SOCIETY OF ARCHITECTURAL HISTORIANS
SAH ARCHIPEDIA
ROTUNDA

TITLE: READING A BUILDING

SUBJECTS/TOPICS: AMERICAN HISTORY, ARCHITECTURE, SOCIAL STUDIES

GRADE LEVEL: 3-5 (2 CLASS PERIODS)

AUTHOR: DANIELLE WILLKENS, PH.D.

LESSON OVERVIEW

Buildings do not come with captions or user manuals, so architects and architectural historians must rely on their ability to read a building. During the exercises presented in this scaffolded lesson plan, students will begin to develop the necessary skills for decoding the rich architectural world around them by learning how to read architecture. With these skills, it will be easier for students to frame essential questions for conducting research on specific buildings while they, simultaneously, develop the tools for working 'in the field' and exploring the world of architecture, independently.

The exercises presented here offer three main ways to read architecture: (1) using physical building artifacts, whether they be complete buildings, fragments or ruins, (2) using drawings, whether from the original architects, designers, and/or engineer or 'as-built' drawings that record the building at a particular time, and (3) using texts, such as primary (letters, personal descriptions, historic structures reports and surveys, etc.) and secondary (books, critiques, etc.) sources. The lesson's products are also divided between analog elements (drawings, annotation exercises, etc.) and digital explorations (online research and digital modeling).

GUIDING QUESTIONS

What is architecture?

What does it mean "to read a building"?

LEARNING OBJECTIVES

Apply architectural vocabulary associated with classical architecture.

Analyze building structures to identify their historic architectural influences, or their architectural 'genealogy.'

LESSON OVERVIEW, CONTINUED

As students continue to study, they will discover that the world of architecture is full of diverse projects: buildings and structures are different because of their cultural, geographic, and historic associations. This is why many of today's architects specialize in distinct building types, although it is possible to have an architectural practice that creates all different types and scales of buildings. Additionally, many architectural historians specialize in certain time periods and regions so that they can fully understand the context of the architecture. By presenting students with a broader survey with several different projects and styles, students will understand why it is essential to have experts with specialties in certain building types or historic eras.

You will also need to develop your skills of visual attentiveness. Have you have used 'contextual clues' in your English class? When you are reading a sentence and do not recognize a new vocabulary word you can often use elements from the surrounding passage to decipher the meaning of the unfamiliar word. Similarly, as you explore a building you may find that there are components that you do not quite understand, so you must look for contextual clues. Just like expanding your reading comprehension skills or mastering a new language, learning how to read a building takes time, practice, and patience, but the rewards are extraordinary!

CONTENT STANDARDS

English Language Arts: Reading: Informational Text

Grade	Key Ideas and Details	Craft and Structure	Integration of Knowledge and Ideas	Range of Reading and Level of Text Complexity
3	**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.3.3** Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.	**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.3.6** Distinguish their own point of view from that of the author of a text.	**CCSS.ELA-LITERACY.RI.3.7** Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur). **CCSS.ELA-LITERACY.RI.3.8** Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence).	
4	**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.4.3** 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.4.4** 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. **CCSS.ELA-LITERACY.RI.4.8** Explain how an author uses reasons and evidence to support particular points in a text. **CCSS.ELA-LITERACY.RI.4.9** Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.	**CCSS.ELA-LITERACY.RI.4.10** By the end of year, read and comprehend informational texts, including history/social studies, science, and technical texts, in the grades 4-5 text complexity band proficiently, with scaffolding as needed at the high end of the range.

5	CCSS.ELA-LITERACY.RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the 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. **CCSS.ELA-LITERACY.RI.5.5** Compare and contrast the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in two or more texts.	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.RI.5.8** Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s). **CCSS.ELA-LITERACY.RI.5.9** Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.	CCSS.ELA-LITERACY.RI.5.10 By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 4-5 text complexity band independently and proficiently.

