PRODUCT DEVELOPMENT EXERCISE
DEVELOPMENT DESIGN SHEET 5

V.Ryan © 2000 - 2012

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 .

PRODUCT DEVELOPMENT EXERCISE
PAGE FOUR

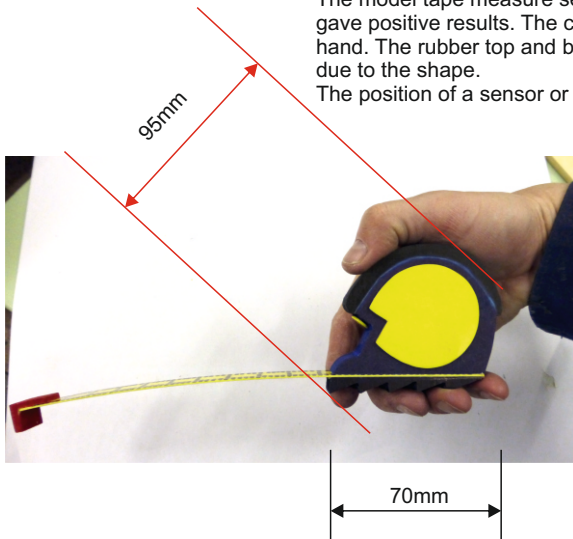# THE TAPE MEASURE

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?

The model tape measure seen in the photograph below gave positive results. The casing felt comfortable in the hand. The rubber top and bottom grips feel comfortable due to the shape.

The position of a sensor or a mechanical switch, to turn on the LED light, will need to be considered. The ergonomic design will need to ensure that the 'switch' can be reached and operated easily.
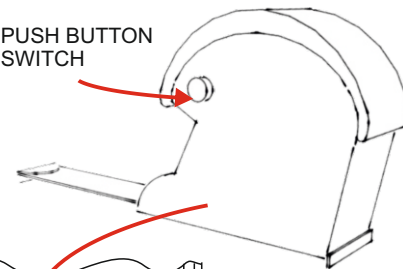
95mm

60mm

70mm

The tape measure has been modified to include a push button switch. This can be activated easily, by one finger. Easy and simple switching on and off of the LED is the result.
A possible problem, is that the switch could be pressed by accident, far too easily.
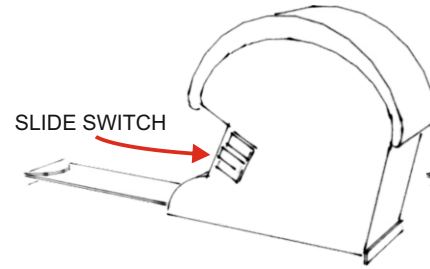
PUSH BUTTON SWITCH

Retractable grip. Can be pulled out of the base, when required.

A slide switch requires a positive on and off. This type of switch is likely to be activated by accident.

