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Note: For your convenience, North Dakota Common Core Standards and Achievement Standards are included in the Pre-visit Lesson and Lesson One. Subsequent Lessons and Activities meet several state and federal education standards as well.
ELMER THOMPSON: THE INVENTOR

The North Dakota Museum of Art is pleased to announce the opening of Elmer Thompson: The Inventor. The exhibition was organized by the North Dakota Museum of Art and is touring the State through the Museum’s Rural Arts Initiative program.

Growing up on a farm in rural North Dakota, Elmer O. Thompson (1891-1984) developed his creative impulses with photography, educating himself in matters of staging, lighting, and processing. Mr. Thompson quickly became an expert in the use of his 5 x 7 camera. His early photographs show the development of a talent that would lead him first to the State Normal and Industrial School in Ellendale, where he served as the official school photographer. He went on to earn an electrical engineering degree at the University of California, served in the Signal Corps in Paris in WWI, and then moved to the center of technological innovation in New York City.

Mr. Thompson earned the first six of his ultimate thirty patents at the AT&T Headquarters at 195 Broadway. From there he moved to RCA Victor, then spent several decades at Philco, where he earned two dozen more patents, including the first wireless radio remote control (Philco’s “Mystery Control”) and a phonograph that transferred the signal from record to the amplifier by means of an optical sensor (the “Beam of Light” system).

Mr. Thompson’s progress—from the prairies of North Dakota to the technological heartland of the early radio and television age—illustrates the marriage of artistic elements with technological innovation. This exhibition illustrates that career with large framed prints of his photographs, many of which were taken in and around Ellendale and near his home in Cavalier County. These include individual portraits, landscapes, buildings, and staged trick photographs.

The North Dakota Museum of Art is the State’s official art museum. As it is located in Grand Forks, it can be difficult for schools to plan day-trips to the Museum. Due to the great distances some schools face, the Museum began bringing exhibitions to towns throughout the State. Exhibitions have been installed in all corners of North Dakota, including smaller towns such as Crosby, Pekin, and Bowman, and larger cities such as Jamestown, Fargo, and Bismarck. Through this program the Museum delivers and installs exhibitions of original artwork free-of-charge to North Dakota communities who are interested. In addition to touring exhibitions, the Museum’s Education Department creates lesson plans and makes them available on the Museum’s website at www.ndmoa.com.

A primary goal of the Museum’s Rural Arts Initiative program is to provide North Dakota schools with quality arts education opportunities. The Museum works with community members to bring schools within a 50 to 60-mile radius of the exhibition site to participate in this unique arts education program. To assist schools with out-of-pocket expenses, the Museum offers travel reimbursements for North Dakota schools wishing to participate.

If you are interested in booking an exhibition or setting up a school tour please call the North Dakota Museum of Art: 701.777.4195
A GUIDE FOR VIEWING ARTWORK

The following activities and lessons rely on three basic methods of visual analysis: description, formal analysis, and interpretation. These methods provide a structure for viewing, analyzing, and writing about visual art. For the purposes of explaining the methods of visual analysis, let’s look at the two images below. The same methods can be applied to analyzing any image or artwork.

Description
The first step in visual analysis is description. Describing an image is a useful technique for looking closely at an image and absorbing its details. Descriptions should try and remain objective, discussing what can be seen without drawing conclusions about an artwork’s meaning. For instance, when looking at Elmer Thompson Self Portrait with Tuba, it would be appropriate to say, “Elmer is playing a tuba,” but it would be inappropriate to say “This is a silly picture.” This sort of subjective comment should be reserved for the interpretation stage. A description can begin anywhere, but generally it is easiest to begin by discussing the subject matter. For example, a description of this image might begin with the basic statement, “This is a black and white photograph of a young man playing the tuba.” Once you have stated the subject matter, simply elaborate on what you can see: “The title of the photograph tells me this is a self portrait, so the young man is Elmer Thompson. Elmer appears to be seated and is in the center of the image. His cheeks are puffed out while blowing into the tuba and his fingers are pressing some valves. I see photographs hanging on a wall behind him. Elmer is wearing a pin striped suit and tie, his hair is combed over and parted, his eyes are open and looking off to the left. His right leg is crossed over his left leg and his body is slightly turned to the left as well.”

Formal Analysis
After looking carefully at an image and considering its properties, formal analysis is the next step. This activity guide includes a description of the elements and principles of art, which can be used as a guide in your formal analysis. The “elements of art” are the building blocks for achieving the “principles of art.” A very good place to start formal analysis is by deciding which elements are most strongly represented. “In the photograph, the contrast between light and dark is immediately apparent. High contrast gives the impression that Elmer is in sharp focus. Low contrast in the background makes that part of the photograph out of focus. That juxtaposition of high contrast and low contrast makes the viewers eyes focus on Elmer. Upon closer inspection, the high contrast of light and dark defined the texture of his suit, skin, hair, hands, and tuba. The tuba looks polished and smooth, this hair is shiny, his suit is dark and looks well taken care of. The composition itself is centralized, Elmer is seated directly in the middle of the photograph. The composition makes Elmer the center of attention”.

Interpretation
This section should focus on the emotions and interpretations that an image evokes for the viewer. Different viewers will react to the same image in different ways, so there are no wrong responses. An example of an interpretative description is, “I can see evidence of technical skill in this photograph in the way the light is intentionally used to draw my eyes directly to Elmer. The contrast between Elmer being in focus and the background being fuzzy meant that he had to set the camera in just the right spot, have a very specific focus, and time the exposure accurately. All of these things also means the photo is carefully staged, everything seems to be technically taken into consideration. That said, I what I enjoy most about this photograph is seeing his sence of whimsy and humor. He seems to playing the tuba and also playing with the camera. The look in his eyes makes me feel like he is listening to the music as he’s playing, and I imaging he relates to the camera in the same way. Listening, learning, and playing”.

“Elmer Thompson: The Inventor” Activities and Lessons North Dakota Museum of Art
Previsit Activity: Look! Think! Discuss!
(This activity can also be done while at the exhibition)

Grade Level: All
Subjects: English–Language Arts and Visual Arts

Learning Objectives:
Students will become familiar with how to look at and examine various works of art through observation and critical thinking.

Materials:
• One photocopy or transparency of an artwork that you provide
• Crayons, markers, colored pencils, papers, and/or other art making supplies

Resources:
See a demonstration of this lesson in action at: http://vimeo.com/9678839, AVTS Discussion with 4th Grade Students.

Procedure:
Part 1: Observe
Select one photograph of artwork you would like to have your students look at. Try to select a piece with people in it, as it is more likely to have a narrative. To begin, have the students take a few moments to view the work of art. Make sure that the title of the work is not visible to the students.

Part 2: Explore and Discuss
1. After an extended period of quiet observation, begin by asking students, “What is going on in this picture?” (If the children are really young, you may rephrase as, “What do you see in this picture?”)

2. Call on students one at a time. Point precisely to what students mention. Paraphrase EACH comment. This validates students and allows the nuances of language to settle in students’ minds. When you paraphrase, be concise and change only the wording, not the meaning of what is said. In paraphrasing, demonstrate the use of proper sentence construction and rich vocabulary to assist students with language. Accept each comment as equal in value to all others.

3. After each student’s observations, the second question you may ask is, “What do you see that makes you say that?” This requires students to provide evidence for their observations. There may be times when this question does not need asking (for example, if a student identifies a ball in the painting, you need not ask, “What do you see that makes you say you see a ball?”).

4. Link students’ related comments. This allows students to feel they are a part of a conversation about art, it’s gratifying, and also allows for the group to come to a shared understanding or acknowledge a discrepancy in interpretation.

5. Follow up each comment with, “What more can we find?” Asking what ELSE we can find implies something OTHER than what has already been said. MORE asks students to look more carefully or deeply at the work of art.

6. Use encouraging body language and facial expressions to foster participation.

7. After approximately 15 to 20 minutes, you should move on to your next work of art. You will be able to feel a long pause in conversation that may feel like the “end” of the discussion. Compliment students on their discussion and move on to the next work of art. When you have completed the entire lesson, tell them what you particularly enjoyed in their discussion. Encourage them to think of viewing art as an open-ended process.
Part 3: Recreate
After the discussion, ask students to draw or recreate one work of art in their own style or how they would have made the work differently. Also, have each student come up with their own title for their new art work. Give the students time to create their works using markers, crayons, or other classroom supplies. If time permits, ask for any volunteers to share and explain their artwork and title.

Common Core Standards – English Language Arts
Speaking and Listening (K-5 and 6-12)

Comprehension and Collaboration
1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others’ ideas and expressing their own clearly and persuasively.
2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
3. Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric.

Presentation of Knowledge and Ideas
4. Present information, findings, and supporting evidence so that listeners can follow the line of reasoning and the organization, development, and style that are appropriate to task, purpose, and audience.

Achievement Standard – Visual Arts
Standard 2: Structure and Function (K-12)
Students understand how works of art are structured and how visual art has a variety of functions.

Visual Thinking Strategies
Techniques for Visual Thinking Strategies are used at the North Dakota Museum of Art as part of our overall education program.

Visual Thinking Strategies (VTS) is a method initiated by teacher-facilitated discussions of art images and is documented to have a cascading positive effect on both teachers and students. It is perhaps the simplest way for teachers and schools to provide students with key behaviors sought by Common Core Standards: thinking skills that become habitual and transfer from lesson to lesson, oral and written language literacy, visual literacy, and collaborative interactions among peers.

For more information about Visual Thinking Strategies, please visit their website: http://vtshome.org/.

VTS is a facilitated discussion about a work of art that starts with just three questions:

What's going on in this picture?
What do you see that makes you say that?
What more can we find?

While facilitating discussion, the teacher paraphrases comments neutrally, points at the area being discussed, and links and frames student comments. The teacher does not provide information or any opinion of the artwork during the discussion.

Based on decades of research in visual thinking and aesthetic education, these methods allow learners of all ages to delve into visual art. Through VTS, students practice careful observation, learn to support their statements with evidence, and consider the viewpoints of others—skills that also form the basis of Common Core standards and 21st Century Skills.

