

PRODUCT DEVELOPMENT EXERCISE DEVELOPMENT DESIGN SHEET 3

V.Ryan © 2000 - 2012

On behalf of The World Association of Technology Teachers

W.A.T.T.



World Association of Technology Teachers

This exercise can be printed and used by teachers and students. It is recommended that you view the website (www.technologystudent.com) before attempting the design sheet .

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PRODUCT DEVELOPMENT EXERCISE

PAGE THREE

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THE TAPE MEASURE

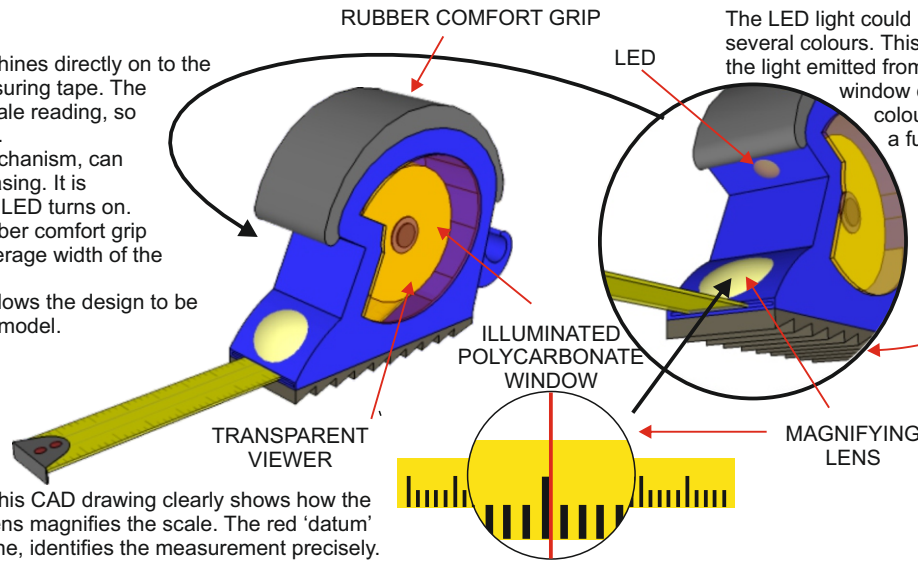
Study the sample development page (page 2).

How many of the key areas (page 3) have been mentioned on this sheet? Place a tick against the areas included.
(See slide three for key areas)

What grade would you give this development sheet?

WHAT AREAS / TECHNIQUES NEED TO BE INCLUDED ON THE FOLLOWING DEVELOPMENT SHEETS?

An ultra bright LED shines directly on to the scale portion of measuring tape. The lens, enlarges the scale reading, so that it is easy to read. The rotating tape mechanism, can be seen inside the casing. It is illuminated when the LED turns on. The extent of the rubber comfort grip can be seen, the average width of the palm of the hand. The CAD drawing, allows the design to be viewed as a realistic model.

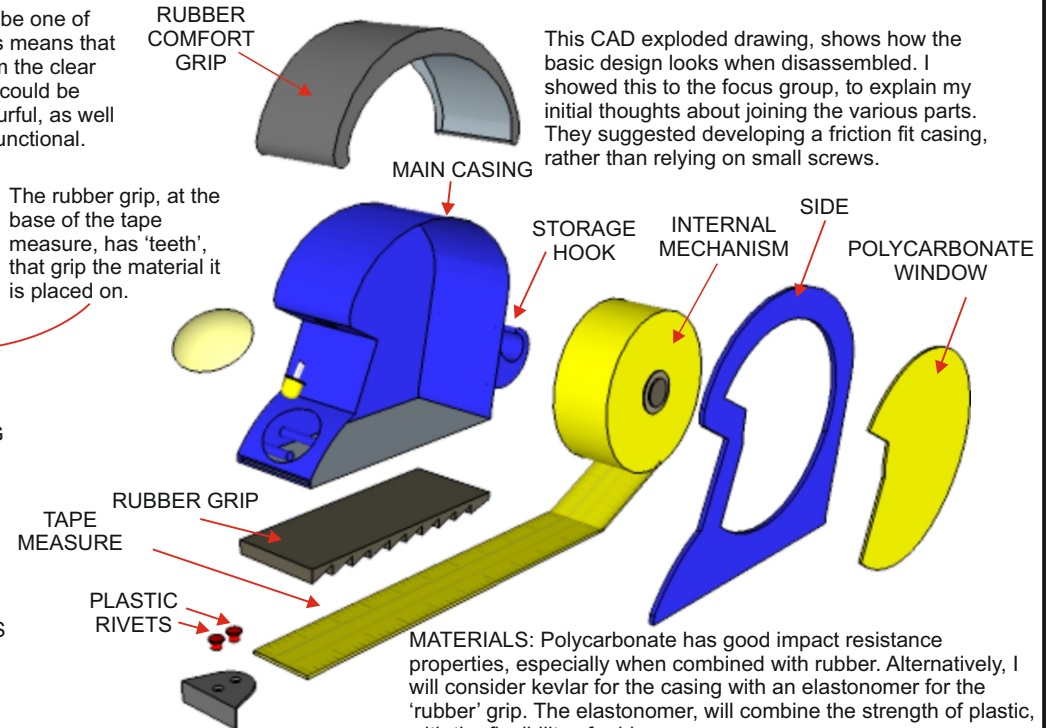


This CAD drawing clearly shows how the lens magnifies the scale. The red 'datum' line, identifies the measurement precisely.

