The sky's the limit: an interdisciplinary curriculum on sustainable architecture within urban communities

Sierra Van Ryck deGroot

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THE SKY'S THE LIMIT:
AN INTERDISCIPLINARY CURRICULUM ON SUSTAINABLE ARCHITECTURE WITHIN URBAN COMMUNITIES

BY SIERRA VAN RYCK DEGROOT
The Sky’s the Limit:
An Interdisciplinary Curriculum on Sustainable Architecture
Within Urban Communities
By
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Museum Education: Childhood

Mentor:
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Abstract

The Sky's The Limit: An Interdisciplinary Curriculum on Sustainable Architecture within Urban Communities

by Sierra Van Ryck deGroot

As trees continue to fall and buildings rise in our expanding internationally-linked cities, the future of technology, design and the health of the environment rests on instilling the importance of sustainable practices in future generations. In this interdisciplinary curriculum unit designed for grades 3-5 in the New York City metropolitan area, students are studying and then developing their own models of multi-purpose skyscrapers, utilizing sustainable technologies to reduce environmental impact.

Starting with the anatomy and functions of trees, there is an explicit identification of the role of trees in our environment. Building a strong foundational understanding of the history and relevance of skyscrapers in our urban environments brings to light the rapidly advancing technological, functional and aesthetic choices being made in our cities to expand with our growing populations. Following these two foundational studies, students link together their understanding of trees and skyscrapers by drawing similarities and differences between the two structures and then taking their knowledge to develop their own models of sustainable architecture.

This curriculum unit was designed with the New York State Social Studies standards in mind, as students between third to fifth grade are studying communities, local history and government, and the history of the Western Hemisphere. Additionally, this curriculum was developed to be aligned with what students are studying in mathematics and science, in accordance with the New York State recommendations and guidelines.
This project is dedicated to my parents
who have always supported me --
no matter how outlandish my dreams became, and
to my partner and to my extended family and friends,
who believed in me and encouraged me through everything.
Imagine yourself tucked into the warm, misty cloud forest of Costa Rica, hiking along the worn paths of the people who came before you, when you find yourself stopping and looking up the large expanse of a trunk that stretches itself to the sun. Its branches and leaves spread out over the sky, touching the branches and leaves of other equally as impressive trees. As you continue to stare at this marvel of a tree, coming to understand that this tree’s life extends over centuries that you have only studied in history books. The tree, while large and awe-inspiring, also is hard at work, serving the community. At its base, the tree’s roots creep across the pathway you’re standing on and dip deep into the earth. Insects and small creatures climb in and around these roots. These roots to you make for an interesting hike, but to them it is home, their food source, their way around the expansive cloud forest. As you go further up the tree, the animals get bigger and their reliance on the tree takes a different approach. The crevices in the trees become nests, hiding spots for food and nurseries. The branches are highways and resting places. The leaves are shelter, food, and a safe space to hide. This tree is teeming with life, and appears to have been for several centuries; yet in this brief moment, you have seen centuries of interconnectedness of communities and species wrapped in the majesty of nature largely untouched.

As educators, we play a large role in teaching future generations about their roles within their communities - whether it is their families, their neighborhoods, and broader. It is imperative that we instill a sense of civic duty within our students so that they are able to make positive, conscious decisions that will impact the future of our world. This sustainability and socially conscious curriculum is centered on building the bridge between traditional children’s play with block building and a consciousness of the environment around them, which must start at a young age to instill the importance of caring for the planet.

While this curriculum unit stems from a particular sense of civic duty to the future, there is an undeniable place that architecture plays in the urban environment, especially in internationally reaching, expansive cities such as New York City, where this curriculum has been designed. Trees are often acknowledged as an important component of an urban landscape, providing a number of purposes and functions, such as “energy savings, improved air quality, aesthetics, health benefits, habitat for bird and other wildlife, and recreation enhancement. These factors are reflected in higher real estate prices, lower energy bills and greater attraction to tourists and talented people and businesses (Bradley, 1995; Dwyer et al., 1992; Orland et al., 1992 as cited in Zhu and Zhang, 2007).” This curriculum attempts to grab the interest of children who either are not exposed to significant amounts of nature at home and the curiosity of those children who are exposed to nature to fuel a study in trees, sustainability, design, and civic engagement.

This curriculum combines topics that have been tackled on their own but seemingly never
brought together. A quick search online for “green curriculum” will link you to sites such as the Green Education Foundation, “a national non-profit organization committed to creating a sustainable future through education” (Green Education Foundation, 2017), where they provide independent lessons, but not entire units focused on sustainable architecture. On the other hand, architecture curriculum units are prevalent and there are quite a few books and online resources. The Center for Architecture in New York has a sustainable green architecture school-based residency, in addition to providing professional development opportunities focusing on green architecture (The Center for Architecture, 2017) to New York City educators. Every March, there is a Green Schools Conference and Expo which provides a national two-day conference for educators and school administrators to “connect with green school champions for two days of learning and collaboration to support equitable, healthy and high-performing schools, where students can learn how to improve the world” (Green School Conference and Expo, 2017). What this curriculum provides is a flexible format that focuses not solely on trees nor solely on architectural practices, but combines both, requiring an interdisciplinary, reflective approach to sustainable education.

We, as educators, recognize the importance of providing opportunities for students to explore and see the world around them. As technology becomes more prevalent in our everyday lives, we look to provide additional tangible outlets of creativity and exploration that provide opportunities for students to use their hands to manipulate materials for creation, as well as being present and consciously involved in their communities. This curriculum looks to cover half a year, split between different subject matter during the week, in addition to read-alouds and periodic outings. During these outings, the children are able to leave the classroom and take a deeper look into their neighborhoods. This experience helps students take what they are learning in the classroom and apply it outside, in efforts to help expand awareness of the community, the urban environment, and their role in it all. The Center for Information & Research on Civic Learning and Engagement (CIRCLE) identify that “individuals with higher levels of education tend to be more civically engaged” (2007). In their research, while conducted for high school students, found that students who engaged in community service performed to meet course requirements or on a voluntary basis had a positive effect by 3.3 percent on their
By encouraging awareness and engagement in their communities at a young age, students gain a stronger understanding of community and ownership.

New York City is not called the concrete jungle for no reason, as children and their families travel on public transportation, walk on the bustling sidewalks, and drive through the endless maze of the New York City streets, one can't help but notice when there is not much nature around them and when there is. In 2007, New York City created the MillionTreesNYC initiative "to plant and care for million trees in New York City (NYC Parks, 2017)." The initiative was completed in 2015 and was part of a resurgence of interest in the urban forest of the city. Even then, there are still those who are not fortunate to live in areas bordering a major park such as Central Park, Brooklyn Bridge Park, and Battery Park or they are able to get in contact with the shoreline or they can reach one of the fantastic botanical gardens in the Bronx or Queens to get a truly immersive experience with nature and trees. While this is a generalized sample of where children can get in contact with nature, this curriculum strives to bring children into these spaces, as well as encouraging them to observe and acknowledge the rising heights of the city.

