Topic: Y3 kinematics

Target: All Y3 classes Duration: 2 lessons (50 mins)

Learning Outcomes:

* State what is meant by uniform acceleration and calculate the value of an acceleration, using change in velocity/time taken
* Deduce from the shape of a speed-time and velocity-time graph when a body is moving with uniform acceleration

Materials needed:

* Laptop with Tracker software (provided in lab or you can get student to use their own laptop)
* Measuring Tape
* Stop Watch
* Masking tape
* Camera with video function
* Sample video (attached in email)

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| No | Description | Duration | Remarks |
| 1 | **FIRST LESSON**  Show sample video.  **A1 Ask question**:  What can be an appropriate way to study the motion of a person walking? | 5 min | Use Tracker and do video analysis |
| 2 | **A2 Use model:**  Demonstrate how the Tracker can be used to analysis the motion of the person in the video. | 5 min | For teachers, if you are not sure how to use it, look for Him Nok |
| 3 | **A3 Plan**  Give out the worksheet to the students.  In group of 4, get students to devise a plan to capture a video of a person walking in a straight line with a constant acceleration of **0.50 m/s2** as accurate as possible for 5.0 seconds.  [Can use white board or mahjong paper to record the planning process]  You are allowed to use the following materials to complete the task.  a) Measuring Tape  b) Stop watch  c) Masking tape  d) Software Tracker | 20 min | Teachers can move around to listen to their plan. Let them make mistakes. |
| 4 | **A3 Carrying out investigation**  Ask students to capture the video according to their plan.  **A4 Analyze data**  Allow the students to do motion analysis using tracker at home and present their findings and answers in the next lesson.  Presentation will include:   * Explanation of their plan * Graphs obtained from the video using Tracker (velocity-time and displacement-time graph) * Explanation of the results obtained using any mathematical equations used in analysis if any * Average acceleration of the person walking * Suggestion for improvement | 20 min | First lesson will end here. If students are fast. They can immediately do an analysis using Tracker.  **A5 Mathematical thinking & A6 Explanation**  In presentation |
| 5 | **SECOND LESSON**  **A8 Communication**  Present their findings and suggestion for improvement (approximately 5 min in each group) | 50 min | **A7 Argumentation**  Allow students to ask questions after each presentation. Let them comment on each other’s group methods |