#### ROBBINSVILLE PUBLIC SCHOOLS

## OFFICE OF CURRICULUM AND INSTRUCTION

#### **DEPARTMENT**

# Grade 5 Technology

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BOARD OF EDUCATION INITIAL ADOPTION DATE: September, 2017

## **Course Philosophy**

The Technology program focuses on every individual developing technology problem solving skills, technological literacy, and 21st century skills through hands-on activities integrating Science, Technology, Engineering, and Mathematics (STEM). The Technology education program is dedicated in providing experiences that prepare students to be successful in their transition through secondary education and into post secondary careers. Teaching technological literacy, will help students develop the skills necessary to be lifelong learners and successfully contribute and function in a technological society.

# **Course Description**

In 5th grade, Technology is an activity based course that introduces students to technology by examining Design and Engineering
Transportation technology. Students will study and apply the problem solving procedures, 21st century computer skills, technical drawing, physical
laws of motion, aerospace engineering, structural engineering, and the engineering design process. Students will have a variety of projects and activities
in the Design and Engineering Tech lab related to transportation technology. Students will work in teams and individually to complete required
classroom and lab assignments. A STEM approach is used to integrate Science, Technology, Engineering, and Mathematics concepts in a student lead
classroom environment.

#### Robbinsville Public Schools

#### Curriculum Map

(This is a worksheet intended to support the development of the overall document. It should be submitted to the supervisors if appropriate but it will not be included in the final board-approved document)

## 5th Grade Technology- Transportation Technology and Design

Relevant Standards	Standards Unpacked Skill / Concept / Process?	Enduring Understandings / Unit Goals	Essential Questions	Unit Title / Suggested Timeline
Common Core	ELA/Literacy -	Technology is anything	How does technology impact	Technology & The
ELA/Literacy	W.5.7 Conduct short	humanmade or designed	society?	Design Loop
W.5.7	research projects that use	• The purpose of technology is to		
W.5.8 W.5.9	several sources to build knowledge through investigation of different	<ul><li>solve problems and make life easier</li><li>The Engineering Design Process,</li></ul>	<ul> <li>How does the design loop affect innovation and invention in society?</li> </ul>	Timeline: 120 Minutes ( two class periods)
Mathematics	aspects of a topic.	or Design Loop, is a set of		introduce and
MP.2		sequential steps and the driving		practices will be
MP.4	<b>3-5-ETS1-1.</b> Define a	force behind invention and		embedded within all
MP.5	simple design problem	innovation		units
	reflecting a need or a want	The Design Loop is an iterative		diffes
NGSS:	Influence of Science,	process constantly improving on		
3-5-ETS1-1.	Engineering, and	itself		
3-5-ETS1-2.	Technology on Society and the Natural World			
Common Core				
Technology:	<b>3-5-ETS1-2.</b> Generate and			
The	compare multiple			
characteristics	solutions to a problem			
and scope of	based on how well they			
technology.	meet the criteria and			
8.2.5.A.1	constraints of the design			
8.2.5.A.2	problem.			
0.2.3.11.2	problem.			

The core	The core concepts of		
concepts of	Technology.		
Technology.	8.2.5.A.3 Investigate and		
8.2.5.A.3	present factors that		
8.2.5.A.5	influence the development		
	and function of products		
The attributes	and systems, e.g.,		
of design.	resources, criteria and		
8.2.5.C.1	constraints.		
8.2.5.C.2			
8.2.5.C.3	The attributes of design.		
	8.2.5.C.3 Research how		
The application	design modifications have		
of engineering	lead to new products.		
design.			
8.2.5.C.4	8.2.5.C.4 Collaborate and		
8.2.5.C.5	brainstorm with peers to		
	solve a problem evaluating		
The role of	all solutions to		
troubleshooting	provide the best results		
,	with supporting sketches		
research and	or models.		
development,			
invention and	<b>8.2.5.C.5</b> Explain the		
innovation and	functions of a system and		
experimentation	subsystems.		
in problem			
solving	<b>8.2.5.D.4</b> Explain why		
8.2.5.C.6	human-designed systems,		
8.2.5.C.7	products, and		
	environments need to be		
D. Abilities for	constantly monitored,		
a Technological	maintained, and improved.		
World: The			
designed world	<b>8.2.5.D.5</b> Describe how		
is the product of	resources such as material,		
a design	energy, information, time,		
process that	tools, people and		