On almost every street, you can see scaffolding and construction as the city, pushed out to its physical borders, climbs upwards and below to manage the growing numbers of residents, students, commuters, tourists and everyone in between. Often, more people means more waste, more energy, more water usage and this puts a strain on the environment. However, many of the more recent constructions have acknowledged the challenges of New York City, and designers, architects, and engineers alike have been creating and developing innovative, sustainable and aesthetically different structures. In this curriculum, we not only study trees and their role in the environment, students will be studying the history of skyscrapers in the city and follow the rapid increase of technology and design that has led to the cityscape that exists today. Students will be looking at case studies of iconic buildings such as the Empire State Building and the 1 World Trade Center tower and will even learn about design from a prominent sustainable architecture firm during an in-class visit. Ultimately, we can only hope that these discussions and explorations will lead to more "green" children and eventually, "green" adult citizens. Our overarching unit topic is “Sustainability” as we want to cater this experience to the individuals in the class. A letter will go home to the parents and guardians in the beginning that will provide an overview of the upcoming units of study and ask them for their assistance in building the curriculum into a cooperative study between home and school.
Dear Educator,

The Sky’s the Limit: An Interdisciplinary Curriculum on Sustainable Architecture within Urban Communities Using Trees is an introductory approach to the prevalent issues of sustainability, eco-friendly living, and sustainable architecture. Each one of those topics could be a full year unit on their own, but this half-year unit allows for your third to fifth-grade students to get an opportunity to experience trees and architecture simultaneously while making conscious decisions about the community and the world they live in.

The Sky’s the Limit is a flexible framework for your classroom, as you can add to and expand lessons as you see fit for your students. Focused on the New York City metropolitan area, this curriculum could easily be adapted for another city or fitted for a suburban/rural school environment where students may not be exposed to skyscrapers as often. The field trips are all easily adaptable, with the New York Botanical Garden trip and the 1 World Trade Center visits being easy to change out with any local institutions in your area. The same goes for the visit from the sustainable architecture firm, as there are many across the country and internationally.

This curriculum unit seeks to be stimulating for students creatively, mentally, physically, and socially. Students will be drafting, building, cutting, writing, charting, walking, and collaborating on the various activities and final project for the unit, which neatly culminates with a presentation of their buildings. I hope that you truly read this curriculum and make it truly your own for your classroom and region. As they say, the sky is the limit.

Sincerely,

Sierra Van Ryck deGroot
Curriculum Developer
Common Core Standards

Third Grade
CCSS.ELA-LITERACY.W.3.1: Write opinion pieces on topics or texts, supporting a point of view with reasons.

CCSS.ELA-LITERACY.W.3.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

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.

CCSS.ELA-LITERACY.RI.3.5: Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.

CCSS.ELA-LITERACY.RI.3.7: Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate an understanding of the text (e.g., where, when, why, and how key events occur).

CCSS.MATH.CONTENT.3.G.A.1: Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides) and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

CCSS.MATH.CONTENT.3.G.A.2: Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.

Fourth Grade
CCSS.ELA-LITERACY.RL.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.RL.4.7: Make connections between the text of a story or drama and a visual or oral presentation of the text, identifying where each version reflects specific descriptions and directions in 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.4.3: Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the 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.

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

CCSS.ELA-LITERACY.W.4.4: Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience. (Grade-specific expectations for writing types are defined in standards 1-3 above.)

CCSS.ELA-LITERACY.W.4.5: With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing. (Editing for conventions should demonstrate command of Language standards 1-3 up to and including grade 4 here.)

CCSS.ELA-LITERACY.W.4.6: With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of one page in a single sitting.

CCSS.ELA-LITERACY.W.4.7: Conduct short research projects that build knowledge through investigation of different aspects of a topic.

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.
Fifth Grade
CCSS.ELA-LITERACY.RI.5.7: Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

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.MATH.CONTENT.5.MD.A.1: Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

In accordance with NYC Blueprint for Visual Arts 5th grade Art Making Benchmark.

Fifth Grade:

Students begin sequential unit projects; extend knowledge of art media and compositional and design elements; choose new way of using familiar tools and materials; and deepen imaginative capacities, observational and expressive skills.

Students hone observation skills and discuss works of art; develop visual arts vocabulary to describe art making, the tools and techniques used to produce art, and the elements and principles of design; read and write about art to reinforce literacy skills; interpret artwork by providing evidence to support assertions; reflect on the process of making art.

Students recognize the societal, cultural and historical significance of art; connect the visual arts to other disciplines; apply the skills and knowledge learned in visual arts to interpreting the world.

By working with a variety of school staff, students access primary resources in the community, the borough, and the city to extend their learning beyond the classroom.

Students gain an awareness of careers in visual arts; recognize personal, social and professional goals; develop a career plan; learn to work independently and in teams; gain an appreciation of art as a source of enjoyment and lifelong learning.
GOALS AND OBJECTIVES:
Learn the parts of a tree and understand their basic functions in relationship to the development of the tree.
PROCEDURE:
1. Start off the lesson, by asking students to create a K-W-L (Know, Want to Know, Learned) chart in their journals. On the K (Know) side of the chart, ask students to fill out everything they know about trees. If they need additional space, have them put it on a separate page. Then on the W (Want to Know) chart in their journals, have them put in any questions they may have about trees. Feel free to give examples such as “How do trees eat?” “Why are different trees different shapes?”

2. Have students share out their thoughts in small groups to try to get the answers for their Ws for approximately five minutes.

3. Distribute to each student a worksheet with a tree and flower. Give students approximately five minutes to complete this worksheet independently.

4. After completing the independent work time, as a class, have the students correctly identify and label these parts of a tree and flower.

VOCABULARY
- Bark
- Bud
- Flower
- Fruit
- Leaf
- Roots
- Seed
- Tree
- Trunk

MATERIALS
Tree and flower worksheet
Crossword puzzle
Pencil
Journals
5. If not discussed during the labeling, assign a small group of students a part of a tree or flower to find out what the function of it is. This could be a table discussion or a take home assignment to be discussed the next day. After the small group research, the cumulative answer should be shared with the entire class as a whole.

6. Give each student a crossword puzzle with the vocabulary. If any students feel as if they have answered some of their questions in the W section, have them fill out what they learned in the L (Learned) portion of their chart. Remind them that as they go along, they should be adding to the L of their chart.

ADAPTATIONS:
UNIVERSAL DESIGN COMPONENTS:

1. **Presentation:** This lesson is fairly explicit in expectations; however, through the use of individual work and small group discussion, students of varying abilities should be able to participate. Teachers should be checking in on students to get a sense of where each student is comprehending the material, as to make sure that the following lessons are at an appropriate level of challenge and engagement for most, if not all, students.

   A. Auditory: Students will be able to listen to their peers and teachers as they comment and inquire about trees. Teachers will model content-related vocabulary words and appropriate implementation of these words.