English Language Arts: Speaking & Listening

Grade	Comprehension and Collaboration	Presentation of Knowledge and Ideas
3	**CCSS.ELA-LITERACY.SL.3.2** Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally. **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.3.5** Create engaging audio recordings of stories or poems that demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details. **CCSS.ELA-LITERACY.SL.3.6** Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification. (See grade 3 Language standards 1 and 3 here for specific expectations.)
4	**CCSS.ELA-LITERACY.SL.4.2** Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally. **CCSS.ELA-LITERACY.SL.4.3** Identify the reasons and evidence a speaker provides to support particular points.	**CCSS.ELA-LITERACY.SL.4.4** Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. **CCSS.ELA-LITERACY.SL.4.5** Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.
5	**CCSS.ELA-LITERACY.SL.5.2** Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally. **CCSS.ELA-LITERACY.SL.5.3** Summarize the points a speaker makes and explain how each claim is supported by reasons and evidence.	**CCSS.ELA-LITERACY.SL.5.4** Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace. **CCSS.ELA-LITERACY.SL.5.5** Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or theme

PREPARATION

Familiarize yourself with SAH Archipedia (https://sah-archipedia.org/), by exploring the website and reading the HISTORY and FAQ sections. In order to understand certain elements of architecture and their meanings, students must become familiar with new vocabulary. Please see the "Architectural Vocabulary" PDF document.

The activities in the following matrix rely on the following SAH Archipedia resources, which are referred to throughout the lesson as **Building Set 1, 2, or 3**:

1. *Classical architecture, reinterpreted*
    These buildings use two of the most famous structures in the classical world as inspiration for New World experiments.
    o   The Parthenon (1920-1931) in Nashville, TN
        ▪   Originally built for the 1897 Tennessee Centennial Exposition, this reproduction of the Athenian Parthenon is entirely made of concrete and still serves a tourist population.
    o   Rotunda, University of Virginia (1826, with several additions, renovations, and restorations) in Charlottesville, VA
        ▪   Unlike the Roman Pantheon's original purpose as a temple to all the gods, the Rotunda at the University of Virginia represented Thomas Jefferson's vision for a temple to knowledge to help educate the citizens of the Early Republic. Although the building underwent several additional, renovations, and restorations, it is still an active library within the university's grounds.

2. *References to home in the colonial world:*
    These buildings allow students to explore the impacts of colonization and remembrance.
    o   Mission Nuestra Señora (1934) in Goliad, TX
        ▪   Reconstructed in the 1930s to resemble a mission church, this site demonstrates a different approach to historic preservation as well as the translation of the architecture of Catholic churches in Spain to the colonial frontier.
    o   Wren Building (1695-1699; with several additions, renovations, and restorations) in Williamsburg, VA
        ▪   As one of the first institutions for higher learning outside of the northeast, this structure resembles some of the work of English astronomer-architect Sir Christopher Wren.

3. *Vernacular and natural environment, reinterpreted*
    These buildings took familiar forms and reinterpreted them into architectural icons.
    o   Denver International Airport (1995) in Denver, CO
        ▪   Instead of a massive transportation center in concrete, this airport references its location through an unexpected structure said to resemble both the mountains and the regional architecture.
    o   Vanna Venturi House (1960-1963) in Chestnut Hill, PA
        ▪   As one of the architect's first projects, this structure reimagines the forms and features of a 'traditional' house.

ACTIVITIES

Can you read a building? How about an architectural drawing? The following activities will help you decode a few significant buildings within the American landscape and these skills in reading architecture can, then, be used to explore other buildings. If you know what to look for, works of architecture have the wonderful ability to speak across the ages in order to give us clues about the people, values, and priorities of different cultures and eras. Each of these activities follow a Bloom's Taxonomy progression:

- remember and understand (define, duplicate, list, classify, describe, discuss, locate);
- apply and analyze (demonstrate, sketch, organize, question, compare/contrast, critique);
- evaluate and create (present, construct, adapt, design, hypothesize, write).

Several of these activities offer the opportunity to explore digital graphic manipulation and this will be particularly beneficial for schools with Adobe Creative Cloud subscriptions. There are exercises that could be modeled digitally using SketchUp. There are SketchUp for Schools options for browser-based modeling.

Activity #1 The Language of Architecture
- Read SAH Archipedia entry for the Rotunda at the University of Virginia.

- You will have a copy of a worksheet with the Ancient Roman Pantheon and the early 19th century Rotunda at the University of Virginia.

- Use the Architectural Vocabulary resource and see if you can identify and label the following elements on the worksheet:
    - architrave
    - base
    - capital
    - column
    - cornice
    - entablature
    - frieze
    - intercolumniation

- Next to the labels on the worksheet, write a short definition of the term in your own words.

