# Understanding by Design – Stage 1 and 2


**Workshop Title:** **Painting with Light**
**Grade Level** **8**
**Approximate Duration:** **2- 1 hour lessons**
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| STAGE 1: DESIRED RESULTS | | |
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| **Unit Planning Elements** | **Description** | **Unit Overview:** |
| **Goals/Standards VSC Objectives Essential Learner Outcomes** (Established by the National, State, or local school district) | The Established Goals of a Particular Content Area or Discipline – these are the things students should KNOW and be able to DO by the end of the grade level or course level (select those relevant to the unit) | **Grade 8 MSC Objectives:**<br><br>**1.3a.** Analyze why artists may select specific design concepts to convey meaning in artistic exemplars.<br>**2.2b.** Plan personal artworks inspired by universal themes that reflect aspects of daily life.<br>**2.3a.** Compare similarities and differences in subject matter, styles, and techniques among various cultures and periods of art history.<br>**3.1c.** Select and use a variety of tools, materials, processes, and techniques safely to solve specific visual problem.<br>**4.1a.** Analyze ways the elements of art and principles of design contribute to aesthetic response. |
| **Big Idea: Theme/Topic** | Primary Concept, Focus or Main Emphasis of the unit | **Big Idea:** How is photography timeless?<br><br>*Brief description of unit*:<br>Students will be introduced to physics of light by taking them inside a camera obscura. Students will then be introduced to some of the early photographic techniques that were invented, including the daguerreotype, wet plate collodions, and stereographs/stereoscope. They will learn how to make a cyanotype. They will build a pinhole camera and take a picture with it. They will turn the negative pinhole images into positives digitally. |
| **Essential Questions** | Open-ended questions related to the Big Idea that is important in making art - may be "revisited" in another unit | • How is photography a reflection of culture?<br>• How are antiquated methods in art-making still relevant?<br>• How are other disciplines related to photography? |
| **Enduring Understandings** | A generalization or important concept about the Big Idea and art that students will come to understand while studying this unit - may be "revisited" in another unit | *(Primary overarching transferable understandings)*<br>STUDENTS WILL UNDERSTAND THAT: *Artists use many different techniques to make an image, including techniques that were used long ago.*<br><br>*(Supporting understandings that are unit specific)*<br>STUDENTS WILL UNDERSTAND THAT*: Photography is heavily dependent on physics and chemistry.* |
| **Knowledge and Skills (Specific unit content, concepts and** | What you want students to KNOW and be able to DO as a result of | **(Students will KNOW *specific information related to unit)***<br>• Photographic artists who made cyanotypes, photograms, and pinhole images.<br>• Understand the parallels between a pinhole camera and a camera obscura. |

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| **skills to be introduced in the unit)** | studying this unit | • How to properly and safely use chemicals to make a cyanotype photogram and pinhole image.<br><br>**(Students will DO *specific activities related to unit)***<br>• Select, experiment with, and use different media and techniques to create a cyanotype photogram.<br>• Build, use, and process a pinhole image. |
| **STAGE 2: ASSESSMENT EVIDENCE** | | |
| **Performance Tasks, Criteria for Assessment and Assessment Tools** | A description of specific tasks and other activities that students will DO to show what they KNOW and UNDERSTAND .<br><br>(These describe the types of assessments (formative and summative) and the rubrics or other tools used to evaluate student progress) | **PRIMARY EVIDENCE (summative)**<br><br>**PERFORMANCE TASK(S):** *(elegant problem)*<br>• Create 2-4 cyanotypes with thoughtful and meaningful composition.<br>• Build a pinhole camera and use it to make a successful pinhole image.<br><br>**OTHER EVIDENCE (formative)**<br><br>• Students will use See/Think/Wonder as a way to discuss different photographic images both by established artists, each other, and themselves.<br>• Students will properly manipulate materials to create photographic artworks.<br>• Students will show an understanding of photography's relationship to physics and chemistry.<br><br>**KEY CRITERIA:**<br>**1. Artwork**<br>• Each cyanotype will need to demonstrate an understanding of<br>  ○ How to properly use the chemicals and equipment<br>  ○ How to create an interesting composition from everyday objects<br>• Each pinhole will need to demonstrate an understanding of<br>  ○ How to properly use the chemical s and equipment in the darkroom<br>  ○ How to successfully create a pinhole negative<br>**2. Assessment**<br>• Do students understand<br>  ○ How cyanotype chemicals and photo paper are light sensitive?<br>  ○ How positives and negatives are used in photography?<br>  ○ Why artists used these techniques?<br>  ○ How camera obscura works?<br><br>**ASSESSMENT TOOLS:**<br>☑*Performance Checklist* ☐ ☐*Rubric* ☐ ☑*Self-assessment checklist* |

## The Language of the Unit Plan – Stage 3

| **STAGE 3: THE LEARNING PLAN SEQUENCE** | | |
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| **Vocabulary** | | **Camera Obscura:** (Latin; "camera" is a "vaulted chamber/room" + "obscura" means "dark"= "darkened chamber/room") is an optical device that projects an image of its surroundings on a screen. It is used in drawing and for entertainment, and was one of the inventions that led to photography. The device consists of a box or room with a hole in one side. Light from an external scene passes through the hole and strikes a surface inside where it is reproduced, upside-down, but with color and perspective preserved.<br>**Cyanotype**: is a photographic printing process that gives a cyan-blue print. The |

