

# Wee Engineer® and EiE® for Kindergarten Alignment to Virginia Science Standards of Learning



WeeEngineer



EiE for  
Kindergarten

Wee Engineer – One Unit, Four Challenges		
Engineering Challenge	Science Concept Connections	Science Standards of Learning
		Kindergarten
Noisemakers	<ul style="list-style-type: none"> <li>forces</li> <li>sound</li> <li>properties of materials</li> </ul>	K.1a-f K.3a-d K.5b
Fans	<ul style="list-style-type: none"> <li>forces</li> <li>properties of materials</li> </ul>	K.1a-f K.2a, c K.3a-d K.5b
Wrecking Balls	<ul style="list-style-type: none"> <li>weight</li> <li>force and motion</li> <li>action and reaction</li> </ul>	K.1a-f K.2a-c K.3a-d
Rafts	<ul style="list-style-type: none"> <li>sinking and floating</li> </ul>	K.1a-f K.3a-d K.4a

# Wee Engineer® and EiE® for Kindergarten Alignment to Virginia Science Standards of Learning



WeeEngineer



EiE for  
Kindergarten

EiE for Kindergarten – Three Units		
Unit	Science Concept Connections	Science Standards of Learning
		Kindergarten
<b>Raise the Roof: Designing Shelters</b>	<ul style="list-style-type: none"> <li>light and shadow</li> <li>the warming effect of the Sun</li> <li>animals and animal needs</li> </ul>	<div> <div>K.1a-f</div> <div>K.3a-d</div> <div>K.5b</div> <div>K.7a</div> </div> <div> <div>K.8a-c</div> <div>K.9a</div> <div>K.11c</div> </div>
<b>Here's the Scoop: Designing Trash Collectors</b>	<ul style="list-style-type: none"> <li>the basic needs of living things</li> <li>animal habitats and ecosystems</li> <li>human impact on the environment</li> <li>recycling and environmental stewardship</li> </ul>	<div> <div>K.1a-f</div> <div>K.2a-c</div> <div>K.3a-d</div> <div>K.4a-b</div> </div> <div> <div>K.7a</div> <div>K.10a-d</div> <div>K.11c</div> </div>
<b>Sort It Out: Programming Robots to Recycle</b>	<ul style="list-style-type: none"> <li>the basic needs of living things</li> <li>animal habitats and ecosystems</li> <li>human impact on the environment</li> <li>recycling and environmental stewardship</li> </ul>	<div> <div>K.1a-f</div> <div>K.7a</div> <div>K.11a-c</div> </div>



### Units with Life Science Topics

Unit	Engineering and Science Fields	Science Standards of Learning					
		Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
<b>The Best of Bugs: Designing Hand Pollinators</b>	Agricultural Engineering  Insects and Plants	K.1a-f K.3a-d K.6b K.7a-b	1.1a-f 1.3a-b 1.4a-b 1.5a-c	2.1a-f 2.4a-b 2.5a-c 2.8b	3.1a-f 3.4a-b 3.5b 3.8a	4.1a-f 4.2b-c 4.3a, d	5.1a-f
<b>Just Passing Through: Designing Model Membranes</b>	Bioengineering  Needs of Organisms	K.1a-f K.3b-d K.4a K.6a-b K.7a K.9b	1.1a-f 1.3a-b 1.5a-b 1.7a-c	2.1a-f 2.5a-c 2.7a	3.1a-f 3.8b	4.1a-f 4.3a, c 4.4b-c	5.1a-f
<b>No Bones About It: Designing Knee Braces</b>	Biomedical Engineering  Skeletal and Muscular Systems	K.1a-f K.3b-c	1.1a-f 1.2a 1.3a	2.1a-f	3.1a-f 3.2a-d	4.1a-f	5.1a-f
<b>A Slick Solution: Cleaning an Oil Spill</b>  <i>Also listed with Earth Science</i>	Environmental Engineering  Ecosystems	K.1a-f K.3b-d K.4a-b K.6a-b K.7a K.10.a-d K.11c	1.1a-f 1.3a-b 1.4a 1.5a 1.8a-b	2.1a-f 2.5a-c 2.8a, b	3.1a-f 3.3a 3.4a-b 3.5a-b 3.6a-b 3.7a 3.8a-c	4.1a-f 4.3a-c	5.1a-f 5.9a
<b>Thinking Inside the Box: Designing Plant Packages</b>	Package Engineering  Plants	K.1a-f K.3a-c K.4a K.6b K.7a K.11a-b	1.1a-f 1.3a-c 1.4a-b	2.1a-f 2.5a-b	3.1a-f 3.6a-b	4.1a-f	5.1a-f



