Inquiring Minds
Multiple Visit Program Teacher Guide
How to Use This Guide
These materials provide additional context for what your students will experience when visiting the museum. Pre- and post-visit lessons target a variety of curricular areas including science, math, literacy, and visual art. They ask students to think critically and solve problems. Lesson plans are carefully aligned to provide either an entry into the conversations that will take place in the galleries, or further ideas that were constructed during time spent at the Blanton. We recommend that you teach them in order and within two weeks of your museum visits.

You will notice that lessons vary in duration from thirty minutes to one hour, and many include extensions for both the classroom and home. Specific TEKS are outlined within each lesson plan and also on the Teaching Timeline. The timeline will help you quickly assess the content of all six lessons, as well as let you know what materials are needed.

The Inquiring Minds curriculum, both in the museum and classroom, is organized around three STEAM-related themes that build upon one another: experimentation in the art museum, design and engineering, art and the natural sciences. It has been written for elementary, middle, or high school students. TEKS are aligned to grades 3-8. Occasionally suggestions are included for scaffolding content to accommodate student needs. You are encouraged to adapt lessons to meet the needs of your students and to fit your teaching objectives.

We welcome your feedback!
Please get in touch to let us know how things went! We would love to see pictures of students at work or of completed projects. Don’t hesitate to share suggestions for how we can improve our teacher resource materials. Email us at education@blantonmuseum.org.

Blanton Education
For more information about education programs at the Blanton, including teacher resources, school programs, opportunities for families and public audiences, please visit our website: www.blantonmuseum.org.

Support for K-12 education programs at the Blanton is provided by the Buena Vista Foundation, the Burdine Johnson Foundation and the Lowe Foundation.

Additional support is provided by The Brown Foundation, Inc. Education Endowment and the Burdine Johnson Foundation Education Endowment.
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<td><strong>Essential Question</strong></td>
<td>How do artists experiment with color?</td>
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<td><strong>Essential Question</strong></td>
<td>How can you make an artists' concept your own?</td>
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<tr>
<td><strong>Materials</strong></td>
<td>Pre: heavy drawing paper, oil pastels or acrylic paint, rulers, pencils</td>
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<tr>
<td></td>
<td>Post: acrylic painting (dry), Golden brand Fluid Matte Medium, small plates, black and white photocopies, paint brushes, brayers</td>
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<tr>
<td>Sequence</td>
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**Abstract**
Students will learn about Josef Albers and his experimentations with color through discussion of the artist’s seminal series Homage to the Square. They will formulate hypothesis about color and draw conclusions through a color experiment in the style of Albers.

**Focus Work of Art**
Josef Albers  
*Late, from Homage to a Square: Soft Edge - Hard Edge*  
1965

**TEKS Correlations**

**Art**
(3.b.1, 4.b.1, 5.b.1, 6.c.1, 7.c.1, 8.c.1) The student develops and organizes ideas from the environment.  
(3.b.2, 4.b.4, 5.b.4, 6.c.4, 7.c.4, 8.c.4) The student makes informed judgments about personal artworks and the artworks of others.

**English Language Arts**
(3.b.1, 4.b.1, 5.b.1, 6.b.26, 7.b.26, 8.b.26) The student listens actively and purposefully in a variety of settings.  
(3.b.29, 4.b.27, 5.b.27) The student listens and speaks both to gain and share knowledge of his/her own culture, the culture of others, and the common elements of cultures.  
(3.b.23, 4.b.23, 5.b.23, 6.b.22) The student understands and interprets visual images, messages, and meanings.  
(3.b.24, 4.b.24, 5.b.24, 6.b.23) The student analyzes and critiques the significance of visual images, messages, and meanings.  
(3.b.17, 4.b.15, 5.b.15, 6.b.14, 7.b.14, 8.b.14) Students use elements of the writing process to compose text.  
(3.b.19, 4.b.17, 5.b.17, 6.b.16, 7.b.16, 8.b.16) Students write about their own experiences.

**Science**
(3.b.2, 4.b.2, 5.b.2, 6.b.2, 7.b.2, 8.b.2) The student uses scientific inquiry methods during laboratory and outdoor investigations.  
(3.b.3, 4.b.3, 5.b.3, 6.b.3, 7.b.3, 8.b.3) The student knows that information, critical thinking, scientific problem solving, and the contributions of scientists are used in making decisions.

