NEXT GENERATION SCIENCE STANDARDS

SciGirls PBS KIDS

SciGirls Invent Engineer Your World

	Grades 3-5			Grades 6-8							
	Engineering Design			Physical Science				Engineering Design			
	3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	3-5-ETS1-3. Plan and carry out fair tests in which variable are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.	MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	MS-PS3-1. Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.	MS-PS3-2. Develop a model to describe that when the arrangement of object interacting at a distance changes, different amounts of potential energy are stored in the system.	MS-P3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes energy is transferred to or from the object.	MS-ETS1-1. Define the criteria and constrains of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
The Awesome Game Race	X	X	X						X	X	X
Pedal Power	X	X	X	X	X	X	X	X	X	X	X
Crank It Up	X			X	X	X	X	X	X	X	X
Grab and Go	X	X	X	X				X	X	X	X
Deep Sea Diver	X	X	X								X

	COMMON CORE STANDARDS FOR ENGLISH LANGUAGE ARTS & LITERACY IN SCIENCE AND TECHNICAL SUBJECTS				COMMON CORE STATE STANDARDS FOR MATHEMATICS
	Grade 5			Grades 6-8	Grade 7
	Speaking & Listening			Writing Standards	Expressions & Equations
	SL.5.1 Engage effectively in a range of collaborative discussions with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.	SL.5.3 Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.	SL.5.4 Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.	W.6.7 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.	7.EE.B.3 Solve real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
The Awesome Game Race	X	X	X	X	
Pedal Power	X	X	X	X	X
Crank It Up	X	X	X		
Grab and Go	X	X	X		
Deep Sea Diver	X	X	X	X	

Grades 3-5

	Scope of Technology	Core Concepts of Technology			Relationships Among Technologies and other Fields		Attributes of Design		Engineering Design		Other Problem Solving Approaches	Apply Design Processes			Medical Technologies
	1.E Creative thinking and economic and cultural influences shape technological development.	2.J Materials have many different properties.	2.K Tools and machines extend human capabilities, such as holding, lifting, fastening, separating, and computing.	2.L Requirements are the limits to designing or making a product or system.	3.B Technologies are often combined.	3.C Various relationships exist between technology and other fields of study.	8.C The design process is a purposeful method of planning practical solutions to problems.	8.D Requirements for a design include such factors as the desired elements and features of a products or system or the limits that are placed on the design.	9.C The engineering design process involves defining a problem, generating ideas, selecting a solution, testing the solution(s), making the items, evaluating it, and presenting the results.	9.D When designing an object, it is important to be creative and consider all ideas.	10.C Troubleshooting is a way of finding out why something does not work so that it can be fixed.	11.E The process of designing involves presenting some possible solutions in visual form and then selecting the best solution from many.	11.F Test and evaluate the solutions for the design problem.	11.G Improve design solutions.	14.E Technological advances have made it possible to create new devices, to repair or replace certain parts of the body, and to provide a means for mobility.
The Awesome Game Race	X		X	X	X	X	X	X	X	X	X	X	X	X	
Pedal Power	X		X			X	X	X	X					X	
Crank It Up	X		X	X	X	X	X	X	X	X	X	X	X	X	
Grab and Go	X		X	X	X	X	X	X	X	X	X	X	X	X	x
Deep Sea Diver	X	X		X		X	X	X	X	X	X	X	X	X	

STANDARDS FOR TECHNOLOGICAL LITERACY

Grades 6-8

	Scope of Technology	Core Concepts of Technology		Relationships Among Technologies and Other Fields		Attributes of Design			Engineering Design		Other Problem Solving Approaches		Apply Design Processes	
	1.H Technology is closely linked to creativity, which has resulted in innovation.	2.M Technological systems include input, processes, output, and at times, feedback.	2.R Requirements are the parameters placed on the development of a product or system.	A product, system, or environment developed for one setting may be applied to another setting.	Knowledge gained from other fields of study has a direct effect of the development of technological products and systems.	8.E Design is a creative planning process that leads to useful products and systems.	8.F There is no perfect design.	8.G Requirements of a design are made up of criteria and constraints.	9.F Design involves a set of steps, which can be performed in different sequences and repeated as needed.	9.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.	10.F Troubleshooting is a problem-solving method used to identify the cause of a malfunction in a technological system.	10.G Invention is a process of turning ideas and imaginations into devices and systems. Innovation is the process of modifying an existing product of system to improve it.	11.K Test and evaluate the design in relation to pre-established requirements, such as criteria and constraints and refine as needed.	11.L Make a product or system and document the solution.
The Awesome Game Race	X	X	X	X		X	X	X	X	X	X	X	X	X
Pedal Power	X	X	X		X	X	X	X	X	X		X		X
Crank It Up	X	X	X	X	X	X	X		X	X	X	X	X	X
Grab and Go	X	X	X	X		X	X	X	X	X	X	X	X	X
Deep Sea Diver	X		X	X	X	X	X	X	X	X	X	X	X	X