CreositySpace – Community Designers
Sustainable Cities

Activity Descriptions and Standards Alignment

General Activity Descriptions:

Below you will find brief descriptions of the hands-on activities associated with the *Green Architects* Technology Entrepreneurship Curriculum module.

Practice Activity – Designing a Green Home

Objective:

Before students start "building" their green home or building it is important that they consider what types of things go into making a building or home green.

As a class or in small groups have the students brainstorm what components they could use for their green buildings.

Main Activity – Building your Green Building

Objective:

To illustrate different methods for making a building more sustainable.

Materials:

Your imagination is really the limit on materials for this activity.

Students bring in a shoe box (or something of similar size) and something that they would throw away or recycle. You provide "building" materials (e.g. cotton for insulation, felt as recycle rugs, popsicle sticks as sustainably harvested wood, tin foil as solar panels, cupcake wrappers as rain barrels, etc.).

Education Standards Supported

Don't see the standards for your school district? Contact us at and we will determine the appropriate standards alignment for your district.

Common Core ELA Standards:

Grade 3

Reading Informational Text:

CCSS.ELA-LITERACY.RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
CCSS.ELA-LITERACY.RI.3.2 Determine the main idea of a text; recount the key details and explain how they support the main idea.
CCSS.ELA-LITERACY.RI.3.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 3 topic or subject area*.

Writing:

CCSS.ELA-Literacy.W.3.1 Write opinion pieces on topics or texts, supporting a point of view with reasons.
CCSS.ELA-Literacy.W.3.1.a Introduce the topic or text they are writing about, state an opinion, and create an organizational structure that lists reasons.
CCSS.ELA-Literacy.W.3.1.b Provide reasons that support the opinion.
CCSS.ELA-Literacy.W.3.1.c Use linking words and phrases (e.g., *because, therefore, since, for example*) to connect opinion and reasons.
CCSS.ELA-Literacy.W.3.1.d Provide a concluding statement or section.
CCSS.ELA-Literacy.W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
CCSS.ELA-Literacy.W.3.2.a Introduce a topic and group related information together; include illustrations when useful to aiding comprehension.
CCSS.ELA-Literacy.W.3.2.b Develop the topic with facts, definitions, and details.
CCSS.ELA-Literacy.W.3.2.c Use linking words and phrases (e.g., *also, another, and, more, but*) to connect ideas within categories of information.
CCSS.ELA-Literacy.W.3.2.d Provide a concluding statement or section.
CCSS.ELA-Literacy.W.3.4 With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose. (Grade-specific expectations for writing types are defined in standards 1-3 above.)
CCSS.ELA-Literacy.W.3.5 With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.
CCSS.ELA-Literacy.W.3.7 Conduct short research projects that build knowledge about a topic.
CCSS.ELA-Literacy.W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.

Speaking & Listening:

CCSS.ELA-LITERACY.SL.3.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.
CCSS.ELA-LITERACY.SL.3.1.A Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
CCSS.ELA-LITERACY.SL.3.1.B Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
CCSS.ELA-Literacy.SL.3.1.C Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.
CCSS.ELA-Literacy.SL.3.1.D Explain their own ideas and understanding in light of the discussion.
CCSS.ELA-Literacy.SL.3.3 Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.
CCSS.ELA-Literacy.SL.3.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
CCSS.ELA-Literacy.SL.3.6 Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

Language:

CCSS.ELA-LITERACY.L.3.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
CCSS.ELA-LITERACY.L.3.1.A Explain the function of nouns, pronouns, verbs, adjectives, and adverbs in general and their functions in particular sentences.
CCSS.ELA-LITERACY.L.3.2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
CCSS.ELA-LITERACY.L.3.4 Determine or clarify the meaning of unknown and multiple-meaning word and phrases based on grade 3 reading and content, choosing flexibly from a range of strategies.

Grade 4

Reading Informational Text:

CCSS.ELA-LITERACY.RI.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

CCSS.ELA-LITERACY.RI.4.2 Determine the main idea of a text and explain how it is supported by key details; summarize the text.

CCSS.ELA-LITERACY.RI.4.4 Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a *grade 4 topic or subject area*.

CCSS.ELA-LITERACY.RI.4.5 Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.

