

Fifth Grade STEAM Tour: Architecture

Introduction

Students will observe and explore the architecture of the three distinct buildings comprising Mia as well as some of the furnished historic period rooms to learn about the many kinds of design decisions architects and designers around the globe have to make. Students will learn how architects use the Engineering Design Process: Ask, Imagine, Plan, Create, and Improve, with the end goal of designing a floor plan for a building in their neighborhood. Hands-on activities throughout the tour reinforce the idea that art, math, and science are very closely related. This tour is designed to last 1.5 hours.

Supplies (in blue tour bag)

PC House original sketch and a more finished sketch
Current Mia floor plan
Image of Mia's three buildings
Photographs of real Mia blueprints
Rulers
Levels
Sketch paper
Blue paper
White pencils
Pencils

Artworks

Introduce students to the three main buildings comprising Mia and help them understand how the three are connected. Aerial views and individual pictures are included on a two-sided handout in your bag. Invite discussion about the kinds of decisions architects have to make when they are thinking about how different parts of a building will be used (e.g. contrast the fountain court to a gallery space in the McKim, Mead and White building). Compare and contrast the museum architecture with the Japanese and Chinese audience halls to talk about how the cultural beliefs and practices of each influence the design of the spaces. Be sure to also visit the Frank Lloyd Wright Hallway and Prairie School gallery.

Blue prints, sketches, and floor plans

Use the photos of original Mia blue prints and the modern floor plan diagrams to engage the students in conversations about the elements of floor plans and how the different buildings are joined in the plans. These also support conversations about how architects think about repetition and emphasis, and the importance of math. Use the sketch and more finished plan for the Purcell Cutts House to illustrate how architects start with ideas and sketches. They ask for feedback on these ideas before finalizing their plans. There are a lot of images to pick from. Select those that will best support your tour and group's needs.

Word problems

Each student has a word problem handout in their notebook. Using the notebook as a guide, walk the students through each problem when you are standing at the art. Allow them to see it in person before applying their math skills.

If a Japanese audience hall is an 8-tatami mat room, and each mat is 3 ft. x 6 ft., how large is the hall?

If 1 stair in the Target Wing is ____ inches tall, and there are ____ stairs, what is the distance between the first and second floors in inches and what is it in feet? Remember: to find the distance in feet, you divide your inches by 12.

Level it out

Have students place the small levels on different architectural elements. Ask them why being level matters. Discuss the importance of making sure that all of the parts of the building are measured correctly. Also discuss all of the details that go into architecture. Ask them about symmetry and refer them to their notebooks. Ask the students to draw the missing parts of the architectural designs in their notebook. Discuss whether it is easy or difficult to draw two identical sides to a column? Encourage them to think about the architect's tools. They are using pencils, but what about carving something symmetrical into stone?

Support visual arts standards

At each work of art on the tour, describe a few of the elements and principles of visual art that the artist used: color, line, shape, value, form, texture and space. Ask the students how repetition, emphasis and balance are essential to architecture. When possible, show or describe the tools an architect might use to design spaces.

Art making

Students will use the design process (Ask, Imagine, Plan, Create, and Improve) to design a blueprint of a floor plan for a building in their neighborhood. First have them consider: Who will use the building? How will it be used? What do they need to think about to make sure that their building blends with their neighborhood? After they sketch plans for the blueprint (floor plan) have them reflect on their plan or ask a classmate or you for feedback for improvements. With this input, they will create the blueprint using white pencils on blue paper.

Science Standard – Nature of Science and Engineering, Substrand 3. Interactions Among Science, Technology, Engineering, Mathematics, and Society Standard 2: 5.1.3.2.1 - Men and women throughout the history of all cultures, including Minnesota American Indian tribes and communities, have been involved in engineering design and scientific inquiry. Benchmark: Describe how science and engineering influence and are influenced by local traditions and beliefs.

Math – Geometry and Measurement Describe, classify, and draw representations of three-dimensional figures. 5.3.1.1 Benchmark – Describe and classify three-dimensional figures including cubes, prisms, and pyramids by the number of edges, faces or vertices as well as the types faces.

Visual Arts 4.1.1.5.1 Describe the characteristics of the elements of visual art including color, line, shape, value, form, texture and space.

Visual Arts 4.1.1.5.2 Describe how the principles of visual art such as repetition, pattern, emphasis, contrast and balance are used in the creation, presentation or response to visual artworks.

Visual Arts 4.1.2.5.1 Describe the tools, materials and techniques used in a variety of two-and three-dimensional media such as drawing, printmaking, ceramics or sculpture.

Visual Arts 4.2.1.5.1 Create original two-and-three-dimensional artworks to express specific artistic ideas.

Visual Arts 4.2.1.5.2 Revise artworks based on the feedback of others and self-reflection.