provides the	capital are used in			
means to	products or systems.			
convert				
resources into				
products and				
systems.				
Apply the				
design process.				
8.2.5.D.1				
8.2.5.D.2				
Use and				
maintain				
technological				
products and				
systems.				
8.2.5.D.3				
8.2.5.D.4				
8.2.5.D.5				
Unit #2:	ELA/Literacy -	Transportation Technology is a	<ul> <li>Explain how technology and</li> </ul>	Transportation
Transportation	W.5.7 Conduct short	category of technology involved in	the design loop prcocess can	Technology (17 hours)
Technology	research projects that use	the process of moving people and	impact society.	
	several sources to build	goods from one place to another		
	knowledge through	The Design Loop is followed	How does the design loop	
Common Core	investigation of different	when creating pieces of	allow us to develop our ideas	
ELA/Literacy W.5.7,	aspects of a topic.	Transportation Technology	efficiently?	
W.5.8		Engineers must work within		
W.5.9	<b>3-5-ETS1-1.</b> Define a	specific constraints when	How does collaborating with	
Mathematics	simple design problem	designing and building	peers help provide the best	
MP.2	reflecting a need or a want		results while solving a	
MP.4	Influence of Science,		problem and evaluating	
MP.5	Engineering, and		solutions?	
	Technology on Society			
NGSS:	and the Natural World		Why does the placement of	
3-5-ETS1-1			materials and safety features	
3-5-ETS1-2.			within the vehicle play a role	

	<b>3-5-ETS1-2.</b> Generate and	in protecting the passenger	
Common Core	compare multiple	and cargo?	
Technology:	solutions to a problem		
8,1	based on how well they		
The	meet the criteria and		
characteristics	constraints of the design		
and scope of	problem.		
technology.	The core concepts of		
8.2.5.A.1	Technology.		
8.2.5.A.2	<b>8.2.5.A.3</b> Investigate and		
	present factors that		
The core	influence the development		
concepts of	and function of products		
Technology.	and systems, e.g.,		
8.2.5.A.3	resources, criteria and		
8.2.5.A.5	constraints.		
The attributes	The attributes of design.		
of design.	8.2.5.C.3 Research how		
8.2.5.C.1	design modifications have		
8.2.5.C.2	lead to new products.		
8.2.5.C.3			
	8.2.5.C.4 Collaborate and		
The application	brainstorm with peers to		
of engineering	solve a problem evaluating		
design.	all solutions to		
8.2.5.C.4	provide the best results		
8.2.5.C.5	with supporting sketches		
	or models.		
The role of	<b>8.2.5.C.5</b> Explain the		
troubleshooting	functions of a system and		
,	subsystems.		
research and			
development,	<b>8.2.5.D.4</b> Explain why		
invention and	human-designed systems,		
innovation and	products, and		
experimentation	environments need to be		

in problem	constantly monitored,	
solving	maintained, and improved.	
8.2.5.C.6		
8.2.5.C.7	8.2.5.D.5 Describe how	
	resources such as material,	
Apply the	energy, information, time,	
design process.	tools, people and	
8.2.5.D.1	capital are used in	
8.2.5.D.2	products or systems.	
Use and		
maintain		
technological		
products and		
systems.		
8.2.5.D.3		
8.2.5.D.4		
8.2.5.D.5		

## Robbinsville Public Schools Scope, Sequence, and Assessment

# Technology, Grade 5

		Recommended	Assessments			
Unit Title	Unit Understandings and Goals	Duration	Diagnostic (before)	Formative (during)	Summative (after)	
Technology & The Design Loop	<ul> <li>Technology is anything humanmade or designed</li> <li>The purpose of technology is to solve problems and make life easier</li> <li>The Engineering Design Process, or Design Loop, is a set of sequential steps and the driving force behind invention and innovation</li> <li>The Design Loop is an iterative process constantly improving on itself</li> </ul>	120 minutes ( 2 class periods)	Do Now: Turn & talk Share out "What is Technology?" "What is the purpose of Technology?" "What do you think the Engineering Design Process refers to?"	<ul> <li>Class Discussions</li> <li>Exit Tickets</li> <li>Peer check of collaboration skills and accountability using rubric</li> <li>Self assessment of collaboration skills and accountability using a rubric</li> </ul>	<ul> <li>Quiz</li> <li>Reflection of project outcomes</li> <li>Peer Project Assessment (rubric based)</li> </ul>	
Transportation Technology	<ul> <li>Transportation Technology is a category of technology involved in the process of moving people and goods from one place to another</li> <li>The Design Loop is followed when creating pieces of Transportation Technology</li> <li>Engineers must work within specific constraints when designing and building</li> <li>Blueprints are an essential part of planning that must follow specific guidelines</li> </ul>	18 hours (18 class periods)	Class Discussion: "What is Transportation Technology? Give examples." "How has it changed over time?"	<ul> <li>Class Discussions</li> <li>Project journals (         Peer, Self, and         Teacher check         given with         feedback)</li> <li>Teacher         Conferences</li> <li>Exit Tickets</li> </ul>	<ul> <li>Inquiry based, problem based projects</li> <li>STEM Design Challenges focused around problem solving for, real world issues, based on</li> </ul>	