SLIDE SWITCH

A light / dark sensor could automatically turn on the LED, when illumination is required. However, a 'master' switch will be needed, as the LED will come on when the tape measure is placed in a bag, for instance.
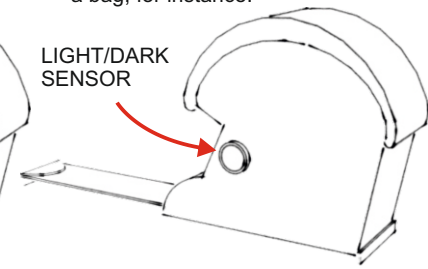
LIGHT/DARK SENSOR
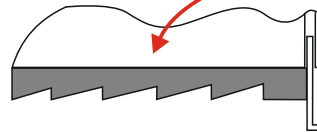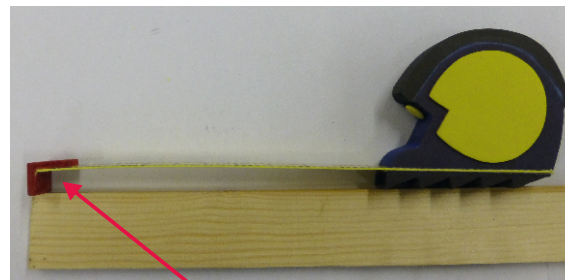
The refined design below, is a result of testing the model. The small change to the top rubber grip, allows the 'thumb' to fit into the grip. This is even more comfortable and means the tape measure can be held even more securely.
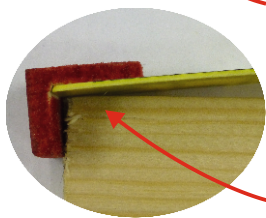
THUMB GRIP
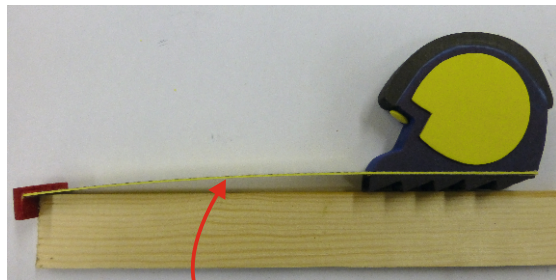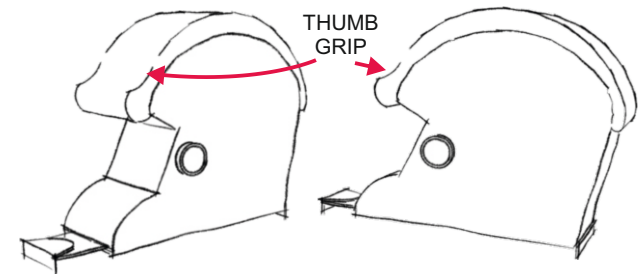
Testing the model highlighted a problem. The tape dis not flat on the surface of the material being measured. It is slightly raised, making the measurement inaccurate.

The grip at the end of the tape does its job and allows the tape to be pulled out of the tape measure casing.

The 'tape' was level, when the end grip 'sat' on top of the material, rather than gripping.

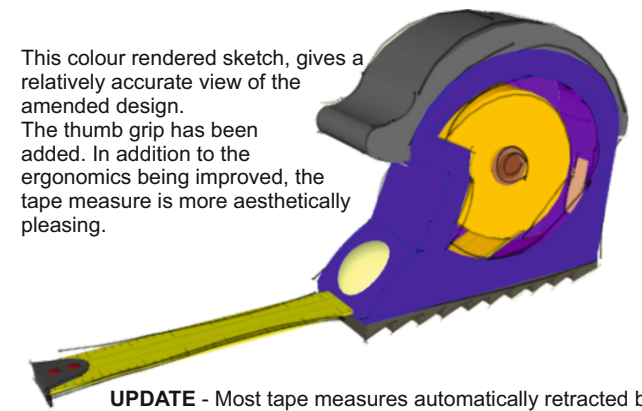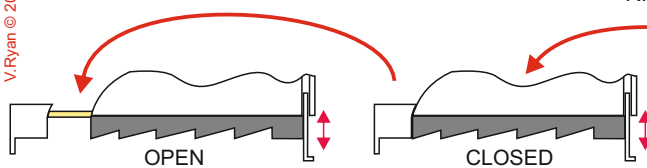Developing an new type of end grip, that securely sits on top of the material, may be the solution.

RIVETS/PINS

OPEN

CLOSED
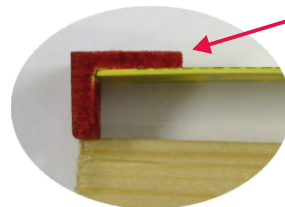
One possible solution, is to redesign the end grip. The one shown below has been modified to hold the tape level with the material and at the same time, grip the end of the material securely.

This colour rendered sketch, gives a relatively accurate view of the amended design.
The thumb grip has been added. In addition to the ergonomics being improved, the tape measure is more aesthetically pleasing.

UPDATE - Most tape measures automatically retracted back into the casing, when the tape is released from the edge of the material. However, the tape measure could be designed, so that the tape stays extended automatically and has to be released by pressing a button (working in the opposite way).

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

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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