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| | | process was popular in engineering circles well into the 20th century. The simple and low-cost process enabled them to produce large-scale copies of their work, referred to as blueprints. Two chemicals are used in the process:<br>Ammonium iron (III) citrate<br>Potassium ferricyanide.<br>**Photogram**: is a photographic image made without a camera by placing objects directly onto the surface of a photo-sensitive material such as photographic paper and then exposing it to light. The result is a negative shadow image varying in tone, depending on the transparency of the objects used. Areas of the paper that have received no light appear white; those exposed through transparent or semi-transparent objects appear grey.<br>**Positive:** is a film or paper record of a scene that represents the color and luminance of objects in that scene with the same colors and luminances (as near as the medium will allow).<br>**Negative:** is a total inversion of a positive image, in which light areas appear dark and vice versa.<br>**Pinhole Camera:** is a simple camera without a lens and with a single small aperture – effectively a light-proof box with a small hole in one side.<br>**Aperture:** is the hole that light passes through in a camera.<br>**Developer/Stop/Fix:** are wet darkroom chemicals.<br>**Light Sensitivity:** refers to chemicals or metals that react to light. |
| **Materials/ Resources** | Instructional Resources to support unit<br><br>Specific art materials needed for the unit | Visuals:<br>• PPT of cyanotype photograms<br>• Trifold (cyanotype photograms)<br>• Trifold (pinhole photography)<br>• *Antiquarian Avant Garde*<br>• *I Am Not This Body*<br>• Antique photography examples<br>• Teacher examples<br>• Pinhole Tent<br>Art Materials:<br>• Chemicals to make cyanotypes<br>• Cotton paper<br>• Foam brushes<br>• Mixing cups<br>• Hair dryer<br>• Sink<br>• Hygrogen Peroxide<br>• Drying rack<br>• Objects to create photograms<br>• Contact printers<br>• Exposure unit<br>• Computer/printer/scanner<br>• Pinhole camera materials (cans, electrical tape, pins, heavy aluminum)<br>• Gloves |
| **Accommodation** | | Students will receive one-on-one assistance from instructor as needed. |
| **Summary of Lesson Sequence and Student Accommodations for each** | The scope and sequence of lessons on the unit<br><br>(A description | **Day 1:** (Focus on MSC 2.2b, 2.3a, 3.1c)<br><br>***Essential Questions:***<br>Why is it important to understand the history of photography?<br>How has photography affected our perception of the world? |

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| **lesson** | of activities that will take place in each lesson from which fully developed and detailed lesson plans will be written)<br><br>Note: Teacher reflections should follow each lesson to assess progress, need for adjustments, and/or changes in direction | ***Objectives:***<br>• SWBAT to produce 2-4 cyanotype photograms<br>• SWBAT to explain how a camera obscura works<br>• SWBAT use See/Think/Wonder to engage in a conversation about the cyanotype examples they are shown<br><br>***Description:***<br>A. Preassessment<br>• What do they know about photography already?<br>• Can they name any photographers?<br>• Can they list other disciplines photography uses?<br>B. Introduction: Motivation/ Presentation of concepts<br>• Who wants to paint with light and use chemistry?<br>• Who wants to see the world turned upside down? (for end of lesson)<br>• Show examples of what other photographers have created and discuss.<br>C. Demonstration:<br>• Making cyanotypes<br>• Discuss with them how they are making negative images and what the difference between a negative and positive is in photography.<br>• During waiting periods while cyanotypes are "cooking" show students daguerreotypes, wet plate collodion images, stereographs, and the stereoscope.<br>D. Studio:<br>• Students will make their own cyanotype photograms using the materials and equipment provided.<br>• Students will be encouraged to make adjustments to the images they are making based on the results of their previous images.<br>E. Clean-up<br>F. Closure:<br>• What is the difference between a photographic positive and a photographic negative?<br>• What happens to light when it passes through our eye? How does this relate to other disciplines?<br>• Why is it important to understand how things were made a long time ago?<br>• How well did you meet the criteria?<br>• How well did you use art elements/principles of design to communicate the idea/theme of the structure and space?<br><br>**Due to time constraints with the next lesson, students will be introduced to the camera obscura at the end of this lesson. We will also discuss how light works and how this relates to physics.**<br><br>**Day 2:** (Focus on MSC 1.3a,2.2b, 4.1a)<br><br>***Essential Questions:***<br>• How can we manipulate light to take a photograph?<br>• How do cameras inform us about our world?<br><br>***Objectives:***<br>• SWBAT use what they know about how light works to build a pinhole camera.<br>• SWBAT make a negative image with a pinhole camera. |

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| | | • SWBAT use wet darkroom chemicals to process their images.<br>• SWBAT invert their images (with much guidance) digitally into positives.<br><br>***Description:***<br>A. Preassessment<br>• How does a camera obscura work?<br>• What body part also works this way?<br>B. Introduction: Motivation/ Presentation of concepts<br>• Who wants to build their own camera?<br>• Show examples of what other photographers have created and discuss.<br>C. Demonstration:<br>• Making a pinhole camera.<br>• Discuss with them how they are again making negative images like they did with cyanotypes, except this time their images will be inverted into positives.<br>D. Studio:<br>• Students will make their own camera.<br>• Students will be taken to the darkroom to load their cameras.<br>• Students will be taken outside to shoot images with their cameras.<br>• Students will return to the darkroom to unload and process (with much guidance) their images.<br>• Students will make adjustments (exposure times and subject matter) according to their results.<br>• Students will be heavily guided through scanning and inverting images into positives using Photoshop.<br>E. Clean-up<br>F. Closure:<br>• What is the difference between a photographic positive and a photographic negative?<br>• What happens to light when it passes through our eye? How does this relate to other disciplines?<br>• How are pinhole cameras like modern cameras?<br>• Where do we see photography and how does this affect our perceptions of the world?<br>• How well did you meet the criteria?<br>• How well did you use art elements/principles of design to communicate the idea/theme of the structure and space? |