Activity/Lesson One: Three Steps to Viewing Artwork

Grade Level: All
Subjects: English–Language Arts and Visual Arts

Learning Objectives
Students will learn a basic method for analyzing images using description, reflection, and formal analysis.
Students will:
• work in teams to interpret and analyze an assigned work of art
• write responses to the work of art that will demonstrate an understanding of description, formal analysis, and interpretation

Materials
• Background Information: “A Guide for Viewing Artwork” (first page of this Activity/Lesson guide)
• Student handout: “Formal Analysis: Elements and Principles of Art” (page 45 and 46 of this Activity/Lesson Guide)
• Writing paper, pencils, pens, or a computer

Artworks
Artworks in the exhibition Elmer Thompson: The Inventor

Procedure
1. Choose an artwork that works best with your curricular goal, or, using as an example, introduce the basic concepts of description, formal analysis, and reflection, as described in the previous section “A Guide for Viewing Artwork” by modeling these methods for the students.

2. Distribute copies of the student handouts “Formal Analysis: Elements and Principles of Art.” This resource will help students to process the new vocabulary and concepts. Model the processes of description, formal analysis, and interpretation by explaining each method to the class. The discussion of formal analysis may require extra time and explanation since it will introduce new vocabulary to students. Explain each of the elements and principles of art and demonstrate where each appears in the images.

Students will now analyze an image in the exhibition Elmer Thompson: The Inventor by working in small groups. If you would like the class to focus on a particular work of art, choose a specific image and ask your class to gather around it. If you would like the students to focus broadly on the processes of analysis, give each group a different set of images to examine.

Description
1. Give students time to quietly examine the art. Emphasize the importance of close looking and thoroughly cataloguing the details in a work of art. Prompt students to write objective descriptions of the art. Ask students to share their responses with their group. Discuss how a work of art changes when you look closely.

   Three crucial Visual Thinking Strategy sentences to keep you and students looking are:
   What’s going on in this image?
   What do you see that makes you say that?
   What more do you see?
   repeat...

Formal Analysis
4. Ask students to refer to their copies of the “Formal Analysis: Elements and Principles of Art” student handouts. Remind students that not all of the elements and principles of art will be obvious in each image. Some of the elements and principles will be more strongly represented than others. Ask students to choose three elements of art and three principles of art and record where and how each appears in the image. Ask students to share their answers with their groups.
Interpretation
5. When students have completed their written descriptions, they should reflect on their image. Ask students to consider how the image makes them feel or how the artist may have intended the audience to react. Ask students to share their answers with their groups.

6. Finally, ask students to consider how each method of analysis enhanced their understanding of the image and to share their answers with their groups.

Assessment
Teacher:
Observation of student discussion and small groups for inclusion of the following:
- Demonstration of close looking skills
- Application of the three methods of visual analysis

Peer:
Evaluation of written assignment for:
- Demonstration of close looking skills
- Application of the three methods of visual analysis
- Ability to use the vocabulary of the elements and principles of art to conduct formal analysis and apply it to an image

Self:
Students should be able to articulate in discussion and through written assignment:
- The three methods of visual analysis and how each can contribute to a greater understanding of a work of art
- The vocabulary of formal analysis and an understanding of how it can be applied to an image

Common Core Standards – English Language Arts
Speaking and Listening (K-5 and 6-12)

Comprehension and Collaboration
1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others’ ideas and expressing their own clearly and persuasively.
2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
3. Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric.

Presentation of Knowledge and Ideas
4. Present information, findings, and supporting evidence so that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

Achievement Standard – Visual Arts
Standard 2: Structure and Function (K-12)
Students understand how works of art are structured and how visual art has a variety of functions.
Activity/Lesson Two: A Closer Look

Grade Level: All
Subjects: English–Language Arts and Visual Arts

Learning Objectives
Students will:
• look closely and critically at works of art
• use the methods of description, formal analysis, and interpretation to analyze the images encountered in the gallery
• write interactive descriptions of images of their choice
• sketch simple compositions using the elements and principles of art based on the images
• apply what they have learned by writing their own poems

Materials
– Sketchbooks (or notebooks) and pencils

Artworks
Artworks in the exhibition Elmer Thompson: The Inventor

Procedure
Note: If it is not possible to make a trip to the exhibition, the same strategies and activities will work in the classroom. Additionally, any artwork will work well for this lesson. Choose images that are rich in details, emotive qualities, and strong formal properties.

This lesson contains three activities. Each activity uses a different object to explore one method of analysis and emphasize concentrated looking. When looking at visual art, emphasize that the tools students are learning can be used to analyze any work of art from any time period. This activity is an engaging way to help students create rich, descriptive sentences.

Description Activity
This activity should focus on an artwork that is rich in details, which will give students the opportunity to write highly detailed descriptions. Images like A Happy Balance will work very well for this activity because there are many details for students to observe and describe. Any artwork in the exhibition will work.

1. Ask students to divide a page from their sketchbook (or notebook) into quadrants and label each quadrant with one part of speech: nouns, verbs, adverbs, and adjectives. Students should then be divided into four groups. Explain that each group will be responsible for brainstorming words for one part of speech. The “noun group” will come up with a list of nouns that they see in the image. The “adverb group” will come up with a list of adverbs that they see, and so on. Give the groups five minutes to compose their lists. When groups have completed their lists, each should choose a spokesperson to read their list, and the other groups should copy the words down in the appropriate quadrant.

When completed, lists should look something like this:

<table>
<thead>
<tr>
<th>Nouns</th>
<th>Verbs</th>
<th>Adverbs</th>
<th>Adjectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plank</td>
<td>Looking</td>
<td>Happily</td>
<td>Loud</td>
</tr>
<tr>
<td>Woman</td>
<td>Poised</td>
<td>Sadly</td>
<td>Soft</td>
</tr>
<tr>
<td>Dress</td>
<td>Rocking</td>
<td>Softly</td>
<td>Small</td>
</tr>
<tr>
<td>Eyes</td>
<td>Balancing</td>
<td>Loudly</td>
<td>Large</td>
</tr>
<tr>
<td>Barrel</td>
<td>Shine</td>
<td>Angrily</td>
<td>Wide</td>
</tr>
<tr>
<td>Post</td>
<td>Sit</td>
<td>Lightly</td>
<td>Narrow</td>
</tr>
<tr>
<td>Shoes</td>
<td>Growing</td>
<td>Heavily</td>
<td>Blurry</td>
</tr>
</tbody>
</table>
Next, using the words from the four lists, students should compose sentences that use at least one word from each of the quadrants. Some examples based on the words above might be: “In this image the goose is blurry and the windmill is in focus.”

**Formal Analysis Activity**
For this activity, students will be sketching an image of one of the prints in *Elmer Thompson: The Inventor* in their sketchbooks or notebooks. Pick an image that would provide good opportunities to discuss formal analysis in detail. Objects selected for this activity should have strong lines and other formal characteristics. Explain that artists-in-training often sketch the works of master artists to learn.

1. Ask students to sketch the image in their sketchbooks. Review the terms line, shape, and space. Have the class or group begin by using line to draw main areas of the image. Remind them to keep space in mind, both positive and negative, as they fill the page.

2. Once the main shapes are in place, review the terms form, value, and texture. Ask the students to add shading and texture to their drawing to emphasize volume. (They may need to create another sketch.) If students get frustrated or are not sure how to re-create an area of the masterwork, instruct them to go back to using line, then shape, then space, then form, etc. Students may adjust their sketches or compositions as they see fit.

3. Referring to the student handouts Elements of Art and Principles of Design, conduct a formal analysis of the artwork they chose to sketch. Ask students to identify the key principles based on their process of sketching. Discuss the sketching process and how it enhanced their understanding of the artwork. Students may also write a formal analysis of the piece, focusing on three main elements or principles in the artwork.

As they move through the process of re-creating the composition on paper, students will come to appreciate how the formal characteristics contribute to the overall composition.

**Interpretation Activity**
In this section, students will assess and respond to the work of art on a personal level, analyzing the effects that the work has on its audience. Images should be chosen that have a strong emotive characteristic.

1. Ask students to brainstorm why the artist would have created an image like this. Ask them to consider how the artist wanted the viewers to feel when they looked at this image. Students should record their answers in their sketchbook. Students should discuss their answers with a partner or in a small group.

2. Ask students to write a persona poem inspired by the image. Explain to students that in a persona poem, the poet writes from the perspective of someone else or even something else in the image, like the tuba or glasses. Each student should write the poem as if he or she is the artist. The poem should reveal why the artist was drawn to create the artwork. Invite students to refer to their sketchbooks for ideas and to the word bank they generated in the Description Activity for words and images. Remind students that, since we cannot know what is in the artist’s mind when the image was made, there are no correct responses. Encourage them to use their imaginations and picture themselves as the artist. What is moving, curious, or interesting about the scene? What is the first thing they notice? What textures, sounds, and smells would they encounter if they were the artist sitting with the subject?
Activity/Lesson Three: Writing About Art

Grade Level: (4-12)
Subjects: English Language Arts and Visual Arts

Learning Objectives
Students will:
• examine the relationships between the image and the artist's statement or text panel
• look closely at an image in the exhibition
• use the methods of description, reflection, and formal analysis to write their own interpretations of the artwork

Materials
• Notebooks and pencils

Artworks
Artworks in the exhibition Elmer Thompson: The Inventor

Procedure
1. Inform students that they will examine the image and write their own interpretations.

2. Examine the image Two Scoops, by Elmer Thompson. Joseph Hanson, Elmer's uncle, is in front of the farm cook car. Elmer's double exposure trick photographs were set up carefully and obtained precise results, considering the limited equipment available to him. Give students time to quietly examine the images. Before discussing, students should brainstorm questions they have about the artwork. A useful tool for beginning this dialogue is asking the students what they would like to know about the picture or the artist(s). These questions can be recorded in their notebooks, and will ideally form the basis for the artist's statements the students will write.

Elmer Thompson (1891 – 1984), Two Scoops, Digital scan of a glass plate negative.
After looking at the image, the following can be used as discussion questions:

- What is the most visually striking to you about this photograph?
- What do you think the title refers to?
- How was this photo created?
- What are some adjectives you could use to describe the image?

5. Next, each student will write a statement or interpretation based on another artwork from the exhibition. Students should select the artwork that they find most captivating.

6. Once students have selected an artwork, they should write responses based on the three methods of analysis that they practiced in the previous two lessons. As a prewriting activity, students can use the activities outlined in A Closer Look (Lesson 2) as a way to brainstorm ideas for their own statements. The questions that the class provided in Step 2 of this lesson may also be helpful.

7. The students’ interpretations should be at least three paragraphs in length (one paragraph can be committed to each analytic method: Description, Formal Analysis, and Interpretation). Remind them to be aware of transitions between sentences to unify important ideas. Students should also use correct grammar, spelling, and punctuation.

8. When writing their descriptive paragraphs, students should describe specific details in their image(s) using complete sentences.