- Although the Pantheon and Rotunda are similar, how are they different? Use the terms above to explain the projects in your own words. Craft a three-sentence comparison.

- This exercise can be repeated for the Athens and Nashville Parthenons.

Extension:
The students are learning how to identify specific architectural elements within built works. For an extension activity, students could explore buildings in their hometown and then create an annotated architectural vocabulary worksheet that shows specific elements in situ. For this exercise, the architectural dictionaries noted in the Bibliography will be beneficial resources.

Activity #2   Geometry and Order

- Read about the SAH Archipedia entries for the projects in Building Set #1.

- Now, using Google's image search feature, find images of both projects. Try to find images that show the building from elevational views (e.g. straight on), from 3/4 perspective (e.g. the corner), and from above to give a sense of the project's scale and context. For the last view, try using Google Earth on the satellite view. Give original names to your collected images and then add these to a digital folder.

- Using the collected images, create a single sheet of images of the Rotunda and another for the Nashville Parthenon. These sheets, on a canvas of 8x11" or 11"x17", could be composed in graphic design software such as Adobe Creative Cloud's Photoshop or GIMP freeware, but this exercise could also be completed using PowerPoint. If any of these programs are new, their respective websites have great introductory tutorials and tips; plus, YouTube can be a helpful resource for basic functions such as copy, paste, crop, scale, and other transform tools.

- In the printouts, identify the main shapes in the architectural projects. First do this through a visual assessment, then use a sheet of tracing paper to craft the main shapes over the printouts. What are the main architectural forms that make the building's composition?

- Now that you've identified key forms, use your printouts and carefully cut out the identified shape and architectural forms, practicing dexterity and planning. You may have to decide what shapes you cut out first in order to not cut into other forms on the architectural composition. Since there may be some errors, you may want to have extra copies ready.

- Classical architecture is a compositional kit of parts: can you make a new design that combines elements from the Rotunda and the Parthenon? This is your architectural chimera (a mythical Greek hybrid consisting of a lion's head, goat's body, and serpent's tail).

- Present your work to the class, using the proper architectural vocabulary to describe your design.

Extension:
To translate the buildings from 2D photographs and drawings to 3D structures, students could use their geometric assessments to create models of the building in paper or cardboard.

To explore the ancient precedents, there are models in the 3D Warehouse and Thingverse that may be useful to explore 3D modeling and even creating 3D prints of classical architecture elements, ranging from models of columns to full models of the Parthenon and Pantheon.

Activity #3   Reading a Plan

- Read about the SAH Archipedia entries for the projects in Building Set #3.

- Learning how to read an architectural drawing is like learning a new language: there are some conventions, or standards, in architectural drawings that are important to know. The three main types of architectural drawings that we'll explore are elevations, plans, and sections. These are commonly used as construction drawings for the creation of building. We also use these drawings to record existing buildings.
  - An **elevation** is a view of the exterior of a building. Unlike we see buildings in person, or even through the lens of a camera, elevations show buildings without any perspective distortion.
  - A **plan** is a horizontal slice through a building, typically taken at 4'-0" so that it does not cut through key elements of furniture such as tables and chairs.
  - A **section** is a vertical slice.

- Look at the drawings provided of the Vanna Venturi House, and see if students can identify the different rooms on the first floor. Can you identify what two types of architectural drawings are shown here? On a worksheet with the drawings, complete the exercise below:
  - Color code the drawings: circle all the doors in blue and all the windows in green. Can you see how the elements align between the two drawings? Use red and a straightedge to draw the regulating lines between the drawings. See if you can identify other detail elements on the drawings: bedroom, bathroom, kitchen, stairs, and fireplace. (There is a key provided below).

- Using these architectural drawings as a guide, can you draw the plan of your classroom? Make sure you include walls, windows, and doors. If you want an extra challenge, see if you can also draw the furniture, such as desks and chairs.

Extension:
The students are learning how to read, and create, architectural drawings. For additional resources, the following is particularly useful: Ching, Frank. *A Visual Dictionary of Architecture*. Hoboken, NJ: Wiley, 2011.

