Bemidji Middle School Industrial Technology Outcomes – Revised 2010

Gateway To Technology (GTT)			Grade 8
			Term 1: Design and Modeling
Standards	**Benchmarks**		**Activities/Examples**
1. Students will develop an understanding of the characteristics and scope of technology.	F	New products and systems can be developed to solve problems or to help do things that could not be done without the help of technology.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences 5. Use
			Lesson 2: Design Process (4 Days) 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
	G	The development of technology is a human activity and is the result of individual and collective needs and the ability to be creative.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences **5.** Use
			Lesson 2: Design Process (4 Days) 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design

			Term 1: Design and Modeling
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Sketching Views (4 Days) 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application
			Lesson 4: 3D Computer Modeling (12 Days) 4.1.1. Modeling 4.1.2. Computer Modeling 4.1.3. Descriptive Geometry 4.1.4. Application
			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	H	Technology is closely linked to creativity, which has resulted in innovation.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences **5.** Use

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			Lesson 2: Design Process (4 Days) 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
			Lesson 3: Sketching Views (4 Days) 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application
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Standards	**Benchmarks**		**Activities/Examples**
	I	Corporations can often create demand for a product by bringing it onto the market and advertising it.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences **5.** Use
			Lesson 2: Design Process (4 Days) 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
2. Students will develop an understanding of the core concepts of technology.	M	Technological systems include input, processes, output, and at times, feedback.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences 5. Use
			Lesson 5: First Steps in Prototype Fabrication 4.1.1. Design a 3D Dragster within the stated parameters 4.1.2. Design a MagLev vehicle within the stated parameters

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Standards	**Benchmarks**		**Activities/Examples**
	N	Systems thinking involves considering how every part relates to others.	**Lesson 2: Design Process (4 Days)** 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
			Lesson 5: First Steps in Prototype Fabrication 4.1.1. Design a 3D Dragster within the stated parameters 4.1.2. Design a MagLev vehicle within the stated parameters
	Q	Malfunctions of any part of a system may affect the function and quality of the system.	**Lesson 5: First Steps in Prototype Fabrication** 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	R	Requirements are the parameters placed on the development of a product or system.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences **5.** Use

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			Lesson 3: Sketching Views (4 Days) 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application
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	S	Trade-off is a decision process recognizing the need for careful compromises among competing factors.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences **5.** Use
			Lesson 2: Design Process (4 Days) 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
			Lesson 3: Sketching Views (4 Days) 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application
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			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	T	Different technologies involve different sets of processes.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences 5. Use
3. Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.	D	Technological systems often interact with one another.	**Lesson 5: First Steps in Prototype Fabrication** 4.1.1. Design a 3D Dragster within the stated parameters 4.1.2. Design a MagLev vehicle within the stated parameters
	E	A product, system, or environment developed for one setting may be applied to another setting.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences 5. Use

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			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	F	Knowledge gained from other fields of study has a direct effect on the development of technological products and systems.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences **5.** Use

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4. Students will develop an understanding of the cultural, social, economic, and political effects of technology,	D	The use of technology affects humans in various ways, including their safety, comfort, choices, and attitudes about technology's development and use.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences **5.** Use
			Lesson 2: Design Process (4 Days) 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
	E	Technology, by itself, is neither good nor bad, but decisions about the use of products and systems can result in desirable or undesirable consequences.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences **5.** Use
			Lesson 2: Design Process (4 Days) 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design

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			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	F	The development and use of technology poses ethical issues.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences 5. Use
	G	Economic, political, and cultural issues are influenced by the development and use of technology.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences 5. Use
5. Students will develop an understanding of the effects of technology on the environment.	E	Technologies can be used to repair damage caused by natural disasters and to break down waste from the use of various products and systems.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences 5. Use

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Standards	**Benchmarks**		**Activities/Examples**
	F	Decisions to develop and use technologies often put environmental and economic concerns in direct competition with one another.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences 5. Use
			Lesson 2: Design Process (4 Days) 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
6. Students will develop an understanding of the role of society on the development and use of technology.	C	Individual, family, community, and economic concerns may expand or limit the development of technologies.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences 5. Use
	D	Throughout history, new technologies have resulted from the demands, values, and interests of individuals, businesses, industries, and societies.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences 5. Use

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			Lesson 2: Design Process (4 Days) 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
	E	The use of inventions and innovations has led to changes in society and the creation of new needs and wants.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences 5. Use
			Lesson 2: Design Process (4 Days) 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
	F	Social and cultural priorities and values are reflected in technological devices.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences 5. Use