9. The following is a list of questions that can prompt students to write responses based on formal analysis:

- Which are the two or three most important elements of art or principles of design in your image?
- How did you use the principles of design in your work?
- Which principles of design are most visible in your work?
- How do these principles contribute to the meaning of your work?

10. Finally, for the reflective section, the following is a list of possible questions that can be used to provoke responses. Students can use the answers to these questions to guide their overall interpretations:

- Why did you choose this image to write about?
- What first caught your eye?
- From what perspective was the image created?
- How did Elmer create this photograph?
- When was this photograph made?
- Why do you think Elmer chose to create the photograph?
- What ideas or feelings is Elmer conveying through his photograph?
- Is this a successful image?
- What would you do differently?
- What other title would you give to the photograph?

11. Because writing about art is complex, students should go through a process of revisions. Peer review will also help students refine their ideas as well as get an outside opinion on their works of art. The goal of writing about art is not to make all-encompassing grand declarative interpretation, but rather to come to an interpretation of an image through plausible reasoning – whatever that interpretation is.
General Discussion Questions for Talking about, and Looking at, Portraits

Talking about portraits

• Has anyone ever had his or her portrait made by an artist? What did the artist use to make your portrait?
• If you have had your portrait drawn or painted, how long did you have to sit for your portrait to be made? If you have never had your portrait drawn or painted, how long do you think it would take?
• Has anyone ever had his or her photograph taken? Would you consider that a portrait? How long does that take?
• Are you always satisfied with the results of your portrait? Explain.
• What things would a person consider when choosing an artist to create his or her portrait?
• What do you think about when you know that you are going to have your portrait made?
• How would you dress?
• What might you bring with you?
• What will the setting be for your portrait?
• Will you be sitting or standing?
• Will you be alone, or will someone be in it with you?

Looking at portraits

• What can we discover about a person just by looking at his or her portrait?
• What do you think the person in this portrait wanted to communicate about himself or herself?
• How does the relationship between artist and sitter change the outcome of the portrait?
• What kind of life do you think this person leads? Does he or she work? If so, as what? Are there any props that give clues about the sitter’s profession or lifestyle?
• Is this a person you would like to meet? Why, or why not?
• If the person in this portrait could speak to you, what do you think he or she would say?
• What does the facial expression tell us about how the person is feeling at this moment, or what the artist wants to suggest that the person is feeling?
• What can we say about the person’s social status, time period, and private likes and dislikes by looking at his or her attire?
• Who do you think this portrait was made for? Why? Where do you think it was displayed?
Activity/Lesson Four: Looking at Portraits — Including Your Own

Grade Level: (K-6)
Subjects: English–Language Arts and Visual Arts

Learning Objectives
Students should be able to:
• learn about portraits
• discuss, analyze, and interpret a portrait
• create their own self-portraits using facial expressions and props that say something about themselves

Materials
• Drawing paper or construction paper
• Markers

Artworks
Portraits in the exhibition Elmer Thompson: The Inventor or their own portraits

Procedure
1. Begin by using the following questions while looking at a portrait:
   • Describe the objects, items, and clothes you see in this portrait. From the things you see surrounding this person, what do you think his/her job might be?
   • What does the person's posture and gesture communicate in this work? What do you think the artist wanted to communicate about the person in this portrait?
   • If you were going to create a portrait and dedicate it to someone in your family, who would it be and why would you choose him or her? What would you want to communicate about them? Think about where you might display your self-portrait. Who would you want to see it?

2. Explain to students what a marker is: a felt-tip pen with a broad tip.

3. Facial expression, clothing, posture, and props are all important. Discuss with students what facial expressions and props they want to include in their own self-portraits that would tell something about themselves. Talk about their interests, hobbies, sports, etc.

4. Explain to students that they are going to create their own self-portraits using markers. They should fill the page with their drawings and reinforce their facial expression with at least two objects that tell something about themselves.

5. Model for students how to begin their portrait with an oval for the face. You may want to show them how to set their portraits on the page, encouraging them to fill the entire sheet of paper. Reinforce that this is not a drawing contest.

6. Possibly provide mirrors for the students to examine themselves and draw from. They can include the clothes that they are wearing when they make their portrait, or they could choose to use a favorite piece of clothing.

7. After they are finished, bring them together and talk about the self-portraits as a class. What has each person tried to communicate about himself or herself and about his or her individual interests? Discuss what the other students see in the individual portraits that they created.
Activity/Lesson Five: What Do Portraits Communicate?

Grade Level: (K-6)
Subjects: English–Language Arts and Visual Arts

Learning Objectives
Students will make connections between their personal experiences and a work of art and use visual analysis to describe a portrait.

Materials
• Paper and pencils

Artworks
Portraits in the exhibition, Elmer Thompson: The Inventor, or their own portraits

Procedure
1. Begin with the following opening questions:
   • Have any of you ever had your portrait made? (Remind students of ID cards, passports, photographs, etc.)
   • What are some of the things you thought about before your portrait was made? (Consider clothing, facial expression, background, etc.)
   • What did it feel like to have your portrait made?
   • Do you like to show off that portrait, or do you keep it hidden?

   Next, review the “Looking at Portraits Vocabulary.” Display one of the portraits or group of portraits in the exhibition you will use to inspire discussion so the entire class can view it.

2. Choose a portrait in the exhibition and ask the following discussion questions:
   • What is the first thing you notice about this person?
   • What does the facial expression tell us about him or her? His or her posture? His or her gestures?
   • How about his or her attire? The setting?
   • Do you think he or she works? What does he or she do?
   • Would you like to meet this person? Why or why not?
   • What do you think the sitter wanted his or her portrait to communicate?
   • What do you see that makes you say that?

SUGGESTED ACTIVITIES
• Have students pose like the sitter and describe how it makes them feel.
• Bring in props, such as a hat, cane, or fan, and have students discuss how using the props makes them feel (“realia” activity).
• Have students write down what they think the sitter was thinking about while his or her portrait was being made.
Looking at Portraits Vocabulary

Photography
the process or art of producing images of objects on sensitized surfaces by the chemical action of light or of other forms of radiant energy, as x-rays, gamma rays, or cosmic rays

Portrait
A representation of a person or group of people

Subject Matter (or Sitter)
The person (or people) who is (are) shown in a portrait

Facial Expression
The way the different parts of the face work together to show emotion

Gestures
What the sitter does with his or her hands

Posture
The position of the body

Setting
The place or environment in which the sitter is shown

Attire
The clothing the person in the portrait is wearing

Props
The things the sitter is holding or is surrounded by

Artist
Someone who creates art

Background
The part of a scene or picture that is or seems to be farthest towards the back and from the viewer

Composition
The arrangement or structure of the formal elements that make up the image or work of art

Framing
What the artist has placed within the boundaries of the artwork

Focus
The area which appears clearest or sharpest in the image; also the area of interest or activity

Vantage point
The place from which an artist creates a portrait
Activity/Lesson Six: How Do Portraits Communicate?

Grade Level: (K-6)
Subjects: English—Language Arts and Visual Arts

Learning Objectives
Students will “read” a visual image very much like they would read words in a story

Materials
• Paper and pencils
• Looking at “Portraits Vocabulary”
• Student Activity Sheet: Personal Letter

Artworks
Images in the exhibition Elmer Thompson: The Inventor or their own art images

Procedure
1. Look at one of the portraits in the exhibition and distribute “Looking at Portraits Vocabulary”

2. Have students highlight the following words:
   facial expression
   gestures
   posture
   setting
   attire
   props

2. Explain to students that we can “read” a picture just like we read the words in a story.

3. Explain that they will be “reading” the story of one of the sitters in the image.

4. Ask students to work in pairs. Explain that they are each to choose a different portrait to focus on. They should start by going through the highlighted words, “reading” the image as they think of each word, and then writing one to two sentences on how each word relates to something they see in the sitter. (For example: I think my sitter’s facial expression looks sad and frustrated. She is looking off into the distance which may mean she’s thinking about the future.)

5. Give students time to write their responses. Then ask them to share with their partners their discoveries about the different portraits and to try to figure out the relationship between the portraits. Finally, ask students to discuss what story is being told in the portrait.

6. Ask volunteers to share their findings with the class.

SUGGESTED ACTIVITIES
• Have students write a letter to one of the sitters asking about his or her life. (Feel free to use the Personal Letter activity sheet.)
• Ask students to act out a conversation between the different sitters in the portraits.
Activity Sheet: Personal Letter

Date:

Dear

,  

Sincerely,

Sincerely,
Activity/Lesson Seven: The Interview

Grade Level: (K-6)
Subjects: English–Language Arts and Visual Arts

Learning Objectives
Students will spend time looking at details and write an imagined interview with a sitter.
Students use portrait vocabulary to answer questions about visual images.

Materials
• Paper and pencils
• Looking at Portraits Vocabulary
• Student Activity Sheet: Interview

Artworks
Images in the exhibition Elmer Thompson: The Inventor or their own art images

Procedure
1. Look at the portraits in the exhibition.

2. Have students pretend they are newspaper reporters and their assignment is to interview the person in the portrait. Ask them to take out their Interview activity sheet. Students should imagine possible answers based on careful observation of the portrait.

3. Give students enough time to work on their interviews. Ask them to write complete sentences and to explain their answers using their new vocabulary. (For example: Her posture and attire show that she is a wealthy woman who is very proud.)

4. Ask students to share their answers with the class. If you do not have time for everyone to share, ask each person to share only one question on their interview sheet.

SUGGESTED QUESTIONS
What do you think the artist wanted to communicate through the portrait? Explain your answer.
• If this person in the portrait were speaking, what would they say?
• Does he or she remind you of anyone you know? If so, compare the characteristics of the two people.
Interview

Interview with ________________________________ (name of sitter)

Which three words best describe the sitter?

What is their favorite kind of music?

What is their favorite way to get around town?

Describe three things you might find in their kitchen:

Describe some things their likes to do on the weekends:

If they had a tattoo, what would it be?

What is their biggest secret?
Activity/Lesson Eight: Commission Letter

Grade Level: (K-12)
Subjects: English–Language Arts and Visual Arts

Learning Objectives
Students will apply what they have learned about portraits in a formal writing exercise.
Students write a formal letter using new vocabulary about portraits.
Students practice public speaking skills.

Materials
• Paper and pencils
• Looking at Portraits Vocabulary
• Student Activity Sheet: Formal Letter or Commission Statement

Artworks
Images in the exhibition Elmer Thompson: The Inventor or their own art images

Procedure
1. Explain to students that they will pretend that they are hiring an artist (this can be a known artist or a made-up artist) to create their portraits. In order to do so, they must send a formal, written commission statement to that artist. Explain to students that they will practice writing a formal letter to the artist.