**Learning Outcomes**
The student will be able to articulate their experimentations with color, using a strategy influenced by color studies for the series Homage to the Square by Josef Albers.

**Vocabulary**
Homage: something that is done to honor something or someone

Scientific method: The scientific method is a process for experimentation that is used to explore observations and answer questions. Scientists use the scientific method to search for cause and effect relationships in nature. In other words, they design an experiment so that changes to one item cause something else to vary in a predictable way. The method includes five steps:
1. Make an observation,
2. Ask a question,
3. Form a hypothesis,
4. Conduct an experiment,
5. Confirm or reject hypothesis

**Materials**
Images  
Heavy drawing paper  
Oil pastels
<table>
<thead>
<tr>
<th>Resources</th>
<th><a href="http://collection.blantonmuseum.org">http://collection.blantonmuseum.org</a> (search: Albers)</th>
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<tbody>
<tr>
<td></td>
<td><a href="http://www.themorgan.org/exhibitions/exhibition.asp?id=62">http://www.themorgan.org/exhibitions/exhibition.asp?id=62</a></td>
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<td></td>
<td><a href="http://www.pantone.com">http://www.pantone.com</a></td>
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<tr>
<td></td>
<td><a href="http://www.sciencebuddies.org">http://www.sciencebuddies.org</a></td>
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| About the Artwork/Artist | In 1920, the young artist Josef Albers enrolled at the Bauhaus, the recently founded school of art, architecture, and design in Weimar, Germany. With its strong utilitarian emphasis, the Bauhaus placed equal importance on technical and artistic skills. The basis of its education was the "preliminary course," a curriculum designed to prepare the students for further study in the school’s various workshops; the course’s central concept was the "contrasting effects" of form, texture, and color. After completing his course of study, Albers was appointed as a teacher at the Bauhaus in 1925, and he remained there until the school closed in 1933 under pressure from the Nazi party. He emigrated to the United States with his wife Anni and taught first at Black Mountain College in North Carolina, then at Yale University in New Haven, Connecticut. In this way, Albers disseminated his Bauhaus education and his own artistic philosophy to a new generation of artists in America. He also published the influential treatise *Interaction of Color* (1963), a study of color theory that was used widely in art instruction. Around the time that he joined the Yale faculty in 1950, Albers began his celebrated *Homage to the Square* series. This would become a body of more than a thousand works executed over a period of twenty-five years, including paintings, drawings, prints, and tapestries. The entire series was based on a mathematically determined format of several squares, which appear to be overlapping or nested within one another. This geometric abstraction was Albers’ template for exploring the subjective experience of color—the effects that adjacent colors have on one another, for example, and the illusion of flat planes of color advancing or receding in space. |
**Lesson Components**

**Introduction to artwork (10 minutes)**
Using the same strategy that students learn at the Blanton, invite them to silently LOOK at Late, from Homage to a Square: Soft Edge - Hard Edge. Next, ask students to DESCRIBE what they see. After taking full inventory, students should move on to ANALYZING the artwork. [As facilitator, the teacher should link observations and descriptions to assist student analysis.] How are the colors interacting with one another? What choices did the artist make when creating this work of art? Finally, students should be asked to RELATE their discussion to their own lives. What are their favorite color combinations? Does context influence their color preferences (social, environmental)?

**Warm-up (5 minutes)**
Invite different pairs of students to stand next to each other. Do the color of their clothes appear more muted or bright depending on who is standing next to them? For example, you might pair a student in a dark grey shirt with a student in a red shirt and then pair the same student wearing the dark grey shirt next to a student in a black shirt.

**Activity (25 minutes)**
Pass out paper and oil pastels. Instruct students to choose one color as their starting point. Pressing hard, and with the same color, they should draw three small shapes of their choosing, in a row (squares and circles are easiest). What color or colors can you place next to this first color to make it appear brighter or duller? Ask students to form their hypothesis, write it down, and then move to the next step.

They should then choose different colors to surround the central shape, trying to prove their hypothesis. These colors should echo the central shape (so if the central shape is square, then all other shapes should also be square).

Students should add at least two or three rows of colors to each of their initial three shapes, each time noticing how these colors interact and how they affect their hypothesis. All three shapes should contain a different variety of hues and values so that students can view how colors look against one another.

