Curriculum Grid

OBJECTIVE NUMBER	Next Generation Science Standards • = addresses standard • = partially addresses standard	BASICS OF GEARS	Basics of Gears	LEARNING MISSIONS	Controlled Movements	Precise Turns	Turn Using Sensor	Detect a Color	Detect an Object	Follow a Line	Detect and React	Intelligent Movements	Calibrate Color Sensor	CHALLENGE MISSIONS	Activate Communication	Assemble Your Crew	Free the MSL Robot	Launch the Satellite into Orbit	Return the Rock Samples	Secure Your Power Supply	Initiate Launch	RESEARCH PROJECTS	How Can Humans Survive in Space?	How Do We Generate Energy for Human Outposts?	How Can Robots Help Humans Explore?
Practic																									
1	Asking questions		•		•	٠	•	•	•	٠	٠	•	٠		•	•	•	•	•	•	•		•	•	•
2	Developing and using models		•										•		•	•	•	•	•	•	•			_	
3 4	Planning and carrying out investigations Analyzing and interpreting data		•					•				•			•				•	•	-		•	•	•
5	Using mathematics and computational thinking		•			•	-			•	-	•	-		•		•	•	•				•	-	-
6	Constructing explanations and designing solutions		•			•	•	•	•	•	•	•	•		•	•	•	•	•	•	•		•	•	•
7	Engaging in argument from evidence		•		•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•		•	•	•
8	Obtaining, evaluating, and communicating information		•		•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•		•	•	•
Crossc	utting Concepts																								
1	Patterns				٠	٠	٠	٠	٠	٠	٠	٠	٠		●	●	●	●	●	●	●			Τ	٦
2	Cause and effect: Mechanism and explanation		●		٠	٠	٠	٠	٠	٠	٠	٠	٠		٠	٠	٠	٠	٠	٠	٠		●	●	●
3	Scale, proportion, and quantity		٠		٠	٠	٠	٠	٠	٠	٠	٠	٠		●	●	●	●	●	●	●				
4	Systems and system models		●		٠	٠	٠	٠	٠	٠	٠	٠	٠		٠	٠	٠	٠	٠	٠	٠		●	•	●
5	Energy and matter: Flows, cycles, and conservation				•	●	●	●	●		●		●		●		●	●	●	●	●			•	●
6	Structure and function		_		•	٠	•	٠	•	٠	٠	•	٠		٠	•	٠	•	•	٠	٠				•
7	Stability and change												•				•			•	•				€
-	al Science																								٩.
MS-PS1	Matter and its Interactions												_						_	_	_		_	_	_
MS-PS2 MS-PS3	Motion and Stability: Forces and interactions Energy						•			•			•		•					•			_	•	
MS-PS4	Waves and Their Applications in Technologies for Information Transfer			-		•		•	•	•	•	•	•		•	•				•				-	
Life Sc	ience																								
MS-LS1	From Molecules to Organisms																						●		
MS-LS2	Ecosystems																						٠	●	
MS-LS3	Heredity																								
MS-LS4	Biological evolution																						●	●	
	and Space Science																								
MS-ESS1			-																				•	•	
MS-ESS2	,		-		<u> </u>																		•	•	
MS-ESS3	·																								
Engine MS-ETS1	ering Design Engineering Design		٠																						•
WJ-E131	ะเพิ่มเดียแห้ กระเห็น		-		•	•	•	•	V	•	♥	•⁄	•⁄		-	-	-	-	-	-	-				-

CTA NIDA DD	GRADE	Common Core English Language Arts • = addresses standard • = partially addresses standard	BASICS OF GEARS	Basics of Gears	LEARNING MISSIONS	Controlled Movements	Precise Turns	Turn Using Sensor	Detect a Color	Detect an Object	Follow a Line	Detect and React	Intelligent Movements	Calibrate Color Sensor	CHALLENGE MISSIONS	Activate Communication	Assemble Your Crew	Free the MSL Robot	Launch the Satellite into Orbit	Return the Rock Samples	Secure Your Power Supply	Initiate Launch	RESEARCH PROJECTS	How Can Humans Survive in Space?	How Do We Generate Energy for Human Outposts?	How Can Robots Help Humans Explore?
5	beak	ing and Listening Standards - Presentation of Knowledg	e a	nd	Ide	as																				
	6-8	Engage effectively in a range of collaborative discussions (one-on- one, in groups, and teacher-led) with diverse partners on topics, texts, and issues, building on others' ideas and expressing their own clearly.		●		•	٠	•	•	•	•	•	•	•		•	•	•	•	•	•	•		•	•	٠
	6	Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.		●		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		•	•	•
	7	Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.		●		●	●	●	●	●	●	●	●	●		●	●	€	●	●	●	●		•	•	•
	8	Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.		●		●	●	●	●	●	•	●	●	●		●	●	●	●	●	●	●		•	•	•
	6	Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.				●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		•	•	٠
	7	Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.				●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		•	•	•
	8	Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.				●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		•	•	•
Re	eadi	ng Standards for Literacy in Science and Technical Subj	ect	5																						
1	6-8	Cite specific textual evidence to support analysis of science and technical texts.																						●	●	●
2	6-8	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.																						•	•	•
3	6-8	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.		•		•	•	•	•	•	•	•	•	•		٠	•	•	•	•	•	•				
4	6-8	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.		•		•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•		•	•	•
7	6-8	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).				●	●	●	●	●	•	●	●	●		●	●	●	●	●	●	●		•	•	•
8	6-8	Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.																						•	•	•
9	6-8	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.		●		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●				
.0	6-8	By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.																						•	•	•

