Summer Physics project – The Stacking of Particles

You will probably need the following:

- a tile or small tray
- a funnel (or make your own from paper/card and plastic containers)
- various powders; e.g. sand, salt and sugar (three is enough)
- protractor
- baking scales

Design an experiment which allows a powder to fall from the funnel to form a pyramid – see diagram below.
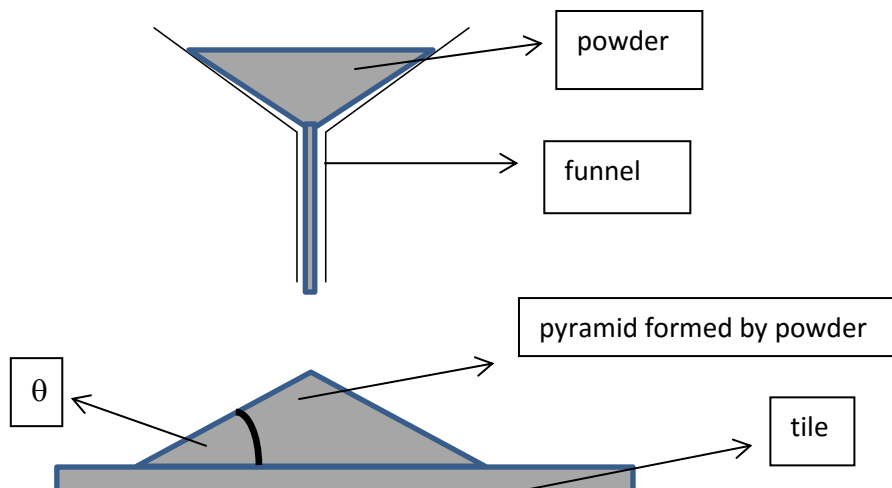
Now investigate factors that might affect the angle of the slope (i.e. θ in diagram); e.g. drop height, type of powder, amount and dampness of powder (it's best to do one in detail rather than several in less depth).

Suggestions:

- Design a good method to measure θ accurately.
- Ensure it's a fair test; i.e. identify the independent variable (the factor you change), dependent variable (what you measure, i.e. θ) and control variables (all other factors that might affect angle θ).

Write up for September – word processed if you wish – and <u>no more than two sides of A4</u>; quality not quantity matters.

You could include the following:

- Diagram
- Short method including comment on repeatability (i.e. why take several values of θ and work out the mean).
- Results (in a table if possible) and if appropriate a chart or graph.
- Conclusion – i.e. any patterns in the results and what you have found out. Try to explain the pattern (access to a microscope or magnifying glass would be useful to look at the shape of a powder's crystals).
- A link to existing research (including Harvard referencing) – find some similar research and say how it is similar or different to yours.
- A suggestion for how this research may be applied to a context in everyday life?

Good luck, <u>only do the above if it sparks an interest</u> (alternately, do some research on careers linked to Physics) and above all else enjoy the summer break.