   B. Visual: This lesson allows for the individual development of their K-W-L charts, so that is accessible and personalized to each student's experience with trees. Questions and comments will be recorded on a SMART Board or other content display board in the classroom so that the information is accessible to visual learners. When applicable, the teacher will use visuals and pictures so that content presented is concrete.

   C. Physical: Students will be able to move around and position their bodies in a manner that most comfortable to them as they do their work.

2. **Expression:** The entire lesson is focused on the individual experience, so students are encouraged to share their thoughts, previous experiences, knowledge, concerns, and feelings through their oral and written language. Teachers will ask open-ended questions throughout the lesson as to encourage students to share their personal experiences or ask questions in a safe, comfortable manner. If there are students with expressive challenges, they will have an opportunity to turn and talk to a partner or with a teacher before sharing aloud so that they can plan out and practice what they would like to share.

3. **Motivation/Engagement:** By prompting students to write down everything that they know about trees, students are reflecting on their acquired knowledge to make connections to this aspect of the unit.

ASSESSMENT/EVALUATION:
In order to best assess students, students should be able to bring in a picture or object of an
assigned part of the tree and describe why this part of the tree was important to the tree’s development in their journals, as well as discuss this during class.

EXTENSIONS TO OTHER ACTIVITIES/ROUTINES/CLASSROOM EXPERIENCES:

**Literacy:** Students will be able to read content-related books in the classroom library to gather more information.

**Language Arts:** Teachers will incorporate and encourage the use of the content-related vocabulary into daily conversations and encourage students to ask questions and make comments on what they notice about trees throughout the unit.

**Art:** Instead of a traditional K-W-L chart, a student could draw out a tree K, W, L chart with the roots as the K, the trunk of the trees are the W, and the L would be the leaves. They could do this individually on a plain piece of paper or it could be a large-scale class project.

**Home:** Students will be encouraged to communicate with their families about what they know about trees. Students will also be encouraged to make note of the number of trees in their communities.
LES SSON TWWO
INTRODUCTION TO
SKYSCRAPERS

GOALS AND OBJECTIVES:
• Identify the characteristics of the skyscraper
• Learn about what makes a skyscraper versus a tall building
PROCEDURE:

1. Have students distribute magazines, construction paper, and scissors. Instruct students to independently open a spread of blank pages (two facing blank pages) in their notebooks, labeling the left page with the word “Skyscrapers” and “Tall Buildings” on the right page. Ask students to find examples of each and place them on the sides, but do not glue them down.

2. Once students have completed their comparison, have students discuss in small groups about why they had chosen to place certain buildings in particular locations. Try to see if the group can come to a consensus about why one building may be placed in one area and why another would be put somewhere else. Ask the groups to share out what they found across their work.

3. After they have completed this, pull up the two videos about what makes a skyscraper versus a tall building.

4. After watching the videos, give students the opportunity to correct their clippings and paste them correctly on either side, using glue or tape.

5. After discussing the skyscrapers, distribute and have the students work on the Skyscraper Detectives worksheet independently and then check them in small groups.

6. Complete the worksheet together as a class using a SmartBoard or a whiteboard.

7. Hand out the combined crossword puzzle for homework or transitional material.

ADAPTATIONS:

1. **Presentation:** This lesson incorporates media and multi-modal activities for the students to engage in learning and demonstrate their background knowledge.

   1. Auditory: The students will be listening to their peers, in addition to two short videos on the history and
development of skyscrapers. The teacher will model content-related vocabulary words and appropriate usage of term. Students will be encouraged to share their observations and ask questions about skyscrapers and tall buildings.

2. **Visual:** The two videos allow students to make visual observations about the nature of skyscrapers. Students will be able to assemble their own collages about skyscrapers and tall buildings, allowing for visual recognition and comprehension of the structures.

3. **Physical:** Students will be able to cut, examine and paste their own collages about skyscrapers and tall buildings. During this activity and the videos, students will be able to position themselves in a way that would be most comfortable, but safe for them, especially with the handling of cutting implements. Assistance with cutting will be available with a teacher or adult.

**2. Expression:** The students will have the opportunities to share their thoughts, comments, concerns and feelings about the content through their oral language. The teachers will ask open-ended questions as well as opinion questions in order for students to share their knowledge about the subject matter as well as expressing themselves. Children with limited oral language abilities will be able to express their knowledge through collage, as well as with teacher/adult support to organize and address their comments/or questions when necessary.

3. **Motivation/Engagement:** As we work to bring these two seemingly different aspects of life together, we will be encouraging students to make inferences about why we may be studying skyscrapers and trees and what that may lead to as the lesson develops.

**ASSESSMENT/EVALUATION:** Have students find their own building in the city and write whether it is a skyscraper or not a skyscraper and how they know. This can be either written in the journals or as an independent writing assignment.

**EXTENSIONS TO OTHER ACTIVITIES/ROUTINES/CLASSROOM EXPERIENCES:**

**Literacy:** Students will be able to read content-related books in the classroom library to gather more information.

**Language Arts:** Students will be encouraged to write about why they chose certain buildings for the collages. They should be using descriptive language and content-related vocabulary words when speaking about skyscrapers and tall buildings.

**Art:** The students will be able to use the art materials in the classroom to draw examples of buildings for further understanding of the difference.
GOALS AND OBJECTIVES:
• Learn how trees make food and oxygen through their growth and development
• Learn how trees fight air pollution
• Learn how many products we use and rely on come from trees
• Discuss the importance of trees in the environment

LESSON THREE
TREES ANALYSIS
**PROCEDURE:**

1. Before the class, assign students to complete a scavenger hunt in their home. Depending on class size, feel free to split up the list so that students are bringing in a selection of things. Have them bring in their objects in a paper bag. If the object is too large, have them bring in a photograph or magazine/newspaper clipping of the object.

2. Begin the class with a review of the parts of the tree. Put on the video from NOVA about photosynthesis.

3. After students finish the video, have them turn and talk to someone next to them about what they saw. After the turn and talk, encourage a class discussion of the video. Make sure to make note of the idea of “solar power”. Ask students what they know about solar power and sustainability. Use answers and build on them to reach the definition. Use solar power as an example of sustainability.

4. Bring out the scavenger hunt and the paper bags. Have students split into small groups to discuss and split up the objects into two groups - whether the objects are tree-based products and whether they are not.

5. Have each group discuss why they felt that way about their selections. Keep a chart on the SmartBoard/whiteboard or chalkboard so that students are able to see. Have students make a duplicate chart in their notebooks and follow along with the discussion.

6. After that (the trick is that they are all tree products), have students separate their objects based on Wood-based, Food, Bark-based, Paper, Cellulose. Go through each section and explain what it is. Have students record their findings in their notebooks or on chart paper.

