suggest labels.

- **Predict and start game**

  o Make a sequence with the block cards starting with green flag block. Ask children to predict where they will finish if they move in the sequence. Can the children read the sequence?

  o Tap the green flag trigger block. Do the children move? Do they finish where they expected to?

  o Make a new sequence with finger tap card. Ask the children to predict where they will finish. Tap a child (gently on forehead), do they start to move in the sequence? Do they friends wait to move until you tap them?

  o Which block do we need to start with for everyone to move?

  o Which block do we start with for just one person to move?

- Show the children the red end block. What do you think this block does? Where does it go? Add to class display.

on the stage when I tap them?

Two characters moving on the stage

- Add a second character (click on the plus sign on the left of the screen to add another character to the character list.)
- Using the yellow trigger blocks and blue motion blocks – what can you make happen?

- Children will need to understand the tap block makes one character move. The green flag will make both characters move at the same time. (*It is important that children recognise the difference between clicking on the green flag block in the script area and clicking on the green flag at the top of the screen. Clicking on the green flag at the top of the start will start actions for all characters that have that block to start a sequence.*)

- *Remind children of the blue home block to restart the characters in the same position.*

- Show children how to save and name their project by tapping on the orange shape in the top right of their screen then tapping in the white box to change the name.

- Rotate groups to let children show each other what they have created.

- What ideas have you seen that you would like to make part of your project?

- Let children have time to make changes to their projects based on the ideas their friends have shown them.

- *Make sure children recognise:*
  - *They don't need to have trigger and end blocks to make things happen, individual blocks and sequences can run without these.*
  - *The green flag can allow lots of things to happen at the same time.*

3	**Programming** I can tell you the	**Speedy animals (an idea from http://www.scratchjr.org)** *You will need to have made a project as per slides 5 and 6 to be ready for the children to see what happens.*	Gold: Can I implement an algorithm as a program for more than one sprite?

| order I need to do things to make something happen and talk about this as an algorithm.

I can watch a program execute and spot where it goes wrong so that I can debug it. | • Show slide 5 Ask children to **predict** what will happen. 'Read' the program / code together to help children predict. Do they recognise the penguin will move across and jump, move across and jump, move across and jump, move across.

• Run the program on your device, tapping on the green flag block (not green flag at the top of the screen). Ask the children why you have the reset block in your programming area. Let them see that you can return the penguin to the starting point.

• Show slide 6 Ask children to **predict** what will happen. 'Read' the program / code together to help children predict.

• Run the program on your device, tapping on the green flag block (not green flag at the top of the screen). Ask the children how you can return the dog to the starting point – tap on reset block.

• How can I return make both animals move at the same time? (*green flag at the top of the screen*)

• Show the children the yellow speed block (slide 7). What do you think this block will do?

• Show slide 8 and 9. Ask children to **predict** what each will do.

• Use slide 10 for children to compare Can they **predict** which animal will win the race?

• Run your program using the green flag (make sure both animals have been reset). Did the children predict the winner?

• Ask children to add the speed block to the sequences in their projects. Let them try making changes to the drop down arrow.

• How should we label this block on our display?

Create a race

• Bring the class together and show them dog, penguin, lizard and pig sprites. | Silver: Can I create a program for more than one sprite to move differently but at the same time?

Bronze: Can I make two sprites move at the same time? |

Which animal would win a race? Agree the finishing order together.

- What is the algorithm for a race between these animals? Say the algorithm rap together (slide 11). What is the sequence of things that need to happen? Write the algorithm for one animal to race. Talk about using the same algorithm for each animal but ask what will need to change for each animal.

- Which programming blocks will we need to use to implement this as a program?   Remind children or model where necessary the use of KS1 Self-assessment poster to check they are ready to program. 'I don't know what to do yet.'

  - Talk with my friends, can any of the children help you?

  - Act it out, show the children how you can pretend to be Bee-Bot to check out the moves you will need to do.

  - Try something; see what happens; decide that you will have a go.

