

Wee Engineer – One Unit, Four Challenges

Engineering Challenge	Science Concept Connections	New York State Science Learning Standards, 2016	
		Pre-K	Kindergarten
Noisemakers	- forces - sound - properties of materials	P-PS4-1	
Fans	- forces - properties of materials		K-PS2-1 K-PS2-2
Wrecking Balls	- weight - force and motion - action and reaction		K-PS2-1 K-PS2-2
Rafts	sinking and floating		

EiE for Kindergarten

Unit	Science Concept Connections	New York State Science Learning Standards, 2016
		Kindergarten
Raise the Roof: Designing Shelters	• light and shadow • the warming effect of the Sun • animals and animal needs	Energy: K-PS3-1, K-PS3-2 Earth's Systems: K-ESS2-2 Engineering Design: K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3
Here's the Scoop: Designing Trash Collectors	• the basic needs of living things • animal habitats and ecosystems • human impact on the environment • recycling and environmental stewardship	Earth and Human Activity: K-ESS3-3 Engineering Design: K-2-ETS1-1, K-2-ETS1-2, K-2-ETS1-3

Units with Life Science Topics

Unit	Engineering and Science Fields	New York State Science Learning Standards, 2016					
		Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
The Best of Bugs: Designing Hand Pollinators	Agricultural Engineering Insects and Plants		1-LS1-1 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3	2-LS2-2 2-PS1-1 2-PS1-2 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3	3-LS4-3 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3		
Just Passing Through: Designing Model Membranes	Bioengineering Needs of Organisms	K-LS1-1 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3	1-LS1-1 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3		3-LS4-3 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3		
No Bones About It: Designing Knee Braces	Biomedical Engineering Skeletal and Muscular Systems					4-LS1-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	
A Slick Solution: Cleaning an Oil Spill <i>Also listed with Earth Science</i>	Environmental Engineering Ecosystems				3-LS4-3 3-LS4-4 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3		5-LS1-1 5-LS2-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
Thinking Inside the Box: Designing Plant Packages	Package Engineering Plants	K-LS1-1 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3		2-LS2-1 2-PS1-1 2-PS1-2 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3		4-LS1-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	



Units with Earth Science Topics

Unit	Engineering and Science Fields	New York State Science Learning Standards, 2016					
		Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Catching the Wind: Designing Windmills <i>Also listed with Physical Science</i>	Mechanical Engineering Weather	K-ESS2-1 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3			3-ESS2-2 3-PS2-1 3-PS2-2 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3		
Now You're Cooking: Designing Solar Ovens <i>Also listed with Physical Science</i>	Green Engineering Energy and Energy Resources					4-ESS3-1 4-PS3-2 4-PS3-4 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	5-ESS3-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
A Slick Solution: Cleaning an Oil Spill <i>Also listed with Life Science</i>	Environmental Engineering Ecosystems	K-ESS2-1 K-ESS3-1 K-ESS3-3 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3					5-ESS2-1 5-ESS2-2 5-ESS3-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
Solid as a Rock: Replicating an Artifact	Materials Engineering Rocks and Minerals			2-PS1-1 2-PS1-2 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3		4-ESS1-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	
A Stick in the Mud: Evaluating a Landscape	Geotechnical Engineering Landforms and Maps			2-ESS1-1 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3	3-ESS3-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	4-ESS2-1 4-ESS2-2 4-ESS3-2 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	

Earth Science continues on next page.



Units with Earth Science Topics, *continued*

Unit	Engineering and Science Fields	New York State Science Learning Standards, 2016					
		Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Taking the Plunge: Designing Submersibles <i>Also listed with Physical Science</i>	Ocean Engineering Sinking and Floating					4-ESS2-2 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	5-ESS2-1 5-ESS2-2 5-PS1-3 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
Water, Water Everywhere: Designing Water Filters	Environmental Engineering Water			3-LS4-4 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3			5-ESS2-1 5-ESS3-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3