### Units with Earth Science Topics

Unit	Engineering and Science Fields	Science Standards of Learning					
		Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
<b>Catching the Wind: Designing Windmills</b> <i>Also listed with Physical Science</i>	Mechanical Engineering  Weather	K.1a-f K.2a K.3c-d K.9a	1.1a-f 1.2a 1.3a-b 1.8a-c	2.1a-f 2.2a, c 2.6a-c	3.1a-f 3.2a-d	4.1a-f 4.4a	5.1a-f 5.2a-c 5.9a-c
<b>Now You're Cooking: Designing Solar Ovens</b> <i>Also listed with Physical Science</i>	Green Engineering  Energy and Energy Resources	K.1a-f K.3a-d K.8a-c K.11a-c	1.1a-f 1.3a-c 1.6a-b 1.8a-c	2.1a-f 2.5a, c	3.1a-f 3.5a-b 3.8a	4.1a-f 4.3a	5.1a-f 5.2a-c 5.6d 5.9a-c
<b>A Slick Solution: Cleaning an Oil Spill</b> <i>Also listed with Life Science</i>	Environmental Engineering  Ecosystems	K.1a-f K.3b-d K.4a-b K.6a-b K.7a K.10.a-d K.11c	1.1a-f 1.3a-b 1.4a 1.5a 1.8a-b	2.1a-f 2.5a-c 2.8a, b	3.1a-f 3.3a 3.4a-b 3.5a-b 3.6a-b 3.7a 3.8a-c	4.1a-f 4.3a-c	5.1a-f 5.9a
<b>Solid as a Rock: Replicating an Artifact</b> <i>Available as a digital unit. Materials Kit not available for purchase.</i>	Materials Engineering  Rocks and Minerals	K.1a-f K.3b-d K.10a-d	1.1a-f 1.3a-b	2.1a-f	3.1a-f 3.4c	4.1a-f	5.1a-f 5.8c-e
<b>A Stick in the Mud: Evaluating a Landscape</b>	Geotechnical Engineering  Landforms and Maps	K.1a-f K.3b-d K.4a, b, d K.9b K.10a-d	1.1a-f 1.3a 1.7a-c	2.1a-f 2.2a, c 2.5c 2.6a 2.7b-c	3.1a-f 3.2a-b 3.7a 3.8c-d	4.1a-f 4.4b	5.1a-f 5.8a-d

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**Units with Earth Science Topics, *continued***

Unit	Engineering and Science Fields	Science Standards of Learning					
		Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
<b>Taking the Plunge: Designing Submersibles</b>  <i>Also listed with Physical Science</i>	Ocean Engineering  Sinking and Floating	K.1a-f K.3b, d K.4a, b	1.1a-f 1.2a 1.3a	2.1a-f 2.2a, c 2.3a	3.1a-f 3.2a-b 3.7a	4.1a-f 4.7a, c	5.1a-f 5.2a-b
<b>Water, Water Everywhere: Designing Water Filters</b>	Environmental Engineering  Water	K.1a-f K.3a-c K.4a-c K.6b K.7a K.9b K.10a-d K.11c	1.1a-f 1.3a-b 1.5a 1.7a-c 1.8a-b	2.1a-f 2.3b-c 2.5a-c 2.6a 2.7a	3.1a-f 3.3a 3.5a-b 3.7a-c 3.8a-b	4.1a-f 4.3a	5.1a-f 5.7b-c