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7. Students will develop an understanding of the influence of technology on history.	C	Many inventions and innovations have evolved using slow and methodical processes of tests and refinements.	**Lesson 2: Design Process (4 Days)** 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
	D	The specialization of function has been at the heart of many technological improvements.	**Lesson 2: Design Process (4 Days)** 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	E	The design and construction of structures for service or convenience have evolved from the development of techniques for measurement, controlling systems, and the understanding of spatial relationships.	**Lesson 5: First Steps in Prototype Fabrication** 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters

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	F	In the past, an invention or innovation was not usually developed with the knowledge of science.	**Lesson 2: Design Process (4 Days)** 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
			Lesson 4: 3D Computer Modeling (12 Days) 4.1.1. Modeling 4.1.2. Computer Modeling 4.1.3. Descriptive Geometry 4.1.4. Application
			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
8. Students will develop an understanding of the attributes of design.	E	Design is a creative planning process that leads to useful products and systems.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences **5.** Use

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	F	There is no perfect design.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences **5.** Use
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			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	G	Requirements for design are made up of criteria and constraints.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences **5.** Use
			Lesson 2: Design Process (4 Days) 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
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			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
9. Students will develop an understanding of engineering design.	F	Design involves a set of steps, which can be performed in different sequences and repeated as needed.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences **5.** Use
			Lesson 2: Design Process (4 Days) 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design

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			Lesson 4: 3D Computer Modeling (12 Days) 4.1.1. Modeling 4.1.2. Computer Modeling 4.1.3. Descriptive Geometry 4.1.4. Application
			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	G	Brainstorming is a group problem-solving design process in which each person in the group presents his or her ideas in an open forum.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences **5.** Use

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Standards	**Benchmarks**		**Activities/Examples**
	H	Modeling, testing, evaluating, and modifying are used to transform ideas into practical solutions.	**Lesson 2: Design Process (4 Days)** 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
			Lesson 3: Sketching Views (4 Days) 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application
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			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	K	A prototype is a working model used to test a design concept by making actual observations and necessary adjustments.	**Lesson 5: First Steps in Prototype Fabrication** 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters

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Standards	**Benchmarks**		**Activities/Examples**
10. Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.	F	Troubleshooting is a problem-solving method used to identify the cause of a malfunction in a technological system.	**Lesson 3: Sketching Views (4 Days)** 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application
			Lesson 4: 3D Computer Modeling (12 Days) 4.1.1. Modeling 4.1.2. Computer Modeling 4.1.3. Descriptive Geometry 4.1.4. Application
			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	G	Invention is a process of turning ideas and imagination into devices and systems. Innovation is the process of modifying an existing product or system to improve it.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences 5. Use

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			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	H	Some technological problems are best solved through experimentation.	**Lesson 2: Design Process (4 Days)** 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design

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			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	I	Research and development is a specific problem-solving approach that is used intensively in business and industry to prepare devices and systems for the marketplace.	**Lesson 2: Design Process (4 Days)** 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
	J	Technological problems must be researched before they can be solved.	**Lesson 2: Design Process (4 Days)** 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design

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Standards	**Benchmarks**		**Activities/Examples**
	K	Not all problems are technological, and not every problem can be solved using technology.	**Lesson 2: Design Process (4 Days)** 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
	L	Many technological problems require a multidisciplinary approach.	**Lesson 2: Design Process (4 Days)** 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
11. Students will develop the abilities to apply the design process.	E	The process of designing involves presenting some possible solutions in visual form and then selecting the best solution(s) from many.	**Lesson 3: Sketching Views (4 Days)** 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application
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	G	Improve the design solutions.	**Lesson 3: Sketching Views (4 Days)** 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application
			Lesson 4: 3D Computer Modeling (12 Days) 4.1.1. Modeling 4.1.2. Computer Modeling 4.1.3. Descriptive Geometry 4.1.4. Application
			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	H	Apply a design process to solve problems in and beyond the laboratory-classroom.	**Lesson 3: Sketching Views (4 Days)** 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application

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			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	I	Specify criteria and constraints for the design.	**Lesson 3: Sketching Views (4 Days)** 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application
			Lesson 4: 3D Computer Modeling (12 Days) 4.1.1. Modeling 4.1.2. Computer Modeling 4.1.3. Descriptive Geometry 4.1.4. Application

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			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	J	Make two-dimensional and three-dimensional representations of the designed solution.	**Lesson 3: Sketching Views (4 Days)** 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application
			Lesson 4: 3D Computer Modeling (12 Days) 4.1.1. Modeling 4.1.2. Computer Modeling 4.1.3. Descriptive Geometry 4.1.4. Application
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Standards	**Benchmarks**		**Activities/Examples**
	K	Test and evaluate the design in relation to pre-established requirements, such as criteria and constraints, and refine as needed.	**Lesson 3: Sketching Views (4 Days)** 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application
			Lesson 4: 3D Computer Modeling (12 Days) 4.1.1. Modeling 4.1.2. Computer Modeling 4.1.3. Descriptive Geometry 4.1.4. Application
			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
12. Students will develop the abilities to assess the impact of products and systems.	H	Use information provided in manuals, protocols, or by experienced people to see and understand how things work.	**Lesson 3: Sketching Views (4 Days)** 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application