They can continue to experiment in this way until time is up. If they wish, students might label each of their color experiments and select a favorite color combination.

**Reflection (10 minutes)**
Take a few minutes to do walk around the room (a “gallery walk”) with students, viewing everyone’s color choices. What did they learn by doing this experiment? Was your hypothesis correct? How did colors look different depending on the color next to them? How else might they experiment with color?

**Assessments**
Assess student comprehension throughout the lesson by asking clarifying questions and checking for understanding. If a hypothesis was recorded, ask students to write a conclusion that either verifies or corrects their hypothesis.

**In Class Extensions**
Have students choose their favorite study within the series created through this activity and make a larger, final work of art.

Ask students to experiment with color through other media such as photography and found object sculpture.

**At Home Extensions**
Ask students to look around where they live and determine which colors are used most frequently. They can use crayons and paper to create a sketch similar to that from the activity using these colors. Students might choose to insert or remove colors from their home’s palette.

Encourage students to look for color choices made for consumers by large retailers. For example, the next time they go to a store such as Target, they might look for colors commonly used. Which colors are used most often for signage? Are there color themes depending on the time of year?
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<td><strong>Lesson Title</strong></td>
<td>Experimenting with Image</td>
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<td><strong>Grade Level/s</strong></td>
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**Abstract**
Students will experiment with an image transfer technique and with altered images.

**Focus Work of Art**
Oscar Muñoz  
*Narcisos [Narcissi]*  
1994–1995

**TEKS Correlations**
**Art**
(3.b.1, 4.b.1, 5.b.1, 6.c.1, 7.c.1, 8.c.1) The student develops and organizes ideas from the environment.  
(3.b.2, 4.b.4, 5.b.4, 6.c.4, 7.c.4, 8.c.4) The student makes informed judgments about personal artworks and the artworks of others.

**English Language Arts**
(3.b.1, 4.b.1, 5.b.1, 6.b.26, 7.b.26, 8.b.26) The student listens actively and purposefully in a variety of settings.  
(3.b.29, 4.b.27, 5.b.27) The student listens and speaks both to gain and share knowledge of his/her own culture, the culture of others, and the common elements of cultures.  
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(3.b.17, 4.b.15, 5.b.15, 6.b.14, 7.b.14, 8.b.14) Students use elements of the writing process to compose text.  
(3.b.19, 4.b.17, 5.b.17, 6.b.16, 7.b.16, 8.b.16) Students write about their own experiences.

**Science**
(3.b.2, 4.b.2, 5.b.2, 6.b.2, 7.b.2, 8.b.2) The student uses scientific inquiry methods during laboratory and outdoor investigations.  
(3.b.3, 4.b.3, 5.b.3, 6.b.3, 7.b.3, 8.b.3) The student knows that information, critical thinking, scientific problem solving, and the contributions of scientists are used in making decisions.

**Learning Outcomes**
The student will be able to formulate a hypothesis and conclusion about their image transfer experiment.

**Vocabulary**
N/A

**Materials**
- Image  
- Acrylic painting (on canvas or paper), plexi, wood, masonite, or other hard surface  
- Golden (brand) Fluid Matte Medium OR wintergreen oil  
- Small plates for matte medium (or Q-tips if using wintergreen oil)  
- Black and white photocopies of images  
- Paint brushes  
- Brayers or other burnishing tools  
- Palette knives or other type of scraper to remove paper (if using matte medium)

**Prep**
This project works well as a secondary step to acrylic painting. Texture of the painting should be relatively smooth to allow for even image transfer. The painting should be dry before transfer process. Other hard surfaces can also be used (some are suggested in the materials list).
### Resources

- [http://collection.blantonmuseum.org](http://collection.blantonmuseum.org) (search: Munoz)
- [https://www.youtube.com/watch?v=l-AX98blNrc](https://www.youtube.com/watch?v=l-AX98blNrc) (fluid matte medium demo)
- [https://www.youtube.com/watch?v=mscXiGUqrtE](https://www.youtube.com/watch?v=mscXiGUqrtE) (wintergreen oil demo)