2. Review the elements of a formal letter with the class:
   Sender’s Address
   Date
   Recipient Address
   Salutation
   Body
   Closing

3. Explain to students that they will need to include in the letter information about their preferences for their facial expression, gesture, posture, setting, attire, and props. In addition, they must include the same information about any other sitters who may be in their portrait. Ask students to pretend that the artist will never see them in person and will only have a photograph and the commission statement to use while creating the portrait. Thus, it is important to include as much detail as possible in the letter.


5. Give students enough time to work on their commission statements.

6. Have students share their letters with the class.
Formal Commission Letter

______________________________________
(your name)

______________________________________
(street address)

______________________________________
(city, state, zip)

Dear __________________________,

Sincerely,

_____________________________
(city, state, zip)

(your signature)
Activity/Lesson Nine: Pinhole Camera

Grade Level: (3-5)
Subjects: Visual Arts

Learning Objectives
Students create pinhole cameras to understand that light travels in a straight path. They describe the lines and shapes in a nineteenth-century photograph of a building and then use their pinhole cameras to trace the architecture of their school building.

Materials
• Empty cardboard oatmeal canisters
• Black spray paint
• Waxed paper
• Rubber bands
• Thick black paper, cut to the width of each oatmeal canister and the length plus two inches
• Small, thin pin or needle
• Masking tape
• Journals or bound paper for recording notes
• Pencils
• Drawing paper

Artworks
Images in the exhibition Elmer Thompson: The Inventor or other photographs

Procedure
1. Ask students if they have seen or used digital cameras or camera phones. Tell students that taking pictures is much easier now because we simply push a button and see the picture right away. Look at one of Elmer Thompsons photographs. Tell students that while today's digital pictures are viewable instantly, early photographic images like Elmer's had to be developed using special chemicals. Explain that this picture is a paper negative that was created with a camera. A negative is the image that is made with the camera, and the print is the positive image (opposite of the negative).

2. Explain that students will create a simple camera to learn about the type of basic tool that artists use to make photographs. Explain that the paper negative was created using methods similar to those they will be using in this lesson. Inform the class that light travels in a straight path and that humans learned to use light to create images on paper. Tell them that the word photograph means “to write with light,” and that camera means “room.” Therefore, when we take a picture with a camera, we are capturing light in a small dark room.

3. Students will create pinhole cameras. First, you will need to spray-paint black on the insides and outsides of empty cardboard oatmeal canisters. Spray paint works best for an even, thick coat of paint so that no light can come in from the sides of the canisters.
• Give each student a pre-painted oatmeal canister, a piece of waxed paper, a rubber band, a piece of black paper, and masking tape.
• With a pin, help students poke a hole in the center of the bottom of the canister.
• Students will center the waxed paper over the top of the can, wrap it around the sides, and secure it with a rubber band.
• Then students will wrap the black paper around the perimeter of the canister and align the edge of the paper with the bottom of the canister. At the top of the can, the paper should extend past the waxed paper top by at least two inches.
• Secure the paper to the can with masking tape.
4. Take the pinhole cameras outside. Point the bottom of the canister toward the school building. Have students look into the top of the canister and cup their hands around the edge to keep light out. Ask students the following questions:
- What do you see?
- How does the image compare to the way the building looks without the camera?
- How does the image change if you move closer to the object?
- How does it change if you move farther away?
(The students should see the image on the waxed paper screen, but it will be upside down. As they move closer and farther away from the object, it will change in focus and size.)

5. Explain to students that light always travels in a straight path. When they look at an object through the simple camera, it is upside down because the light that hits the top of the object has to pass through the pinhole and will come out on the other side (the screen) in the opposite position.

6. Tell students they will capture the image of an important building, just as Elmer captured images. Tell students they will use the pinhole cameras to document the architecture of their school. Distribute pencils to students. Have students view their school building through the pinhole camera. Tell them to move around until they find an angle of the school building that they like. Allow them to trace the lines and shapes they see on the image of the building onto the waxed paper. Tell students that early cameras were often used to help people to draw. Also point out that breaking down the image into basic lines and shapes will help them to draw.

7. Instruct students to carefully remove the waxed paper from their pinhole cameras. Tell them they will use the sketch of the building as a guide to create a larger drawing of their school. 8. Display the finished drawings in a class book or on the classroom walls. Have students identify lines and shapes in their own drawings.

During the Renaissance (and a little before...and a little after), artists would paint large frescoes on walls. They didn’t have high tech equipment to help them get their small drawing into a large fresco, so they would copy their drawing onto a large piece of thick, heavy paper the same size as the wall where the fresco was to go. When the drawing (called a “Cartoon”) was complete, the artist would poke holes along the outlines, hold the drawing up to the fresco wall and, using a bag of soot, would “pounce” over the holes. When they were finished and pulled the cartoon away from the wall, they would have a perfect outline of their drawing. Most cartoons were covered up by frescoes, but some were never completed and can still be seen today, like the Raphael Cartoons in London.
History of Photography
WRITTEN BY: Andy Grundberg Beaumont Newhall Naomi Rosenblum Helmut Erich Robert Gernsheim

History of photography, method of recording the image of an object through the action of light, or related radiation, on a light-sensitive material. The word, derived from the Greek photos (“light”) and graphing (“to draw”), was first used in the 1830s.

This article treats the historical and aesthetic aspects of still photography. For a discussion of the technical aspects of the medium, see photography, technology of. For a treatment of motion-picture photography, or cinematography, see motion picture, history of, and motion-picture technology.

General Considerations

As a means of visual communication and expression, photography has distinct aesthetic capabilities. In order to understand them, one must first understand the characteristics of the process itself. One of the most important characteristics is immediacy. Usually, but not necessarily, the image that is recorded is formed by a lens in a camera. Upon exposure to the light forming the image, the sensitive material undergoes changes in its structure, a latent (but reversed) image usually called a negative is formed, and the image becomes visible by development and permanent by fixing with sodium thiosulfate, called “hypo.” With modern materials, the processing may take place immediately or may be delayed for weeks or months.

The essential elements of the image are usually established immediately at the time of exposure. This characteristic is unique to photography and sets it apart from other ways of picture making. The seemingly automatic recording of an image by photography has given the process a sense of authenticity shared by no other picture-making technique. The photograph possesses, in the popular mind, such apparent accuracy that the adage “the camera does not lie” has become an accepted, if erroneous, cliché.

This understanding of photography’s supposed objectivity has dominated evaluations of its role in the arts. In the early part of its history, photography was sometimes belittled as a mechanical art because of its dependence on technology. In truth, however, photography is not the automatic process that is implied by the use of a camera. Although the camera usually limits the photographer to depicting existing objects rather than imaginary or interpretive views, the skilled photographer can introduce creativity into the mechanical reproduction process. The image can be modified by different lenses and filters. The type of sensitive material used to record the image is a further control, and the contrast between highlight and shadow can be changed by variations in development. In printing the negative, the photographer has a wide choice in the physical surface of the paper, the tonal contrast, and the image colour. The photographer also may set up a completely artificial scene to photograph.

The most important control is, of course, the creative photographer’s vision. He or she chooses the vantage point and the exact moment of exposure. The photographer perceives the essential qualities of the subject and interprets it according to his or her judgment, taste, and involvement. An effective photograph can disseminate information about humanity and nature, record the visible world, and extend human knowledge and understanding. For all these reasons, photography has aptly been called the most important invention since the printing press.

Inventing The Medium

Antecedents
The forerunner of the camera was the camera obscura, a dark chamber or room with a hole (later a lens) in one wall, through which images of objects outside the room were projected on the opposite wall. The principle was probably known to the Chinese and to ancient Greeks such as Aristotle more than 2,000 years ago. Late in the 16th century, the Italian scientist and writer Giambattista della Porta demonstrated and described in detail the use of a camera obscura with a lens. While artists in subsequent centuries commonly used variations on the camera obscura to create images they could trace, the results from these devices depended on the artist’s drawing skills, and so scientists continued to search for a method to reproduce images completely mechanically.

In 1727 the German professor of anatomy Johann Heinrich Schulze proved that the darkening of silver salts, a phenomenon known...
since the 16th century and possibly earlier, was caused by light and not heat. He demonstrated the fact by using sunlight to record words on the salts, but he made no attempt to preserve the images permanently. His discovery, in combination with the camera obscura, provided the basic technology necessary for photography. It was not until the early 19th century, however, that photography actually came into being.

**Early experiments**

**Heliography**

Nicéphore Niépce, an amateur inventor living near Chalon-sur-Saône, a city 189 miles (304 km) southeast of Paris, was interested in lithography, a process in which drawings are copied or drawn by hand onto lithographic stone and then printed in ink. Not artistically trained, Niépce devised a method by which light could draw the pictures he needed. He oiled an engraving to make it transparent and then placed it on a plate coated with a light-sensitive solution of bitumen of Judea (a type of asphalt) and lavender oil and exposed the setup to sunlight. After a few hours, the solution under the light areas of the engraving hardened, while that under the dark areas remained soft and could be washed away, leaving a permanent, accurate copy of the engraving. Calling the process heliography (“sun drawing”), Niépce succeeded from 1822 onward in copying oiled engravings onto lithographic stone, glass, and zinc and from 1826 onto pewter plates.

In 1826/27, using a camera obscura fitted with a pewter plate, Niépce produced the first successful photograph from nature, a view of the courtyard of his country estate, Gras, from an upper window of the house. The exposure time was about eight hours, during which the sun moved from east to west so that it appears to shine on both sides of the building.

Niépce produced his most successful copy of an engraving, a portrait of Cardinal d’Amboise, in 1826. It was exposed in about three hours, and in February 1827 he had the pewter plate etched to form a printing plate and had two prints pulled. Paper prints were the final aim of Niépce’s heliographic process, yet all his other attempts, whether made by using a camera or by means of engravings, were underexposed and too weak to be etched. Nevertheless, Niépce’s discoveries showed the path that others were to follow with more success.

**Daguerreotype**

Louis-Jacques-Mandé Daguerre was a professional scene painter for the theatre. Between 1822 and 1839 he was coproprietor of the Diorama in Paris, an auditorium in which he and his partner Charles-Marie Bouton displayed immense paintings, 45.5 by 71.5 feet (14 by 22 metres) in size, of famous places and historical events. The partners painted the scenes on translucent paper or muslin and, by the careful use of changing lighting effects, were able to present vividly realistic tableaux. The views provided grand, illusionistic entertainment, and the amazing trompe l’oeil effect was purposely heightened by the accompaniment of appropriate music and the positioning of real objects, animals, or people in front of the painted scenery.