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			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	J	Use computers and calculators in various applications.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences **5.** Use
			Lesson 2: Design Process (4 Days) 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design

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Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Sketching Views (4 Days) 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application
			Lesson 4: 3D Computer Modeling (12 Days) 4.1.1. Modeling 4.1.2. Computer Modeling 4.1.3. Descriptive Geometry 4.1.4. Application
			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	K	Operate and maintain systems in order to achieve a given purpose.	**Lesson 4: 3D Computer Modeling (12 Days)** 4.1.1. Modeling 4.1.2. Computer Modeling 4.1.3. Descriptive Geometry 4.1.4. Application

			Term 1: Design and Modeling
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
16. Students will develop an understanding of and be able to select and use energy and power technologies.	H	Power systems are used to drive and provide propulsion to other technological products and systems.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences 5. Use
17. Students will develop an understanding of and be able to select and use information and communication technologies.	G	Letters, characters, icons, and signs are symbols that represent ideas, quantities, elements, and operations.	**Lesson 3: Sketching Views (4 Days)** 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application
			Lesson 4: 3D Computer Modeling (12 Days) 4.1.1. Modeling 4.1.2. Computer Modeling 4.1.3. Descriptive Geometry 4.1.4. Application

			Term 1: Design and Modeling
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	H	Information and communication systems allow information to be transferred from human to human, human to machine, and machine to human.	**Lesson 2: Design Process (4 Days)** 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
			Lesson 3: Sketching Views (4 Days) 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application
			Lesson 4: 3D Computer Modeling (12 Days) 4.1.1. Modeling 4.1.2. Computer Modeling 4.1.3. Descriptive Geometry 4.1.4. Application
			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters

			Term 1: Design and Modeling
Standards	**Benchmarks**		**Activities/Examples**
	I	Communication systems are made up of a source, encoder, transmitter, receiver, decoder, and destination.	**Lesson 4: 3D Computer Modeling (12 Days)** 4.1.1. Modeling 4.1.2. Computer Modeling 4.1.3. Descriptive Geometry 4.1.4. Application
			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	J	The design of a message is influenced by such factors as intended audience, medium, purpose, and the nature of the message.	**Lesson 2: Design Process (4 Days)** 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
			Lesson 3: Sketching Views (4 Days) 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application

			Term 1: Design and Modeling
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 4: 3D Computer Modeling (12 Days) 4.1.1. Modeling 4.1.2. Computer Modeling 4.1.3. Descriptive Geometry 4.1.4. Application
			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
	K	The use of symbols, measurements, and drawings promotes a clear communication by providing a common language to express ideas.	**Lesson 2: Design Process (4 Days)** 2.1.1. Purpose 2.1.2. Creative process 2.1.3. Problem solving and Design
			Lesson 3: Sketching Views (4 Days) 3.1.1. The Language of Sketches and Drawing 3.1.2. Isometric drawings 3.1.3. Orthographic drawings 3.1.4 Application

			Term 1: Design and Modeling
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 4: 3D Computer Modeling (12 Days) 4.1.1. Modeling 4.1.2. Computer Modeling 4.1.3. Descriptive Geometry 4.1.4. Application
			Lesson 5: First Steps in Prototype Fabrication 5.1.1. Design a 3D Dragster within the stated parameters 5.1.2. Design a MagLev vehicle within the stated parameters
18. Students will develop an understanding of and be able to select and use transportation technologies.	F	Transporting people and goods involves a combination of individuals and vehicles.	**Lesson 1: Introduction to Technology (4 Days)** 1. Technology vs. Science 2. Science Principles 3. Historical implications 4. Consequences 5. Use

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
1. Students will develop an understanding of the characteristics and scope of technology.	F	New products and systems can be developed to solve problems or to help do things that could not be done without the help of technology.	**Lesson 3: Prototyping and Fabrication (21 Days)** 3.1 Design 3.2 Prototyping 3.3 Fabrication
	G	The development of technology is a human activity and is the result of individual and collective needs and the ability to be creative.	**Lesson 3: Prototyping and Fabrication (21 Days)** 3.1 Design 3.2 Prototyping 3.3 Fabrication
	H	Technology is closely linked to creativity, which has resulted in innovation.	**Lesson 3: Prototyping and Fabrication (21 Days)** 3.1 Design 3.2 Prototyping 3.3 Fabrication
2. Students will develop an understanding of the core concepts of technology.	R	Requirements are the parameters placed on the development of a product or system.	**Lesson 3: Prototyping and Fabrication (21 Days)** 3.1 Design 3.2 Prototyping 3.3 Fabrication

