

# Rapid Prototyping

## *Note for teacher*

- This Powerpoint consists of 71 slides, far too many for a single presentation unless they are mature students on advanced courses. For younger students use the introduction and relevant sections.
- Slides 1 – 7 provide an introduction and ‘school’ background to RP Systems.
- Slides 8 – 17 look at RP terms linked to MCP, a specialist RP company
- The remaining part of the presentation has seven sections each of circa 10 slides. *We would suggest you spend some time looking through the presentation and decide which part is best suited to the level of work and course you are delivering or supporting.*
- *The web has considerable information on RP, the Boxford website has some video clips that may be of further interest.*



# IME: Manufacturing Case Study

Focus : Rapid prototyping (RP)  
and modelling



# Rapid Prototyping(RP) in schools

- Imagine a printer that would produce a full 3D product with all the cavities and details you included on your CAD design.
- Imagine replacing the 'print' button with a 'make' button – for some products and components this is already a reality!

# What is rapid prototyping?

- Traditionally models, prototypes, metal dies and patterns for products or components were made *by hand by skilled craftsmen*.
- CAD/CAM using computer controlled milling machines or lathes etc dramatically improved the manufacturing time for these products but could only produce products or models of a certain specification and design.
- Rapid Prototyping is an amazing new technology using CAD to control machines that directly produce full 3D products, metal, dies, models or patterns.

# RP in schools

- Currently RP machines are very expensive but prices are falling quickly.
- An simple RP machine for school would cost around £12,000 - £18,000. This would produce small products in materials that would be prototypes.



From CAD to product: Illustrations  
courtesy of Boxford website :  
[www.boxford.co.uk](http://www.boxford.co.uk)

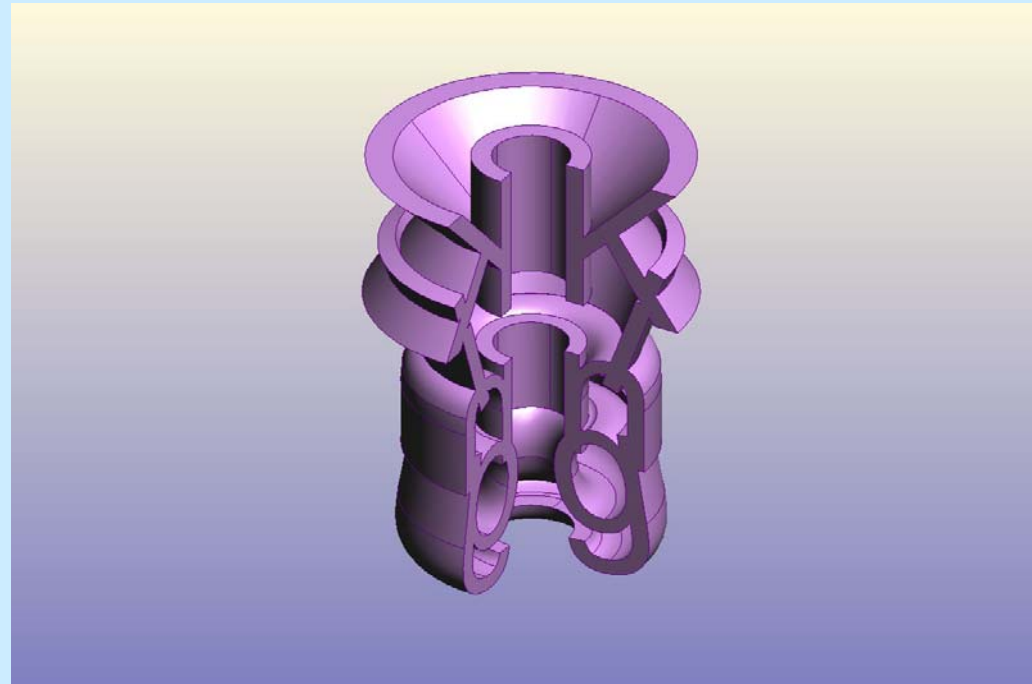
# A low cost RP machine



Illustrations courtesy of Techsoft UK :  
<http://www.techsoftuk.co.uk/>

# RP used in a GCSE product

- A GCSE student used an RP machine to manufacture this 'KING' chess piece.
- A complete set of chess pieces was drawn in ProDesktop.



Question: How could this have been produced using traditional methods?

# MCP Tooling Technology

- This presentation looks at the RP undertaken by one of the worlds leading RP companies.
- This presentation has 7 main sections after the introduction. Your teacher may wish to focus one or more of these sections.



