

# STEM Program

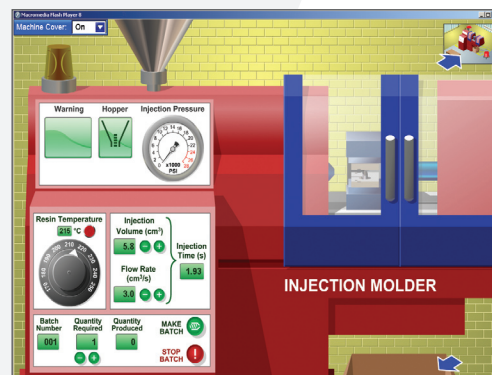
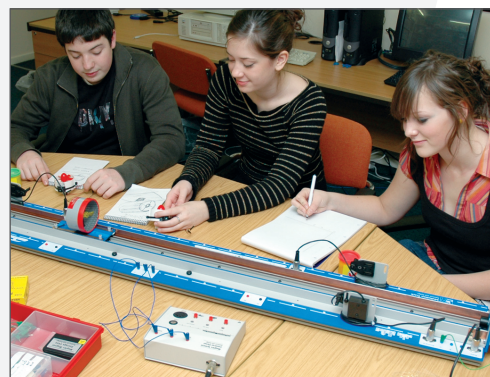
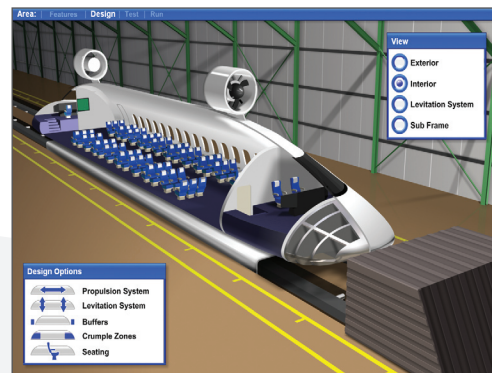
## Semester Course of Study



**LJ CREATE**<sup>™</sup>  
Learning for life

### Package includes:

ST350/ETP	Materials and Processes Class Pack
ST150/ETP	Research and Design Class Pack
ST560/SL	Academic Support Package Site License
ST80 NS10/SL	Laboratory Safety Site License
ST80 NS11/SL	Conducting an Experiment Site License
ST80 NS12/SL	The Scientific Method Site License
ST80 NS12	The Scientific Method Study Kit (x12)
ST80 CHIP	Teacher's Level Three Chemistry Pack
ST80 PHS10/SL	States of Matter Site License
ST80 PHS11/SL	Properties of Matter Site License
ST80 PHS11	Properties of Matter Study Kit
ST80 PHS12/SL	Changes in Properties of Matter Site License
ST85 PH10/SL	Magnetism Site License
ST85 PH10	Magnetism Study Kit
ST85 PH11/SL	Electrical Conductivity Site License
ST85 PH11	Electrical Conductivity Study Kit
ST85 PH23/SL	Density Site License
ST85 PH23	Density Study Kit
ST80 PHS30/SL	Effects of Force Site License
ST80 PHS30	Effects of Force Study Kit
ST80 PHS37/SL	Light Rays Site License
ST80 PHS37	Light Rays Study Kit
ST85 PH02/SL	Springs and Elasticity Site License
ST85 PH02	Springs and Elasticity Study Kit
ST80 E34/SL	Renewable, Non-renewable Energy Site License
ST80 E33/SL	Impact of the Sun's Energy Site License
ST80 E33	Impact of the Sun's Energy Study Kit
ST80 E21/SL	Earth's Atmosphere Site License
ST80 E15/SL	Oil Pollution Site License
ST80 E15	Oil Pollution Study Kit
ST85 BI24/SL	Global Warming Site License
ST85 BI24	Global Warming Study Kit
ST80 PHS31/SL	Friction Site License
ST80 PHS31	Friction Study Kit
ST80 PHS33/SL	Energy Site License
ST80 PHS33	Energy Study Kit
ST80 PHS34/SL	Work and Energy Site License
ST80 PHS34	Work and Energy Study Kit
ST80 PSP14/SL	Populations, Resources & the Environment Site License
ST85 PH15/SL	Electromagnetism Site License
ST85 PH15	Electromagnetism Study Kit
ST80 E35/SL	Gravity Site License
ST85 PH04/SL	Speed and Velocity Site License
ST85 PH04	Speed and Velocity Study Kit
ST85 PH05/SL	Newton's Second Law of Motion Site License
ST85 PH05	Newton's Second Law of Motion Study Kit
ST80 PHS39/SL	Acceleration Site License
ST80 T10/SL	Design and Problem Solving Site License
ST80 T10	Design and Problem Solving Study Kit (x12)
SCI DL	DataLog 120 - Data Logging Device
SCI TE	Temperature Sensor
SCI FO	Force Sensor
SCI MO	Motion Sensor
SCI LG1	Light Gate (x2)
SCI MF	Magnetic Field Sensor
SCI DLT	Data Logger/Sensor Storage Tray (x2)
SCI LSN GD	Science Content Lesson Guide (Per Teacher)



### Optional additional items:

SCI CART/CBN Mobile Demonstrator/  
Workstation/Controller

(Includes Mobile Demonstration Cart, and Cart Controller with Wireless Network Adapter, Wireless Keyboard/Mouse, LCD Monitor, and Sound System)