If students are making their own architectural drawings, graph paper can be quite useful to help with alignments. Depending on the skill level of the class, you can also assign a scale to the grid (e.g. 1 square = 6") so they can create a measured drawing. For an advanced graphic challenge, tape graph paper to a table then place tracing paper on top. Using straightedges (e.g. rulers, architectural scales, drawing triangles, etc.), the students can craft their drawing and when removed from the graph paper underlay, it will look like a much more sophisticated, crisp construction. Enhance the drawing with line weight and type: use a pencil with a higher 'hardness' rating (+2H) to create the base sketch then go over the lines with a pencil with a higher 'blackness' rating (+2B) or fine line graphic pens/markers. Students can darken the 'cut' lines of the plans or sections, known as poche, and they can use dashed lines to show any elements that are above the 4'-0" cutline, such as lighting fixtures, changes in the ceiling plane, etc. All of these drawing conventions, and more, are explored in the Ching text.

Activity #4 Collective Critical Reading and Creative Writing

- As a class, read the SAH Archipedia entries for the projects in Building Set #1 and annotate the texts on the board, calling out key words, essential vocabulary (including unknown words), and the 'tombstone' information for the projects (name, date, place, architect, significance). The SAH Archipedia entry could be projected digitally and students could take individual notes while the teacher records notes on a common board; or students could have printed copies of the SAH Archipedia entry and use this for annotations.

- Now, individually, develop an original narrative where you imagine visiting one of the buildings at the time it was built. In your story, you should incorporate the building name, date, location, and at least three new vocabulary words that you learned from the SAH Archipedia entry. Draw your visitor to the building, and on the side write a short description of your visitor: how old are they, what is their occupation, and what brought them to the site? Then write a short description of your visitor's impression of the building. Finally, craft a sketch of your impression of the building through the eyes of your visitor. This imaginary visitor exercise is an opportunity to think about different types of visitors: the changing experiences of men or women, who wouldn't have been able to visit these sites and why, or even what the experience would have been for an enslaved worker at the Rotunda. This shows use that architectural history has many perspectives, largely dependent on access and social class.

- Let's take this exercise a bit further and write another narrative imaging your own visit to the building. As 21st century citizens, how and why would we experience the buildings differently than if we could visit them at their time of construction? What do you think the ancient architects and builders of the Pantheon and Parthenon would think about the reinventions of the Rotunda and the Nashville Parthenon?

- Finally, present your work to the class.

Extension:
Ask the students to imagine themselves as architectural historians. Firstly, establish a definition for this profession. From the perspective of an architectural historian, consider the following questions:
  - Should we consider one building more important than the other because it is older?
  - Do you think the architects and builders of the 18th and 19th century reinventions were just 'copying'? Why or why not?
  - Can we fully understand the reinvented building without understanding the ancient precedent?
  - How can knowledge of the reinvention enhance our understanding of the ancient precedent?

Activity #5 Critical Reading and Collage, v2

o   As a class, read the SAH Archipedia entries aloud for the structures in Building Set #1 and annotate the text as a group, calling out key words, essential vocabulary (including unknown words), and the 'tombstone' information for the project (name, date, place, architect, significance). The SAH Archipedia entry could be projected digitally and students could take individual notes while the teacher records notes on a common board; or students could have printed copies of the SAH Archipedia entry and use this for annotations.

o   Now, individually or in small groups, research the precedents for these buildings:
  ▪   Nashville Parthenon = Parthenon on the Athenian Acropolis in Greece
  ▪   UVA's Rotunda = Pantheon in Rome, Italy

o   Your research should use a combination of printed resources in the library and online resources. You should collect images as well as key facts about the construction and significance of the buildings (both the precedent and the American reinventions). In preparation for the next part of the exercise, either print the collected images or get ready to create a digital collage, using a piece of graphic manipulation software. Ideally, you will be able to use programs such as Adobe Creative Cloud's Photoshop or GIMP freeware, but this exercise could also be completed using PowerPoint. If any of these programs are new, their respective websites have great introductory tutorials and tips; plus, YouTube can be a helpful resource.

o   Create an original diptych (images presented as complements, example above) showing one of the ancient precedents (Pantheon OR Parthenon) and its respective American reinvention. Now, make a second diptych as a collage: that answers the following questions:
  ▪   How do you think the tools for design and construction changed between the ancient building and the 19th/20th century building?
  ▪   What did the American architects and builders have access to that was unavailable in ancient Greece or Rome?
  ▪   How are the buildings different in terms of materials, the use of color, or how the buildings are used (the architectural "program")?