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**VOCABULARY:**

- Chlorophyll
- Deciduous
- Evergreen
- Greenhouse Effect
- Photosynthesis
- Respiration
- Smog
- Solar Power
- Sustainable
- Transpiration
- Environment
- Environmentalist

**Materials:**

- Video of Photosynthesis (NOVA | PBS)
- Pencils
- A Copy of the Lorax
- Scavenger Hunt Worksheet
7. After the discussion on tree products, read students the Lorax by Dr. Seuss. After reading the Lorax, lead a guided discussion on the Lorax, asking students to figure out how all of the previous lessons may be related.

8. Prepare students for the trip to the New York Botanical Garden, by explaining the tour, the travel to the location and prompting them that they’ll be bringing their journals to write about how they feel about sustainability in that setting, as well as the conservation of trees. Allow them to write in their journals and collect (with the permission of the staff) droppings from the trees. If they can’t collect things, they can draw them.

ADAPTATIONS:

UNIVERSAL DESIGN COMPONENTS:

1. **Presentation:** This lesson has a home and class component, as well as being highly interactive. Students will be looking at the vocabulary they had learned in the previous lesson as a way of clarifying vocabulary and activating background knowledge. This lesson is highly visual and interactive and includes a strong auditory component with the group work so that students will be able to speak and listen to one another. Students will be able to see the categories and the objects being placed in them so that they can process that information in a way that is comfortable for them. Students will also be participating in a read-aloud so that they are able to sit and absorb information in a way that is most comfortable for them.

2. **Expression:** There are ample opportunities for students to express themselves in this lesson, as they sort out the objects and discuss their reasoning with classmates. Students will be sharing through small group discussion and they will be able to write or draw their chart in a way that is most helpful for them.

3. **Motivation/Engagement:** Students are collecting their own objects, making their own inferences and developing their own charts, so they are fairly invested in the responses and subject matter. Getting to discuss in small groups will be a great way for students to get to collaborate and share information among peers.

ASSESSMENT/EVALUATION:

Students will be assessed based on their involvement in the scavenger hunt, the objects/clippings they bring in, their chart composition,
as well as their discussion following the reading of the Lorax.

**EXTENSIONS TO OTHER ACTIVITIES/ROUTINES/CLASSROOM EXPERIENCES:**

**Literacy:** Students will be able to read content-related books in the classroom library to gather more information.

**Language Arts:** Teachers will incorporate the relevant vocabulary into the daily conversations and encourage students to ask questions and make comments on their observations about trees and tree derivatives throughout the school day.

**Art:** Students can use art supplies to make a small flip book of the different kinds of tree products that we encounter in our everyday lives.

**Home:** Students will be encouraged to communicate with their families about different products that come from trees, especially if it is not on the scavenger list.
LESSON FOUR
NEW YORK BOTANICAL GARDEN VISIT
PROCEDURE:

1. Prior to the visit, share with your NYBG educator the lesson plan so that they can prepare and supplement the visit with appropriate vocabulary and visual/tactile examples.

2. Prompt students to make observations about how the animals and environment responded to the presence of the trees.

ADAPTATIONS:

UNIVERSAL DESIGN COMPONENTS:

1. Presentation: This field trip experience will allow for the students to engage in learning and demonstrate their knowledge in multiple ways. This field experience has several entry points:

   A. Auditory: The students will be listening to an educator and the teacher. The teacher and the NYBG educator will model content-related vocabulary words and appropriate usage of the terms. Students will be encouraged to share their observations and ask questions throughout the trip.

   B. Visual: Students will be able to make visual observations throughout the field trip. They will also be able to demonstrate their knowledge through drawings and recordings in their journals.

   C. Physical: The students will be able to hold and examine items from the botanical garden. During these activities, students will also be able to position themselves in a way that is most comfortable for them but is safe for them and the plant life. Students with mobility issues will be accommodated with the assistance of the NYBG and a chaperone so that they can have the most accessible and pleasant experience.

2. Expression: Students will have ample opportunities to share their thoughts, concerns, observations and feelings orally and through their writing. The teachers and NYBG educator will ask open-ended
questions as well as opinion questions in order for the students to share their knowledge as well as express their thoughts and feelings. Students with varied language abilities will be able to express themselves on through writing and drawing, as well as additional chaperone support to organize their thoughts and recordings.

3. **Motivation/Engagement:** Since we have been discussing trees and plants, students are interested in the experience of getting to see some species and variations of trees that they may not get to encounter in their everyday life. This hands-on activity is engaging for all students.

**ASSESSMENT/EVALUATION:**
Students will be assessed on their involvement and journaling on the trip.

**EXTENSIONS TO OTHER ACTIVITIES/ROUTINES/CLASSROOM EXPERIENCES:**
**Literacy:** Students have been asked to collect their observation in their journals and may be asked to connect their observations to some of the books they may be reading in the classroom.

Language Arts: The students will be discussing their field trip experience with peers, teachers and their families. They will also be encouraged to use content-related vocabulary and descriptive language when speaking about the experience.

Art: Students will be able to use the art materials in the classroom to draw about the trip during a review activity.

Home: The students will be encouraged to speak about the field trip experience with their families, friends, and neighbors. Students will also be encouraged to share their trip journaling with their families to initiate discussion about the preservation of trees and plants.
LESSON FIVE
SKYSCRAPER ANALYSIS

GOALS AND OBJECTIVES:
• Learn about and identify different forms of architecture
• Identify different buildings and their styles of architecture
• Describe the function and purpose of a building
PROCEDURE:

1. Using the “Do You Know These Buildings” powerpoint, have students try to identify and then make careful observations about the buildings, in their journal. Ask students to think about what their function may be. Have them be as detailed as possible.

2. Reviewing the buildings after looking at the powerpoint, there should be a guided discussion on the purpose of these buildings, bringing in the vocabulary as much as possible.

3. Use the video of the Empire State Building to discuss the history of buildings and their purposes. Talk about older buildings making way for skyscrapers and the implications of this. Predict which would make more money. Talk about safety, neighborhood, location, etc.

4. Once it has been established that buildings have purposes and functions, students will bring back out their notes from the botanical garden. Prompt students in their groups to discuss the purpose of trees in their environment. As a class, discuss how trees are similar to buildings and how they are dissimilar. Have students make a Venn diagram with trees on one side and buildings on the other.

5. Have them complete these Venn diagrams independently in their notebooks. Afterwards, hand out notecards with different building functions and purposes on them. Have enough to distribute at least one or two to each student. Put students into small groups, and have them discuss the purposes that they have gotten on their card and whether not it would be successful in a skyscraper, where in the building would it be most successful, and why do some skyscrapers serve a particular function better than others.

6. In their small groups, have students draft their own skyscraper using as many of their notecards as possible. After drawing their design, have the group compose a paragraph or two about why they designed their building this way.

7. Following their design process, talk about the kind of environmental impact that their building may have. Ask them how much water they think they’d be using, how many tree products daily, weekly, or even yearly.