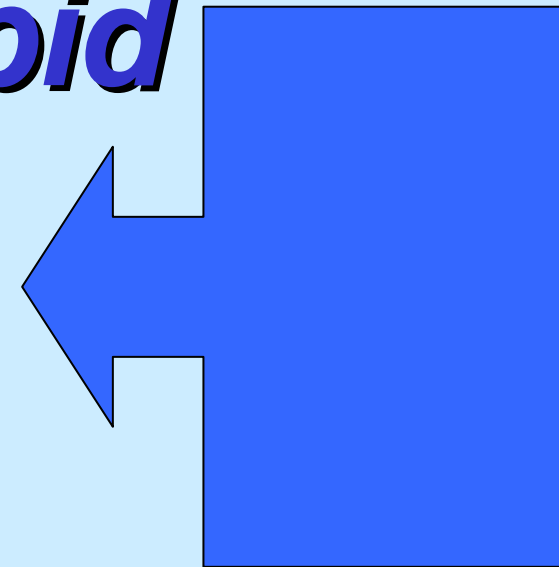
# The 7 PR systems featured

- **1) RESIN VACUUM CASTING**
- **2) NYLON CASTING**
- **3) WAX CASTING**
- **4) METAL PART CASTING**
- **5) RAPID TOOLING SYSTEM**
- **6) INJECTION MOULDING SYSTEMS**
- **7) SELECTIVE LASER MELTING**



MCP Tooling Technologies

**All about Industry  
standard *Rapid*  
*Prototyping*  
Systems**

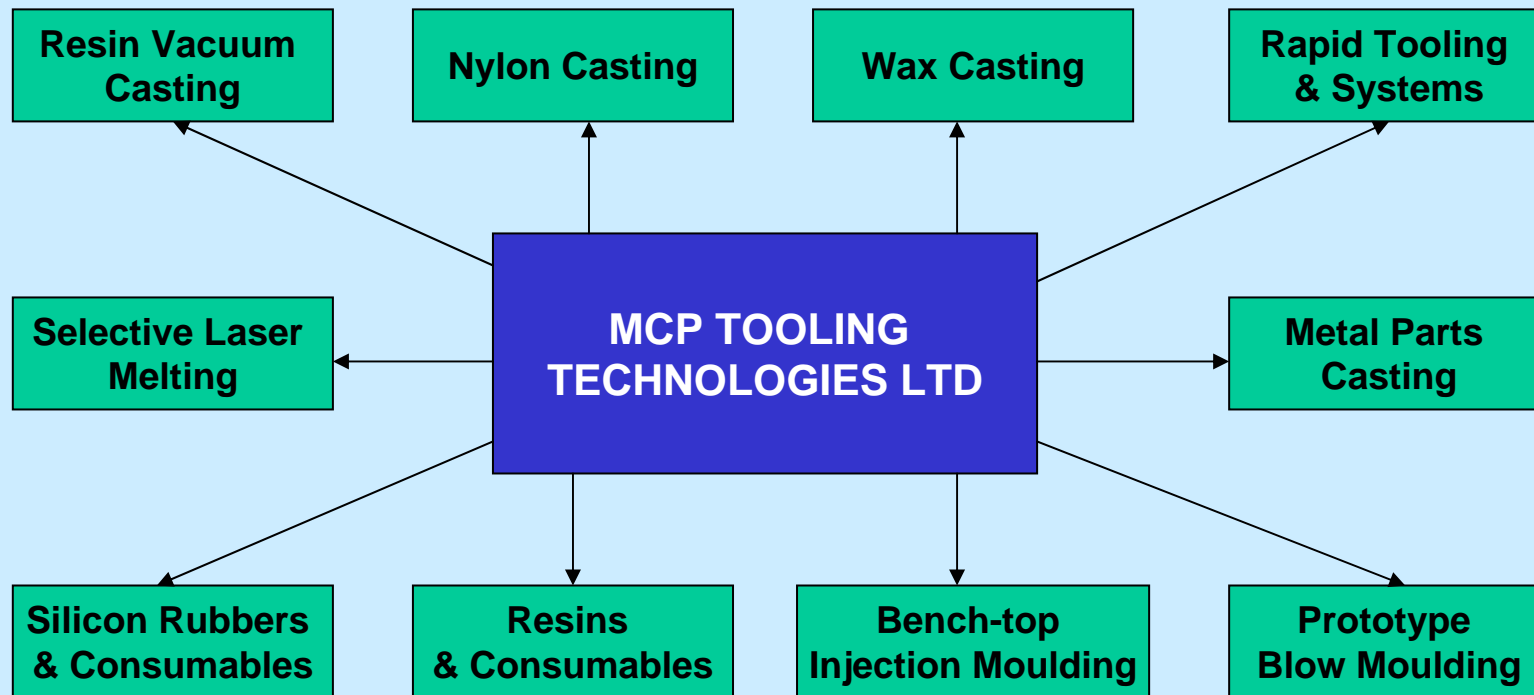


# MCP – The UK Technical Centre

- Design, Research & Development.
- Manufacturing Facility.
- Technical Support and Service
- UK Sales & Marketing Function.



