Determine calibration curve for the x-ray energy detector and then identify an unknown sample.

**Procedure:**

Take X-ray Fluorescence spectra for different metals as a function of channel number. (It’s in test data)

**Plot good graphs:**

Plot the raw spectra for at least 2 different spectra. Each data set has to have different data labels. A legend, a title and axes labels are necessary.

Zoom in on your data!

**Fit your data and extract something:**

Identify the line energies (K-alpha and K-beta peaks) (fit a Gaussian function and determine the full width half maximum)

**Tabulate the data**

Compare the values with the published values of line energies.

Produce a table of these

**Plot a straight line and fit it.**

Plot the channel number as a function of line energy with error bars (function of FWHM).

Determine the line of best fit and X^2 for the straight line fit. Identify any anomalies.

**Do something with your data (this doesn’t need to be on the video)**

Convert the final data set to identify the line energies with uncertainties of the unknown metal sample.

Conduct a consistency check\* against published values.

Things for Rob to be aware of (i.e. common errors with this sort of data set!)

Time: Ag = 5 minutes, All others = 180s

Gain: Cu= column B is gain 4, Column E = gain 2. All others, column B is gain 4, Column E = gain 2

Channel number for Iron, Gain level 2 starts at 6

Ag doesn’t have a Gain Level 4 data set and Glain level 2 is nice and noisy because it’s small and there is an iron sample behind it to hold it in place.

Unknown 1 is 1971 2p coin (so pure copper)

Unknown 2 is aluminium – but I can’t remember if it was gain 2 or 4 so….I may remove the Cu data and use Unknown 1.