For an advanced challenge, complete this exercise with Building Set #2 or 3 since this will require more advanced investigative skills to see the connections between the projects and their respective precedents: students will have to move beyond aesthetics to look at additional elements within SPEAR.

Extension:

Instead of just a digital collage, see if the students can make a 3D diptych.

For an advanced challenge, complete this exercise with Building Set #2 or 3. This will require more advanced investigative skills to see the connections between the projects and their respective precedents: students will have to move beyond aesthetics to look at additional elements within SPEAR:

- *Structure*
  - Are there key elements of the building that are innovative, unique, or problematic?
  - What are the structural techniques and construction methods? Are they conventional?
  - Is the building in a location that makes structural issues more important to the design?
  - Has the building ever failed? How? Why?
  - E.g., materials, building load
- *Program*
  - What was the building used for? What is the building's typology?
  - Who used the building? Who did not? Has the program changed?
  - E.g.: typology, adaptive reuse (how the building changed, such as the ancient Pantheon from a temple to all the Roman gods to a Catholic church and tourist site)
- *Economics*
  - Who funded the design/construction of the building (patron)?
  - How and why is the building maintained (e.g. why do we still value it)?
- *Aesthetics*
  - What are the key visual elements of the building?
  - Is the building conventional or atypical for the time and/or place?
  - E.g.: color, light and shadow, materiality
- *Region*
  - Where is the building located?
  - Did the location (climate, orientation, culture) have a strong impact on the design?
  - E.g.: globalism, sustainability (orientation, ventilation)

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Bibliography for Building Sets

Building Set #1A: Parthenon in Nashville, TN and the Parthenon in Athens, Greece

- Print:
  - Beard, Mary. *The Parthenon*. Rev. ed ed. Cambridge, MA: Harvard University Press, 2010.
- Online:
  - http://www.britishmuseum.org/visiting/galleries/ancient_greece_and_rome/room_18_greece_parthenon.aspx
  - http://www.acropolisvirtualtour.gr
  - https://www.ancient-greece.org/architecture/parthenon.html
  - https://www.britannica.com/topic/Parthenon
  - https://www.archdaily.com/803931/ad-classics-the-parthenon-ancient-greece-ictinus-callicrates
  - https://www.metmuseum.org/art/collection/search/10482
  - https://www.metmuseum.org/art/collection/search/12263
- Images:
  - Engravings of "Temple Du Parthenon A Athenes" from Hector d'Espouy's *Fragments D' Architecture Antique* Volume II (1900), Public Domain
  - Greyhound advertisement (1935), Public Domain
  - https://commons.wikimedia.org/wiki/File:The_Parthenon,_Nashville_TN_(6274940873).jpg
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Building Set #1B: University of Virginia's Rotunda, Charlottesville, VA and the Pantheon in Rome, Italy

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  - o [Thomas Jefferson's Drawings of UVA at the Massachusetts Historical Society](#)
  - o [Thomas Jefferson's Drawings of UVA at the University of Virginia's Special Collections](#)
  - o https://www.archdaily.com/802201/ad-classics-roman-pantheon-emperor-hadrian
  - o https://www.archdaily.com/800786/ad-classics-university-of-virginia-thomas-jefferson
  - o https://www.metmuseum.org/art/collection/search/348799
  - o https://www.metmuseum.org/art/collection/search/459349
- Images:
  - o Holsinger Studio photographs of the [Rotunda and Lawn](#), [Rotunda South Facade](#), [Rotunda on Fire](#)
  - o Reconstruction of the Pantheon in Rome (1553) published by Antonio Lafreri, Public Domain
  - o View of the Pantheon (c. early 1670s) by Lievin Cruyl (1634-1720), Public Domain
  - o Postcard of the Pantheon (ca. 1907-1914), Public Domain
  - o Color postcard of the Pantheon (ca. 1907-1914), Public Domain

Building Set #2A: Mission Nuestra Señora, and other related resources

- Print:
  - o Christensen, Pixie. *Lone Star Steeples: Historic Places of Worship in Texas*. College Station, TX: Texas A&M University Press, 2016.
  - o Early, James. *Presidio, Mission, and Pueblo: Spanish Architecture and Urbanism in the United States*. College Station, TX: Texas A&M University Press, 2004.
  - o Kennedy, Roger G. *Mission: The History and Architecture of the Missions of North America*. edited by David Larkin. Boston, MA: Houghton Mifflin, 1993.
  - o Moorhead, Gerald, ed. *Buildings of Texas: Central, South, and Gulf Coast*. Charlottesville, VA: University of Virginia Press, 2013.
- Online:
  - o https://tshaonline.org/handbook/online/articles/uqn16
  - o http://www.texasmissionguide.com/about-the-missions/
- Images
  - o Goliad Chamber of Commerce

