

**Year 7** Investigation into what different types of automaton they could produce.  
What cams do the automata use to produce the different types of motion?  
Can you find an automaton which produces a reciprocating motion?  
How have they managed to do this?

Investigation into a different type of mechanical toy.  
What mechanism have they used in the toy?  
How have they managed to produce the different types of motion?

**Year 8** Research and design a totally different type of stationery holder  
Consider which types of stationery you'll want to hold  
Use the same techniques and processes we're using to produce our stationery holder in school to help you develop your design into a working product  
Processes include chiselling, drilling, line bending (heating and bending plastic).

At KS4, the following are all extension tasks that the students can do:

### **Year 10** Engineers

Unit 1 Go through and answer questions on Show My Homework and use the mark scheme to check your answers  
Find further examples and YouTube clips reinforcing your learning on each of the specific topics for the theory element of the course  
Produce your own PowerPoint presentation for the topics you have found most difficult giving examples of exam style questions for each of these topics

Unit 2 Using a product of your choice, investigate this and use the assignment titles as a guide to your investigation

Specification  
Materials  
Manufacture  
Quality Control/Assurance

Unit 7 Investigate how the products you are making as a one-off in school could be produced in a batch in industry

### **Year 10** Resistant Materials

Students should use the controlled assessment booklet to work independently on their research and development work.

They should use this time to practise drawing/sketching techniques and learn how to present their work to the best possible standard

Use the following link <https://www.youtube.com/watch?v=xOV2iPSiOZA> to find out how to practise isometric sketching

This link simply shows how to sketch generally  
<https://www.youtube.com/watch?v=xrzwFKRTxPM>

The following links will show you how you can use markers to render your sketches (make them look real) <https://www.youtube.com/watch?v=oqthQt6wXZs>

<https://www.youtube.com/watch?v=KsGzmHSiNPQ>,  
<https://www.youtube.com/watch?v=k8bFG2gNTzk>

There are huge numbers of YouTube clips for how to sketch and render your work so look around to find one more suitable to you if you are struggling

Visit material stockists to appreciate the cost of materials (DIY stores such as Wickes or B&Q, possibly even timber or builders merchants such as Travis Perkins or the Timberstore  
Investigate a similar product in their own home to see how the product may have been manufactured

### **Year 11** Engineers

Unit 2 Using a product of your choice, investigate this and use the assignment titles as a guide to your investigation

Specification  
Materials  
Manufacture  
Quality Control/Assurance

Unit 7 Investigate how the products you are making as a one-off in school could be produced in a batch in industry

All years

Watch episodes of Grand Designs, George Clarks Amazing Spaces, Channel 4s The Reverse Engineers