Timed Plan: Maths in the Wild: The Maths and Neuroscience of Walking

Duration: 60 minutes

Learning Intentions

- Understand how multiple senses contribute to walking.
- Describe multisensory integration using real examples.
- Interpret graphs related to memory and walking accuracy.
- Recognise how mathematics is used to predict human movement.

Success Criteria

- I can name the senses involved in walking.
- I can explain why the brain combines sensory information.
- I can describe what memory and walking graphs show.
- I can explain how maths helps scientists make predictions.

Resources

- Maths in the Wild - Multisensory slides
- Projector / interactive board
- Worksheet and MCQs
- Whiteboard and markers

Lesson Structure with Timing

1. Starter – Context & Engagement (5 minutes)

Show the opening slide “Walking Away from the Bear”.
Teacher questions students on how they know where they are moving and which senses they rely on.
Introduce the idea that walking is both a sensory and mathematical problem.

2. The Senses and Walking (10 minutes)

Present the Big Five senses and the additional walking-related senses: proprioception and vestibular.
Class discussion on which senses are most important for balance and movement.
Key idea: walking depends on multiple sensory inputs working together.

3. Memory and Perception Activity (10 minutes)

Students participate in the object naming and memory activity shown in the slides.
Teacher displays memory graphs and discusses how memory performance changes as tasks become harder.
Link to the concept of error increasing with task complexity.

4. Multisensory Integration and Walking Experiments (15 minutes)

Introduce visual cues, body cues, and combined cue conditions.
Explain blindfold experiments and virtual reality studies used to isolate senses.
Discuss the concept of sensory weighting and how combining senses reduces error.

5. Mathematics Making Predictions (10 minutes)
Examine walking graphs and reliability plots from the slides.
Introduce the idea of perfect performance versus real behaviour.
Explain how mathematical models are used to predict walking accuracy.

6. Plenary and Reflection (10 minutes)
Class discussion linking research to real life: ageing, falls, Parkinson's disease.
Students reflect on how understanding walking can improve safety and health.
Summarise key learning points from the lesson.

Assessment for Learning
Teacher questioning throughout the lesson, interpretation of graphs, and completion of MCQs.