Units with Physical Science Topics

Unit	Engineering and Science Fields	New York State Science Learning Standards, 2016					
		Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
An Alarming Idea: Designing Alarm Circuits	Electrical Engineering Electricity					4-PS3-2 4-PS3-4 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	5-PS1-3 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
The Attraction Is Obvious: Designing Maglev Systems	Transportation Engineering Magnets				3-PS2-3 3-PS2-4 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3		5-PS1-3 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
Catching the Wind: Designing Windmills <i>Also listed with Earth Science</i>	Mechanical Engineering Weather				3-PS2-1 3-PS2-2 3-ESS2-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	4-PS3-1 4-PS3-4 4-ESS3-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	
To Get to the Other Side: Designing Bridges	Civil Engineering Forces	K-PS2-1 K-PS2-2 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3			3-PS2-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3		5-PS2-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
Lighten Up: Designing Lighting Systems	Optical Engineering Light		1-PS4-2 1-PS4-3 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3			4-PS4-2 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	
A Long Way Down: Designing Parachutes	Aerospace Engineering Solar System				3-PS2-1 3-PS2-2 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3		5-PS2-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3

Physical Science continues on next page.

Units with Physical Science Topics, *continued*

Unit	Engineering and Science Fields	New York State Science Learning Standards, 2016					
		Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
Marvelous Machines: Making Work Easier	Industrial Engineering Simple Machines				3-PS2-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3		5-PS2-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
Now You're Cooking: Designing Solar Ovens <i>Also listed with Earth Science</i>	Green Engineering Energy					4-PS3-2 4-PS3-4 4-ESS3-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	
Sounds Like Fun: Seeing Animal Sounds	Acoustical Engineering Sound		1-PS4-1 1-PS4-4 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3			4-PS3-2 4-PS4-1 4-PS4-3 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	
A Sticky Situation: Designing Walls	Materials Engineering Earth Materials			2-PS1-1 2-PS1-2 2-PS1-3 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3			5-PS1-4 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
Taking the Plunge: Designing Submersibles <i>Also listed with Earth Science</i>	Ocean Engineering Sinking and Floating			2-PS1-1 2-PS1-2 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3			5-PS1-3 5-ESS2-1 5-ESS2-2 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
A Work in Process: Improving a Play Dough Process	Chemical Engineering Process Engineering Solids and Liquids			2-PS1-1 2-PS1-2 K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3			5-PS1-3 5-PS1-4 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3

Grade	Unit	Engineering Field	New York State Science Learning Standards, 2016	
			Science	Engineering Design
1st	Designing Lighting Systems	Optical Engineering	1-PS4-2 1-PS4-3	K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3
2nd	Designing Hand Pollinators	Agricultural Engineering	2-LS2-2 2-PS1-1 2-PS1-2	K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3
3rd	Designing Maglev Systems	Transportation Engineering	3-PS2-3 3-PS2-4	3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
4th	Designing Solar Ovens	Green Engineering	4-ESS3-1 4-PS3-2 4-PS3-4	3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
5th	Cleaning an Oil Spill	Environmental Engineering	5-ESS2-1 5-ESS2-2 5-ESS3-1 5-LS1-1 5-LS2-1	3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3

EiE® Computer Science Essentials™
Alignment to New York State Computer Science
and Digital Fluency Standards, 2020

Grade	Unit	Concept Tool Type	NYS Computer Science and Digital Fluency Standards		
			Grades K – 1	Grades 2 – 3	Grades 4 – 6
1st	Programming Robots	Computing Systems Robotics	K-1.IC.1 K-1.IC.2 K-1.IC.3 K-1.CT.4 K-1.CT.6 K-1.CT.9 K-1.CT.10 K-1.NSD.1 K-1.NSD.2 K-1.DL.2	2-3.IC.1 2-3.IC.3 2-3.IC.7 2-3.CT.4 2-3.CT.6	4-6.IC.7 4-6.CT.4 4-6.CT.5 4-6.CT.6 4-6.CT.10 4-6.NSD.2
2nd	Creating Animations	Algorithms & Programming Visual Programming	K-1.IC.1 K-1.IC.2 K-1.IC.3 K-1.CT.1 K-1.CT.4 K-1.CT.6 K-1.CT.8 K-1.CT.9 K-1.CT.10 K-1.NSD.1 K-1.NSD.2 K-1.DL.2 K-1.DL.4	2-3.IC.1 2-3.IC.3 2-3.IC.7 2-3.CT.4 2-3.CT.6 2-3.CT.9 2-3.CT.10 2-3.DL.2	4-6.IC.7 4-6.CT.4 4-6.CT.5 4-6.CT.6 4-6.CT.10 4-6.NSD.2

