



Curriculum Connections

Dream Big



From the world’s tallest building to underwater robots and a solar car race across Australia, diverse groups of engineers define problems and develop solutions, testing them and trying new options when they encounter failure points. *Dream Big* celebrates the human ingenuity behind engineering marvels big and small, and reveals the heart that drives engineers to create better lives for people around the world.

Grades 3-5		Grades 6-8	Grades 9-12
Film Activity			
NGSS Disciplinary Core Ideas:	Natural Hazards Conservation of Energy and Energy Transfer		Natural Hazards
NGSS Science and Engineering Practices:	Defining Problems, Developing and Using Models, Planning and Carrying Out Investigations, Designing Solutions, Engaging in Argument from Evidence		
CCSS Strands:	Speaking and Listening: Comprehension and Collaboration		

Grades 3-5		Grades 6-8	Grades 9-12
Slender Tower Challenge Activity			
NGSS Disciplinary Core Ideas:	Developing Possible Solutions, Optimizing the Design Solution	Defining and Delimiting an Engineering Problem,* Developing Possible Solutions	
NGSS Science and Engineering Practices:	Developing and Using Models, Planning and Carrying Out Investigations, Analyzing and Interpreting Data, Using Mathematics and Computational Thinking, Designing Solutions, Obtaining, Evaluating and Communicating Information		
CCSS Strands:	Speaking and Listening: Comprehension and Collaboration		

* Activity partially covers performance expectation. Teacher may want to add to activity to meet entire performance expectation.



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Grades 3-5		Grades 6-8	Grades 9-12
My Robot Friend Activity			
NGSS Disciplinary Core Ideas:	Defining and Delimiting an Engineering Problem*		
NGSS Science and Engineering Practices:	Developing and Using Models, Planning and Carrying Out Investigations, Analyzing and Interpreting Data, Obtaining, Evaluating and Communicating Information		
CCSS Strands:	Speaking and Listening: Comprehension and Collaboration		

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Grades 3-5		Grades 6-8	Grades 9-12
Lidar: Mapping with Lasers Activity			
NGSS Disciplinary Core Ideas:			Wave Properties*
NGSS Science and Engineering Practices:		Developing and Using Models, Planning and Carrying Out Investigations, Analyzing and Interpreting Data, Obtaining, Evaluating and Communicating Information	
CCSS Strands:		Speaking and Listening: Comprehension and Collaboration	

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Grades 3-5		Grades 6-8	Grades 9-12
Designing Highway Interchanges Activity			
NGSS Disciplinary Core Ideas:	Defining and Delimiting an Engineering Problem, Developing Possible Solutions		
NGSS Science and Engineering Practices:	Defining Problems, Developing and Using Models, Planning and Carrying Out Investigations, Obtaining, Evaluating and Communicating Information		
CCSS Strands:	Speaking and Listening: Comprehension and Collaboration		



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Grades 3-5		Grades 6-8	Grades 9-12
Windy City Tower Activity			
NGSS Disciplinary Core Ideas:		Defining and Delimiting an Engineering Problem*	
NGSS Science and Engineering Practices:		Defining Problems, Developing and Using Models, Planning and Carrying Out Investigations, Analyzing and Interpreting Data, Obtaining, Evaluating and Communicating Information	
CCSS Strands:		Speaking and Listening: Comprehension and Collaboration	

Grades 3-5		Grades 6-8	Grades 9-12
Make Your Own Glue Activity			
NGSS Disciplinary Core Ideas:	Defining and Delimiting an Engineering Problem*	Developing Possible Solutions	
NGSS Science and Engineering Practices:	Planning and Carrying Out Investigations, Analyzing and Interpreting Data		
CCSS Strands:	Speaking and Listening: Comprehension and Collaboration		

* Activity partially covers performance expectation. Teacher may want to add to activity to meet entire performance expectation.

Grades 3-5		Grades 6-8	Grades 9-12
Build an Earthquake-Resistant Building Activity			
NGSS Disciplinary Core Ideas:	Developing Possible Solutions	Developing Possible Solutions Optimizing the Design Solution	
NGSS Science and Engineering Practices:	Defining Problems, Developing and Using Models, Planning and Carrying Out Investigations, Analyzing and Interpreting Data, Designing Solutions, Obtaining, Evaluating and Communicating Information		
CCSS Strands:	Speaking and Listening: Comprehension and Collaboration		



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Grades 3-5		Grades 6-8		Grades 9-12	
Build a Cable-Stayed Bridge Activity					
NGSS Disciplinary Core Ideas:					
NGSS Science and Engineering Practices:	Defining Problems, Developing and Using Models				
CCSS Strands:	Speaking and Listening: Comprehension and Collaboration				

Grades 3-5		Grades 6-8		Grades 9-12	
Dream Big Robot Challenge Activity					
NGSS Disciplinary Core Ideas:		Defining and Delimiting an Engineering Problem		Optimizing the Design Solution	
NGSS Science and Engineering Practices:		Developing and Using Models, Planning and Carrying Out Investigations, Designing Solutions, Engaging in Argument from Evidence, Obtaining, Evaluating and Communicating Information			
CCSS Strands:	Speaking and Listening: Comprehension and Collaboration				

Grades 3-5		Grades 6-8		Grades 9-12	
Lights, Camera, Engineering! Activity					
NGSS Disciplinary Core Ideas:					
NGSS Science and Engineering Practices:		Obtaining, Evaluating and Communicating Information			
CCSS Strands:	Speaking and Listening: Comprehension and Collaboration, Presentation of Knowledge and Ideas, Writing in Science and Technical Subjects: Text Types and Purposes*, Range of Writing*				

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Performance Expectations/Grade-Specific Standards

Film (Grades 3-5, 6-8, 9-12)

Grades 3-5

NGSS/MSS-3-ESS3-1

Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.