VOCABULARY:
Commercial
Function
Mixed Use
Public
Residential
Bar Graph
Circle Graph

MATERIALS:
Do You Know These Buildings Powerpoint
Empire State Building video (https://www.youtube.com/watch?v=SjVYTKkUai4&t=97s)
Project Sheet
Blank Notecards
Notecards with functions on them
8. Have students go home and over a weekend, make note of the number of times that someone used water in their house, what were these uses, how many times electricity was used, the number of times someone took out the garbage, how many garbage cans are in the house, is there recycling, how many times was the recycling taken out, what kinds of things were recycled, etc.

9. When students return, ask them if they can explain what a pie chart or a bar graph is and why they would be useful. Then, explain how these charts and graphs are excellent visual tools to help us visualize what numbers represent. Discuss with students their data. Using examples from the class, show them how to use the different kinds of charts. Explain the difference between a pie/circle chart and bar graphs. Have students try their hand at creating a graph of their own with their data.

10. After drafting the charts, ask students again how much they think that skyscraper uses in water, waste, power, etc. Ask students what the difference between a skyscraper and tree is, having them reflect on their Venn diagrams and bringing their observations into a whole group setting. Introduce the word sustainable and ask students what they know about the term sustainable or the term "green".

11. Explain that a prominent sustainable architecture firm will be coming to visit to discuss the importance of sustainable architecture. Have students write out on notecards what questions they have for the architects and the design process, reflecting on the use charts we made.

12. Hand out the project sheets and answer any questions that may arise from them.

**ADAPTATIONS: UNIVERSAL DESIGN COMPONENTS:**

1. **Presentation:** This lesson is interactive and highly visual, but does incorporate a fair amount of auditory elements. As the first activity is just a fun way for students to look at different architecture in the New York City area, the goal is not guess all of the buildings, but for students to think about aesthetics as well as functions of buildings. The notecard exercise is an interactive small group work where students can express themselves through oral communication, as well as visual implementation of their skyscraper functions. The third component of the lesson focuses on the collection of data and charts.

   A. Auditory: Students will listen to peers, the teacher, and the video to access the content in this lesson. Teachers will model content-related vocabulary and appropriate usage of these words.

   B. Visual: This lesson has a strong visual component with the video, drawing, and chart development, so that information will be readily available for visual learners. When applicable, the teacher will use additional visuals and pictures so that the content presented is more concrete, especially with the chart development.

   C. Physical: Students will be able to move around as they work in their small groups, as well as position themselves in a manner that is most comfortable to them during the video.
2. **Expression:** Students will have ample opportunities to share their thoughts, observations, concerns and feelings through oral expression, as well as through drawing and writing. Teachers will ask open-ended questions during the lesson and activities to encourage students to share their own personal experiences with skyscrapers and the New York City metro area.

3. **Motivation/Engagement:** Students are getting to engage with the city around them in the beginning of the lesson and are creatively thinking about the design and usage of skyscrapers. They are doing a short “case study” on the Empire State Building to see how one of the most iconic buildings in the world was developed and came to be. Students are able to make a lot of autonomous decisions in their development of the group skyscraper, which highly motivates them at this age. Using their expressive language to interact and engage with the content by asking questions, making inferences and making text-to-self connections will aid students in accessing the content.

**ASSESSMENT/EVALUATION:**
Students will be assessed in the lesson based on their involvement and recorded observations in the “Do You Know This Building” activity, their interest and interaction with their group’s notes and observations from the New York Botanical Gardens, the development of their Venn diagram, their involvement in the building a skyscraper activity, as well as their data collection and chart development. This is a complex lesson, so there are ample opportunities for students to be formally and informally assessed in this, especially since this
is the point where the tree curriculum comes to meet with the skyscraper curriculum.

EXTENSIONS TO OTHER ACTIVITIES/ROUTINES/CLASSROOM EXPERIENCES:

Literacy: Students will be encouraged to write questions or draw pictures on a post-it and place it up on an "Urban Forest of Questions" in front of the classroom so that the teacher can reference their inquiries and address them in class. Students will also be encouraged to read content related books in the classroom library to gather more information.

Language Arts: Teachers will incorporate the relevant vocabulary into the daily conversations and encourage students to ask questions, make inferences and note the usage of terms "sustainable", "eco-friendly" and "green". Students will be encouraged to journal about things they see with these labels and how they make them feel.

Art: Student could use different art materials to create their own construction paper skyscrapers.

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**Different Building Functions:**

- Law offices
- Doctor's office
- Hospital
- Shopping Mall
- Convenience Store
- News Offices
- Playground
- Police Station
- Supermarket
- Elementary School
- Residence
- Gymnasium
- A Penthouse Suite
- Television Studio
- Coffee Shop
- Pizza Parlor
- Book Store
- Laundromat
- Post Office
- Subway Station
- Fancy Restaurant
- Museum
LESSON SIX

A VISIT FROM A SUSTAINABLE ARCHITECTURE FIRM

GOALS AND OBJECTIVES:

• Learn about how architects and engineers are developing sustainable architecture presently

• Learn about the design process and how to create a basic blueprint
PROCEDURE:

1. When contacting a firm, do so as early as possible as many are very busy throughout the year. When contacting the firm, be as honest and specific as you can be about why you would like them to come out. Some firms have education initiatives in place and will have their own curriculums that they and you can adjust to fit the needs of your class and this curriculum unit. If they don’t, you can work with them to develop a session where they can discuss their work and you can collaborate with the art teacher or another group to do the design basics and/or blueprint.

The session should cover:

A. What is sustainable architecture and what are some practices going on now (Bring examples!!)

B. What is the design process for creating a skyscraper

C. Designing a blueprint

2. Make sure the students ask their questions so that they are able to have them answered going forward into their work.

ADAPTATIONS:

UNIVERSAL DESIGN COMPONENTS:

1. Presentation: Students will be reviewing the vocabulary that they have been learning and using in previous lessons as a way of clarifying vocabulary and scaffolding for additional content-specific vocabulary that the firm may incorporate in their lesson.

2. Expression: Students will be able to express themselves through designing their blueprint and oral communication with the representatives of the firm and their peers. As they had already received their project sheets in advance, students are already thinking about their skyscraper and its various purposes and functions.

3. Engagement: Students will be able to ask their own questions that they developed for the representatives so they are already interested in the response and subject matter. Getting to ask questions is an excellent way for students to further engage with the content.
ASSESSMENT/EVALUATION:
Students will be evaluated based on their attentiveness to the workshop and their involvement in the blueprint designing activity. Students will be assigned to complete a draft blueprint of their skyscraper for homework.