### Units with Physical Science Topics

Unit	Engineering and Science Fields	Science Standards of Learning					
		Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
<b>An Alarming Idea: Designing Alarm Circuits</b>	Electrical Engineering Electricity	K.1a-f K.3d	1.1a-f 1.3a	2.1a-f	3.1a-f	4.1a-f	5.1a-f 5.2a-c 5.4a-b, d
<b>The Attraction Is Obvious: Designing Maglev Systems</b>	Transportation Engineering Magnets	K.1a-f K.3b, d	1.1a-f 1.3a-b	2.1a-f 2.2a-c	3.1a-f 3.2a-b	4.1a-f	5.1a-f 5.2a-c
<b>Catching the Wind: Designing Windmills</b>  <i>Also listed with Earth Science</i>	Mechanical Engineering Weather	K.1a-f K.2a, c K.3a-d K.9a	1.1a-f 1.2a 1.3a-b 1.8a-c	2.1a-f 2.2a, c 2.6a-c	3.1a-f 3.2a-d	4.1a-f 4.4a	5.1a-f 5.2a-c 5.9a-c
<b>To Get to the Other Side: Designing Bridges</b>	Civil Engineering Forces	K.1a-f K.3b, d	1.1a-f 1.3a-b	2.1a-f 2.2c	3.1a-f 3.2a-b	4.1a-f	5.1a-f
<b>Lighten Up: Designing Lighting Systems</b>	Optical Engineering Light	K.1a-f K.5b K.8b K.9c	1.1a-f 1.3a-c	2.1a-f	3.1a-f	4.1a-f	5.1a-f 5.6a-c
<b>A Long Way Down: Designing Parachutes</b>	Aerospace Engineering Solar System	K.1a-f K.3b-d K.9c	1.1a-f 1.2a 1.3a-b	2.1a-f 2.2a-c	3.1a-f 3.2a-b	4.1a-f 4.5a-c	5.1a-f
<b>Marvelous Machines: Making Work Easier</b>	Industrial Engineering Simple Machines	K.1a-f K.2a-c K.3d	1.1a-f 1.2a 1.3a-b	2.1a-f 2.2a, c	3.1a-f 3.2a-d	4.1a-f	5.1a-f 5.2a-d 5.3c 5.9b-c

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**Units with Physical Science Topics, *continued***

Unit	Engineering and Science Fields	Science Standards of Learning					
		Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
<b>Now You're Cooking: Designing Solar Ovens</b>  <i>Also listed with Earth Science</i>	Green Engineering  Energy and Energy Resources	K.1a-f K.3a-d K.8a-c K.11a-c	1.1a-f 1.3a-c 1.6a-b 1.8a-c	2.1a-f 2.5a-c	3.1a-f 3.5a-b 3.8a	4.1a-f 4.3a	5.1a-f 5.2a-c 5.6d 5.9a-c
<b>Sounds Like Fun: Seeing Animal Sounds</b>	Acoustical Engineering  Sound	K.1a-f K.3a, b, d K.5a-b	1.1a-f 1.2b	2.1a-f	3.1a-f	4.1a-f	5.1a-f 5.5a-d
<b>A Sticky Situation: Designing Walls</b>	Materials Engineering  Earth Materials	K.1a-f K.3a-c K.4a	1.1a-f 1.3a-b 1.4a	2.1a-f 2.3a-b	3.1a-f 3.2a-b 3.3a	4.1a-f	5.1a-f 5.7b
<b>Taking the Plunge: Designing Submersibles</b>  <i>Also listed with Earth Science</i>	Ocean Engineering  Sinking and Floating	K.1a-f K.3b, d K.4a, b	1.1a-f 1.2a 1.3a	2.1a-f 2.2a, c 2.3a	3.1a-f 3.2a-b 3.7a	4.1a-f 4.7a, c	5.1a-f 5.2a-b
<b>A Work in Process: Improving a Play Dough Process</b>	Chemical Engineering Process Engineering  Solids and Liquids	K.1a-f K.3b-c K.4a, c	1.1a-f 1.3a-b	2.1a-f 2.3a-b	3.1a-f 3.3a	4.1a-f	5.1a-f 5.7a-b