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
3. Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.	D	Technological systems often interact with one another.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
	E	A product, system, or environment developed for one setting may be applied to another setting.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
	F	Knowledge gained from other fields of study has a direct effect on the development of technological products and systems.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
5. Students will develop an understanding of the effects of technology on the environment.	C	The use of technology affects the environment in good and bad ways.	**Lesson 2: Energy Conversion Systems (6 Days)** 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems
	E	Technologies can be used to repair damage caused by natural disasters and to break down waste from the use of various products and systems.	**Lesson 2: Energy Conversion Systems (6 Days)** 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems
	F	Decisions to develop and use technologies often put environmental and economic concerns in direct competition with one another.	**Lesson 2: Energy Conversion Systems (6 Days)** 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
6. Students will develop an understanding of the role of society on the development and use of technology.	D	Throughout history, new technologies have resulted from the demands, values, and interests of individuals, businesses, industries, and societies.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
	E	The use of inventions and innovations has led to changes in society and the creation of new needs and wants.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
	F	Social and cultural priorities and values are reflected in technological devices.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
8. Students will develop an understanding of the attributes of design.	E	Design is a creative planning process that leads to useful products and systems.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
			Lesson 2: Energy Conversion Systems (6 Days) 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
	F	There is no perfect design.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
			Lesson 2: Energy Conversion Systems (6 Days) 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
	G	Requirements for design are made up of criteria and constraints.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 2: Energy Conversion Systems (6 Days) 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
9. Students will develop an understanding of engineering design.	F	Design involves a set of steps, which can be performed in different sequences and repeated as needed.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
			Lesson 2: Energy Conversion Systems (6 Days) 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
	G	Brainstorming is a group problem-solving design process in which each person in the group presents his or her ideas in an open forum.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
			Lesson 2: Energy Conversion Systems (6 Days) 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems
	H	Modeling, testing, evaluating, and modifying are used to transform ideas into practical solutions.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 2: Energy Conversion Systems (6 Days) 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
	K	A prototype is a working model used to test a design concept by making actual observations and necessary adjustments.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
			Lesson 2: Energy Conversion Systems (6 Days) 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
10. Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.	F	Troubleshooting is a problem-solving method used to identify the cause of a malfunction in a technological system.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
			Lesson 2: Energy Conversion Systems (6 Days) 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
	G	Invention is a process of turning ideas and imagination into devices and systems. Innovation is the process of modifying an existing product or system to improve it.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
			Lesson 2: Energy Conversion Systems (6 Days) 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems
	H	Some technological problems are best solved through experimentation.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 2: Energy Conversion Systems (6 Days) 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems
11. Students will develop the abilities to apply the design process.	E	The process of designing involves presenting some possible solutions in visual form and then selecting the best solution(s) from many.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
	G	Improve the design solutions.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
	H	Apply a design process to solve problems in and beyond the laboratory-classroom.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
	I	Specify criteria and constraints for the design.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
	J	Make two-dimensional and three-dimensional representations of the designed solution.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
	K	Test and evaluate the design in relation to pre-established requirements, such as criteria and constraints, and refine as needed.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
	L	Make a product or system and document the solution.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
12. Students will develop the abilities to assess the impact of products and systems.	H	Use information provided in manuals, protocols, or by experienced people to see and understand how things work.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
	I	Use tools, materials, and machines safely to diagnose, adjust, and repair systems.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
	J	Use computers and calculators in various applications.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
	K	Operate and maintain systems in order to achieve a given purpose.	**Lesson 1: The Mechanics of Motion (17 Days)** 1.1 Mechanics of Motion 1.2 Law of Conservation of Energy 1.3 Potential Energy 1.4 Kinetic Energy 1.5 Systems
13. Students will develop the abilities to assess the impact of products and systems.	F	Design and use instruments to gather data.	**Lesson 2: Energy Conversion Systems (6 Days)** 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
	G	Use data collected to analyze and interpret trends in order to identify the positive and negative effects of a technology.	**Lesson 2: Energy Conversion Systems (6 Days)** 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems
	H	Identify trends and monitor potential consequences of technological development.	**Lesson 2: Energy Conversion Systems (6 Days)** 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems
	I	Interpret and evaluate the accuracy of the information obtained and determine if it is useful.	**Lesson 2: Energy Conversion Systems (6 Days)** 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
16. Students will develop an understanding of and be able to select and use energy and power technologies.	E	Energy is the capacity to do work.	**Lesson 2: Energy Conversion Systems (6 Days)** 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
	F	Energy can be used to do work, using many processes.	**Lesson 2: Energy Conversion Systems (6 Days)** 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Prototyping and Fabrication (21 Days) 3.1 Design 3.2 Prototyping 3.3 Fabrication
	G	Power is the rate at which energy is converted from one form to another or transferred from one place to another, or the rate at which work is done.	**Lesson 2: Energy Conversion Systems (6 Days)** 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems
	H	Power systems are used to drive and provide propulsion to other technological products and systems.	**Lesson 2: Energy Conversion Systems (6 Days)** 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems
	I	Much of the energy used in our environment is not used efficiently.	**Lesson 2: Energy Conversion Systems (6 Days)** 2.1 Energy 2.2 Energy Conversion Systems 2.2.1 Inexhaustible Energy Systems 2.2.2 Thermal Systems 2.2.3 Electrical Systems