EXTENSIONS TO OTHER ACTIVITIES/ROUTINES/CLASSROOM EXPERIENCES:
- **Literacy**: Students will be able to read content-related books in the classroom library to gather more information about the design of buildings.
- **Language Arts**: Teachers will incorporate the relevant vocabulary into the daily conversations and encourage students to ask questions and make comments on their design process and sustainability efforts throughout the school day.
- **Art**: Students could use various art supplies to supplement their drawings. Students will also be encouraged to create thank you cards and invitations to the final presentation day for the representatives of the firm.
- **Home**: Students will be encouraged to communicate with their family, friends and neighbors about their design process to get suggestions and ideas about the development of their building.
LESSON SEVEN
VISIT TO 1 WORLD TRADE CENTER AND THE OCULUS
PROCEDURE:
1. Prepare students for the visit by allowing them to research the website for the building in advance, either in class or at home. Encourage them to develop questions in their notebooks for the educator when they arrive.
2. When arriving, have students walk through the space before they begin the lesson with the museum educator.

ADAPTATIONS:

UNIVERSAL DESIGN COMPONENTS:
1. Presentation: This field trip experience will allow for the students to engage in learning and demonstrate their knowledge in multiple ways. This field experience has several entry points:

   A. Auditory: The students will be listening to an educator and the teacher. The teacher and the World Trade Center (WTC) educator will model content-related vocabulary words and appropriate usage of the terms. Students will be encouraged to share their observations and ask questions throughout the trip.

   B. Visual: Students will be able to make visual observations throughout the field trip. They will also be able to demonstrate their knowledge through drawings and recordings in their journals.

   C. Physical: During these activities, students will also be able to position themselves in a way that is most comfortable for them, but is safe for them and the other patrons. Students with mobility issues will be accommodated with the assistance of the WTC and a chaperone, so that they can have the most accessible and pleasant experience.

2. Expression: Students will have ample opportunities to share their thoughts, concerns, observations and feelings orally and through their writing. The teachers and WTC educator will ask open-ended questions as well as opinion questions in order for the students to share their knowledge as well as express their thoughts and feelings. Students with varied language abilities will be able to express themselves on
through writing and drawing, as well as additional chaperone support to organize their thoughts and recordings.

3. **Motivation/Engagement:** Since we have been developing and designing our own sustainable skyscrapers, students are interested in the experience of getting to see a working operating example of a multi-use skyscraper that they may not get to encounter in their everyday life. This hands on activity is engaging for all students.

**ASSESSMENT/EVALUATION:**
Students will be assessed on their involvement and journaling on the trip.

**EXTENSIONS TO OTHER ACTIVITIES/ROUTINES/CLASSROOM EXPERIENCES:**

**Literacy:** Students have been asked to collect their observation in their journals and may be asked to connect their observations to some of the books they may be reading in the classroom.

**Language Arts:** The students will be discussing their field trip experience with peers, teachers and their families. They will also be encouraged to use content-related vocabulary and descriptive language when speaking about the experience.

**Art:** Students will be able to use the art materials in the classroom to draw about the trip during a review activity.

**Home:** The students will be encouraged to speak about the field trip experience with their families, friends and neighbors. Students will also be encouraged to share their trip journaling with their families to initiate discussion about the importance of sustainable, multi-use skyscrapers.
GOALS AND OBJECTIVES:
• Reinforce the knowledge of the design process
• Learn how to constructively critique other people’s work
PROCEDURE:
1. Discuss how individuals were feeling about the process and answer any lingering questions.

2. Show students how to critique someone else’s work.

3. Have students bring in their blueprints and have them set up in the most accessible location for everyone to get to see one another’s work.

4. Hand out a small stack of post-it notes to students. Split the class into two groups. Have Group A stand with their designs, ready to share their process and what their thought process was. Group B will go around with their sticky notes and pencils and write out comments and constructive critiques of the pieces. Leave adequate time for the groups to switch roles.
5. Once everyone has received critiques, they may make changes as they see fit and in small groups, they can discuss their works and the challenges they may be having.

ADAPTATIONS:

UNIVERSAL DESIGN COMPONENTS:

1. **Presentation:** This lesson is open-ended to the extent that it is essential for it interactive and participatory dependent on the students. Students will be encouraged to review the vocabulary that they have been learning and implement it in their critiques. Students will be speaking and listening to one another, in addition to the teacher, and they will be writing down their questions, in addition to hearing them, so that they can process the information in a way that is most comfortable for them.

2. **Expression:** Students are encouraged to utilize oral communication and written language heavily in this lesson. This lesson is really focused on the individual, as well as the cumulative experience with the project.

3. **Engagement:** At this point, students should be well into their building development and they should have plenty of questions about their design for their peers, in addition to being interested in what other people are incorporating in their buildings. Collaboration is important to the design process and this is reaffirming that feeling.

ASSESSMENT/EVALUATION:

Students will be assessed on their involvement and interaction with the critique and the following collaborative work period.

EXTENSIONS TO OTHER ACTIVITIES/ROUTINES/CLASSROOM EXPERIENCES:

Literacy: Students will be able to read content-related books in classroom library to gather more information.

Mathematics: Students will be encouraged to make scales and measurements for their buildings, to be shown on their blueprints, for a deeper understanding of the work that goes into modeling the buildings.

Language Arts: Teachers will incorporate the relevant vocabulary into the daily conversations and encourage students to ask questions and make comments on their design process and sustainability efforts throughout the school day.

Home: Students will be encouraged to communicate with their family, friends, and neighbors about their design process to get suggestions and ideas about the development of their building.
What is a critique?

A critique is an oral or written discussion strategy used to analyze, describe, and interpret works of art. Critiques help students hone their persuasive oral and writing, information-gathering, and justification skills.

Provide direction and guidance with the critique to ensure that students stay on task and address the purpose and objectives of the lesson.

Below is a sample set of focus questions for an art critique related to four major areas of art criticism: description, analysis, interpretation, judgment. (The number of questions and aspects of specificity will vary according to the art form and number of works in the critique).

Description

Describe the work without using value words such as "beautiful" or "ugly":

What is the written description on the label or in the program about the work?

What is the title and who is (are) the artist(s)?

When and where was the work created?

Describe the elements of the work (i.e., line movement, light, space).

Describe the technical qualities of the work (i.e., tools, materials, instruments).

Describe the subject matter. What is it all about? Are there recognizable images?

Analysis

Describe how the work is organized as a complete composition:

How is the work constructed or planned (i.e., acts, movements, lines)?

Identify some of the similarities throughout the work (i.e., repetition of lines, two songs in each act).

Identify some of the points of emphasis in the work (i.e., specific scene, figure, movement).
If the work has subjects or characters, what are the relationships between or among them?

**Interpretation**

Describe how the work makes you think or feel:

Describe the expressive qualities you find in the work. What expressive language would you use to describe the qualities (i.e., tragic, ugly, funny)?

Does the work remind you of other things you have experienced (i.e., analogy or metaphor)?

How does the work relate to other ideas or events in the world and/or in your other studies?

**Judgment or Evaluation**

Present your opinion of the work's success or failure:

What qualities of the work make you feel it is a success or failure?

Compare it with similar works that you think are good or bad.

What criteria can you list to help others judge this work?