CCSS.SL.3.2

Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

NGSS/MSS-4-PS3-2

Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

NGSS/MSS-4-ESS3-2

Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

CCSS.SL.4.2

Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

NGSS/MSS-5-ESS3-1

Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

CCSS.SL.5.2

Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

Grades 6-8

CCSS.SL.6.2.

Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

CCSS.SL.7.2

Analyze the main ideas and supporting details presented in diverse media and formats (e.g., visually, quantitatively, orally) and explain how the ideas clarify a topic, text, or issue under study.

Grades 9-12

NGSS/MSS-HS-ESS3-1

Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

Slender Tower Challenge (Grades 3-5, 6-8, 9-12)

Grades 3-5

NGSS/MSS-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.

NGSS/MSS-3-5-ETS1-3

Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

CCSS.SL.3-5.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

Grades 6-8

NGSS/MSS-MS-ETS1-1

Define the criteria and constraints 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.

NGSS/MSS-MS-ETS1-2

Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.*

CCSS.SL.6-8.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

Grades 9-12

CCSS.SL.9-12.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

My Robot Friend (Grades 3-5, 6-8)

Grades 3-5

NGSS/MSS-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.*

CCSS.SL.3-5.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

Grades 6-8

CCSS.SL.6-8.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

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Lidar: Mapping with Lasers (6-8, 9-12)

Grades 6-8

CCSS.SL.6-8.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

Grades 9-12

NGSS/MSS-HS-PS4-5

Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.*

CCSS.SL.9-12.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

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Designing Highway Interchanges (3-5, 6-8)

Grades 3-5

NGSS/MSS-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.*

NGSS/MSS-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.

CCSS.SL.3-5.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

Grades 6-8

NGSS/MSS-MS-ETS1-1

Define the criteria and constraints 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.*

NGSS/MSS-MS-ETS1-2

Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

CCSS.SL.6-8.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

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Windy City Tower (Grades 6-8, 9-12)

Grades 6-8

NGSS/MSS-MS-ETS1-1

Define the criteria and constraints 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.*

CCSS.SL.6-8.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

Grades 9-12

NGSS/MSS-HS-ETS1-1

Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.*

CCSS.SL.9-12.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

*Activity partially covers performance expectation. Teacher may want to add to activity to meet entire performance expectation.

Make Your Own Glue (Grades 3-5, 6-8)

Grades 3-5

NGSS/MSS-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.*

CCSS.SL.3-5.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

Grades 6-8

NGSS/MSS-MS-ETS1-2

Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

CCSS.SL.6-8.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

*Activity partially covers performance expectation. Teacher may want to add to activity to meet entire performance expectation.

Build an Earthquake-Resistant Building (Grades 3-5, 6-8)

Grades 3-5

NGSS/MSS-3-5-ETS1-3

Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

NGSS/MSS 4-ESS3-2

Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

CCSS.SL.3-5.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

Grades 6-8

NGSS/MSS-MS-ETS1-2

Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

NGSS/MSS-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.

CCSS.SL.6-8.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

Build a Cable-Stayed Bridge (Grades 3-5, 6-8)

Grades 3-5

CCSS.SL.3-5.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

Grades 6-8

CCSS.SL.6-8.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

Dream Big Robot Challenge (Grades 6-8, 9-12)

Grades 6-8

NGSS/MSS-MS-ETS1-1

Define the criteria and constraints 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.*

CCSS.SL.6-8.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

Grades 9-12

NGSS/MSS-HS-ETS1-2

Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

CCSS.SL.9-12.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade level topics and texts, building on others' ideas and expressing their own clearly.

Lights, Camera, Engineering! Activity (Grades 6-8, 9-12)

Grades 6-8

CCSS.SL.6.1.B

Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.

CCSS.SL.6.4

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.

CCSS.SL.6.5

Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.

CCSS.SL.7.1.B

Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.

CCSS.SL.7.4

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.

CCSS.SL.7.5

Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

CCSS.SL.8.1.B

Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

Lights, Camera, Engineering! Activity (Grades 6-8, 9-12) *(continued)*

CCSS.SL.8.4

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.

CCSS.SL.8.5

Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

CCSS.WHST.6-8.2

Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.*

*Activity partially covers performance expectation. Teacher may want to add to activity to meet entire performance expectation.

Grades 9-12

CCSS.SL.9-10.1.B

Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.

CCSS.SL.9-10.4

Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

CCSS.SL.9-10.5

Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

CCSS.SL.11-12.1.B

Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.

CCSS.SL.11-12.4

Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.

CCSS.SL.11-12.5

Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

CCSS.WHST.9-12.2

Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.*

CCSS.WHST.9-12.10

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.*

*Activity partially covers performance expectation. Teacher may want to add to activity to meet entire performance expectation.