### About the Artwork/Artist

Narcisos began with the small photograph on Muñoz’s identification card, which the artist enlarged and used to create a silkscreen. Then, on a gallery floor, he set up the nine Plexiglas boxes that now frame the pictures and lined their bottoms with paper scraps from various sources: a cut-up map, an aerial photograph of Cali (where he lives), book pages, and rubbings taken from various surfaces. Next, he poured water into the boxes and “printed” his likeness onto the surface by rubbing fine carbon powder through the screen bearing the image. These nine identical faces floated on the water until it evaporated, which deposited them on the paper. As the paper dried, the ghostly images were fixed. They were no longer identical, having been altered by various factors during their time in the gallery—air currents, the force of gravity, temperature changes, and occasional jostling by curious visitors. This complex process extended the act of image making to draw attention to the difficulties of representation: the impossibility of capturing with any exactness the fleeting events of life. In conversation, Muñoz has discussed the metaphorical nature of the work. He sees the process the image undergoes as comparable to the life cycle and its final condition as death.

### Lesson Components

**Introduction to artwork (10 minutes)**

Using the same strategy that students learn at the Blanton, invite them to silently **LOOK** at Narcisos [Narcissi]. Next, ask students to **DESCRIBE** what they see. After taking full inventory, students should move on to **ANALYZING** the artwork. [As facilitator, the teacher should link observations and descriptions to assist student analysis.]

*How are the images related to each other? Why might the artist be interested in altering a photograph of himself? Finally, students should be asked to **RELATE** their discussion to their own lives. Have you ever altered a photograph? If yes, how and why?*

**Warm up (5 minutes)**

Ask students to form a hypothesis about how an image might be transferred. Demonstrate transfer process to students. **Were their hypotheses correct? How or why not? What conclusions can they draw from observing the transfer demonstration?**

**Activity (30 minutes to transfer, overnight to set and remove paper if using matte medium)**

Have students select a photocopy image that they will transfer and their transfer surface (the board that will receive the transferred image). Pass out all materials and have students work on their transfers. If students wish, they can transfer more than one image. Once dry, students might wish to add pencil or other media to their image.

**Reflection (10 minutes)**

Take a few minutes to do a gallery walk with students, viewing everyone’s images. **How were the images changed? Were there aspects of the process that they would do differently or repeat?**

### Assessments

Assess student comprehension throughout the lesson by asking clarifying questions and checking for understanding.

### In Class Extensions

Practice making rubbings. How is this process similar and different from image transfers?
Sequence
Pre Lesson for Museum Visit 2

Lesson Title
Practicing Knot Drawing Designs

Grade Level/s
3-8

Subject Area/s
Art, English Language Arts, Math

Duration
55 minutes

Essential Question
How is a knot drawing created?

Abstract
Students will learn about and practice drawing Celtic knots.

Focus Work of Art
Albrecht Dürer
*Knot with a Heart-Shaped Shield, from The Six Knots* 1505-07 16th century

TEKS Correlations
Art
(3.b.1, 4.b.1, 5.b.1, 6.c.1, 7.c.1, 8.c.1) The student develops and organizes ideas from the environment.
(3.b.2, 4.b.4, 5.b.4, 6.c.4, 7.c.4, 8.c.4) The student makes informed judgments about personal artworks and the artworks of others.

English Language Arts
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(3.b.17, 4.b.15, 5.b.15, 6.b.14, 7.b.14, 8.b.14) Students use elements of the writing process to compose text.
(3.b.19, 4.b.17, 5.b.17, 6.b.16, 7.b.16, 8.b.16) Students write about their own experiences.

Math
(3.b.6, 4.b.6) The student applies mathematical process standards to analyze attributes of two-dimensional geometric figures to develop generalizations about their properties.

Learning Outcomes
Students will learn how to draw Celtic knots using geometry concepts.

Vocabulary
Celtic knot: Celtic knots are complete loops without any beginning or end.

Materials
Image
Drawing paper
Pencils
Erasers
Fine tip ink pens

Resources
http://collection.blantonmuseum.org (search: Durer)
https://www.youtube.com/watch?v=TsxRBCh5FK8
https://www.youtube.com/watch?v=xce8NSx3AKo

About the Artwork/Artist
Dürer produced six variations of this kind of ornament design, which the artist referred to as “knots.” The designs are literal woodcut copies of engravings thought to have been designed by Leonardo da Vinci and executed to by his followers. Although the practical function of these designs remains unclear, they may have been intended as embroidery designs or purely as a kind of decorative puzzle. While Dürer rarely
copied other artist’s works so directly, such a complex and challenging design must have been hard to resist for an artist with such relentless curiosity.