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w	ritin	g Standards for Literacy in History/Social Studies, Scienc	ce, i	and	d Te	ech	nic	al	Suk	ojeo	cts	6–1	2													
1	6-8	Write arguments focused on discipline-specific content.																						٠	٠	٠
2	6-8	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.		●		●	●		●	●	●		●	●		•	•	•	•	٠	•	•				●
4	6-8	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.														●	●	●	●	●	●	●				●
5	6-8	With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.														●	●	●	●	●	●	●				●
6	6-8	Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.		●		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●
7	6-8	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.		•		•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•		•	•	•
8	6-8	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.																						•	•	•
9	6-8	Draw evidence from informational texts to support analysis, reflection, and research.																						•	•	•
10	6-8	Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.		●		●	●	●	●	●	•		●	●		●	●	●	●	●	●	●				●

	Common Core Mathematics Standards	BASICS OF GEARS	Basics of Gears	LEARNING MISSIONS	Controlled Movements	Precise Turns	Turn Using Sensor	Detect a Color	Detect an Object	Follow a Line	Detect and React	Intelligent Movements	Calibrate Color Sensor	CHALLENGE MISSIONS	Activate Communication	Assemble Your Crew	Free the MSL Robot	Launch the Satellite into Orbit	Return the Rock Samples	Secure Your Power Supply	Initiate Launch	RESEARCH PROJECTS	How Can Humans Survive in Space?	How Do We Generate Energy for Human Outposts?	How Can Robots Help Humans Explore?
Practi					-	-	-	-	-	-	-	-	-			•	•	•							
1,1	Make sense of problems and persevere in solving them.				•	-	•	•	•		•	•	-										-		
1,2 1,3	Reason abstractly and quantitatively. Construct viable arguments and critique the reasoning of others.		-		• •		-	-				-	-		♥ ●						● ●		\vdash	<u> </u>	
1,4	Model with mathematics.				•	•			•	•	•	•	•		-	•	•	•	•	•	•				
1,5	Use appropriate tools strategically.		•		•	•		•	•	•	•	•	•		●		●								
1,6	Attend to precision.				•	٠	٠	٠	•	•	٠	•	٠		٠	٠	٠	٠	٠	٠	٠				
1,7	Look for and make use of structure.				٠	٠	٠	٠				٠	٠												
1,8	Look for and express regularity in repeated reasoning.				٠	٠	٠	٠					٠												
Ratios	and Proportional Relationships																								
irade 6	Understand ratio concepts and use ratio reasoning to solve problems.		•		٠	٠	•																		
àrade 7	Analyze proportional relationships and use them to solve real- world and mathematical problems.		٠		٠	٠	٠						٠												
The N	umber System																								
irade 6	Apply and extend previous understandings of multiplication and division to divide fractions by fractions.					●																			
rade 6	Compute fluently with multidigit numbers and find common factors and multiples.					●																			
rade 6	Apply and extend previous understandings of numbers to the system of rational numbers.				●	●																			
rade 7	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.		●		٠	٠																			
rade 8	Know that there are numbers that are not rational, and approximate them by rational numbers.																								
Expre	ssions and Equations																								
rade 6	Apply and extend previous understandings of arithmetic to algebraic expressions.		●		•	•	●																		
rade 6	Reason about and solve one-variable equations and inequalities.				٠	٠	●					●													
rade 6	Represent and analyze quantitative relationships between dependent and independent variables.				•	•	●	٠					•												
rade 7	Use properties of operations to generate equivalent expressions.																								
rade 7	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.		●		٠	٠	●	●	●	●	●	●	●												
rade 8	Work with radicals and integer exponents.																								
rade 8	Understand the connections between proportional relationships, lines, and linear equations.				●	●		●					●												
rade 8	Analyze and solve linear equations and pairs of simultaneous							●																	

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Funct	ions																								
Grade 8	Define, evaluate, and compare functions.				٠	٠	●	●					●												
Grade 8	Use functions to model relationships between quantities.		٠		٠	٠	٠	●				٠	●												
Geom	etry																								
Grade 6	Solve real-world and mathematical problems involving area, surface area, and volume.																								
Grade 7	Draw, construct, and describe geometrical figures and the relationship between them.						•		•																
Grade 7	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.				•	٠	•																		
Grade 8	Understand congruence, and similarity using physical models, transparencies, or geometry software.																								
Grade 8	Understand the Pythagorean theorem.																								
Grade 8	Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.																								
Statis	tics and Probability																								
Grade 6	Develop understanding of statistical variability.				●	●	●	●	●	●	●	●	●												
Grade 6	Summarize and describe distributions.																								
Grade 7	Use random sampling to draw inferences about a population.																								
Grade 7	Investigate chance processes and develop, use, and evaluate probability models.								●																
Grade 8	Investigate patterns of association in bivariate data.																								

