**Lesson Plan**

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| **Activity** | **Instruction** | **Duration** | **Resources** |
| Pre-test (at home) | * At the beginning of Dynamics chapter: Subject tutor (ST) to instruct students to do online pre-test at home. * Students to complete pre-test. * ST to collate pre-test data | 10 min | Online pre-test |
|  | Every ST to have one H2 class divided into 2 groups (a) and (b), randomised based on the pre-test data. |  |  |
| (a) Teacher-led instruction ***{control group}*** | * ST to conduct teacher-led section on Conservation of Linear Momentum (COLM) using Java applet (<http://www.phy.ntnu.edu.tw/ntnujava/htmltag.php?code=users.sgeducation.lookang.Momentum1D2010web01_pkg.Momentum1D2010web01Applet.class&name=Momentum1D2010web01&muid=14019>) within given time. * ST to use simplified worksheet on COLM in class * ST to cover only the following concepts (no derivation, no examples) for 2 types of collisions using simplified worksheets:   - **elastic collision** (total momentum is conserved, total KE is conserved, RSA=RSS)  - **inelastic collision** (total momentum is conserved, total KE is not conserved, RSARSS) | 30 min | Teacher to download applet onto laptop |
| (b) SDL & CoL ***{experimental group}*** | * Buddy ST to facilitate the SDL and CoL lesson covering the same section on COLM as the other group. * Students to work in pairs on a laptop to complete the worksheet. They are to download the Java applet: <http://www.phy.ntnu.edu.tw/ntnujava/htmltag.php?code=users.sgeducation.lookang.Momentum1D2010web01_pkg.Momentum1D2010web01Applet.class&name=Momentum1D2010web01&muid=14019> * Role of buddy ST: to facilitate students’ use of the Java applet and ensure that they have no problems using it. | 40 min | Students assigned 1 laptop for every pair (borrowed from library); worksheet (printed). Buddy ST to download applet onto laptops. |
| In class: Post-test | Students of **both** teacher-led (control) and SDL & CoL (experimental) groups to complete post-test (same questions as pre-test) on OTAS. | 5 min | Post-test (question paper & OTAS) |