Like many other artists of his time, Daguerre made preliminary sketches by tracing the images produced by both the camera obscura and the camera lucida, a prism-fitted instrument that was invented in 1807. His attempt to retain the duplication of nature he perceived in the camera obscura’s ground glass led in 1829 to a partnership with Niépce, with whom he worked in person and by correspondence for the next four years. However, Daguerre’s interest was in shortening the exposure time necessary to obtain an image of the real world, while Niépce remained interested in producing reproducible plates. It appears that by 1835, three years after Niépce’s death, Daguerre had discovered that a latent image forms on a plate of iodized silver and that it can be “developed” and made visible by exposure to mercury vapour, which settles on the exposed parts of the image. Exposure times could thus be reduced from eight hours to 30 minutes. The results were not permanent, however; when the developed picture was exposed to light, the unexposed areas of silver darkened until the image was no longer visible. By 1837 Daguerre was able to fix the image permanently by using a solution of table salt to dissolve the unexposed silver iodide. That year he produced a photograph of his studio on a silvered copper plate, a photograph that was remarkable for its fidelity and detail. Also that year, Niépce’s son Isidore signed an agreement with Daguerre affirming Daguerre as the inventor of a new process, “the daguerreotype.”

In 1839 Niépce’s son and Daguerre sold full rights to the daguerreotype and the heliograph to the French government, in return for annuities for life. On August 19 full working details were published. Daguerre wrote a booklet describing the process, An Historical and Descriptive Account of the Various Processes of the Daguerreotype and the Diorama, which at once became a best seller; 29
Photographic Drawing
The antecedents of photogenic drawing can be traced back to 1802, when Thomas Wedgwood, son of the famous potter Josiah Wedgwood, reported his experiments in recording images on paper or leather sensitized with silver nitrate. He could record silhouettes of objects placed on the paper, but he was not able to make them permanent. Sir Humphry Davy published a paper in the Journal of the Royal Institution, London, in June 1802, on the experiments of his friend Wedgwood; this was the first account of an attempt to produce photographs.

In 1833 the French-born photographer Hercules Florence worked with paper sensitized with silver salts to produce prints of drawings; he called this process “photography.” However, since he conducted his experiments in Brazil, apart from the major scientific centers of the time, his contributions were lost to history until 1973, when they were rediscovered. Others in Europe, including one woman, claimed to have discovered similar photographic processes, but no verifiable proof has come to light.

William Henry Fox Talbot, trained as a scientist at the University of Cambridge, could not draw his scientific observations, even with the aid of a camera lucida; this deficiency inspired him to invent a photographic process. He decided to try to record by chemical means the images he observed, and by 1835 he had a workable technique. He made paper light-sensitive by soaking it alternately in solutions of common salt (sodium chloride) and silver nitrate. Silver chloride was thus produced in the fibers of the paper. Upon exposure to light, the silver chloride became finely divided silver, dark in tone. Theoretically, the resulting negative, in which tonal and spatial values were reversed, could be used to make any number of positives simply by putting fresh sensitized paper in contact with the negative and exposing it to light. Talbot’s method of fixing the print by washing it in a strong solution of sodium chloride was inadequate, however, and the process was not successful until February 1839, when his astronomer friend Sir John Herschel suggested fixing the negatives with sodium hyposulphite (now called sodium thiosulfate) and waxing them before printing, which reduced the grain of the paper.

When news of Daguerre’s process reached England in January 1839, Talbot rushed publication of his “photogenic drawing” process and explained his technique in complete detail to the members of the Royal Society—six months before the French government divulged working directions for the daguerreotype.

Early views of the medium’s potential
Photography’s remarkable ability to record a seemingly inexhaustible amount of detail was marveled at again and again. Still, from its beginnings, photography was compared—often unfavourably—with painting and drawing, largely because no other standards of picture making existed. Many were disappointed by the inability of the first processes to record colours and by the harshness of the tonal scale. Critics also pointed out that moving objects were not recorded or were rendered blurry and indistinct because of the great length of time required for an exposure.

Despite these deficiencies, many saw the technique of photography as a shortcut to art. No longer was it necessary to spend years in art school drawing from sculpture and from life, mastering the laws of linear perspective and chiaroscuro. Others saw these realizations as threatening. For example, upon first seeing the daguerreotype process demonstrated, the academic painter Paul Delaroche declared, “From today, painting is dead”; although he would later realize that the invention could actually aid artists, Delaroche’s initial reaction was indicative of that of many of his contemporaries. Such artists at first feared what Daguerre boasted in a 1838 broadsheet: “With this technique, without any knowledge of chemistry or physics, one will be able to make in a few minutes the most detailed views.”

Photography’s Early Evolution, C. 1840–C. 1900

Development of the daguerreotype
Daguerre’s process rapidly spread throughout the world. Before the end of 1839, travelers were buying daguerreotypes of famous monuments in Egypt, Israel, Greece, and Spain; engravings of these works were made and then published in two volumes as Excursions daguerriennes between 1841 and 1843. Although Daguerre’s process was published “free to the world” by the French government, he took out a patent for it in England; the first licensee was Antoine-François-Jean Claudet. The first daguerreotypes in the
United States were made on September 16, 1839, just four weeks after the announcement of the process. Exposures were at first of excessive length, sometimes up to an hour. At such lengthy exposures, moving objects could not be recorded, and portraiture was impractical.

Experiments were begun in Europe and the United States to improve the optical, chemical, and practical aspects of the daguerreotype process to make it more feasible for portraiture, the most desired application. The earliest known photography studio anywhere opened in New York City in March 1840, when Alexander Wolcott opened a “Daguerrean Parlor” for tiny portraits, using a camera with a mirror substituted for the lens. During this same period, József Petzval and Friedrich Voigtländer, both of Vienna, worked on better lens and camera design. Petzval produced an achromatic portrait lens that was about 20 times faster than the simple meniscus lens the Parisian opticians Charles Chevalier and N.M.P. Lerebours had made for Daguerre’s cameras. Meanwhile, Voigtländer reduced Daguerre’s clumsy wooden box to easily transportable proportions for the traveler. These valuable improvements were introduced by Voigtländer in January 1841. That same month another Viennese, Franz Kratochwila, freely published a chemical acceleration process in which the combined vapours of chlorine and bromine increased the sensitivity of the plate by five times.

The first studio in Europe was opened by Richard Beard in a glasshouse on the roof of the Royal Polytechnic Institution in London on March 23, 1841. Unlike the many daguerreotypists who were originally scientists or miniature painters, Beard had been a coal merchant and patent speculator. Having acquired the exclusive British license for the American mirror camera (he later also purchased the exclusive rights to Daguerre’s invention in England, Wales, and the colonies), Beard employed the chemist John Frederick Goddard to try to improve and accelerate the exposure process. Among the techniques Goddard studied were two that Wolcott had tried: increasing the light sensitivity of the silver iodide with bromine vapours and filtering the blindingly bright daylight necessary for exposure through blue glass to ease the portrait sitter’s eye strain. By December 1840 Goddard had succeeded well enough to produce tiny portraits ranging in size from 0.4 inch (1 cm) in diameter to 1.5 by 2.5 inches (4 by 6 cm). By the time Beard opened his studio, exposure times were said to vary between one and three minutes according to weather and time of day. His daguerreotype portraits became immensely popular, and the studio made considerable profits the first few years, but competition soon appeared, and Beard lost his fortune in several lawsuits against infringers of his licenses.

The finest daguerreotypes in Britain were produced by Claudet, who opened a studio on the roof of the Royal Adelaide Gallery in June 1841. He was responsible for numerous improvements in photography, including the discovery that red light did not affect sensitive plates and could therefore be used safely in the darkroom. The improvements that had been made in lenses and sensitizing techniques reduced exposure times to approximately 20 to 40 seconds.

Daguerreotyping became a flourishing industry. Practitioners such as Hermann Biow and Carl Ferdinand Stelzner worked in Germany, and William Horn opened a studio in Bohemia in 1841. It was the United States, however, that led the world in the production of daguerreotypes. Portraiture became the most popular genre in the United States, and within this genre, standards of presentation began to develop. Certain parts of the daguerreotype portrait, usually the lips, eyes, jewelry, and occasionally the clothing, were hand-coloured, a job often done by women. Because of their fragile nature, daguerreotype images always were covered with glass and encased in a frame or casing made of leather-covered wood or gutta-percha, a plasticlike substance made from rubber.

In the late 1840s every city in the United States had its own “daguerrean artist,” and villages and towns were served by traveling photographers who had fitted up wagons as studios. In New York City alone there were 77 galleries in 1850. Of these, the most celebrated was that of Mathew B. Brady, who began in 1844 to form a “Gallery of Illustrious Americans,” a collection of portraits of notables taken by his own and other cameramen. Several of these portraits, including those of Daniel Webster and Edgar Allan Poe, were published by lithography in a folio volume.

Cities and towns, as well as their inhabitants, were also photographed by American daguerreotypists: the rapid growth of San Francisco was documented month by month, and the first history of the city, published in 1855, was illustrated with engravings made from daguerreotypes.

Daguerreotyping spread throughout the world during the 1850s as photographers from England, France, and the United States followed colonialist troops and administrators to the Middle East, Asia, and South America. Army personnel and commercial photographers portrayed foreign dignitaries, landscape, architecture, and monuments in order to show Westerners seemingly exotic cultures. Particularly notable were daguerreotypes made in Japan by the American photographer Eliphalet Brown, Jr., who...
accompanied the 1853–54 mission led by Matthew C. Perry to open Japan to Western interests.

While most of the initial photographic work in these places was by Westerners, by the 1860s local practitioners had begun to open studios and commercial establishments. Marc Ferrez in Brazil, Kusakabe Kimbei in Japan, the (French-born) Bonfils family in Lebanon, and Kassian Céphas in Indonesia were among the international photographers who set up studios to supply portraits and views during this period.

**Development of the calotype**

The popularity of the daguerreotype surpassed that of the photogenic drawing, but Talbot, convinced of the value of duplicability, continued to work to improve his process. On September 21–23, 1840, while experimenting with gallic acid, a chemical he was informed would increase the sensitivity of his prepared paper, Talbot discovered that the acid could be used to develop a latent image. This discovery revolutionized photography on paper as it had revolutionized photography on metal in 1835. Whereas previously Talbot had needed a camera exposure of one hour to produce a 6.5-by-8.5-inch (16.5-by-21.6-cm) negative, he now found that one minute was sufficient. Developing the latent image made photography on paper as valued as the daguerreotype, although the image still was not as clearly defined. Talbot named his improved negative process the calotype, from the Greek meaning “beautiful picture,” and he protected his discoveries by patent.