CCSS.ELA-LITERACY.RI.4.7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

Writing:

CCSS.ELA-LITERACY.W.4.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

CCSS.ELA-LITERACY.W.4.1.A Introduce a topic or text clearly, state an opinion, and create an organizational structure in which related ideas are grouped to support the writer's purpose.

CCSS.ELA-LITERACY.W.4.1.B Provide reasons that are supported by facts and details.

CCSS.ELA-LITERACY.W.4.1.C Link opinion and reasons using words and phrases

CCSS.ELA-LITERACY.W.4.1.D Provide a concluding statement or section related to the opinion presented.

CCSS.ELA-LITERACY.W.4.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

CCSS.ELA-LITERACY.W.4.2.A Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.

CCSS.ELA-LITERACY.W.4.2.B Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.

CCSS.ELA-LITERACY.W.4.2.C Link ideas within categories of information using words and phrases.

CCSS.ELA-LITERACY.W.4.2.D Use precise language and domain-specific vocabulary to inform about or explain the topic.

CCSS.ELA-LITERACY.W.4.2.E Provide a concluding statement or section related to the information or explanation presented.

CCSS.ELA-LITERACY.W.4.4 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

CCSS.ELA-LITERACY.W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

Speaking & Listening:

CCSS.ELA-LITERACY.SL.4.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.4.1.A Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.

CCSS.ELA-LITERACY.SL.4.1.B Follow agreed-upon rules for discussions and carry out assigned roles.

CCSS.ELA-LITERACY.SL.4.1.C Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.

CCSS.ELA-LITERACY.SL.4.1.D Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

CCSS.ELA-LITERACY.SL.4.3 Identify the reasons and evidence a speaker provides to support particular points.

Language:

CCSS.ELA-LITERACY.L.4.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

CCSS.ELA-LITERACY.L.4.1.A Use relative pronouns (*who, whose, whom, which, that*) and relative adverbs (*where, when, why*).

CCSS.ELA-LITERACY.L.4.2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

CCSS.ELA-LITERACY.L.4.3 Use knowledge of language and its conventions when writing, speaking, reading, or listening.

CCSS.ELA-LITERACY.L.4.3.A Choose words and phrases to convey ideas precisely.

CCSS.ELA-LITERACY.L.4.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.

Grade 5

Reading Informational Text:

CCSS.ELA-LITERACY.RI.5.2 Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
CCSS.ELA-LITERACY.RI.5.3 Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.
CCSS.ELA-LITERACY.RI.5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 5 topic or subject area*.

Writing:

CCSS.ELA-LITERACY.W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
CCSS.ELA-LITERACY.W.5.1.A Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer's purpose.
CCSS.ELA-LITERACY.W.5.1.B Provide logically ordered reasons that are supported by facts and details.
CCSS.ELA-LITERACY.W.5.1.C Link opinion and reasons using words, phrases, and clauses
CCSS.ELA-LITERACY.W.5.1.D Provide a concluding statement or section related to the opinion presented.
CCSS.ELA-LITERACY.W.5.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
CCSS.ELA-LITERACY.W.5.2.A Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.
CCSS.ELA-LITERACY.W.5.2.B Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.
CCSS.ELA-LITERACY.W.5.2.C Link ideas within and across categories of information using words, phrases, and clauses (e.g., *in contrast*, *especially*).
CCSS.ELA-LITERACY.W.5.2.D Use precise language and domain-specific vocabulary to inform about or explain the topic.
CCSS.ELA-LITERACY.W.5.2.E Provide a concluding statement or section related to the information or explanation presented.
CCSS.ELA-LITERACY.W.5.4 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
CCSS.ELA-LITERACY.W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.

Speaking & Listening:

CCSS.ELA-LITERACY.SL.5.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.
CCSS.ELA-LITERACY.SL.5.1.A Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
CCSS.ELA-LITERACY.SL.5.1.B Follow agreed-upon rules for discussions and carry out assigned roles.
CCSS.ELA-LITERACY.SL.5.1.C Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others.
CCSS.ELA-LITERACY.SL.5.1.D Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.
CCSS.ELA-LITERACY.SL.5.3 Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.