  - **OR**, 'I know what to do', share their thinking to help someone else, check it works.

- Identify the children who may need further support. Where appropriate, encourage confident programmers to become teacher to less confident children. Work with group of children that may need to increase understanding of building a sequence.

- Ask children to start a new project.

Challenge: Create a race for the animals

- Children can work in pairs or in groups depending on the number of devices. It can be best to group children with those of similar confidence so that they work at the problem together with a similar level of understanding.

- Tell children they are going to implement the algorithm as a program. How will they make sure that the program for each sprite starts at the same time? Check they recognise that they will need to use the green flag trigger block. Tell them they must keep testing their programming. What do we call it if we

find a mistake that we need to sort out? Remind the children of the word debug. You can use debug stickers to reinforce the idea of it is good to make mistakes and sort them out.

- Challenge the confident children to add interest to the race. The race could include a diagonal line. Perhaps the penguin waddles from side to side!

Optional: Move in a diagonal

- Add two green flag blocks to your script area.

- Add a forward blue block to one.

- Add an up or down blue block to the other.

- What happens when you tap the green flag? (It must be the flag at the top of the screen.)

Running the two sequences at the same time will make the cat move in a diagonal line.

Add a background
- Tell the children they can choose a background for their race. Has anyone discovered how we change the background?

- Introduce children to the select a background for your characters. Tap on the image at the top of the screen to choose.

- Let children have the time to select an appropriate background for their race.

Show: predict and run

- Model looking at someone's project.

  o Look at the blocks before running the program and model predicting what will happen. You will need to tap on each character to 'read' the blocks.

  o Go to full screen and tap green flag to start project. Give

		two stars and a wish. Talk through any debugging that may be needed. • Ask children to show each other their projects. Predicting first and then running project. Give two stars and a wish. (slide 19).	
4	**Programming** I can tell you the order I need to do things to make something happen and talk about this as an algorithm. I can use the word debug when I correct mistakes when I program *a floor robot*.	**Hide, show and tell** • Ask the children to explore the pink hide, show and say blocks (slide 12). What can you make happen? • Add labels to the blocks in the display. • Show children the wait block (slide 13). What do you think this will let you do? • Show slide 14. Can the children **predict** what will happen? 'Read' the blocks together and agree. • As the children to 'implement' these blocks as a program to see if they were right. Make sure they recognise they need to put the wait block between disappear and reappear. • Add the wait block to the display **Challenge: Magic Spell** • Model adding a wizard to the stage. What will happen when the wizard says a magic word to disappear and then says another word and appears again? (slide 15). Act out what happens – you become the wizard for a child to tap or prepare a child to be the wizard and to 'disappear' when tapped, count to 3 and reappear. • Use slide 16 to remind children of what an algorithm is. • Model talking through the algorithm to meet the challenge eg *Tap on the wizard, wizard says a spell, wizard disappears, wizard waits, wizard appear*	Gold: Can I debug a program accurately at the prediction stage? Silver: Can I debug a program accurately after testing? Bronze: Can I attempt to debug a program after testing?

- Tell the children to talk through the algorithm with their friend and then to show the algorithm as a set of pictures. When will the wizard disappear? When the green flag is clicked or when you tap the wizard? You may want to show your algorithm to help them – slide 17.

- Once they have agreed on the algorithm ask the children to self-assess – using the poster. Do they know what to do to implement the algorithm as a program? Are there children who can be 'teachers' to help their friends? Are there a group of children that would benefit from further work with you before doing the challenge? Remind them to keep testing their program and debugging any mistakes.

- Stop the children part way through. Show the children the program on slide 18. 'Read' the program together. What mistake have I made? Can they debug the program? Give debug stickers to children who provide a clear explanation to debug the program.

- Give children time to finish their program. Remind them how to save their project.

- Tell the children they will be showing their wizard projects to each other. Model giving positive feedback to a friend - slide 19.

- Give the children time to show their wizards to each other asking them to give each other positive feedback eg two stars and a wish.