The first aesthetically satisfying use made of this improved process was in the work of David Octavius Hill, a Scottish landscape painter, and his partner, Robert Adamson, an Edinburgh photographer. In 1843 Hill decided to paint a group portrait of the ministers who in that year formed the Free Church of Scotland; in all, there were more than 400 figures to be painted. Sir David Brewster, who knew of Talbot’s process from the inventor himself, suggested to Hill that he make use of this new technique. Hill then enlisted the aid of Adamson, and together they made hundreds of photographs, not only of the members of the church meeting but also of people from all walks of life. Although their sitters were posed outdoors in glaring sunlight and had to endure exposures of upward of a minute, Hill and Adamson managed to retain a lifelike vitality. Hill’s aesthetic was dominated by the painting style of the period in lighting and posing, particularly in the placement of the hands; in many of Hill’s portraits, both the sitter’s hands are visible, placed in a manner meant to add grace and liveliness to a dark portion of an image. Indeed, many of his calotypes are strikingly reminiscent of canvases by Sir Henry Raeburn and other contemporary artists. Proving the calotype’s artistic qualities, William Etty, a royal academian, copied in oils the calotype Hill and Adamson made of him in 1844 and exhibited it as a self-portrait. In addition to their formal portraiture, the partners made a series of photographs of fishermen and their wives at Newhaven and in Edinburgh, as well as architectural studies.

The calotype, which lent itself to being manipulated by chemicals and paper, was used in the 1850s to create exceptionally artistic images of architectural monuments.

**Development of stereoscopic photography**

Stereoscopic photographic views (stereographs) were immensely popular in the United States and Europe from about the mid-1850s through the early years of the 20th century. First described in 1832 by English physicist Sir Charles Wheatstone, stereoscopy was improved by Sir David Brewster in 1849. The production of the stereograph entailed making two images of the same subject, usually with a camera with two lenses placed 2.5 inches (6 cm) apart to simulate the position of the human eyes, and then mounting the positive prints side by side laterally on a stiff backing. Brewster devised a stereoscope through which the finished stereograph could be viewed; the stereoscope had two eye pieces through which the laterally mounted images, placed in a holder in front of the lenses, were viewed. The two images were brought together by the effort of the human brain to create an illusion of three-dimensionality.

Stereographs were made of a wide range of subjects, the most popular being views of landscapes and monuments and composed narrative scenes of a humorous or slightly suggestive nature. Stereoscopes were manufactured for various price ranges and tastes, from the simple hand-held device introduced by Oliver Wendell Holmes (who promoted stereography through articles in The Atlantic Monthly) to elaborate floor models containing large numbers of images that could be flipped into place. The stereograph became especially popular after Queen Victoria expressed interest in it when it was exhibited at the 1851 Crystal Palace Exposition. Like television today, stereography during the second half of the 19th century was both an educational and a recreational device with considerable impact on public knowledge and taste.
Development of the wet collodion process

Photography was revolutionized in 1851 by the introduction of the wet collodion process for making glass negatives. This new technique, invented by the English sculptor Frederick Scott Archer, was 20 times faster than all previous methods and was, moreover, free from patent restrictions. Paper prints could easily be made from glass-plate negatives. The process had one major drawback: the photographer had to sensitize the plate almost immediately before exposure and expose it and process it while the coating was moist. Collodion is a solution of nitrocellulose (guncotton) in alcohol and ether; when the solvents evaporate, a clear plastic-like film is formed. Since it is then impervious to water, the chemicals used for developing the exposed silver halides and removing the unexposed salts cannot penetrate the coating to act upon them. The wet collodion process was almost at once universally adopted because it rendered detail with great precision that rivaled that of the daguerreotype. It reigned supreme for more than 30 years and greatly increased the popularity of photography, despite the fact that it was unequally sensitive to different colours of the spectrum.

At first the positive prints made from the glass plate negatives were produced by Talbot's salt paper method, but from the mid-1850s on they were made on albumen paper. Introduced in 1850 by Louis-Désiré Blanquart-Evrard, albumen paper is a slow printing-out paper (i.e., paper that produces a visible image on direct exposure, without chemical development) that had been coated with egg white before being sensitized. The egg white gave the paper a glossy surface that improved the definition of the image.

A new style of portrait utilizing albumen paper, introduced in Paris by André-Adolphe-Eugène Disdéri in 1854, was universally popular in the 1860s. It came to be called the carte-de-visite because the size of the mounted albumen print (4 by 2.5 inches [10.2 by 6 cm]) corresponded to that of a calling card. Disdéri used a four-lens camera to produce eight negatives on a single glass plate. Each picture could be separately posed, or several exposures of the same pose could be made at once. The principal advantage of the system was its economy: to make eight portraits the photographer needed to sensitize only a single sheet of glass and make one print, which was then cut up into separate pictures. At first cartes-de-visite almost invariably showed the subjects standing. Over time, backgrounds became ornate: furniture and such architectural fragments as papier-mâché columns and arches were introduced, and heavy-fringed velvet drapes were hung within range of the camera. With the advent of the cabinet-size (6.5 by 4 inches [16.5 by 10.2 cm]) picture in 1866, the decorative strategies of the photographer became yet more pronounced, so that in 1871 a photographer wrote: “One good, plain background, disrob ed of castles, piazzas, columns, curtains and what not, well worked, will suit every condition of life.”

The new wet collodion process was also used to produce positive images on glass called ambrotypes, which were simply underexposed or bleached negatives that appeared positive when placed against a dark coating or backing. In pose and lighting, these popular portraits were similar to daguerreotypes in sizes and were enclosed in similar types of cases. They did not approach the brilliancy of the daguerreotype, however.

Tintypes, first known as ferrotypes or melainotypes, were cheap variations of the ambrotype. Instead of being placed on glass, the collodion emulsion was coated on thin iron sheets that were enameled black. At first they were presented in cases, surrounded by narrow gilt frames, but by the 1860s this elaborate presentation had been abandoned, and the metal sheets were simply inserted in paper envelopes, each with a cutout window the size of the image. Easy to make and inexpensive to purchase, tintypes were popular among soldiers in the Civil War and remained a form of folk art throughout the 19th century. Poses of sitters in tintypes were often informal and sometimes humorous. Because they were cheap and easy to produce, tintypes became a popular form of street photography well into the 20th century. Street-corner photographers, often equipped with a donkey, were common in European countries.

Development of the dry plate

In the 1870s many attempts were made to find a dry substitute for wet collodion so that plates could be prepared in advance and developed long after exposure, which would thereby eliminate the need for a portable darkroom. In 1871 Richard Leach Maddox, an English physician, suggested suspending silver bromide in a gelatin emulsion, an idea that led, in 1878, to the introduction of factory-produced dry plates coated with gelatin containing silver salts. This event marked the beginning of the modern era of photography.

Gelatin plates were about 60 times more sensitive than collodion plates. The increased speed freed the camera from the tripod, and a great variety of small hand-held cameras became available at relatively low cost, allowing photographers to take instantaneous snapshots. Of these, the most popular was the Kodak camera, introduced by George Eastman in 1888. Its simplicity greatly
accelerated the growth of amateur photography, especially among women, to whom much of the Kodak advertising was addressed. In place of glass plates, the camera contained a roll of flexible negative material sufficient for taking 100 circular pictures, each roughly 2.5 inches (6 cm) in diameter. After the last negative was exposed, the entire camera was sent to one of the Eastman factories (Rochester, New York, or Harrow, Middlesex, England), where the roll was processed and printed; “You Press the Button, We Do the Rest” was Eastman’s description of the Kodak system. At first Eastman’s so-called “American film” was used in the camera; this film was paper based, and the gelatin layer containing the image was stripped away after development and fixing and transferred to a transparent support. In 1889 this was replaced by film on a transparent plastic base of nitrocellulose that had been invented in 1887 by the Reverend Hannibal Goodwin of Newark, New Jersey.

Photography of movement
A few years before the introduction of the dry plate, the world was amazed by the photographs of horses taken by Eadweard Muybridge in California. To take these photographs, Muybridge used a series of 12 to 24 cameras arranged side by side opposite a reflecting screen. The shutters of the cameras were released by the breaking of their attached threads as the horse dashed by. Through this technique, Muybridge secured sets of sequential photographs of successive phases of the walk, the trot, and the gallop. When the pictures were published internationally in the popular and scientific press, they demonstrated that the positions of the animal’s legs differed from those in traditional hand-drawn representations. To prove that his photographs were accurate, Muybridge projected them upon a screen one after the other with a lantern-slide projector he had built for the purpose; the result was the world’s first motion-picture presentation. This memorable event took place at the San Francisco Art Association in 1880.

Muybridge, whose early studies were made with wet plates, continued his motion studies for some 20 years. With the new gelatin plates, he was able to improve his technique greatly, and in 1884–85, at the invitation of the University of Pennsylvania, he produced 781 sequential photographs of many kinds of animals as well as men and women engaged in a wide variety of activities. He was aided in this project by painter Thomas Eakins, who also made motion studies.

Muybridge’s photographic analysis of movement coincided with studies by French physiologist Étienne-Jules Marey to develop chronophotography. Whereas Muybridge had employed a battery of cameras to record detailed, separate images of successive stages of movement, Marey used only one, recording an entire sequence of movement on a single plate. With Marey’s method, the images of various phases of motion sometimes overlapped, but it was easier to see and understand the flow of movement. Marey was also able to record higher speeds at shorter intervals than Muybridge. Both his and Muybridge’s work greatly contributed to the field of motion study and to the development of the motion picture.

Early attempts at colour
Photography’s transmutation of nature’s colours into various shades of black and white had been considered a drawback of the process from its inception. To remedy this, many portrait photographers employed artists who hand-tinted daguerreotypes and calotypes. Artists also painted in oils over albumen portraits on canvas. Franz von Lenbach in Munich, for example, was among the many who projected onto canvas an image that had been made light-sensitive, whereupon he painted freely over it. In Japan, where hand-coloured woodcuts had a great tradition and labour was cheap, some firms from the 1870s onward sold photographs of scenic views and daily life that had been delicately hand-tinted. In the 1880s photochromes, colour prints made from hand-coloured photographs, became fashionable, and they remained popular until they were gradually replaced in the first decades of the 20th century by Autochrome plates.