Building Set #2B: Wren Building in Williamsburg, VA, and other related resources

- Print:
  - o Darn, Harold and Robert Mark. "The Architecture of Christopher Wren." *Scientific American* 245, no. 1 (1981): 160-75.
  - o Dearstyne, Howard. *The Wren Building of the College: Architectural History*. Colonial Williamsburg, VA: Architects' Office, The Colonial Williamsburg Foundation, 1950, revised 1951.
  - o Jardine, Lisa. *Ingenious Pursuits: Building the Scientific Revolution*. London: Little, Brown, 1999.
  - o Jardine, Lisa. *On a Grander Scale: The Outstanding Career of Sir Christopher Wren*. London: Harper Collins, 2002.
  - o Wilson, Richard Guy, ed. *Buildings of Virginia: Tidewater and Piedmont*. Oxford: Oxford University Press, 2002.

- Online:
  - o https://www.wm.edu/about/history/historiccampus/wrenbuilding/
  - o https://www.archdaily.com/558958/spotlight-sir-christopher-wren
- Images
  - o Wren Building photograph (c. 1934-1950) by Thomas Hadley, Public Doman
  - o Bodleian plate, illustrating the College of William and Mary (c. 1781-1782), Public Doman

Building Set #3A: Denver International Airport, and other related resources

- Print:
  - o Fentress Architects. *Now Boarding: Fentress Airports + the Architecture of Flight*. Edited by Donald Albrecht. Denver, CO: Denver Art Museum in association with Scala Publishers, 2012.
- Online:
  - o https://www.architonic.com/en/project/fentress-architects-denver-international-airport/5100647
  - o https://fentressarchitects.com/projects/denver-international-airport
  - o http://rci-online.org/wp-content/uploads/2006-cts-barden.pdf
  - o https://cozine.com/2014-september/dia-story-behind-tents/
- Images
  - o Roof detail, Public domain
  - o Interiors, Public domain
 - o Interior, Fentress Architects

Building Set #3B: Vanna Venturi House, and other related resources

- Print:
  - o Schwartz, Frederic, ed. *Mother's House: The Evolution of Vanna Venturi's House in Chestnut Hill*. New York, NY: Rizzoli, 1992.
  - o Venturi, Robert. *Complexity and Contradiction in Architecture*. New York, NY: Museum of Modern Art, 1966.
- Online:
  - o https://www.archdaily.com/62743/ad-classics-vanna-venturi-house-robert-venturi
  - o https://interactive.wttw.com/tenbuildings/vanna-venturi-house
  - o http://www.uncubemagazine.com/blog/15926627
  - o https://www.moma.org/collection/works/990
  - o https://archpaper.com/2016/05/vanna-venturi-house-found-buyer/
  - o http://constructionlitmag.com/architecture/vanna-venturis-hybrid-house/

Lesson Extensions:

- SAH Archipedia pages on select architectural styles:
  - American Colonial
  - Classical Revival
  - Expressionist
  - International Style
  - Palladian
  - Postmodern
  - Spanish Colonial
  - Vernacular
- SAH Archipedia pages on building materials:
  - Brick
  - Cast Iron
  - Concrete
  - Fiberglass
  - Limestone
  - Wood
- SAH Archipedia pages on typology (building uses):
  - Airports
  - Churches
    - church-specific vocabulary
  - Colleges and campuses
  - Exhibition buildings
  - Houses
  - Mission churches
- Structural concepts and forms (PDFs):
  - Arch
  - Cantilever
  - Column
    - Capital
    - Fluting
  - Dome
  - Tensile
- Relevant external links:
  - Historic American Buildings Survey
  - National Park Service