<ul> <li>Safety procedures must be followed when working among peers in the classroom</li> <li>Cares continue to be made safer due to the logical placement of safety features, improved technology, and the design loop.</li> </ul>	"How do we protect passengers and cargo?"	Project planning evaluation and revision (teacher check) Checks for Understanding Peer check of collaboration skills and accountability using rubric Brainstorms Blueprints Hot Glue Gun Safety Quiz	transportation technology.  Performance based assessments (testing of the product and evaluating the products ability to meet goal of design challenges.)  Group and individual) presentation of
		Safety Quiz	presentation of product(s) from design challenge

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# Unit #1: Technology & The Design Loop

Enduring Understandings:	Essential Questions:		
The design loop is an iterative process used to invent and improve	How does technology impact society?		
products that impact our daily lives.	How does the design loop affect innovation and invention in society?		

Guiding / Topical Questions with Specific Standards		Content, Themes, Concepts, and Skills	Teaching Strategies	Instructional Resources and Materials	Assessment Strategies
ELA/Literacy	What is	Technology is anything	Mini lesson/lecture	Internet resouces	Formative:
-W.5.7	technology?	humanmade or designed	<ul> <li>Project based</li> </ul>		<ul> <li>Check for</li> </ul>
(3-5-ETS1-1)		• The purpose of technology is to	learning	Content Resource	understanding
W.5.8	What is the	solve problems and make life	Cooperative Learning	manuals	questions will be
(3-5-ETS1-1)	purpose of	easier	<ul> <li>Hands-On Activities</li> </ul>		utilized during
W.5.9	technology?	The Engineering Design	Input/Output	Tech Lab tools and	large group
(3-5-ETS1-1)		Process, or Design Loop, is a	stations	materials (wood	instruction.
	How does the	set of sequential steps and the	<ul> <li>Independent work</li> </ul>	cutters, hot glue,	
	design loop		Socratic Seminar	scissors, tape,	<ul> <li>Exit tickets</li> </ul>

Mathematics	maximize	driving force behind invention	STEM design	calculators, safety	
-	efficiency when	and innovation	challenge projects	equipment)	Temperature
MP.2	creating	The Design Loop is an iterative	<ul> <li>Class discussion</li> </ul>		guages
(3-5-ETS1-1)	something new	process constantly improving	Large Group Demos	<ul> <li>PowerPoint</li> </ul>	
MP.4 .	or revamping an	on itself	Small Group	Presentation	<ul> <li>Students will be</li> </ul>
(3-5-ETS1-1)	existing		Instruction		asked open
MP.5(3-5-ETS	product?		<ul> <li>Individualized</li> </ul>	Google software suit	ended questions
1-1)			Instruction		during small
			Multimedia	Design Software	group and
			Presentations		individualized
The			• Interactive Comp.	Tools and Materials	instruction to
characteristic			Software	Student workstations	check for
s and scope of			<ul> <li>Webquests</li> </ul>	MS Software	understanding
technology.			Journal Writing		
8.2.5.A.1				Tech Lab Equipments	Students will
				and Design Tools	complete Project
8.2.5.A.2				• 3D printers	journals that will
				• CO <sub>2</sub> Laser	be reviewed for
The core				Band saw	accountability
concepts of					and
Technology.					understanding.
8.2.5.A.3					understanding.
8.2.5.A.5					Students will
0.2.3.11.3					complete
The attributes					Self-evaluation/r
of design.					eflection rubric
8.2.5.C.1					after group and
8.2.5.C.2					independent
8.2.5.C.3					work.
0.2.3.0.3					WOIK.
The					Summative:
application of					• Quizzes/Tests
engineering					<ul> <li>Inquiry based,</li> </ul>
design.					problem based
8.2.5.C.4					projects and
8.2.5.C.5					investigations.
0.2.3.0.3					Performance
The role of					based
THE TOLE OF			1		Daseu