Unit / Engineering Field	Suggested Grades	Science Standards of Learning					
		Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
<i>Designing Lighting Systems</i> Optical Engineering	K, 1	K.1a-f K.5a-b K.8b K.9c	1.1a-f 1.3a-c				
<i>Designing Hand Pollinators</i> Agricultural Engineering	1, 2, 3		1.1a-f 1.3a-b 1.4a-b 1.5a-c	2.1a-f 2.4a-b 2.5a-c 2.8b	3.1a-f 3.4a-b 3.5b 3.8a		
<i>Designing Maglev Systems</i> Transportation Engineering	1, 2, 3		1.1a-f 1.3a-b	2.1a-f 2.2a-c	3.1a-f 3.2a-b		
<i>Cleaning an Oil Spill</i> Environmental Engineering	2, 3, 4			2.1a-f 2.5a-c 2.8b	3.1a-f 3.3a 3.4a-b 3.5a-b 3.6a-b 3.7a 3.8a-b	4.1a-f 4.3a-c	
<i>Designing Solar Ovens</i> Green Engineering	4, 5					4.1a-f 4.3a	5.1a-f 5.2a-d 5.6d 5.9a-c



# **EiE® Computer Science Essentials™** **Alignment to Virginia Computer Science** **Standards of Learning, 2017**

Unit Title Concept / Tool Type	Suggested Grades	Computer Science Standards of Learning							
		Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5		
<b>Sort It Out:</b> <i>Programming Robots to Recycle*</i> Algorithms & Programming / Robotics	K <b>EiE for Kindergarten</b>	K.1 K.2 K.4 K.9	1.1 1.2 1.3 1.5	2.1a-b 2.2a-b 2.3 2.5 2.7					
<b>Programming Robots</b> Computing Systems / Robotics	K, 1, 2	K.1 K.2 K.4	1.1a 1.2a 1.3 1.5 1.9	2.1a, c 2.2a, c 2.3 2.5 2.12					
<b>Creating Animations</b> Algorithms & Programming / Visual Programming	1, 2, 3		1.1a-b 1.2a-b 1.3 1.4 1.5 1.7 1.9	2.1a-c 2.2a-c 2.3 2.4 2.5 2.12	3.1a-c 3.2a-c 3.3 3.4 3.6 3.13				
<b>Building Automated Systems</b> Computing Systems / Visual Computing	2, 3, 4			2.1a-c 2.7 2.2a-c 2.8 2.3 2.9 2.4 2.12 2.5	3.1a-c 3.6 3.2a-c 3.8 3.3 3.9 3.4 3.13	4.1a-c 4.6 4.2a-c 4.8 4.3 4.9 4.4 4.13 4.5 4.14			
<b>Designing Computer Games</b> Impacts of Computing / Visual Programming	3, 4, 5				3.1a-c 3.5 3.2a-c 3.6 c 3.8 3.3 3.13 3.4	4.1a-d 4.6 4.2a-d 4.8 4.3 4.12 4.4 4.13 4.5	5.1a-e 5.5 5.2a-e 5.7 5.3 5.11 5.4 5.12		
<b>Analyzing Digital Images</b> Data & Analysis / Visual Programming	4, 5					4.1a-d 4.6 4.2a-d 4.8 4.3 4.12 4.4 4.13 4.5 4.14	5.1a-e 5.7 5.2a-e 5.11 5.3 5.12 5.4 5.13		

\*This *EiE for Kindergarten* unit can be used with *Computer Science Essentials* units to create K–5 coverage for computer science.

Unit	Engineering Fields and Science Connections	Science Standards of Learning		
		Grade 3	Grade 4	Grade 5
<b>Bubble Bonanza: Engineering Bubble Wands</b>	Materials Engineering Matter and Its Interactions	3.1a-f	4.1a-f	5.1a-f
<b>Go Green: Engineering Recycled Racers</b>	Green Engineering Energy, Forces	3.1a-f 3.2a-d	4.1a-f	5.1a-f 5.9b
<b>In Good Hands: Engineering Space Gloves</b>	Materials Engineering Properties of Materials, Energy Transfer	3.1a-f	4.1a-f	5.1a-f
<b>Liftoff: Engineering Rockets and Rovers</b>	Aerospace Engineering Forces and Interactions	3.1a-f 3.2a-d	4.1a-f	5.1a-f 5.3a-c
<b>Light Up the Night: An Electrical Engineering Challenge</b>	Electrical Engineering Electric Circuits, Light	3.1a-f	4.1a-f	5.1a-f 5.2a-c 5.4a-b, d
<b>Music to My Ears: An Acoustical Engineering Challenge</b>	Acoustical Engineering Sound	3.1a-f	4.1a-f	5.1a-f 5.2a-c 5.5a-d
<b>The Sky's the Limit: Engineering Flying Technologies</b>	Aeronautical Engineering Forces and Interactions	3.1a-f 3.2a-b	4.1a-f	5.1a-f 5.3a-c, e