Establishing genres

Portraiture
From the medium’s beginnings, the portrait became one of photography’s most popular genres. Some early practitioners such as Southworth and Hawes and Hill and Adamson broke new ground through the artistry they achieved in their portraits. Outside such mastery, however, portraiture throughout the world generally took on the form of uninspired daguerreotypes, tintypes, cartes-de-visite, and ambrotypes, and most portraitists relied heavily on accessories and retouching. Such conventions were broken by several important subsequent photographers, notably Gaspard-Félix Tournachon, a Parisian writer, editor, and caricaturist who used the pseudonym of Nadar; Étienne Carjat, likewise a Parisian caricaturist; and Julia Margaret Cameron.
Nadar took up photography in 1853 as a means of making studies of the features of prominent Frenchmen for inclusion in a large caricature lithograph, the “Panthéon Nadar.” He posed his sitters against plain backgrounds and bathed them with diffused daylight, which brought out every detail of their faces and dress. He knew most of them, and the powers of observation he had developed as a caricaturist led him to recognize their salient features, which he recorded directly, without the exaggeration that he put in his drawings. When Nadar’s photographs were first exhibited, they won great praise in the Gazette des Beaux Arts, then the leading art magazine in France.

Carjat depicted the prominent Parisian artists, actors, writers, musicians, and politicians of his day. These portraits display dignity and distinction like those of Nadar, his contemporary and rival, but with a sometimes startling level of intensity in the sitters’ gazes.

Cameron took up photography as a pastime in 1864. Using the wet-plate process, she made portraits of such celebrated Victorians of her acquaintance as Sir John F.W. Herschel, George Frederick Watts, Thomas Carlyle, Charles Darwin, and Alfred, Lord Tennyson. For her portraits, a number of which were shown at the Paris International Exhibition of 1867, Cameron used a lens with the extreme focal length of 30 inches (76.2 cm) to obtain large close-ups. This lens required such long exposures that the subjects frequently moved. The lack of optical definition and this accidental blurring was criticized by the photographic establishment, yet the power of her work won her praise among artists. This can be explained only by the intensity of her vision. “When I have had these men before my camera,” she wrote about her portraits of great figures.

Besides these memorable portraits, Cameron produced a large number of allegorical studies, as well as images of children and young women in costume, acting out biblical scenes or themes based on the poetry of her hero, Tennyson. In making these pictures—which some today find weak and sentimental—she was influenced by the Pre-Raphaelite painters, who portrayed similar themes in their work.

Photojournalism
From the outset, photography served the press. Within weeks after the French government’s announcement of the process in 1839, magazines were publishing woodcuts or lithographs with the byline “from a daguerreotype.” In fact, the two earliest illustrated weeklies—The Illustrated London News, which started in May 1842, and L’Illustration, based in Paris from its first issue in March 1843—owe their origin to the same cultural forces that made possible the invention of photography. Early reproductions generally carried little of the conviction of the original photograph, however.

Photography as an adjunct of war reportage began when Roger Fenton sailed from London to the Crimea to photograph the war between England, Russia, and Turkey in 1855. He was sent to provide visual evidence to counter the caustic written reports dispatched by William Russell, war correspondent for The Times of London, criticizing military mismanagement and the inadequate, unsanitary living conditions of the soldiers. Despite the difficulties of developing wet-collodion plates with impure water, in high temperatures, and under enemy fire, during his four-month stay Fenton produced 360 photographs, the first large-scale camera documentation of a war. Crimean War imagery was also captured by British photographer James Robertson, who later traveled to India with an associate, Felice Beato, to record the aftermath of the Indian Mutiny of 1857–58.

When the Civil War broke out in the United States, Mathew B. Brady, a New York City daguerreotypist and portraitist, conceived the bold plan of making a photographic record of the hostilities. When told the government could not finance such an undertaking, he invested his own savings in the project, expecting to recover his outlay by selling thousands of prints. Brady and his crew of about 20 photographers—among them Alexander Gardner and Timothy H. O’Sullivan, who both left his employ in the midst of hostilities—produced an amazing record of the battlefield. At his New York gallery, Brady showed pictures of the dead at Antietam. The New York Times reported on October 20, 1862: Mr. Brady has done something to bring home to us the terrible reality and earnestness of war. If he has not brought bodies and laid them in our dooryards and along the streets, he has done something very like it….It seems somewhat singular that the same sun that looked down on the faces of the slain, blistering them, blotting out from the bodies all semblance to humanity, and hastening corruption, should have thus caught their features upon canvas, and given them perpetuity for ever. But so it is.

Throughout the remainder of the 19th century, intermittent conflicts in Asia and Africa arising from imperialist ambitions were documented by photographers working for news media and for companies that manufactured stereographs. For the most part, war
images were accepted as truthful depictions of painful events. However, after images of the Communard uprising in Paris in 1871 were shown to have been doctored, the veracity of such camera documentation no longer could be taken for granted.

Regular use of photographs in magazines began with the perfection of the halftone process, which allowed the camera image to be printed at the same time as the type and thereby reduced the cost of reproduction. The first newspaper halftone in the United States appeared in 1888, and shortly thereafter newspapers turned to photography for reporting topical events, making the profession of newspaper illustrator obsolete. Although technical advances improved reproduction quality, apart from impressive examples of combat photography, the subjects and styles of early journalistic photography were generally unimaginative and dull.

**Documentary photography**

**Landscape and architectural documentation**

From the earliest days of the medium, landscape, architecture, and monuments were appealing subjects for photographers. This sort of photography, which was collected by artists, scientists, and travelers, was impelled by several factors. In Europe one powerful factor was the maneuverings among western European powers for control of portions of North Africa and Asia. From the late 1850s through the 1870s, British photographers were particularly active in recording the natural landscape and monuments of the empire’s domains: Francis Frith worked in Egypt and Asia Minor, producing three albums of well-composed images; Samuel Bourne photographed throughout India (with a retinue of equipment bearers); John Thomson produced a descriptive record of life and landscape in China; and French photographer Maxime Du Camp traveled to Egypt with Gustave Flaubert on a government commission to record landscape and monuments.

Both for patriotic reasons and as a commodity for travelers, photographers also were active in recording the landscape of western Europe in the 1850s and ’60s. Important British photographers included Roger Fenton, who worked in England and Wales; Charles Clifford, who worked in Spain; Robert Macpherson, who photographed Rome; and George Washington Wilson, who photographed Scotland. French photographer Adolphe Braun recorded the landscape around his native Alsace, as well as the mountainous terrain of the French Savoy, as did the brothers Louis-Auguste and Auguste-Rosalie Bisson. Herman Krone in Germany and Giacchino Altobelli and Carlo Ponti in Italy were also intent on recording the beauties of their regional landscapes.

Photographs of specific historical buildings were made for a number of purposes: to satisfy antiquarian curiosity, to provide information for restoration, to supply artists with material on which to base paintings, or to effect preservation efforts. Practically from photography’s inception, such documentation was commissioned by public and private authorities. In western Europe and the United States, photographs captured the building of the industrial infrastructure, from bridges to railroad lines, from opera houses to public places to monumental statuary. In the early 1850s Philip Henry Delamotte was hired to document the progress of the construction of the Crystal Place in London, and a few years later Robert Howlett depicted the building of the Great Eastern transatlantic steamship. Alfred and John Bool and Henry Dixon worked for the Society for Photographing Old London, recording historical buildings and relics. In the 1850s the French government commissioned several photographers to document historical buildings. Working with cameras making photographs as large as 20 by 29 inches (51 by 74 cm), Henri Le Secq, Charles Marville, and Charles Nègre produced remarkable calotypes of the cathedrals of Notre-Dame (Paris), Chartres, and Amiens, as well as other structures that were being restored after centuries of neglect. An establishment was set up in Lille, France, by Blanquart-Evrard at which these paper negatives could be printed in bulk.

In the United States explorations of the lands beyond the Great Plains led to the apogee of landscape photography during the period. Before the Civil War, relatively few exceptional images of the Western landscape had been made. In the postwar era railroad companies and government commissions included photographers among their teams sent to determine mineral deposits, rights of way, and other conditions that would be suitable for settlement. Of the photographers confronting the spectacular landscape of the American West in the 1870s and ’80s, William Henry Jackson, O’Sullivan, and Carleton Watkins produced particularly notable work. Both O’Sullivan, who helped survey Nevada and New Mexico, and Watkins, who worked in California and Oregon, were able to convey through their work a sense of the untamed and extraordinary quality of the Western landscape. As a testament to the power of his images, Jackson’s photographs of the Grand Canyon and the Yellowstone River were influential in getting public land set aside for Yellowstone National Park. The work these and other photographers of the American West produced usually was made available in several sizes and formats, from stereographic images to mammoth-sized works.
Landscapes in places outside the United States and Europe were usually portrayed by European photographers during this period. However, exceptions included the Chinese photographer Afong Lai and the Brazilian photographer Marc Ferrez, both of whom produced excellent views of their native countries. In particular, Lai’s serene compositions reflected the conventions of the long-standing tradition of Chinese landscape painting.

**Social documentation**

The recognition of the power of photography to persuade and inform led to a form of documentary photography known as social documentation, or social photography. The origins of the genre can be traced to the classic sociological study issued by Henry Mayhew in 1851, London Labour and the London Poor, although this was illustrated with drawings partly copied from daguerreotypes by Richard Beard and not actual photos. A later effort, Street Life in London (1877), by Adolphe Smith and John Thomson, included facsimile reproductions of Thomson’s photographs and produced a much more persuasive picture of life among London’s working class. Thomson’s images were reproduced by Woodburytype, a process that resulted in exact, permanent prints but was costly because it required hand mounting for each individual print. This pursuit was continued by John Barnardo, who, beginning in the 1870s, photographed homeless children in London for the purpose of both record keeping and fund-raising and thus fulfilled the double objectives of social documentation: capturing theoretically objective description and arousing sympathy. The “before” and “after” images used by Barnardo to demonstrate the efficacy of social intervention became a convention in social documentation. It was taken up to good effect by the Indian photographer Raja Lala Deen Dayal, especially in his documentation of the good works undertaken by the nizam of Hyderabad in the late 19th century. In 1877 Thomas Annan began a project in Edinburgh in which he used the camera to record the need for new housing for the working poor. He concentrated mainly on the derelict buildings and sewerage systems rather than on the inhabitants; eventually the images were collected for their artistic merit rather than their social use.