			Term 2: Science of Technology
Standards	**Benchmarks**		**Activities/Examples**
17. Students will develop an understanding of and be able to select and use information and communication technologies.	K	The use of symbols, measurements, and drawings promotes a clear communication by providing a common language to express ideas.	**Lesson 3: Prototyping and Fabrication (21 Days)** 3.1 Design 3.2 Prototyping 3.3 Fabrication

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
1. Students will develop an understanding of the characteristics and scope of technology.	F	New products and systems can be developed to solve problems or to help do things that could not be done without the help of technology.	**Lesson 1: Science of Electricity (7 Days)** 1.1 Comparing Static and Current Electricity 1.2 Periodic Table and Electrical Conductivity 1.3 Conductivity Lab 1.4 Career Research
			Lesson 4: Digital Electronics (10 Days) 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz
	G	The development of technology is a human activity and is the result of individual and collective needs and the ability to be creative.	**Lesson 2: Electromotive Force (5 Days)** 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor “How Stuff Works” web quest 2.3 DC Motor Construction
			Lesson 3: Circuit Design and Fabrication (22 Days) 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm’s Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
	H	Technology is closely linked to creativity, which has resulted in innovation.	**Lesson 2: Electromotive Force (5 Days)** 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor "How Stuff Works" web quest 2.3 DC Motor Construction
			Lesson 3: Circuit Design and Fabrication (22 Days) 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm's Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit
			Lesson 4: Digital Electronics (10 Days) 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz
	I	Corporations can often create demand for a product by bringing it onto the market and advertising it.	**Lesson 2: Electromotive Force (5 Days)** 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor "How Stuff Works" web quest 2.3 DC Motor Construction

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Circuit Design and Fabrication (22 Days) 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm's Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit
2. Students will develop an understanding of the core concepts of technology.	M	Technological systems include input, processes, output, and at times, feedback.	**Lesson 3: Circuit Design and Fabrication (22 Days)** 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm's Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit
			Lesson 4: Digital Electronics (10 Days) 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
	N	Systems thinking involves considering how every part relates to others.	**Lesson 3: Circuit Design and Fabrication (22 Days)** 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm's Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit
			Lesson 4: Digital Electronics (10 Days) 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz
	O	An open-loop system has no feedback path and requires human intervention, while a closed-loop system uses feedback.	**Lesson 4: Digital Electronics (10 Days)** 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
	Q	Malfunctions of any part of a system may affect the function and quality of the system.	**Lesson 2: Electromotive Force (5 Days)** 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor "How Stuff Works" web quest 2.3 DC Motor Construction
			Lesson 4: Digital Electronics (10 Days) 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz
3. Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.	F	Knowledge gained from other fields of study has a direct effect on the development of technological products and systems.	**Lesson 1: Science of Electricity (7 Days)** 1.1 Comparing Static and Current Electricity 1.2 Periodic Table and Electrical Conductivity 1.3 Conductivity Lab 1.4 Career Research
			Lesson 2: Electromotive Force (5 Days) 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor "How Stuff Works" web quest 2.3 DC Motor Construction

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Circuit Design and Fabrication (22 Days) 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm's Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit
6. Students will develop an understanding of the role of society on the development and use of technology.	D	Throughout history, new technologies have resulted from the demands, values, and interests of individuals, businesses, industries, and societies.	**Lesson 2: Electromotive Force (5 Days)** 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor "How Stuff Works" web quest 2.3 DC Motor Construction
			Lesson 4: Digital Electronics (10 Days) 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
	E	The use of inventions and innovations has led to changes in society and the creation of new needs and wants.	**Lesson 3: Circuit Design and Fabrication (22 Days)** 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm's Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit
			Lesson 4: Digital Electronics (10 Days) 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz
	F	Social and cultural priorities and values are reflected in technological devices.	**Lesson 1: Science of Electricity (7 Days)** 1.1 Comparing Static and Current Electricity 1.2 Periodic Table and Electrical Conductivity 1.3 Conductivity Lab 1.4 Career Research