How Can Houses help rumans explore? Image: Can Houses help rumans explore? Image: Can Human Outposts? Image: Can Human Survive in Space? Image: Can Human S
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tuder	nts demonstrate creative thinking, construct knowledge, and develop i	nnov	ativ	e pr	rodu	ucts	anc	d pr	oce	sse	s us	ing	tec	hno	logy	/.									
а	Apply existing knowledge to generate new ideas, products, or processes.				●	●	●	●	●	●	●	●	●		•	٠	٠	٠	٠	٠	٠		٠	٠	٠
b	Create original works as a means of personal or group expression.														٠	٠	٠	٠	٠	٠	٠		٠	٠	٠
c	Use models and simulations to explore complex systems and issues.		●		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●				
d	Identify trends and forecast possibilities.																						●	●	●
a b c d	Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media. Communicate information and ideas effectively to multiple audiences using a variety of media and formats. Develop cultural understanding and global awareness by engaging with learners of other cultures. Contribute to project teams to produce original works or solve problems.				•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•		•	•	•
	search and Information Fluency nts apply digital tools to gather, evaluate, and use information.																								
a	Plan strategies to guide inquiry.				٠	٠	•	٠	٠	•	•	٠	•		•	•	٠	٠	٠	•	•		٠	•	•
b	Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.						•	•	•	•	•	•	•		-								•	•	•
		-					●	●	●	●	●	●	●		●	●	●	●	●	●	●		•	•	•
с	Evaluate and select information sources and digital tools based on the appropriateness to specific tasks.												-			-			-						
c d	Evaluate and select information sources and digital tools based on the appropriateness to specific tasks. Process data and report results.				•	•	٠	٠	٠	٠	٠	٠	•		•	•	•	•	•	●	●		٠	٠	-
d I . Cri	on the appropriateness to specific tasks.	rojec		solve	• e pr	oble	ems	• , an	• d m	• nake	• infe	orm	ed o	dec					•		•		•	•	
d I. Cri	on the appropriateness to specific tasks. Process data and report results. tical Thinking, Problem Solving, and Decision Making nts use critical thinking skills to plan and conduct research, manage p	rojec		solve	e pr	• oble	• ems	• , an	e d m	• nake	• info	orm	ed (dec					•	•	•		•	•	•
d 1. Cri Studer approj	on the appropriateness to specific tasks. Process data and report results. tical Thinking, Problem Solving, and Decision Making Ints use critical thinking skills to plan and conduct research, manage private digital tools and resources. Identify and define authentic problems and significant questions	rojec		solve	e pr	• oble	ems	_						dec					•	•	•		•	•	•
d 4. Cri Studer approp	on the appropriateness to specific tasks. Process data and report results. itical Thinking, Problem Solving, and Decision Making Ints use critical thinking skills to plan and conduct research, manage private digital tools and resources. Identify and define authentic problems and significant questions for investigation. Plan and manage activities to develop a solution or complete	rojec	cts, s	solve	• • • •		 >>ms <td>_</td><td></td><td></td><td></td><td></td><td></td><td>dec</td><td></td><td></td><td></td><td></td><td>•</td><td>•</td><td>•</td><td></td><td>•</td><td>•</td><td>•</td>	_						dec					•	•	•		•	•	•

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5. Dig	jital Citizenship																								
Stude	nts understand human, cultural, and societal issues related to technology	ogy a	nd	prac	ctice	e leç	gal a	and	ethi	ical	beł	navio	or.												
а	Advocate and practice safe, legal, and responsible use of information and technology.		●		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	
ь	Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.		•		•	٠	•	•	•	•	•	•	•		•	٠	•	•	•	•	•		٠	•	•
с	Demonstrate personal responsibility for lifelong learning.		٠		٠	٠	٠	٠	٠	٠	٠	٠	٠		٠	٠	٠	٠	٠	٠	٠		٠	٠	•
d	Exhibit leadership for digital citizenship.																						●	●	
6. Te	chnology Operations and Concepts																								
Stude	nts demonstrate a sound understanding of technology concepts, syste	ems,	and	lop	erat	ions	5.																		
а	Understand and use technology systems.		٠		٠	٠	٠	٠	٠	٠	٠	٠	٠		٠	٠	٠	٠	٠	٠	٠		●	●	●
b	Select and use applications effectively and productively.		●		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●
	Troubleshoot systems and applications.														•										
с	noubleshoot systems and applications.		-		-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-				•