troubleshooti ng, research and development, invention and innovation and experimentati on in problem solving 8.2.5.C.6 8.2.5.C.7  Apply the design	assessments- results of investigation or design challenge • Accountability assessment of self directed learning. ( assessed through rubric)
process.	
8.2.5.D.1	
8.2.5.D.2	
Use and	
maintain	
technological	
products and	
systems.	
8.2.5.D.3	
8.2.5.D.4	
8.2.5.D.5	

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#### Unit #2: Transportation Technology

#### **Enduring Understandings:**

• Transportation technology impacts how people and goods are moved from one place to another and has been improved throughout history through the design loop.

#### **Essential Questions**

- Explain how technology and the design loop process can impact society.
- How does the design loop allow us to develop our ideas efficiently?
- How does collaborating with peers help provide the best results while solving a problem and evaluating solutions?
- Why does the placement of materials and safety features within the vehicle play a role in protecting the passenger and cargo?

Guiding / Topical Questions with Specific Standards		Content, Themes, Concepts, and Skills	Teaching Strategies	Instructional Resources and Materials	Assessment Strategies
ELA/Literacy	How does	Transportation Technology is a	Mini lesson/lecture	• Internet resouces	Formative:
W.5.7	each step	category of technology involved in the	Project based Learning		• Check for
W.5.8	of the	process of moving people and goods	Cooperative Learning	<ul> <li>Content</li> </ul>	understanding
W.5.9	design	from one place to another	Hands-On Activities	Resource	questions will be
	loop	The Design Loop is followed when	Input/Output stations	manuals	utilized during
Mathematics	contribute	creating pieces of Transportation	Independent work		large group
MP.2	to the	Technology	Socratic Seminar	• Tech Lab tools	instruction.
MP.4 .	creation	Engineers must work within specific	STEM design challenge	and materials	
(3-5-ETS1-1)	or	constraints when designing and	projects	(wood cutters,	<ul> <li>Exit tickets</li> </ul>
MP.5(3-5-ETS1	improvem	building	Class discussion	hot glue, scissors,	
-1)	ent of a	Blueprints are an essential part of	Large Group Demos	tape, calculators,	Temperature
	product?	planning that must follow specific	Small Group Instruction	safety	guages
The		guidelines	Individualized Instruction	equipment)	
characteristics		Safety procedures must be followed	Multimedia Presentations		Students will be
and scope of		when working among peers in the	Interactive Comp. Software	<ul> <li>PowerPoint</li> </ul>	asked open
technology.		classroom	o Webquests	Presentation	ended questions
8.2.5.A.1			Journal Writing		during small
8.2.5.A.2			Accountabilty assessment of	<ul> <li>Google software</li> </ul>	group and
			self drected learning	suit	individualized
The core					instruction to
concepts of				Design Software	check for
Technology.				-	understanding

0.05 4.0	- 71 1 1	1
8.2.5.A.3	Tools and	
8.2.5.A.5	Materials	<ul> <li>Students will</li> </ul>
	Student	complete
The attributes	workstations MS	Project journals
of design.	Software	that will be
8.2.5.C.1		reviewed for
8.2.5.C.2	Tech Lab	understanding.
8.2.5.C.3	Equipments and	Students will
0.2.5.0.5	Design Tools	complete
The		Self-evaluation/
	• 3D printers	
application of	• CO <sub>2</sub> Laser	reflection of
engineering	Band saw	their work after
design.		group and
8.2.5.C.4		independent
8.2.5.C.5		work.
		Summative:
The role of		<ul> <li>Quizzes/Tests</li> </ul>
troubleshootin		<ul> <li>Projects</li> </ul>
g,		
research and		
development,		
invention and		
innovation and		
experimentati		
on in problem		
solving		
8.2.5.C.6		
8.2.5.C.7		
Apply the		
design		
process.		
8.2.5.D.1		
8.2.5.D.2		
0.2.0.2.2		
Lice and		
Use and		
maintain		
technological		

products and			
systems.			
8.2.5.D.3			
8.2.5.D.4			
8.2.5.D.5			