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
7. Students will develop an understanding of the influence of technology on history.	C	Many inventions and innovations have evolved using slow and methodical processes of tests and refinements.	**Lesson 3: Circuit Design and Fabrication (22 Days)** 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm's Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit
			Lesson 4: Digital Electronics (10 Days) 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz
	E	The design and construction of structures for service or convenience have evolved from the development of techniques for measurement, controlling systems, and the understanding of spatial relationships.	**Lesson 4: Digital Electronics (10 Days)** 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
8. Students will develop an understanding of the attributes of design.	E	Design is a creative planning process that leads to useful products and systems.	**Lesson 4: Digital Electronics (10 Days)** 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz
	F	There is no perfect design.	**Lesson 4: Digital Electronics (10 Days)** 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz
	G	Requirements for design are made up of criteria and constraints.	**Lesson 4: Digital Electronics (10 Days)** 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
9. Students will develop an understanding of engineering design.	F	Design involves a set of steps, which can be performed in different sequences and repeated as needed.	**Lesson 3: Circuit Design and Fabrication (22 Days)** 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm's Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit
	G	Brainstorming is a group problem-solving design process in which each person in the group presents his or her ideas in an open forum.	**Lesson 4: Digital Electronics (10 Days)** 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz
	H	Modeling, testing, evaluating, and modifying are used to transform ideas into practical solutions.	**Lesson 2: Electromotive Force (5 Days)** 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor "How Stuff Works" web quest 2.3 DC Motor Construction

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Circuit Design and Fabrication (22 Days) 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm's Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit
			Lesson 4: Digital Electronics (10 Days) 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz
	K	A prototype is a working model used to test a design concept by making actual observations and necessary adjustments.	**Lesson 2: Electromotive Force (5 Days)** 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor "How Stuff Works" web quest 2.3 DC Motor Construction

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Circuit Design and Fabrication (22 Days) 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm's Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit
			Lesson 4: Digital Electronics (10 Days) 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz
10. Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.	F	Troubleshooting is a problem-solving method used to identify the cause of a malfunction in a technological system.	**Lesson 2: Electromotive Force (5 Days)** 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor "How Stuff Works" web quest 2.3 DC Motor Construction

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Circuit Design and Fabrication (22 Days) 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm's Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit
			Lesson 4: Digital Electronics (10 Days) 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz
11. Students will develop the abilities to apply the design process.	K	Test and evaluate the design in relation to pre-established requirements, such as criteria and constraints, and refine as needed.	**Lesson 3: Circuit Design and Fabrication (22 Days)** 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm's Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 4: Digital Electronics (10 Days) 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz
12. Students will develop the abilities to assess the impact of products and systems.	H	Use information provided in manuals, protocols, or by experienced people to see and understand how things work.	**Lesson 2: Electromotive Force (5 Days)** 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor “How Stuff Works” web quest 2.3 DC Motor Construction
	I	Use tools, materials, and machines safely to diagnose, adjust, and repair systems.	**Lesson 2: Electromotive Force (5 Days)** 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor “How Stuff Works” web quest 2.3 DC Motor Construction
			Lesson 3: Circuit Design and Fabrication (22 Days) 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm’s Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 4: Digital Electronics (10 Days) 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz
	J	Use computers and calculators in various applications.	**Lesson 1: Science of Electricity (7 Days)** 1.1 Comparing Static and Current Electricity 1.2 Periodic Table and Electrical Conductivity 1.3 Conductivity Lab 1.4 Career Research
			Lesson 2: Electromotive Force (5 Days) 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor “How Stuff Works” web quest 2.3 DC Motor Construction
			Lesson 3: Circuit Design and Fabrication (22 Days) 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm’s Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 4: Digital Electronics (10 Days) 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz
	K	Operate and maintain systems in order to achieve a given purpose.	**Lesson 2: Electromotive Force (5 Days)** 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor "How Stuff Works" web quest 2.3 DC Motor Construction
13.	F	Design and use instruments to gather data.	**Lesson 1: Science of Electricity (7 Days)** 1.1 Comparing Static and Current Electricity 1.2 Periodic Table and Electrical Conductivity 1.3 Conductivity Lab 1.4 Career Research
			Lesson 3: Circuit Design and Fabrication (22 Days) 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm's Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
	G	Use data collected to analyze and interpret trends in order to identify the positive and negative effects of a technology.	**Lesson 1: Science of Electricity (7 Days)** 1.1 Comparing Static and Current Electricity 1.2 Periodic Table and Electrical Conductivity 1.3 Conductivity Lab 1.4 Career Research
	H	Identify trends and monitor potential consequences of technological development.	**Lesson 1: Science of Electricity (7 Days)** 1.1 Comparing Static and Current Electricity 1.2 Periodic Table and Electrical Conductivity 1.3 Conductivity Lab 1.4 Career Research
	I	Interpret and evaluate the accuracy of the information obtained and determine if it is useful.	**Lesson 1: Science of Electricity (7 Days)** 1.1 Comparing Static and Current Electricity 1.2 Periodic Table and Electrical Conductivity 1.3 Conductivity Lab 1.4 Career Research
			Lesson 3: Circuit Design and Fabrication (22 Days) 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm's Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
16. Students will develop an understanding of and be able to select and use energy and power technologies.	E	Energy is the capacity to do work.	**Lesson 2: Electromotive Force (5 Days)** 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor "How Stuff Works" web quest 2.3 DC Motor Construction
	F	Energy can be used to do work, using many processes.	**Lesson 2: Electromotive Force (5 Days)** 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor "How Stuff Works" web quest 2.3 DC Motor Construction
17. Students will develop an understanding of and be able to select and use information and communication technologies.	K	The use of symbols, measurements, and drawings promotes a clear communication by providing a common language to express ideas.	**Lesson 1: Science of Electricity (7 Days)** 1.1 Comparing Static and Current Electricity 1.2 Periodic Table and Electrical Conductivity 1.3 Conductivity Lab 1.4 Career Research
			Lesson 2: Electromotive Force (5 Days) 2.1 Electron Flow and Electromotive Force 2.2 Electric Motor "How Stuff Works" web quest 2.3 DC Motor Construction