**Lesson Components**

**Introduction to artwork (10 minutes)**
Using the same strategy that students learn at the Blanton, invite them to silently **LOOK** at *Knot with a Heart-Shaped Shield*. Next, ask students to **DESCRIBE** what they see. After taking full inventory, students should move on to **ANALYZING** the artwork. (As facilitator, the teacher should link observations and descriptions to assist student analysis.) **How was it made? Can students tell where the knot starts and stops?** Finally, students should be asked to **RELATE** their discussion to their own lives. **Have they seen anything like this before?**

**Warm-up (5 minutes)**
Demonstrate how to draw a trinity knot, or show video.

**Activity (25 minutes)**
Pass out paper and pencils and invite students to practice drawing their Celtic knots. Students who accomplish the first variation can watch a demonstration or video of more difficult knots (refer to second youtube video referenced). When drawings are finished, make sure students trace with ink pen and erase their pencil lines!

**Reflection (10 minutes)**
Take a few minutes to do a gallery walk with students, viewing everyone’s color choices. **What did they learn by practicing this design? How was this related to geometry?**

**Assessments**
Assess student comprehension throughout the lesson by asking clarifying questions and checking for understanding.

**In Class Extensions**
Challenge students to draw other types of Celtic knots.

**At Home Extensions**
Invite students to share examples of patterned designs from their daily lives.
| **MVP** | Inquiring Minds |
| **Sequence** | Post Lesson for Museum Visit 2 |
| **Lesson Title** | Engineering Catapults |
| **Grade Level/s** | 3-8 |
| **Subject Area/s** | Art, English Language Arts, Math, Science |
| **Duration** | 55 minutes |
| **Essential Question** | How can you engineer a catapult with everyday materials? |

**Abstract**
Students will learn about Hanging Man by Vernon Fisher and consider how his artistic process relates to catapults they will be challenged to create.

**Focus Work of Art**
Vernon Fisher  
*Hanging Man*  
1984

Also referenced: Vernon Fisher  
*Hanging Man Progressive Proof Runs*

**TEKS Correlations**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Correlation</th>
</tr>
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| English Language Arts | (3.b.1, 4.b.1, 5.b.1, 6.b.2, 7.b.26, 8.b.26) The student listens actively and purposefully in a variety of settings.  
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| Math    | (3.b.6, 4.b.6, 5.b.6) The student applies mathematical process standards to analyze attributes of two-dimensional geometric figures to develop generalizations about their properties. |
| Science | (3.b.2, 4.b.2, 5.b.2, 6.b.2, 7.b.2, 8.b.2) The student uses scientific inquiry methods during laboratory and outdoor investigations.  
(3.b.3, 4.b.3, 5.b.3, 6.b.3, 7.b.3, 8.b.3) The student knows that information, critical thinking, scientific problem solving, and the contributions of scientists are used in making decisions.  
(3.b.6, 4.b.6, 5.b.6, 6.b.9, 7.b.7) The student knows that forces cause change and that energy exists in many forms.  
(8.b.6) The student knows that there is a relationship between force, motion, and energy. |

**Learning Outcomes**
Student will be able to:
1. Create a functional catapult.  
2. Articulate similarities and differences between an artist’s creative process and the scientific method.