Activity #1 Worksheet
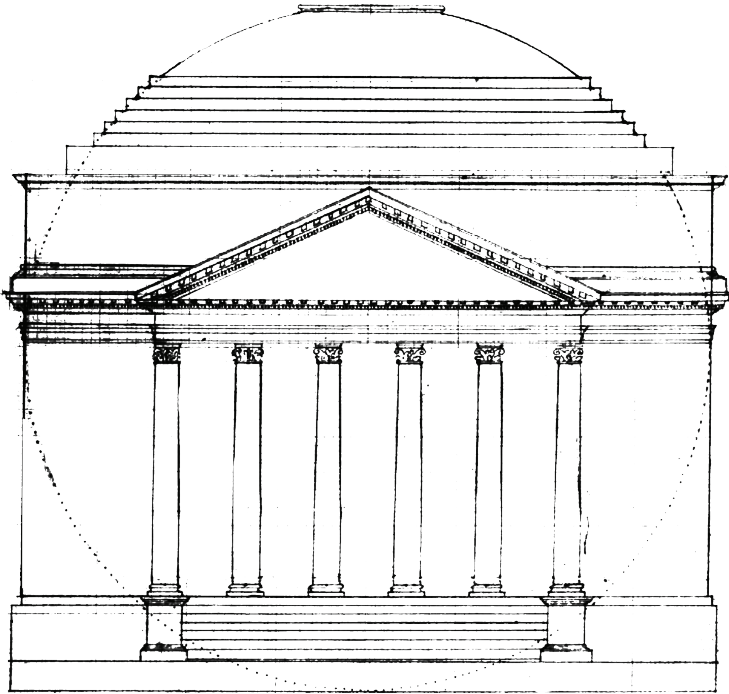
Rotunda
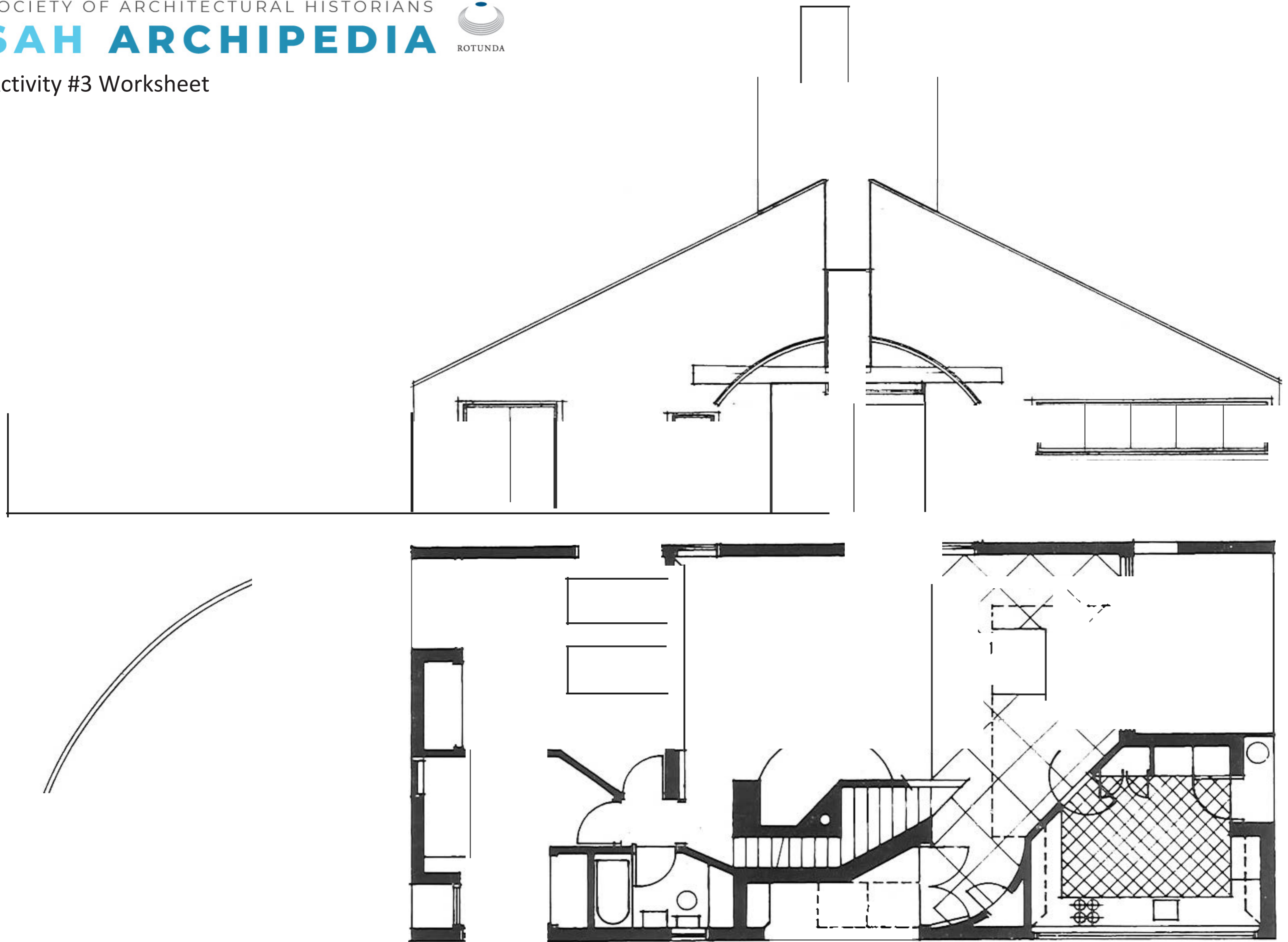### Charlottesville, Virginia