			Term 3: Magic of Electrons Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Circuit Design and Fabrication (22 Days) 3.1 Circuit Construction Lab 3.2 Resistor Lab 3.3 Resistor Identification 3.4 Ohm's Law Proof Lab 3.5 Transistor Research web quest 3.6 Transistorized Viewing Guide 3.7 Transistor Light Sensing Circuit
			Lesson 4: Digital Electronics (10 Days) 4.1 Thinking Digitally 4.2 Bits, Bytes, Boolean, & Gates web quest 4.3 Truth Tables 4.4 Logic Circuit Problems 4.5 Logic Quiz

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
1. Students will develop an understanding of the characteristics and scope of technology.	F	New products and systems can be developed to solve problems or to help do things that could not be done without the help of technology.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers
			Lesson 2: Mechanical Gears and Energy Transfer (12 Days) 2.1 Energy 2.2 Mechanism 2.3 Types of mechanisms 2.4 Gears
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	G	The development of technology is a human activity and is the result of individual and collective needs and the ability to be creative.	**Lesson 2: Mechanical Gears and Energy Transfer (12 Days)** 2.1 Energy 2.2 Mechanism 2.3 Types of mechanisms 2.4 Gears
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly
	H	Technology is closely linked to creativity, which has resulted in innovation.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly
			Lesson 2: Mechanical Gears and Energy Transfer (12 Days) 2.1 Energy 2.2 Mechanism 2.3 Types of mechanisms 2.4 Gears
	I	Corporations can often create demand for a product by bringing it onto the market and advertising it.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
2. Students will develop an understanding of the core concepts of technology.	M	Technological systems include input, processes, output, and at times, feedback.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers
			Lesson 2: Mechanical Gears and Energy Transfer (12 Days) 2.1 Energy 2.2 Mechanism 2.3 Types of mechanisms 2.4 Gears
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	N	Systems thinking involves considering how every part relates to others.	**Lesson 2: Mechanical Gears and Energy Transfer (12 Days)** 2.1 Energy 2.2 Mechanism 2.3 Types of mechanisms 2.4 Gears
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	O	An open-loop system has no feedback path and requires human intervention, while a closed-loop system uses feedback.	**Lesson 3: Fischertechnik Parts and Programming (29 Days)** 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	P	Technological systems can be connected to one another.	**Lesson 3: Fischertechnik Parts and Programming (29 Days)** 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	Q	Malfunctions of any part of a system may affect the function and quality of the system.	**Lesson 3: Fischertechnik Parts and Programming (29 Days)** 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	R	Requirements are the parameters placed on the development of a product or system.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	S	Trade-off is a decision process recognizing the need for careful compromises among competing factors.	**Lesson 3: Fischertechnik Parts and Programming (29 Days)** 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	V	Controls are mechanisms or particular steps that people perform using information about the system that causes systems to change.	**Lesson 3: Fischertechnik Parts and Programming (29 Days)** 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly
3. Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.	D	Technological systems often interact with one another.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly
	E	A product, system, or environment developed for one setting may be applied to another setting.	**Lesson 2: Mechanical Gears and Energy Transfer (12 Days)** 2.1 Energy 2.2 Mechanism 2.3 Types of mechanisms 2.4 Gears
	F	Knowledge gained from other fields of study has a direct effect on the development of technological products and systems.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
4. Students will develop an understanding of the cultural, social, economic, and political effects of technology,	D	The use of technology affects humans in various ways, including their safety, comfort, choices, and attitudes about technology's development and use.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	E	Technology, by itself, is neither good nor bad, but decisions about the use of products and systems can result in desirable or undesirable consequences.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers
	F	The development and use of technology poses ethical issues.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers
	G	Economic, political, and cultural issues are influenced by the development and use of technology.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers
6. Students will develop an understanding of the role of society on the development and use of technology.	D	Throughout history, new technologies have resulted from the demands, values, and interests of individuals, businesses, industries, and societies.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	E	The use of inventions and innovations has led to changes in society and the creation of new needs and wants.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers
	F	Social and cultural priorities and values are reflected in technological devices.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers
7. Students will develop an understanding of the influence of technology on history.	E	The design and construction of structures for service or convenience have evolved from the development of techniques for measurement, controlling systems, and the understanding of spatial relationships.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers
8. Students will develop an understanding of the attributes of design.	E	Design is a creative planning process that leads to useful products and systems.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly
	F	There is no perfect design.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly
	G	Requirements for design are made up of criteria and constraints.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
9. Students will develop an understanding of engineering design.	F	Design involves a set of steps, which can be performed in different sequences and repeated as needed.	**Lesson 3: Fischertechnik Parts and Programming (29 Days)** 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly
	G	Brainstorming is a group problem-solving design process in which each person in the group presents his or her ideas in an open forum.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly
	H	Modeling, testing, evaluating, and modifying are used to transform ideas into practical solutions.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly
	K	A prototype is a working model used to test a design concept by making actual observations and necessary adjustments.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly
10. Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.	F	Troubleshooting is a problem-solving method used to identify the cause of a malfunction in a technological system.	**Lesson 2: Mechanical Gears and Energy Transfer (12 Days)** 2.1 Energy 2.2 Mechanism 2.3 Types of mechanisms 2.4 Gears

