

Uncertainty in Physical Measurements: Needed Equipment, Software, and Data for the Modules

Module 0 – Introduction

None

Module 1 – Backgammon 101

- A pair of dice
- Main version
 - Access to *VIDLE* for *VPYTHON* or equivalent
- *Excel* Version
 - Access to *Excel*

Module 2 – Digital Instruments

- A digital caliper. The accuracy of the caliper should be available to the students: many of our calipers have this printed on the back.

Module 3 – Analog Instruments

- A plastic ruler
- A digital caliper, with the same requirements as the one in Module 2

Module 4 – Repeated Measurements

Activity 1: no equipment required

Activity 2:

- A digital stopwatch

Activity 3:

- At least one sheet of standard 8 ½ x 11 inch or A4 paper
- A digital stopwatch
- Main version
 - Access to *VIDLE for VPYTHON* or equivalent
- *Excel* Version
 - Access to *Excel*

Activity 4

- 2 or preferably 3 metal hoops of different sizes
- Meter stick

Module 5 – Data with Two Variables

- A plastic ruler
- Main Version
 - Access to *VIDLE for VPYTHON* or equivalent
 - Access to *Anscombe.py* (linked to from the document)
- *Excel* Version
 - Access to *Excel*
 - Access to the *Anscombe.xlsx* spreadsheet (linked to from the document)

Module 6 – Miscellaneous Topics**Activity 1**

- Pasco Economy Force Sensor, Model CI-6746, mounted on the tabletop so it is vertical with the hook underneath.
- A set of masses, perhaps 50 g through two 1000 g masses.
- Access to a balance.
- Access to the ForceSensor VI.

Activity 2

- Main Version
 - Access to *VIDLE for VPYTHON* or equivalent
 - Access to *t5.py* (linked to from the document)
- *Excel* Version
 - Access to *Excel*
 - Access to the *t5.xls* spreadsheet (linked to from the document)