EiE® Computer Science Essentials™
Alignment to New York State Computer Science
and Digital Fluency Standards, 2020

Grade	Unit	Concept Tool Type	NYS Computer Science and Digital Fluency Standards		
			Grades K – 1	Grades 2 – 3	Grades 4 – 6
3rd	Building Automated Systems	Computing Systems Visual Computing	K-1.IC.1 K-1.IC.2 K-1.IC.3 K-1.CT.1 K-1.CT.4 K-1.CT.6 K-1.CT.8 K-1.CT.9 K-1.CT.10 K-1.NSD.1 K-1.NSD.2 K-1.NSD.3 K-1.DL.2 K-1.DL.4	2-3.IC.1 2-3.IC.3 2-3.IC.7 2-3.CT.4 2-3.CT.6 2-3.CT.8 2-3.CT.9 2-3.CT.10 2-3.NSD.1 2-3.NSD.3 2-3.DL.2	4-6.IC.7 4-6.CT.2 4-6.CT.4 4-6.CT.5 4-6.CT.6 4-6.CT.8 4-6.CT.9 4-6.CT.10 4-6.NSD.2 4-6.NSD.3
4th	Designing Computer Games	Impacts of Computing Visual Programming	K-1.IC.1 K-1.IC.2 K-1.IC.3 K-1.CT.1 K-1.CT.4 K-1.CT.6 K-1.CT.8 K-1.CT.9 K-1.CT.10 K-1.NSD.1 K-1.NSD.2 K-1.DL.2 K-1.DL.4	2-3.IC.1 2-3.IC.3 2-3.IC.7 2-3.CT.4 2-3.CT.6 2-3.CT.8 2-3.CT.9 2-3.CT.10 2-3.DL.2	4-6.IC.7 4-6.CT.4 4-6.CT.5 4-6.CT.6 4-6.CT.7 4-6.CT.8 4-6.CT.9 4-6.CT.10 4-6.NSD.1 4-6.NSD.2

EiE® Computer Science Essentials™
Alignment to New York State Computer Science
and Digital Fluency Standards, 2020

Grade	Unit	Concept Tool Type	NYS Computer Science and Digital Fluency Standards		
			Grades K – 1	Grades 2 – 3	Grades 4 – 6
5th	Analyzing Digital Images	Data & Analysis Visual Programming	K-1.IC.1 K-1.IC.2 K-1.IC.3 K-1.CT.1 K-1.CT.4 K-1.CT.6 K-1.CT.8 K-1.CT.9 K-1.CT.10 K-1.NSD.1 K-1.NSD.2 K-1.DL.2 K-1.DL.4	2-3.IC.1 2-3.IC.3 2-3.IC.7 2-3.CT.1 2-3.CT.4 2-3.CT.6 2-3.CT.8 2-3.CT.9 2-3.CT.10 2-3.NSD.1 2-3.DL.2	4-6.IC.7 4-6.CT.2 4-6.CT.4 4-6.CT.5 4-6.CT.6 4-6.CT.7 4-6.CT.8 4-6.CT.9 4-6.CT.10 4-6.NSD.1 4-6.NSD.2