**Vocabulary**
Catapult: an ancient weapon used for throwing large rocks

**Materials**
Per student:  
8 small craft sticks  
2 large craft sticks  
3 small rubber bands  
Something small to launch (cotton ball or penny)
<table>
<thead>
<tr>
<th>Drawing paper</th>
<th>Pencil</th>
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<tr>
<td>Prep: review Youtube videos (links in resource section)</td>
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<td><a href="http://collection.blantonmuseum.org">http://collection.blantonmuseum.org</a> (search: Vernon Fisher)</td>
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<td>Vernon Fisher’s preoccupation with archive, information transmission, memory, and taxonomy stems from an early interest in how people make sense of the world. His hallmark blackboard paintings recall pedagogical lessons or speculative renderings, oftentimes replacing sequential logic with disordered notations analogous to excerpts from an unrepressed mindscape.</td>
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<th>Lesson Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to artwork (10 minutes)</td>
</tr>
<tr>
<td>Using the same strategy that students learn at the Blanton, invite them to silently LOOK at Hanging Man. Next, ask students to DESCRIBE what they see. After taking full inventory, students should move on to ANALYZING the artwork. [As facilitator, the teacher should link observations and descriptions to assist student analysis.] Show students a few of the proof runs for Hanging Man. What can they infer about the artist's process by seeing these? Finally, students should be asked to RELATE their discussion to their own lives. Can they think of times that they might make something similar to Fisher’s proof runs?</td>
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<table>
<thead>
<tr>
<th>Warm-up (5 minutes)</th>
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<tbody>
<tr>
<td>Tell students that they will be engineering catapults. Pass out materials. Ask students to take a moment to sketch what their catapult might look like, if they were to construct one using the materials provided. Can students come to a hypothesis about their catapult based on their initial sketch?</td>
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<table>
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<tr>
<th>Activity (30 minutes)</th>
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<tbody>
<tr>
<td>Give students time to create their catapults and test their hypotheses.</td>
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<tr>
<th>Reflection (5 minutes)</th>
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<tr>
<td>Which catapult designs were most successful? What changes would they make to their catapult? How was this process similar to that of Vernon Fisher?</td>
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<table>
<thead>
<tr>
<th>Assessments</th>
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<tr>
<td>Assess student understanding by asking questions and reviewing if their catapults work.</td>
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<tr>
<th>In Class Extensions</th>
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<tr>
<td>Challenge students to engineer other machines with simple materials found in class.</td>
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<tr>
<th>At Home Extensions</th>
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<tbody>
<tr>
<td>Students can teach family members how to make catapults and have contests to see whose can toss an object the farthest.</td>
</tr>
<tr>
<td><strong>MVP</strong></td>
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<td>--------------</td>
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<tr>
<td><strong>Sequence</strong></td>
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<tr>
<td><strong>Lesson Title</strong></td>
</tr>
<tr>
<td><strong>Grade Level/s</strong></td>
</tr>
<tr>
<td><strong>Subject Area/s</strong></td>
</tr>
<tr>
<td><strong>Duration</strong></td>
</tr>
<tr>
<td><strong>Essential Question</strong></td>
</tr>
<tr>
<td><strong>Abstract</strong></td>
</tr>
<tr>
<td><strong>Focus Work of Art</strong></td>
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</tbody>
</table>
| **TEKS Correlations** | **Art**  
(3.b.1, 4.b.1, 5.b.1, 6.c.1, 7.c.1, 8.c.1) The student develops and organizes ideas from the environment.  
(3.b.2, 4.b.4, 5.b.4, 6.c.4, 7.c.4, 8.c.4) The student makes informed judgments about personal artworks and the artworks of others.  

**English Language Arts**  
(3.b.1, 4.b.1, 5.b.1, 6.b.26, 7.b.26, 8.b.26) The student listens actively and purposefully in a variety of settings.  
(3.b.29, 4.b.27, 5.b.27) The student listens and speaks both to gain and share knowledge of his/her own culture, the culture of others, and the common elements of cultures.  
(3.b.23, 4.b.23, 5.b.23, 6.b.22) The student understands and interprets visual images, messages, and meanings.  
(3.b.24, 4.b.24, 5.b.24, 6.b.23) The student analyzes and critiques the significance of visual images, messages, and meanings.  
(3.b.17, 4.b.15, 5.b.15, 6.b.14, 7.b.14, 8.b.14) Students use elements of the writing process to compose text.  
(3.b.19, 4.b.17, 5.b.17, 6.b.16, 7.b.16, 8.b.16) Students write about their own experiences. |
| **Learning Outcomes** | Students will develop observational skills by closely observing a work of art and drawing objects from life. |
| **Vocabulary** | N/A                                 |
| **Materials** | Drawing paper  
Pencil  
Colored pencils |
| **Resources** | http://collection.blantonmuseum.org (search:)  
http://www.audubon.org/john-james-audubon  
http://www.pbs.org/wnet/americanmasters/database/audubon_j_STUB.html |
## Lesson Components

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<th><strong>Introduction to artwork (10 minutes)</strong></th>
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<td>Using the same strategy that students learn at the Blanton, invite them to silently <strong>LOOK</strong> at. Next, ask students to <strong>DESCRIBE</strong> what they see. After taking full inventory, students should move on to <strong>ANALYZING</strong> the artwork. [As facilitator, the teacher should link observations and descriptions to assist student analysis.] Finally, students should be asked to <strong>RELATE</strong> their discussion to their own lives.</td>
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<th><strong>Activity (15 minutes)</strong></th>
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<tr>
<td>Pass out drawing paper and pencils. Have students select an object that is interesting to them and start sketching. They may wish to practice sketching the same object more than once. Reassure students that it is <strong>OK</strong> if their drawing doesn't look just like the object they are looking at.</td>
</tr>
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This activity might be done outside, for a wider range of subjects.