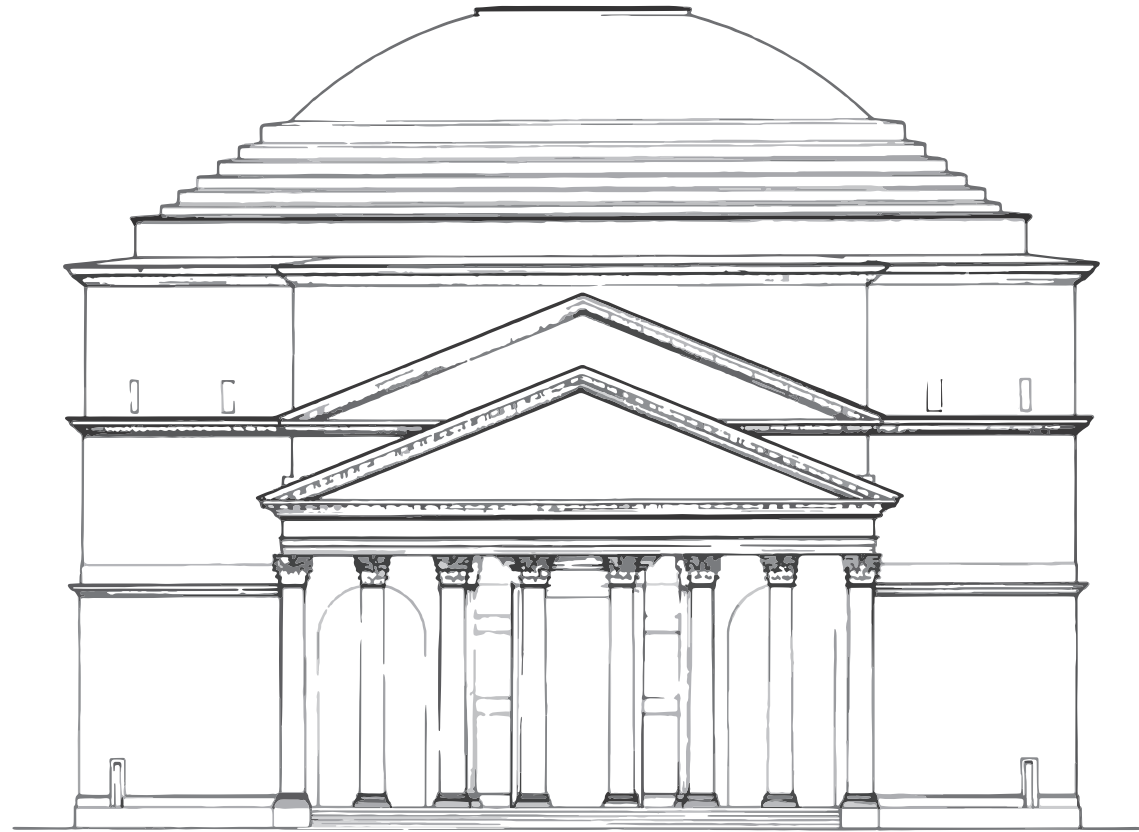
PANTHEON
ROME, ITALY

Activity #3 Worksheet

ELEVATION

PLAN

bed

closet

fireplace

stairs