The LED light could be one of several colours. This means that the light emitted from the clear window could be colourful, as well as a functional.

The rubber grip, at the base of the tape measure, has 'teeth', that grip the material it is placed on.

This CAD exploded drawing, shows how the basic design looks when disassembled. I showed this to the focus group, to explain my initial thoughts about joining the various parts. They suggested developing a friction fit casing, rather than relying on small screws.



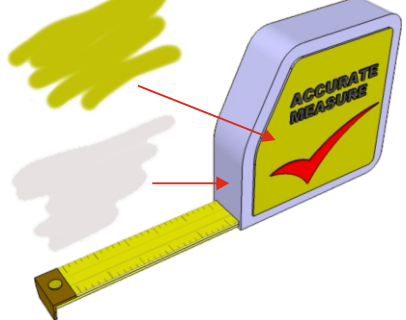
MATERIALS: Polycarbonate has good impact resistance properties, especially when combined with rubber. Alternatively, I will consider kevlar for the casing with an elastomer for the 'rubber' grip. The elastomer, will combine the strength of plastic, with the flexibility of rubber.

Vacuum forming the casings for the tape measure, seems a good manufacturing option at this stage. It will certainly work well for the prototypes and models. Both the main casing and the side, could be designed to fit tightly together, forming a friction fit. This would avoid the need for small screws.



My Focus Group, discussed the first design and viewed the CAD model. They quite liked it, especially the ergonomics and the comfortable handling. They suggested that I should develop the circuit, battery replacement, make real models and consider how the parts will be manufactured.

TYPICAL TRADITIONAL TAPE MEASURE

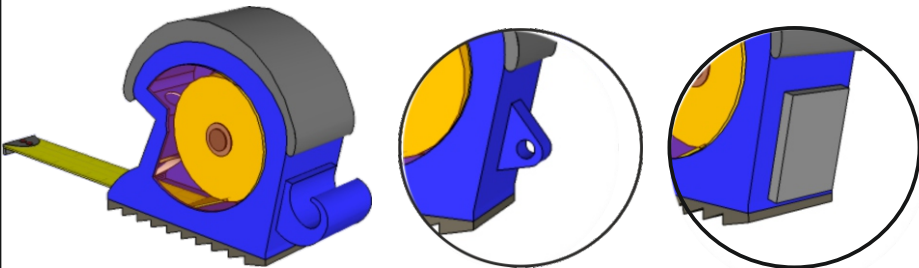


The casing could be manufactured in a range of colours. Four fashionable samples are seen opposite. My design will not be traditional, but will reflected the fact that many tape measures are bought and used by people to carry out DIY at home. The design uses popular colours, not only more traditional colours, used in industry.

SAMPLE FASHIONABLE COLOURS



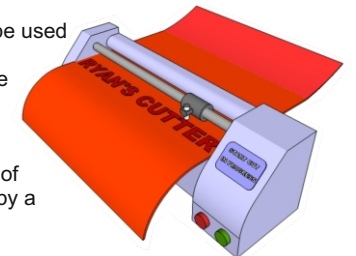
The CAD drawings below, show the different types of storage 'hooks' I am considering. My favourite is the magnet, because of its simplicity and because it will secure the tape to a steel shelf, piece of steel equipment or steel tool box.



IT COULD BE BETTER



A vinyl cutter could be used to manufacture the lettering / logo for the tape measure.



Alternatively, I will consider some form of engraving, possibly by a laser cutter.

ANTHROPOMETRICS AND
ERGONOMICS

HEALTH AND SAFETY ISSUES
DISCOVERED AND RESOLVED?

METHOD OF
CONSTRUCTION
MODEL AND REAL PRODUCT

MANUFACTURING
PROCESSES
INJECTION MOULDING ETC...

MATERIALS
PROPERTIES OF MATERIALS

DISASSEMBLY
OF PRODUCTS/
MODELS

CUSTOMER /
CLIENT VIEWS

STYLE / AESTHETICS

DIFFERENT IDEAS
VALID IDEA ?
DEAD END?

EVALUATE IDEAS

FOUND ANY PROBLEMS?
WHILE SKETCHING / MODELLING

PRODUCT DEVELOPMENT SHEETS

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SOLVED ANY PROBLEMS?
WHILE SKETCHING / MODELLING

EVIDENCE
PHOTOGRAPHS IN REAL TIME
AS YOU WORK
VIDEO CLIPS

VIEWS OF OTHERS

MODELS AND PROTOTYPES
2D AND 3D

ONGOING TESTING
EXPERIMENTATION

ENVIRONMENT
LIFE CYCLE
SUSTAINABILITY

COSTS
TO MANUFACTURE
PRICE TO CUSTOMER

REFER
TO SPECIFICATION
REGULARLY
CHECK YOU ARE KEEPING TO
THE SPECIFICATION

SKETCHES
EXPLODED VIEWS
COLOUR RENDERED ILLUSTRATIONS
SECTIONAL VIEWS
ORTHOGRAPHIC
CAD COMPUTER AIDED DESIGN

SIZES
LENGTH, HEIGHT AND DEPTH