Unit	Engineering Fields and Science Connections	New York State Science Learning Standards, 2016		
		Grade 3	Grade 4	Grade 5
Bubble Bonanza: Engineering Bubble Wands	Materials Engineering Matter and Its Interactions			5-PS1-3 5-PS1-4 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
Go Green: Engineering Recycled Racers	Green Engineering Energy, Forces	3-PS2-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	4-PS3-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	
In Good Hands: Engineering Space Gloves	Materials Engineering Properties of Materials, Energy Transfer	3-ESS3-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	4-PS3-2 4-PS3-3 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	5-PS1-3 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
Liftoff: Engineering Rockets and Rovers	Aerospace Engineering Forces and Interactions	3-PS2-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3		5-PS2-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
Light Up the Night: An Electrical Engineering Challenge	Electrical Engineering Electric Circuits, Light		4-PS3-2 4-PS3-4 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	5-PS1-3 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3
Music to My Ears: An Acoustical Engineering Challenge	Acoustical Engineering Sound		4-PS3-2 4-PS4-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	
The Sky's the Limit: Engineering Flying Technologies	Aeronautical Engineering Forces and Interactions	3-PS2-1 3-PS2-2 3-ESS2-2 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3		5-PS2-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3

Unit	Engineering Fields and Science Connections	New York State Science Learning Standards, 2016		
		Grade 3	Grade 4	Grade 5
Shake Things Up: Engineering Earthquake-Resistant Buildings	Earthquake Engineering Earthquakes	3-PS2-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	4-ESS3-2 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	
A Slippery Slope: Engineering an Avalanche Protection System	Avalanche Engineering Forces and Interactions	3-PS2-1 3-PS2-2 3-ESS2-3 3-ESS3-1 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	4-PS3-2 4-PS4-1 4-ESS3-2 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	
Hop to It: Safe Removal of Invasive Species	Mechanical Engineering Environmental Science	3-PS2-1 3-LS4-2 3-LS4-3 3-LS4-4 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3		
To the Rescue: Engineering Aid Drop Packages	Package Engineering Energy, Forces		4-PS3-3 3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	



Unit	Engineering Field	Science Topics	New York State Science Learning Standards, 2016	
			Science	Engineering
Don't Runoff: Engineering an Urban Landscape	Environmental Engineering	Natural Resources Earth and Human Activity	MS-LS2-1 MS-LS2-4 MS-LS2-5 MS-ESS3-3 MS-ESS3-4	MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4
Food for Thought: Engineering Ice Cream	Process Engineering	Matter Energy Transfer	MS-PS1-2 MS-PS1-6 MS-PS4-2	MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4
Go Fish: Engineering Prosthetic Tails	Biomechanical Engineering	Structures and Function in Animals	MS-LS1-4	MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4
Growing Up: Engineering Vertical Farms	Agricultural Engineering	Light Photosynthesis Natural Resources	MS-PS4-2 MS-LS1-4 MS-LS1-6 MS-LS2-5	MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4
It's in the Bag: Engineering Bioinspired Gear	Materials Engineering Bioinspired Engineering	Structures and Function in Animals	MS-LS1-4	MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4
Outbreak Alert!: Engineering a Pandemic Response	Biomedical Engineering	Cells, Viruses Public Health	MS-LS1-1 MS-LS3-1 MS-LS4-4	MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4
Testing the Waters: Engineering a Water Reuse Process	Process Engineering Water Resource Engineering	Natural Resources	MS-PS1-8 MS-LS2-5 MS-ESS3-3 MS-ESS3-4	MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4
Worlds Apart: Engineering Remote Sensing Devices	Remote Sensing Engineering	Light Solar System	MS-PS4-2 MS-ESS1-3 MS-ESS2-3	MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4



Unit	Engineering Field	Science Topics	New York State Science Learning Standards, 2016	
			Science	Engineering
Plants to Plastics: Engineering Bioplastics	Chemical Engineering	Properties of Matter Chemical Reactions	MS-PS1-2 MS-PS1-3 MS-ESS3-3	MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4
It's About Time: Engineering Timers	Mechanical Engineering	Physical Science	Connections to ETAS	MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4
Put a Lid on It: Engineering Safety Helmets	Biomechanical Engineering	Forces and Motion Nervous System	MS-PS2-1 MS-LS1-8	MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4
Here Comes the Sun: Engineering Insulated Homes	Green Engineering	Thermal Energy Transfer Properties of Matter Natural Resources Earth and Human Activity	MS-PS1-4 MS-PS3-3 MS-PS3-4 MS-PS4-2 MS-ESS3-3 MS-ESS3-4	MS-ETS1-1 MS-ETS1-2 MS-ETS1-3 MS-ETS1-4