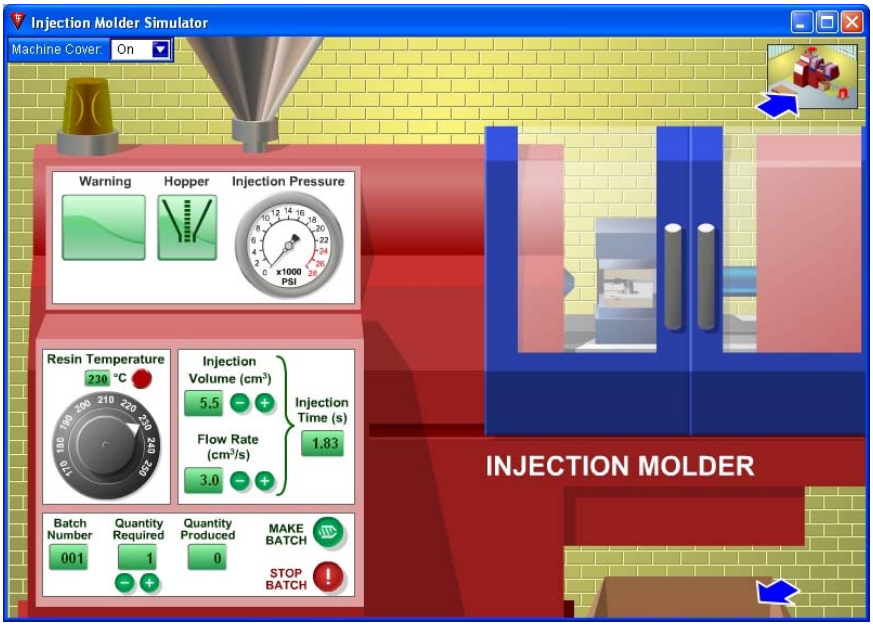
Materials and Processes (Engineering Unit)



This is one of a series of instructional curriculum units designed specifically to operate within a lockstep environment where all students carry out assignments simultaneously within the same topic area. It can be run independently, or as an ideal addition to our ScanTEK Technology Program.

This unit makes use of hardware supplied with the ScanTEK technology module. It includes 10 lessons of on-screen curriculum materials in an html format. These can be delivered via a LAN using our Class*Act* classroom management system or via the Internet using our Class*Campus* management system.

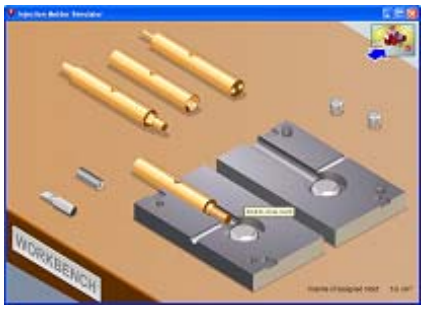
The curriculum includes continuous assessment, assessment tests and a workbook journal to create a portfolio of work during the lessons. Typical activities include hands-on investigations, problem-solving, and group projects.

Each lesson contains between one and two hours of study. A lesson typically begins with a PowerPoint presentation that provides students with background information required to complete the rest of the lesson. If used with our Class*Act* SRS system, questions integrated into the PowerPoint can be tracked as each student responds on their handheld keypad.

Demonstration activities are carried out by the instructor using purpose built hardware. Students carry out hands-on activities using a software simulation of the hardware. The students also have an opportunity to verify their solutions using the hardware.

Where appropriate, research activities that include the use of multimedia explorers are also incorporated.

This instructional unit uses a unique software simulation of an injection molder. This enables the whole class to carry out activities in the same topic areas at the same time.



Students configure a 'smart' mold to make, test and evaluate different designs of molded parts. The simulator is also used to investigate the effect of temperature and flow rate of molten plastic on the molded part. They can also follow the injection molding process by removing the machine cover.

A virtual materials tester simulator is also provided allowing students to test physical properties of materials. These tests include:

- Density
- Heat Conductivity and Melting Point
- Tensile Strength (Young's Modulus)
- Izod Impact
- Electrical Conductivity
- Brinell

Topic areas include:

- Plastics
- Design
- Materials
- Material Properties
- Testing Properties of Materials
- Injection Molding
- Tools and Fabrication
- Suitable Product Material
- Waste, Recycling and Cost
- Problem Solving – Door Knob

Activities include:

- Investigate how plastics, woods and metals can be processed into spoons.
- Research smart materials.
- Investigate the molding process.
- Measure the thermal characteristics of metals, plastics, woods and composites.
- Measure the hardness, impact and tensile strengths of materials.
- Investigate the causes of mold flash and shrinkage.
- Research tools and fabrication processes used in manufacturing.
- Select suitable materials for use in electrical cables.
- Compare the costs of differently designed molded parts.
- Design, prototype, test and evaluate a door knob.

Each lesson is designed to meet a number of performance objectives. These include academic, technical and occupational objectives. The lessons are written in such a way as to enable a student to attain the performance objectives, with continuous assessment activity questions and assessment test questions linked to these in order to provide a measure of true competency.

The performance objectives are used by the ClassAct or ClassCampus management systems to generate a comprehensive portfolio of student reports.

The items supplied with this instructional unit include:

- On-screen Student Curriculum CD
- Instructor's Guide

Additional items required:

- ST350/40 Materials and Processes

Module Facts

Order as:
ST350/LS/10 Materials and Processes (Engineering)

	No.	Average time
Lessons	10	1 hr 20 mins
	Total	13.5 hours

Class*Act*, Class*Act* SRS & Class*Campus* enabled

LJ Technical Systems
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