How original is the work? Why do you feel this work is original or not original?
GOALS AND OBJECTIVES:
• Provide structured in-class time for further development of their multi-purpose buildings
• Allow students to collaborate and ask questions about their progress
PROCEDURE:
1. Allow students to spread out and make space for themselves to further develop their buildings or their essays for the presentation.

2. Instruct students that this is a time to collaborate with other students, ask for advice from one another or a teacher, and to get work done on their projects. As there are two scheduled work periods, you may designate one for working on the building and the other for working on the essay.

VOCABULARY:
N/A

MATERIALS:
Crafting supplies such as glue, pencils, scissors, markers, construction paper, etc.
**ADAPTATIONS:**

**UNIVERSAL DESIGN COMPONENTS:**

As this is an open-ended work period, students will be encouraged to write, talk, listen and interact with one another for the improvement and development of each other’s buildings. Students will be allowed to move to areas that may allow for more comfortable discussion and work, as long as the supplies they are using are safe in that area and they are able to do productive work on whichever aspect of the assignment they are working on at that time. Students are now reaching the cumulative point in the unit and they should be totally invested in the development and description of their skyscraper.

**ASSESSMENT/EVALUATION:**

Students will be assessed based on their attentiveness to their project and involvement in their work.
GOALS AND OBJECTIVES:
• Develop and encourage public speaking skills
• Learn how to articulate one’s thought process and reasoning for deliberate design choices
PROCEDURE:
Depending on the nature and size of your classroom, you may have individual presentations of buildings or have the buildings all set up with their designers, standing by to present them to guests (such as parents and friends).

VOCABULARY:
N/A

MATERIALS:
A desk or table for the buildings to be displayed on

ADAPTATIONS:
UNIVERSAL DESIGN COMPONENTS:
1. Presentation: As this presentation is dependent on what students bring to the table (literally), students are going to be utilizing their vocabulary that they had learned in the previous lessons as a way of communicating their ideas. Students of varying ability levels will be able to present the content in this lesson through an oral presentation,
the visual blueprints and 3-D model (as well as any additional visuals), and their written component. These components make the lesson accessible to all learners, as students are able to read, see and write about their experiences with these presentations.

2. **Expression**: This presentation is entirely student expression. Students are encouraged to ask open-ended questions of their peers, in addition to those that may be posed by teachers, families, friends and invited guests in attendance. For students who may have stage-fright or linguistic challenges, they may be allowed to tape their presentation in advance, as well as ample time to practice their presentation in advance before presenting in front of the class.

3. **Motivation/Engagement**: This is the culminating aspect of the lesson plan, so students will be highly engaged with the content and how they are going to share their ideas through the development of the building.

**ASSESSMENT/EVALUATION:**
Upon turning in their buildings and essays, students will be assessed on their construction and implementation of different sustainability measures, as well as the organization of their buildings. For their essays, students will be assessed on the composition of their work, grammar, clarity of their explanations of their buildings and originality.

**EXTENSIONS TO OTHER ACTIVITIES/ROUTINES/CLASSROOM EXPERIENCES:**
Literacy/Language Arts: Students can create their own "viewbooks" of their buildings, by
making a book of all of the different features and functions of their building to sell it to prospective buyers or clients. Students will be using text-to-self analysis in developing these books.

Community Building: Students can assemble their buildings together to create a sustainable skyscraper city and talk about any changes that would need to be made to make their community even more sustainable.

Citizenship: The entire class can opt to fundraise and donate a tree to a park in the surrounding community through NYC Parks.
GLOSSARY AND APPENDICIES
APPLICATIONS

While this lesson plan is developed with a head teacher in a third to fifth grade classroom setting in mind, this unit and the various lessons included could be adapted to be taught in an after-school programming setting or in an outreach program setting. In addition to the extensions to other activities that is included in the majority of the lesson plans, this unit can be adapted to encourage visual inquiry of tree and skyscraper inspired artworks, a in-depth study of biomes, and/or encouraging student citizenship.
GLOSSARY

Bark
the exterior protective covering of a tree

Bud
a swelling on a branch or twig that develops into a leaf or flower

Flower
the reproductive unit of a seed-bearing plant

Fruit
a ripened seed with tissue around it

Leaf
a tree foliage unit where food production occurs through photosynthesis

Roots
underground growth that extracts water, oxygen, and nutrients from the soil and provides structural support

Seed
part of a flowering plant capable of growing into a new plant

Tree
a tall woody plant, usually with a single trunk and a leafy crown

Trunk
the main stem of a tree where nutrients are transported

Base
the distinctively treated lowermost portion of any construction, as a monument, exterior wall, etc.

Proportion
proper relation between things or parts
**Reinforced Concrete**
concrete that contains steel bars or metal netting to increase its strength

**Skeleton Frame**
a system of columns and beams that supports the weight of a building

**Skyscraper**
a building of exceptional height completely supported by a framework, from which the walls are suspended

**Story**
a floor or level of a building

**Chlorophyll**
pigments that produce the green color of leaves

**Deciduous**
a plant that loses its leaves at the end of the growing season

**Evergreen**
a plant that retains most of its leaves year-round

**Greenhouse Effect**
the trapping of excess gasses in the atmosphere that increases the average temperature

**Photosynthesis**
the process by which green plants make sugar, aided by sunlight, carbon dioxide, minerals and water

**Respiration**
the processing of nutrients and oxygen in a plant resulting in water, energy and carbon dioxide

**Smog**
a combination of smoke, fog, and automobile and industrial exhaust

**Solar Power**
energy harnessed from the sun
Sustainability
a method of managing or using a resource so that the resource is not depleted or permanently damaged

Transpiration
the release of water vapor from plants into the air

Environment
the external conditions that affect the development of an organism

Environmentalist
a person working to solve environmental problems

Commercial
a building used for business purposes, such as office buildings or stores

Function
a use or purpose; in this context, function indicates how a building is used

Mixed Use
buildings that combine residential, commercial, and/or public purposes

Public
a building that is used by all members of the community, such as public libraries or community gardens

Residential
a building people live in, such as an apartment building

Bar Graph
a graph consisting of vertical or horizontal bars whose lengths are proportional to amounts or quantities

Circle Graph
a circular graph divided into sectors proportional to the magnitudes of the quantities represented
**Firm**

a partnership or association for carrying on a business

**Blueprint**

a design plan or other technical drawing
RESOURCES

CHILDREN’S FICTION BOOKS ON RELATIONSHIPS WITH TREES


BOOKS ON BECOMING AN ARCHITECT/ENGINEER

BOOKS ON NATURE

BOOKS ON ARCHITECTURE

BOOKS ON NEW YORK CITY

BOOKS ON COMMUNITY BUILDING

CHILDREN’S NON-FICTION BOOKS ON ARCHITECTURE

BOOKS ON BECOMING AN ARCHITECT/ENGINEER


BOOKS ON SKYSCRAPERS

BOOKS ON COMMUNITY

BOOKS ON INDIVIDUALS MAKING A DIFFERENCE
TEACHER’S PREPARATION MATERIALS
MATERIALS ON TEACHING DESIGN AND THE DESIGN PROCESS

MATERIALS ON ARCHITECTURE

MATERIALS ON TREE-RELATED INITIATIVES/ SUSTAINABILITY

MATERIALS ON SKYSCRAPERS
SUPPLEMENTAL LESSON MATERIALS
MATERIALS ON COMMUNITY BUILDING

MATERIALS ON AN ARCHITECTURE COMPETITION (RECOMMENDED FOR GRADES 5 AND UP, BUT CAN BE ADAPTED)

MATERIALS ON TREES AND COMMUNITY INVOLVEMENT
WORKS CITED


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Labeling Plants

Name: _____________________________
A Tree or Not a Tree?
Scavenger Hunt

Can you find these items in your house? In a paper bag, bring in all of the items you can and if it is too big for the bag or you can’t bring it in, put a picture or magazine clipping of the object in the bag instead. Happy Hunting!