ST520/SRF/32 ClassAct SRS System - RF  
(32 Response Units)

ST520/NTW ClassAct NT - Networked  
Management System

# Lesson plan - scope and sequence

## STEM Design - Manufacturing with Plastics (45 periods)

Week	Subject	Topic	Type
1		Introduction to the Program	
		<b>Plastics</b>	
	s	Laboratory Safety	
	s	Conducting an Experiment	
	s	Properties of Materials	Class Inquiry
	s	Changes in Properties of Materials	Class Inquiry
2	e	Plastic Materials	
	e	Products made from Plastic	Research
	e	Making a Plastic Product	Make
		<b>Product Design</b>	
	e	Design and Problem Solving	
	e	The Design Loop	Design and Make
3	e	Making Design Choices	Design and Make
		<b>Materials</b>	
	s	States of Matter	Class Inquiry
	s	Electrical Conductivity	Class Inquiry
	s	Magnetism	Class Inquiry
4	ela	Reading 1	
	ela	Reading 2	
	ela	Obtaining Information	
	e	Metals	
	e	Difference between Materials	Research
	s	Effects of Force	Class Inquiry
5	s	Light Rays	Class Inquiry
	s	Springs and Elasticity	Class Inquiry
	e	Physical Properties of Materials	
	e	Mechanical Properties of Materials	
	e	Testing the Properties of Materials	Class Inquiry
6	m	Tables, Charts, and Line Graphs 1	
	m	Tables, Charts, and Line Graphs 2	
	m	Area	
	m	Volume	
	m	Area and Volume 2	
	e	Different Tests for Materials	
	e	Hardness, Impact, and Tensile Strength	Class Inquiry
7		<b>Injection Molding and Fabrication</b>	
	e	Injection Molding Machine Controls	Class Inquiry
	e	Flash and Shrinkage	Make
	e	Hand Tools	Research
	e	Machine Tools	Research
8		<b>Design and Make</b>	
	e	Selecting Material - Electric Cables	Problem Solving
	e	Strength to Weight Ratios	Class Inquiry
	m	Multiplying and Dividing	
	m	Read and Interpret Numbers	
	e	Manufacturing Processes and Waste	Research
9	e	Reducing Waste and Cost	Problem Solving
	ela	Speaking	
	ela	Presentation and Layout	
	e	Design/Make/Test a Door Opening Device 1	Design and Make
	e	Design/Make/Test a Door Opening Device 2	Design and Make
	e	Present your Solution	Design and Make

## STEM Design - Mass Transit Systems (45 periods)

Week	Subject	Topic	Type
1		<b>Energy Systems</b>	
	s	Renewable, Non-renewable Energy	Class Inquiry
	s	Earth's Atmosphere	Class Inquiry
	s	Impact of the Sun's Energy	Class Inquiry
	s	Oil Pollution	Class Inquiry
	s	Global Warming	Class Inquiry
2	e	Introduction to Research and Design	
	e	What is the Problem?	Research
	e	Possible Solutions	Problem Solving
		<b>Transportation Systems</b>	
	s	The Scientific Method	Class Inquiry
	ela	Writing 1	
	ela	Writing 2	
3	m	Proportion and Ratio 1	
	m	Proportion and Ratio 2	
	m	Average and Range	
	e	The Design Brief	
	e	Using a Mass Transit Simulator	Class Inquiry
4	e	Transportation Systems	Internet Research
	e	Evaluating Transportation Systems	Internet Research
	e	Transportation Systems in Practice	Problem Solving
		<b>Propulsion Systems</b>	
	s	Effects of Force	Class Inquiry
5	s	Friction	Class Inquiry
	s	Energy	Class Inquiry
	s	Work and Energy	Class Inquiry
	e	Propulsion Systems	
	e	Propulsion Systems - Environmental Impact	Problem Solving
6	e	Propulsion Systems - Fuels	Internet Research
		<b>Transit Systems</b>	
	s	Populations and the Environment	
	m	Formulae	
	e	Transit Systems - Modes of Operation	Class Inquiry
	e	Customer Satisfaction	Problem Solving
7		<b>Magnetic Levitation</b>	
	s	Magnetism	Class Inquiry
	s	Electromagnetism	Class Inquiry
	e	Lifting and Propelling a Maglev Vehicle	Class Inquiry
	e	Transportation that uses Magnetism	
	e	Electrical Power Supply	Class Inquiry
8		<b>Momentum</b>	
	s	Gravity	Class Inquiry
	s	Speed and Velocity	Class Inquiry
	s	Newton's Laws of Motion	Class Inquiry
	s	Acceleration	Class Inquiry
	e	Force and Momentum of Vehicles	
9	e	Calculating Velocity	Class Inquiry
	e	Evaluating Collision Forces	Class Inquiry
		<b>Transit Considerations</b>	
	e	Passenger Safety	
	e	Safety Evaluation	Problem Solving
	e	<b>Design</b>	
9	e	Design a Buffer System	Design and Make
	e	Evaluate the Buffer System	Design and Make
	e	Software Engineering	Class Inquiry
	e	Programming the System	Problem Solving
		<b>Problem Solving - Improve Transit System</b>	
	e	Operating Costs	
9	e	Cost Improvement to a Mass Transit System	Problem Solving

Subject Key: e - Engineering Study, s - Science study, m - Math study, ela - English Language Arts Study

For more information on our STEM resources, please contact:

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