While students are drawing, circulate to talk with them about what they are carefully observing. Encourage younger students to look for simple shapes in objects (for example a pencil is a long rectangle). Older students might add shading to their drawing to produce a 3D effect.

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<th><strong>Reflection (5 minutes)</strong></th>
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<td>Re-visit <strong>Carolina Parrots</strong>. Ask students to compare how their observational drawings were similar and how they were different to the painting.</td>
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Ask students to share which object they liked to draw the most or the least. Ask them to explain why. **How did the objects look different when they were viewed through the magnifying glass? Did you like drawing the objects up close (through the magnifying glass) better? Why or why not?**

## Assessments

The discussion about the work of art and the art making exercise may be used to assess students' ability to look closely.

Research how observational drawings are used in different fields, such as medicine and biology.

## In Class Extensions

Create an oversized classroom sketchbook out of construction paper or butcher paper. During transitions or for a quick art minute, invite students to practice drawing random objects in the classroom (this could also be a “popcorn” type drawing game). Have students take turns choosing what to draw.

Encourage students to continue practicing their observational drawing skills by sketching at center time or during times of the day.

## At Home Extensions

Encourage students to closely observe the world around them and draw objects that they think are interesting.
### Lesson Title
Cameraless Photography

### Grade Level/s
3-8

### Subject Area/s
Art, English Language Arts, Science

### Duration
45 minutes

### Essential Question
How can you take a picture without using a camera?

### Abstract
Students will make sunprints, continuing their experimentation with transfer techniques.

### Focus Work of Art
Eric Avery  
The Last T Cell  
1993  
Relief photo-engraving and linocut over monotype with bleeded handwork

### TEKS Correlations
**Art**  
(3.b.1, 4.b.1, 5.b.1, 6.c.1, 7.c.1, 8.c.1) The student develops and organizes ideas from the environment.  
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(3.b.19, 4.b.17, 5.b.17, 6.b.16, 7.b.16, 8.b.16) Students write about their own experiences.

**Science**  
(3.b.3, 4.b.3, 5.b.3, 6.b.3, 7.b.3, 8.b.3) The student knows that information, critical thinking, scientific problem solving, and the contributions of scientists are used in making decisions.  
(3.b.6, 4.b.6, 5.b.6, 6.b.9) The student knows that forces cause change and that energy exists in many forms.

### Vocabulary
**Sunprint:** also known as cyanotype, is a photographic printing process developed in 1842 as a means to reproduce images and writing, as in blueprints.

### Materials
- sunprint paper (1-2 sheets per student)  
- water (to rinse paper)  
- sunlight  
- small objects that create interesting silhouettes when laid flat  
- drawing paper  
- pencils  
- cardboard  
- tape (to tape down objects to sunprint paper, in lieu of acrylic)  
- Teacher handout: *How Sunprints Work*

### Prep
Make a test sunprint to know how much light is needed for a successful project.
### Set Up (to take outside)
- In large tub: drawing paper, pencils, objects (assorted)
- Pass out when ready: sunprint paper, cardboard, tape

### Resources
- [http://collection.blantonmuseum.org](http://collection.blantonmuseum.org) (search: Avery)
- [http://www.sunprints.org](http://www.sunprints.org)

### About the Artwork/Artist
This print presents the link between the emotional and physical realities of the AIDS patients that Avery treated as a psychiatrist. The Last T Cell refers to the stage of the AIDS epidemic when patients' T-cell counts kept dropping to the point where the remaining T cells would be given names.

### Lesson Components

#### Introduction to artwork (10 minutes)
Using the same strategy that students learn at the Blanton, invite them to silently LOOK at *The Last T Cell*. Next, ask students to DESCRIBE what they see. After taking full inventory, students should move on to ANALYZING the artwork. [As facilitator, the teacher should link observations and descriptions to assist student analysis.] Finally, students should be asked to RELATE their discussion to their own lives.