- Paper towels
- Almonds
- Rubber Bands
- Pencil
- Newspapers
- Baseball bat
- Chewing Gum
- Suntan Lotion
- Shampoo
- Notebook Paper
- Book
- Cork Bulletin Board
- Maple Syrup
- Crayon
- Rayon Clothes
- Carpet
- Toilet Paper
- Wrapping Paper
- Chop Sticks
- Vanilla Extract
- Electrical Tape
- Popsicle Stick
- Sponge (synthetic)
- Plywood
- Tools or tool handles
- Kitchen Cabinets
- Car or Bike Tire
- Camera Film
- Toothpaste
- Fruit
- Wine Cork
- Coffee filters
Directions: Investigate the images to decide which of these five structures are skyscrapers. You will need to use the four characteristics of skyscrapers as clues. Each time you find a clue, check a box.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Does it have a skeleton frame?</th>
<th>Does it have floors that can be occupied?</th>
<th>Does it have an elevator?</th>
<th>Is it taller than buildings around it?</th>
<th>Is it a Skyscraper?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bankers Trust</td>
<td></td>
<td></td>
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<td></td>
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<td>Empire State</td>
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<td>Eiffel Tower</td>
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<td>Time Warner Center</td>
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<td>Statue of Liberty</td>
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The Sky’s the Limit: Multi-Use Building Project
In class we have been studying trees and skyscrapers, discussing them separately and their roles in our daily lives. This project will allow us to further explore the concept of sustainability in building and development.

Part One: Constructing a Multi-Use Building
Similar to what we have been doing in class, you will be constructing a multi-use building. For this part of the assignment, we ask that you:

1. Develop a Blueprint utilizing skills from the class with the sustainable architecture firm.
2. Using recycled materials, construct a stable skyscraper that will be able to have multiple functions/purposes.
3. Using recycled materials, show the different functions and purposes of the building within the model.
4. Show how your skyscraper will be a green and sustainable building by adding different sustainable and green methods to your model.

**PART ONE CHECKLIST:**

<table>
<thead>
<tr>
<th>Task</th>
<th>Due</th>
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<tbody>
<tr>
<td>Develop a Blueprint</td>
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<tr>
<td>Construct a Building using recycled materials</td>
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<tr>
<td>Show the different uses of your building in the model</td>
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<tr>
<td>Include green and sustainable methods to your building</td>
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Part Two: Presenting About Your Building
After constructing and developing your building, you will be presenting it in class. For this part of the assignment, we ask that you:

1. Write five paragraphs about your sustainable skyscraper, emphasizing its:
   1. Originality in design
   2. Green and sustainable procedures in place
   3. What functions/purposes are in your building and why you placed each purpose on that particular level of the building?
2. Be prepared to present for 1 to 2 minutes about your building, making sure you can highlight the important aspects of the building.

**PART TWO CHECKLIST:**

<table>
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<th>Task</th>
<th>Due</th>
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<tbody>
<tr>
<td>Write five paragraphs about your sustainable skyscraper</td>
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<tr>
<td>Prepare a 1 to 2 minute presentation about your skyscraper</td>
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With a construction cost of $50 million, this is one of the least expensive, yet still most celebrated, cultural institutions in the city.

Borough: Manhattan
Purpose: Museum
Answer: New Museum
This building is made of a series of perfect squares, including massive 10-by-10-foot windows and floors that measure 90 feet wide and long.

Borough: Manhattan
Function: Residential
Answer: 432 Park Avenue
This project is clad in 12,000 rusticated metal panels. If you can get tickets, you should try to see a basketball game or one of the amazing concerts that are housed in this Brooklyn design. Besides its unusual façade, this building has one of the largest green roofs in the city, covering three acres — about half the size of Madison Square Park.

Answer: Barclays Center
One of the city’s newest skyscrapers, it measures exactly 1776 feet. On most floors, this building has eight sides, rather than the typical four. When completed, it restored not only offices to the site but also the famed observation deck. Yet it only attracted 2.3 million visitors its first year, 30 percent below projections.

Answer: One World Trade Center
At 870 feet tall, this was briefly the tallest residential building in the city and the hemisphere. In this feat of modern construction, 10,500 rippling stainless-steel panels, no two of which are the same.

Borough: Manhattan
Purpose: Residential
Answer: New York by Gehry
Its jagged concrete facade may look like it was assembled from pieces, but it was actually cast in special formworks on site. It’s one of forty of these types of buildings in the city, but is easily the most striking. We are most grateful for it in the snowy wintertime.

Borough: Manhattan
Purpose: Salt Shed
Answer: Spring Street Salt Shed
Most people don't think of this borough as being a place to find new significant building design, but this building was product of a city-led design competition in 2006 to inspire other developers to create more sustainable, more attractive below-market housing.

Borough: Bronx
Purpose: Residential
Answer: Via Verde
Most architecture and design firms are run by men. However, this is an example of the growing number of women-led firms. The canted windows in shifting blue tones of this 12-story, 47-unit condominium are meant to evoke both the artistic energy of the neighborhood and the current of the Hudson River.

Borough: Manhattan
Purpose: Commercial
Answer: Chelsea Modern
This building borders the East River, but it is not a residential building. Rather this impressive building, holds a variety of readable goods.

Borough: Queens
Purpose: Library
Answer: Queens Library at Hunters Point
This building is all about reclaiming the old and making it new. It features three stories of glass on top of an former market. If you are lucky enough to snag some cozy accommodations, the walls feature custom wallpaper and the beds are made of the wood from the old ceilings.

Borough: Brooklyn
Purpose: Hotel/Commercial
Answer: Wythe Hotel
This landmark is in the center of it all. Hopefully, you don't bump into a creepy Elmo or weird Hello Kitty on your way there.

Borough: Manhattan
Purpose: Commercial
Answer: Times Square plaza
This building is not rectangular like the others. However, you can sleep in it.

Borough: Manhattan
Purpose: Residential
Answer: Via 57 West