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly
11. Students will develop the abilities to apply the design process.	E	The process of designing involves presenting some possible solutions in visual form and then selecting the best solution(s) from many.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	G	Improve the design solutions.	**Lesson 3: Fischertechnik Parts and Programming (29 Days)** 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	H	Apply a design process to solve problems in and beyond the laboratory-classroom.	**Lesson 3: Fischertechnik Parts and Programming (29 Days)** 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly
	J	Make two-dimensional and three-dimensional representations of the designed solution.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	K	Test and evaluate the design in relation to pre-established requirements, such as criteria and constraints, and refine as needed.	**Lesson 3: Fischertechnik Parts and Programming (29 Days)** 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	L	Make a product or system and document the solution.	**Lesson 3: Fischertechnik Parts and Programming (29 Days)** 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
12. Students will develop the abilities to assess the impact of products and systems.	H	Use information provided in manuals, protocols, or by experienced people to see and understand how things work.	**Lesson 3: Fischertechnik Parts and Programming (29 Days)** 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	I	Use tools, materials, and machines safely to diagnose, adjust, and repair systems.	**Lesson 3: Fischertechnik Parts and Programming (29 Days)** 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly
	J	Use computers and calculators in various applications.	**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
			Lesson 3: Fischertechnik Parts and Programming (29 Days) 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	K	Operate and maintain systems in order to achieve a given purpose.	**Lesson 3: Fischertechnik Parts and Programming (29 Days)** 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly
13.	H		**Lesson 1: Robots in Today's World (4 Days)** 1.1 Automation 1.2 Robotics 1.3 Human Interaction with robots 1.4 Influence on society 1.5 Engineering careers

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
16. Students will develop an understanding of and be able to select and use energy and power technologies.	G		**Lesson 2: Mechanical Gears and Energy Transfer (12 Days)** 2.1 Energy 2.2 Mechanism 2.3 Types of mechanisms 2.4 Gears
17. Students will develop an understanding of and be able to select and use information and communication technologies.	G	Letters, characters, icons, and signs are symbols that represent ideas, quantities, elements, and operations.	**Lesson 3: Fischertechnik Parts and Programming (29 Days)** 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly

			Term 4: Automation and Robotics Unit
Standards	**Benchmarks**		**Activities/Examples**
	K	The use of symbols, measurements, and drawings promotes a clear communication by providing a common language to express ideas.	**Lesson 3: Fischertechnik Parts and Programming (29 Days)** 3.1 Systems 3.2 Subsystems 3.3 Automated systems 3.4 Open-loop systems 3.5 Closed-loop systems 3.6 Problem-solving methods 3.6.1 Invention 3.6.2 Innovation 3.6.3 Experimentation 3.6.4 Troubleshooting 3.7 Programming 3.8 Research 3.9 Assembly