Language:

CCSS.ELA-LITERACY.L.5.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
CCSS.ELA-LITERACY.L.5.1.A Explain the function of conjunctions, prepositions, and interjections in general and their function in particular sentences.
CCSS.ELA-LITERACY.L.5.2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
CCSS.ELA-LITERACY.L.5.3 Use knowledge of language and its conventions when writing, speaking, reading, or listening.
CCSS.ELA-LITERACY.L.5.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.

Common Core Math Standards (Grades 3 – 5)

Grade 3

MP.1 Make sense of problems and persevere in solving them.

MP.2 Reason abstractly and quantitatively.

3.OA.1-3 Represent and solve problems involving multiplication and division.

3.OA.7 Multiply and divide within 100.

3MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories.

Grade 4

MP.1 Make sense of problems and persevere in solving them.

MP.2 Reason abstractly and quantitatively.

4.OA.1-3 Use the four operations with whole numbers to solve problems.

4.NBT.1 Generalize place value understanding for multi-digit whole numbers.

4.NBT.4-5 Use place value understanding and properties of operations to perform multi-digit arithmetic.

Grade 5

MP.1 Make sense of problems and persevere in solving them.

MP.2 Reason abstractly and quantitatively.

Next Generation Science Standards/NY State Science Learning Standards 3–5

Performance Expectations

3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.

3-ESS2-2. Obtain and combine information to describe climates in different regions of the world.

4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

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.

Example NGSS "Big Idea" and Topic Bundle: How can we make better choices to decrease our impact on the Earth's resources? (3-LS4-4, 3-ESS2-2, 4-ESS3-1, 5-ESS3-1) In this bundle students will learn about designing structures that use less energy, that are adapted to the environment and that improve the experience of the people who use them.

Science and Engineering Practices

Asking questions / defining problems
Developing and using models
The green building activity is all about asking how we can be more efficient and figuring exactly where the inefficiencies are.
The green building design uses everyday items to model a real system. Something scientists and engineers do at the beginning of each project.

Analyzing and interpreting data
Analysis of their own energy and waste habits involves collecting and interpreting real data
Using math & computational thinking
All the cost analysis involves math

Constructing explanations/designing solutions; Engaging in argument from evidence; Obtaining, evaluating, and communicating information
Green building activity as well as summative challenges focus on pulling together information and designing solutions that are meant to be shared

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Connections to Nature of Science
Scientific knowledge is based on empirical evidence
The effectiveness of green building design is based on measurable cost savings.
Scientific knowledge is open to revision in light of new evidence
Life cycle cost is hard to measure b/c understanding the environmental impact may be difficult to determine. As new information comes up, conclusions in this arena may change.

Disciplinary Core Ideas

ESS2.D Weather and climate
Understanding the weather in different locations influences what green design solutions are applicable.

ESS3.A Natural resources
ESS3.C Human impacts on Earth systems
ESS3.D Global climate change
LS2.A Interdependent relationships in ecosystems
Activities and videos reinforce the interconnectedness between humans and all aspects of their environment.

PS3.A Definitions of energy
Types of energy, energy efficiency and renewable energy are discussed.

ETS1.A: Defining and Delimiting Engineering Problems
ETS1.B: Developing Possible Solutions
ETS1.C: Optimizing the Design Solution
Science and technology based writing prompts, challenge questions and group activities support the three phases of Engineering Design.

The Book of Idea, along with the green building planning and design activities take students through the full cycle of concept to design.

Cross Cutting Concepts

Cause and effect;
The activity and videos emphasize environmental cause and effect as well as the concept of balancing availability and demand of resources.

Systems and system models; Energy and matter: Flows, cycles, and conservation
The activity highlights a model system based on resource balance and optimal usage.

Structure and function
Green building elements connect structure and function and also environmental impact

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Connections to Nature of Science
Science is a way of knowing; Science addresses questions about the natural and material world
Videos and introduction text give support these connections.

Science is a human endeavor
Entrepreneur story and historical timeline highlight the human aspect of science and engineering.

Connections to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology; Influence of Engineering, Technology and Science on Society and the Natural World
Introduction text, historical timeline, entrepreneur story and activities highlight above interactions and interdependencies.

Connections to Common Core State Standards
See previous Common Core Standards section for ELA and Math standards addressed by these activities.