Underwater Race

Activity Structure – 45min

Activity	Timing
Warm up Game	10 mins
Introduce Project	15 mins
Main Activity	30 mins
Final test & debug	throughout
Finishing Up	5 mins

Overview

Children will use different speed blocks to create an underwater race between several characters including their crafted fish. Who will win?

Learning Objectives

- To start to use speed blocks to make a character move at different speeds.
- To practise making a character reach the end of the screen.
- To use an object from the real world in their coding project.

National Curriculum links

- **Spoken Language:** To maintain attention and participate actively in collaborative conversations, staying on topic and initiating and responding to comments.
- **Computing:** children will use technology purposefully to create, organise, store, manipulate and retrieve digital content.

EYFS Curriculum Links

- **Mathematics:** Numbers - In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting.
- **Technology:** Completes a simple program on a computer.

Warm Up: Fishy Coders

- Ask 3-4 children to be the seaweed or piece of coral. Sit them on chairs spread out around the room.
- Pick a 'fish' who needs to travel from the one end of the room to other without bumping into the seaweed. The fish can only move by following instructions from the 'Coders.' Initially make the TA or tutor the fish, but once the children have got the hang of giving precise instructions allow other children to have a go.
- First time: allow the coders to direct the fish without any support. *Are your instructions specific enough?* Support them to give clear and precise instructions, e.g. forward 3 steps. Left 2 steps. Forward 1, etc.
- Repeat and swap roles.
- Repeat and introduce speed blocks.

Underwater Race

Introduction (discuss the project together, share ideas and create excitement)

- *Today we are going to make underwater races*. Show Easy race. *Who do you think will win the race?* Get the children excited by encouraging them to make predictions about who will win the race. Who won the race? Was it who you thought? Which code block changed the speed of the character? Where will we find this block?
- Let's look at the code for Race 1 Would it have been easier to predict the winner if we saw the code first? Show the children the code for the different characters on page 2. *Who will finish first/last? How do you know?*
- Watch the race on page 2. Address any misconceptions about who won and why by comparing the code of the different characters. You may need to watch the race and examine the code a few times.
- *How many times does a character go forward 'fast'? Why do you think the fish won?*
- Show the race on page 3. *Show the code. Can we predict who the winner will be?* Encourage children to predict, this can be with a show of hands. Watch the race. Were our predictions right? What speed blocks did the winner have?
- What code blocks are we using today? Invite the children to select the blocks from the flashcards and display them in the room for reference. What start block are we using? What movement block do we need?

Finishing up

- Children show their races to one another. Select one project to share with the group. Look at each of their three race characters' code. *Who will win this race? How do you know?*
- Recap the blocks used in the lesson.
- What did you find easy/ difficult about creating your project? Would you do anything different next time? What?

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Underwater Race

Main Activity Key questions and teaching

1. Select the underwater background. Experienced coders may like to use the paint editor to personalise their background.
2. For a new character open the Paint Editor and use the circle tool to draw a large circle. Use the camera tool to take a photo of the crafted fish (children may need support to locate the camera on their tablets and position it correctly). Older children can use the curser to edit the shape of their fish (see craft notes for more details.)
3. Choose 2 or 3 underwater characters from the library. Use the grow and shrink blocks to resize the characters and line them all up on the left hand side of the screen.
4. Code the first character. *Which movement block will you need to move the fish across the screen? How many times 'Right' will your character need to move? How can you work this out?* Children can either use the grid and count how many squares the character will need to travel, (remember the first block is in the centre of the character) or children can pull down a move 'Right' block to tap and count until the fish is all the way across the screen. Have a piece scrap of paper to hand to record this number.
5. Now you need to divide this number into two or three unequal "chunks" For example if the character moves Right 15 – Right 5, Right 7, Right 3. Allow the children to tinker with this.
6. *Who is going to win the race? Which speed block will you use for the winner? Which speed block should we use for the loser? How can we make sure each character finishes the race at a different time?* Discuss the idea of using different speed blocks for different characters.
7. Allow the children to tinker with making their character(s) travel at different speeds. Tell the children how long they have left and encourage them to finish the project.
8. When all the characters have the code to finish the race. Test and debug. *Do your characters all reach the end of the screen? Do they all reach it at different times?*
9. *Can you add an interesting movement?* Jumping, turning, a wiggle, flashing. We want this movement to happen at the same time as the character races across the screen, so it will need a new start block – *Which start block will you use?* Test it. *Do you need a repeat or a repeat fo*rever? What happens if you don't tell the computer to repeat the interesting movement?
10. Test and Debug

Teaching points
- Young children may find it hard to predict the outcome of their code so the winner may not be who they intended.
- To ensure there's progression and learning encourage the children to copy-code the first character, do the second character with less support, and attempt to code the third character independently.

Possible Extensions
- Use wait blocks and a recorded "Ready Steady Go!" to start the race.
- The first character to reach the end of Scene 1, uses screen switch to second scene. Then use 'Wait' 'Hide' and 'Show' for the other characters to join the race at the appropriate time. Children can code 2 characters initially and then add the other characters if time as this is challenging.

To Simplify
- Use one or two speed blocks for each character .
- Support the children to determine how far the character needs to travel across the screen.
- Pull the code blocks down for the children and they can put them in the correct order and then independently select the speed for each character.