Flinders View Primary School **Week 5, Term 1**

1) Key lesson intentions

a) Student code pathways using three different instruction types – step forward, turn left and turn right
b) Using questions from the Proficiencies to drive deep thinking in the students. A focus on 'What do you think?', 'Why do you think that?', 'What might we need to find out?', 'Can you tell me more?', 'What questions do you have? not 'What is the answer?'.
c) Force students to use their 'stop and think' skills or their 'slow' thinking by altering the parameters of the task (in particular can they be cognitively flexible when rules change and can they stop and think before jumping into an answer).

2) Australian Curriculum Content Descriptions- Measurement and Geometry (Location and transformation)

Year 3
Create and interpret simple grid maps to show position and pathways

Year 4
Use simple scales, legends and directions to interpret information contained in basic maps

Year 5
Use a grid reference system to describe locations. Describe routes using landmarks and directional language

3) Lesson outline

Lesson Activities	**Questions for the students** Fluency Understanding Problem Solving Reasoning	**Executive functions** Cognitive flexibility, Impulse control and Working memory
1. Lesson introduction Use post it notes and have students to work in pairs to write down what they think of when they hear the word: maths. Collate student responses and discuss. Use the Stroop Power point to introduce the concept of stop and think. Focus on thinking flexibly, mistakes are important, asking questions is important, that pausing and thinking is very important in maths and that everyone can learn maths.		Begin to explain to students the concept of executive functions. Discuss how they had to stop and resist the urge to say the word (impulse control), how they had to hold in their head that they had to say the colour (using their working memory) and how they had to think flexibly to say the colour.

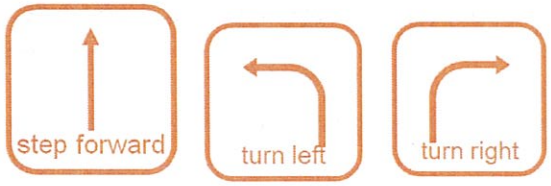
2. Coding Part 1

Community of Inquiry

What questions do you have? What might you need to find out to help you answer the question?

Students code to move a teacher from Point A to Point B in the classroom, using as many of the three instructions shown below.
Students are not able to walk it out.

Give them thinking time then ask them:
'What might you need to find out?
'How would you find that out"
Use Post-it-notes to share student thinking on the board.
Identify similar elements from each group
Things they may ask are: how big is the teacher's stride, does a turn include a step?



Trial each set of instructions.
Then tell groups they can change one / two things.
Ask them why they chose to change those one/two things.

Trial and see if there is a difference.
If there is / is not – ask students why. Can they notice key and important features in their code?

What questions do you have? (F)

What do you notice about ...? U

Is there a connection between.....(the stride length and number of steps)? (U)

Is there an alternative way to answer? (PS)

Why have you said that? (R)

If you have changed your mind can you explain why you have? (R)

Executive functions

Impulse control – can they stop and think and code without being reminded that they cannot walk it out? Do they use another mechanism to help them?

Cognitive flexibility – can they change their code to make it more accurate without being prompted?

Working memory - Do they need to write down their thoughts as well as code it?

Key Questions:
CF – 'And what if', OR 'is there another way to...'

IC – 'Just wait, lets' OR 'stop, and consider', 'Where might you have...?'

WM – "Is there too much information for me to hold in my head? What can I do to support this?'

3. Coding Part 2 Have one student move onto the next group and allow them to change one instruction so that the other two CANNOT get from Point A to Point B. Have each group try it out and see what happens. Then ask them why they chose to alter that particular instruction. How much stopping and thinking did they need to do before they changed the instruction. If they had a chance to change it again, would it be different and why?	What facts do you need to know? (F) What do you notice about the code? U Is there a connection between the code and trying to alter the instructions? (U) How can you be sure of what you are saying? (R) Can you justify why your answers are correct? (R) Can you solve the question in more than one way? (PS)	**Executive functions** Impulse control – can they stop and think and realise that there is a key part of their code that needs to be changed? Cognitive flexibility – can they show there are multiple ways to alter the pathway?
3. Coding Part 3 Use coding instructions anyway they want, ask student to write a set of instructions to move a teacher from a different Point A to Point B OR Students have to code for the quickest route from Point A to Point B and then returning to Point A. How can they prove it is the quickest?		