Unit	Engineering Fields and Science Connections	Science Standards of Learning		
		Grade 3	Grade 4	Grade 5
<b>Shake Things Up: Engineering Earthquake-Resistant Buildings</b>	Earthquake Engineering Earthquakes	3.1a-f 3.2a-b	4.1a-f	5.1a-f 5.2a 5.8b
<b>A Slippery Slope: Engineering an Avalanche Protection System</b>	Avalanche Engineering Forces and Interactions	3.1a-f 3.2a-d 3.8c	4.1a-f 4.4b	5.1a-f 5.2a-b 5.3a-e
<b>Hop to It: Safe Removal of Invasive Species</b>	Mechanical Engineering Environmental Science	3.1a-f 3.2d 3.5b 3.8a	4.1a-f 4.3a	5.1a-f
<b>To the Rescue: Engineering Aid Drop Packages</b>	Package Engineering Energy, Forces	3.1a-f 3.2a-b	4.1a-f	5.1a-f 5.3c, e

Unit	Engineering Field	Science Topics	Science Standards of Learning	
			Grade 6	Grades 7/8 Sciences
<b>Don't Runoff: Engineering an Urban Landscape</b>	Environmental Engineering	Natural Resources Earth and Human Activity	6.1a-f 6.6f 6.8a 6.9a-c, e-f	LS.1a-f LS.5a LS.9a-c  ES.1a-f ES.6a-b ES.8a-c
<b>Food for Thought: Engineering Ice Cream</b>	Process Engineering	Matter Energy Transfer	6.1a-f	PS.1a-f PS.5b
<b>Go Fish: Engineering Prosthetic Tails</b>	Biomechanical Engineering	Structures and Function in Animals	6.1a-f	LS.1a-f LS.3b LS.7b
<b>Growing Up: Engineering Vertical Farms</b>	Agricultural Engineering	Light Photosynthesis Natural Resources	6.1a-f 6.4a 6.6f	LS.1a-f LS.4a-b
<b>It's in the Bag: Engineering Bioinspired Gear</b>	Materials Engineering Bioinspired Engineering	Structures and Function in Animals	6.1a-f	LS.1a-f LS.3b LS.7b
<b>Outbreak Alert!: Engineering a Pandemic Response</b>	Biomedical Engineering	Cells, Viruses, Public Health	6.1a-f	
<b>Testing the Waters: Engineering a Water Reuse Process</b>	Process Engineering Water Resource Engineering	Natural Resources	6.1a-f 6.6f 6.9a-c	ES.1a-f ES.6a-b ES.8a, c

Unit	Engineering Field	Science Topics	Science Standards of Learning	
			Grade 6	Grades 7/8 Sciences
<b>Worlds Apart: Engineering Remote Sensing Devices</b>	Remote Sensing Engineering	Light Solar System	6.1a-f	PS.1a-f PS.6a, d PS.7a-b  ES.1a-f ES.2d
<b>Plants to Plastics: Engineering Bioplastics</b>	Chemical Engineering	Properties of Matter Chemical Reactions	6.1a-f 6.5c-e 6.6a, c 6.9e	PS.1a-f PS.3a-b
<b>It's About Time: Engineering Timers</b>	Mechanical Engineering	Physical Science	6.1a-f	PS.1a-f PS.8a
<b>Put a Lid on It: Engineering Safety Helmets</b>	Biomechanical Engineering	Forces and Motion Nervous System	6.1a-f	
<b>Here Comes the Sun: Engineering Insulated Homes</b>	Green Engineering	Thermal Energy Transfer Properties of Matter Natural Resources Earth and Human Activity	6.1a-f 6.4a, c, d	PS.1a-f PS.5b