#### Activity (30 minutes)
Show your sunprint sample to the class. Tell students that you will be working in a sunny area outside (if it is a cloudy or overcast day your sunprint will just take more time).

- Follow steps on handout *Sunprints: How They Work and Tips for Best Results* c2010 Regents of University of California [http://www.sunprints.org/how-it-works/](http://www.sunprints.org/how-it-works/)

- Take group outside to make sunprints.

- As students wait for their prints to be exposed, have them make sketches of their objects.

- Once sunprints are brought back inside the classroom and are ready to be rinsed off, students can trace their objects, create rubbings, or make another sketch. They will then have between two and four complete works of art by the end of the project.

#### Reflection (5 minutes)
- Have a gallery walk to view everyone's finished sunprints. What were the results of students' sunprints? Did some objects print better than others? How did this method of photography compare to digital photography commonly used today?

### Assessments
- Compare and contrast sunprints and photographs with the class to assess understanding of the medium.
- Chart student responses to questions.

### In Class Extensions
- Invite students to create rubbings of the same objects from which they made their sunprints. *How was this process different? How was it similar?*

- Ask students to notice how many photographs they see every day. *Are the photographs of people, objects, places, or something else?*

- Look at family pictures together. *Do you have a family photo album where you keep your favorite pictures or pictures from special occasions?*
I. **What you need**
   1. Sunprint paper, acrylic sheet, cardboard, a tub full of water, fun and interesting objects to print.

II. **Arrange your objects on a piece of Sunprint paper out of the reach of the sun.**
   1. The blue molecules embedded in the paper are sensitive to ultra-violet light. For best results, prepare your print in a place where the sun’s light cannot reach the paper as you arrange objects on top of it. Direct sunlight will expose the paper quickly, but even ambient light in the shade, or in a room with a big window will cause slow exposure of the paper.

III. **Place the acrylic pressing sheet on top to flatten and hold your items to the Sunprint paper.**
   1. Using the acrylic pressing sheet when taking prints of flat or almost-flat objects will help to sharpen the edges between blue and white in your final print. The ambient sunlight outdoors will find its way underneath the edges of your objects if they are not pressed firmly to the paper, and you will get Sunprints with blended edges.

IV. **Take your Sunprint outside and lay it in direct sunlight for 2-5 minutes.**
   1. The areas of the paper exposed to the sun will fade from blue to white. When you see most of the color disappear from the paper, your print has been fully exposed. If no direct sunlight is available, don’t worry—just expose your print a little longer and wait for the same fading effect. Under cloud cover, the process will take 5-20 minutes depending on the thickness of the clouds. What is happening in this step? Two crucial molecules in the paper are interacting, forming a new molecule. Their interaction is initiated by specific wavelengths of ultra-violet light. The new molecule is colorless so that as the blue molecules are converted, the white of the paper base begins to show through. Areas of the paper covered by your objects still contain the original blue molecule, so they remain blue.

V. **Rinse your Sunprint in water. Watch the white turn into blue and the blue turn into white.**
   1. To get the deepest blue that the paper can give, leave it in the water for a while: 1-5 minutes. There are two exciting things happening underwater. First, the original blue compound is water soluble so that when you immerse it in the bath, the water carries it away, leaving only the white paper base in those areas. Second, the colorless compound whose formation was caused by the sun’s energy is *not* water soluble, so it cannot wash away in the water bath. It is sensitive to the water in another way. Just as the Sun’s light stimulated a chemical change in the previous step, the water stimulates another chemical change. The water causes an oxidation reaction that turns the colorless compound into the deep blue of a finished Sunprint.

VI. **Lay your Sunprint flat on an absorbent surface and allow it to try.**
   1. You can use a paper towel, or a piece of cardboard as a bed for your Sunprint while it dries. Putting it on something absorbent helps to avoid the formation of water spots by drawing the water from the Sunprint paper.
   2. When you take your paper out of the water, it will probably not have finished oxidizing. The water remaining in the paper will do the job before it evaporates. By the time it is all gone you should have a beautiful deep blue Sunprint!

If you have any questions about any of the steps in this process or about how to get the best results from your Sunprints, contact Seth at 510-642-8856 or sharthun@berkeley.edu.

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