# MCP are the Market leader in Rapid Prototyping Systems and Solutions.



The vocabulary of Rapid Prototyping

Rapid Production

Rapid Prototyping

*RP & T*

*Rapid Manufacturing*

Rapid Product Development

**Time Compression Technologies**

Rapid Tooling

**Advanced Digital Manufacturing**

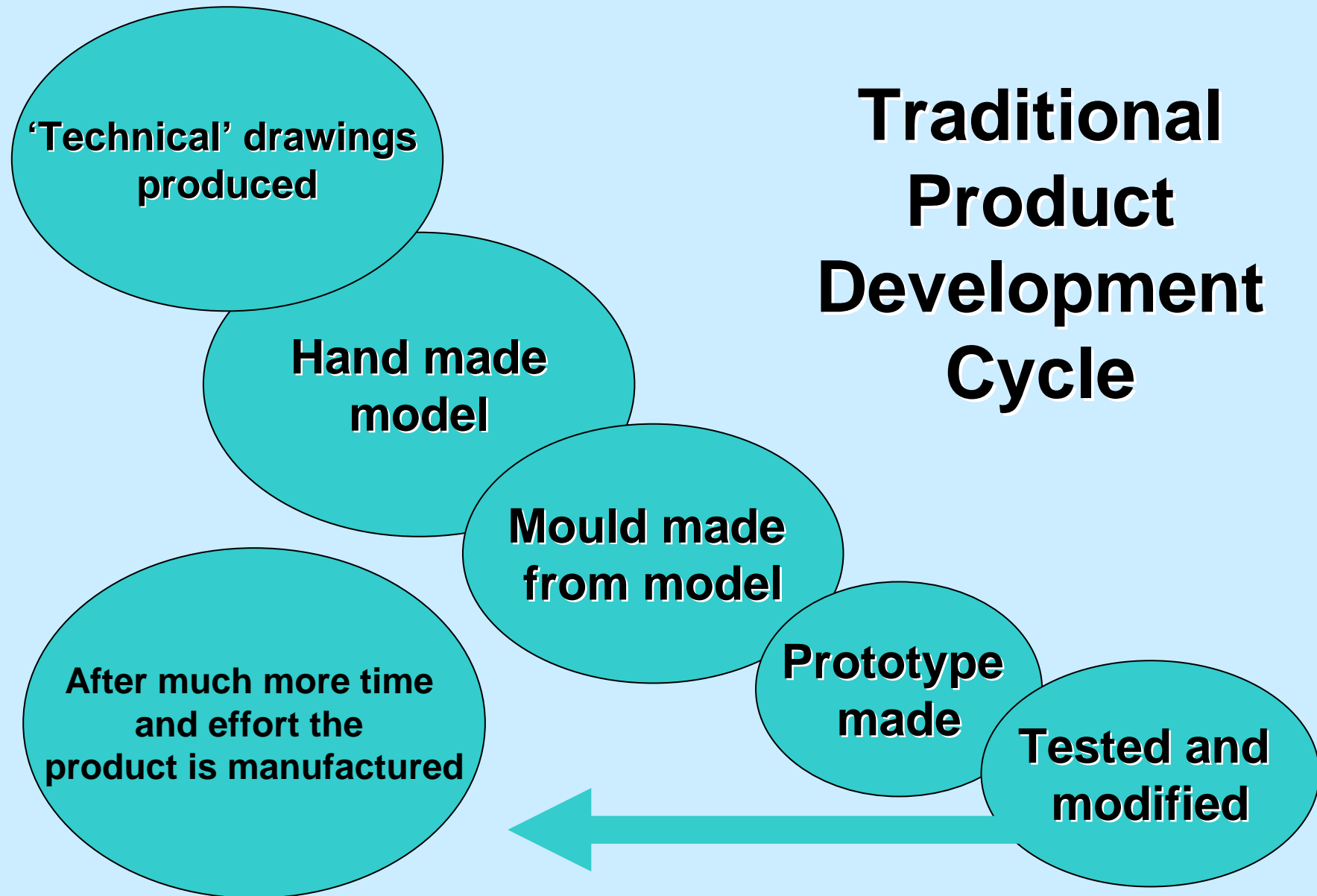


# Rapid Prototyping Systems

- **Stereolithography (SLA)**
- **Selective Laser Sintering (SLS)**
- **Laminated Object Manufacture (LOM)**
- **Fused Deposition Modelling (FDM)**
- **Selective Laser Melting (SLM)**
- **Concept Modellers**



# Traditional Product Development Cycle



# Changes in Product Development