Social documentation became more focused in the work of Jacob A. Riis, a police reporter in New York City in the 1880s who spent about four years depicting slum life. Employing cameramen at first, Riis eventually learned the rudiments of the medium so that he could himself portray the living and working conditions of immigrants whose social circumstances, he believed, led to crime and dissolution. Reproduced by the recently developed halftone process, the photographs and drawings based on them illustrated How the Other Half Lives (1890), Riis’s first book about immigrant life. They also were turned into positive transparencies—slides—to illustrate Riis’s lectures, which were aimed at a largely middle-class audience, some of whom were said to have fainted at the sight of the conditions the images documented. Able to convince the progressive reformers of the time of the need for change, Riis’s work was instrumental in effecting slum-clearance projects in New York.

In European countries especially, there was also an awakened interest in documenting social customs during this period. Sometimes this meant recording those European customs that were being replaced by advancing industrialization. This interest led to the establishment of photographic archives, such as the National Photographic Record Association, set up in the mid-1890s by Benjamin Stone, a British member of Parliament. Left to the city of Birmingham, the collection included photographs taken by Stone and others of vanishing local customs. Other times this led to an interest in the particularities of dress and custom of those living in distant regions. William Carrick, a Scotsman, portrayed daily life in Russia. In addition to portraying nature and artifacts, John Thomson, Felice Beato, and Samuel Bourne also depicted indigenous peoples in China and India. In 1888 the journal National Geographic, which produced photographic accounts of cultures throughout the world, was established.

**Photography as art**

**Early developments**

Photographic societies—made up of both professionals and amateurs enticed by the popularity of the collodion process—began to form in the mid-19th century, giving rise to the consideration of photography as an aesthetic medium. In 1853 the Photographic Society, parent of the present Royal Photographic Society, was formed in London, and in the following year the Société Française de Photographie was founded in Paris. Toward the end of the 19th century, similar societies appeared in German-speaking countries, eastern Europe, and India. Some were designed to promote photography generally, while others emphasized only artistic expression. Along with these organizations, journals promoting photography as art also appeared.
At the first meeting of the Photographic Society, the president, Sir Charles Eastlake (who was then also president of the Royal Academy), invited the miniature painter Sir William Newton to read the paper “Upon Photography in an Artistic View” (Journal of the Photographic Society, 1853). Newton’s argument was that photographs could be useful so long as they were taken “in accordance [as far as it is possible] with the acknowledged principles of Fine Art.” One way the photographer could make his results more like works of art, Newton suggested, was to throw the subject slightly out of focus. He also recommended liberal retouching. (Eastlake’s wife, Lady Eastlake, née Elizabeth Rigby, was one of the first to write lucidly about the artistic problems of collodion/albumen photography.)

In response to this desire to create photographs that would fit an established conception of what “art” should be, several photographers began to combine several negatives to make one print. These consisted of compositions that were considered too complicated to be photographed in a straightforward manner and thus pushed photography beyond its so-called mechanical capabilities. A famous example of this style was by O.G. Rejlander, a Swede who had studied art in Rome and was practicing photography in England. He joined 30 negatives to produce a 31-by-16-inch (79-by-41-cm) print entitled The Two Ways of Life (1857), an allegory showing the way of the blessed led through good works and the way of the damned through vice. Rejlander, who described the technique in detail in photographic journals, stated that his purpose was to prove to artists the aesthetic possibilities of photography, which they had generally denied. The photograph was shown in the Manchester Art Treasures Exhibition of 1857 and was purchased by Queen Victoria for Prince Albert.

Rejlander’s technique stimulated Henry Peach Robinson, a professional photographer who had been trained as an artist, to produce similar combination prints. He achieved fame with a five-negative print, Fading Away, produced in 1858. The subject, a dying girl, was considered by critics as too painful a subject to be represented by photography. Perhaps the implied authenticity of the camera bothered them, since painters had long presented subjects of a far more sensitive nature.

Robinson became an articulate member of the Photographic Society, and his teaching was even more influential than his photography. In 1869 the first of many editions and translations of his book, Pictorial Effect in Photography, was published. Robinson borrowed compositional formulas from a handbook on painting, claiming that use of them would bring artistic success. He stressed the importance of balance and the opposition of light against dark. At the core of his argument was the assumption that rules set up for one art form could be applied to another.

So long as photographers maintained that the way to photography as art was the emulation of painting, art critics were reluctant to admit the new medium to an independent aesthetic position. Portraits, when done as sensitively and as directly as those produced by Hill and Adamson, Nadar, and Cameron, won praise. But sentimental genre scenes, posed and arranged for the camera and lacking the truthfulness thought to be characteristic of photography, were the subject of considerable controversy. This debate would reach a crescendo at the end of the century.

Naturalistic photography

Opposing the strategies advocated by Robinson, in the 1880s the English physician and photographer Peter Henry Emerson proposed that photographs should reflect nature, offer “the illusion of truth,” and be produced without using retouching techniques, recombing multiple prints, or utilizing staged settings, models, and costumes. He believed that the unique qualities of tone, texture, and light inherent in photography made it a unique art form, making any embellishments used for the sake of “art” unnecessary. This is not to say his own photographs were purely documentary—in fact, his work in some ways mimicked the artistic effects of the Barbizon school and Impressionist painting—but they eschewed the manipulated artistic effects of his contemporaries. Emerson’s views, known as naturalistic photography, gained a considerable audience through his widely read 1889 publication entitled Naturalistic Photography and through numerous articles that appeared in photography journals throughout the 1890s.

Pictorialism and the Linked Ring

The ideas of Newton, Rejlander, Robinson, and Emerson—while seemingly varied—all pursued the same goal: to gain acceptance for photography as a legitimate art form. These efforts to gain acceptance were all encompassed within Pictorialism, a movement that had been afoot for some time and that crystallized in the 1890s and early 1900s, when it was promoted through a series of international exhibiting groups. In 1892 the Brotherhood of the Linked Ring was founded in Britain by Robinson, George Davison, a leader of the Art Nouveau movement, and others dissatisfied with the scientific bias of the London Photographic Society. The group held annual exhibitions, which they called salons. While the members’ work varied from naturalism to staged scenes to manipulated prints, by the
turn of the century it was their united belief that “through the Salon the Linked Ring has clearly demonstrated that pictorial photography is able to stand alone and that it has a future entirely apart from that which is purely mechanical.” Similar Pictorialist groups formed in other countries. These included the Photo-Club of Paris, the Trifolium of Austria, and like associations in Germany and Italy. Unity of purpose enabled members to exchange ideas and images with those who had similar outlooks in other countries.

**Perfecting The Medium, C. 1900–C. 1945**

**The Photo-Secession**

At the turn of the 20th century, one of the most influential Pictorialist groups was the Photo-Secession, founded in New York City in 1902 by photographer Alfred Stieglitz. The Secession's name was taken from the avant-garde secessionist movements in Europe that sought to differentiate themselves from what they considered outmoded ways of working and thinking about the arts. With the help of Edward Steichen, Stieglitz opened the Little Galleries of the Photo-Secession—popularly known as “291” after its address on Fifth Avenue—which exhibited the work of Modernist painters and sculptors as well as that of photographers who used a wide variety of printing processes, including gum-bichromate and bromoil printing. These procedures required considerable handwork and resulted in one-of-a-kind prints that in their softening effects resembled etchings or lithographs rather than photographs. Among the members of the Photo-Secession were Steichen, Alvin Langdon Coburn, Gertrude Käsebier, and Clarence H. White. Between 1903 and 1917 Stieglitz published 50 issues of the beautifully printed journal Camera Work, which contained, among other works, fine gravure reproductions of American and European photographs and halftone reproductions of artwork by Henri Matisse and Pablo Picasso.

Over the 15-year period of the Photo-Secession’s existence, the outlook of Stieglitz and individual members changed, reflecting the general move away from the more artificial aspects of Pictorialism as the 20th century began. Increasingly, photographers wanted their work to look like photographs, not paintings, and valued the qualities that were unique to photography. Over time, 291 began to show more painting than photography, and, as Stieglitz became even more convinced of the value of “straight,” rather than manipulated, photographic printing, several original adherents fell away, among them Käsebier and White. The final two issues of Camera Work were devoted to “straight” work by Paul Strand, who was the only photographer Stieglitz considered promising at the time. Strand’s images, consisting mainly of New York views and close-up portraits (made with a 45-degree prism lens so that the subject was unaware of being photographed), combined pure formal qualities, such as beautiful tone and sharp focus, with intense feeling.

**The New Objectivity**

In the period immediately following World War I, much photography was characterized by sharply defined imagery, especially of objects removed from their actual context. The clean lines and cool effects of this style—variously called the “New Objectivity,” the “new vision,” or “Precisionism”—was a reflection, perhaps, of the overarching role of industry and technology during the 1920s.

Strand, continuing in the direction he had unveiled in 1917, produced powerful, highly detailed close-ups of machines and organic matter and made sparkling landscapes in Gaspé, Quebec, and the American West. His approach changed again when he was invited to Mexico to produce educational films for the government. There he made a series of portraits (again with the prism lens) and landscapes, which he published in 1940 as gravure prints. Steichen, who had been in command of aerial photography for the American Expeditionary Forces, abandoned his earlier impressionistic handling in favour of crisp, sharply focused celebrity, fashion, and product images, which appeared in Vanity Fair and Vogue magazines. Others whose sharp, well-designed images of industrial products appeared in advertising brochures and magazines included Margaret Bourke-White, Paul Outerbridge, and Charles Sheeler.

A preference for a straight, highly detailed presentation of natural and manufactured forms also characterized the work of California photographer Edward Weston. Using large-format (8-by-10-inch [20.3-by-25.4-cm]) equipment with lenses stopped down to the smallest aperture, Weston, whose earlier career had been in commercial portraiture, formulated a method of “rendering the very substance and quintessence of the thing itself, whether it be polished steel or palpitating flesh.” Further, Weston, like Strand, did not approve of cropping or hand work of any kind on the negative; both held that the final image should be composed in the ground glass of the camera prior to exposure.

Several Californians, a number of whom looked to Weston as a mentor, took up the concentration on organic forms and objects and...
the preference for using the smallest aperture of the lens to create maximum depth of field and sharpness. Known as Group f.64, for the smallest lens aperture, the group included, besides Weston and his son Brett, Ansel Adams and Imogen Cunningham. After seeing Strand's negatives, Adams decided to pursue photography as a profession, specializing in photographing Western wilderness areas such as Yosemite National Park and the Sierra Nevada mountain range. His dramatic photographs masterfully captured the beauty of such natural wonders, and the popularity of his photographs helped raise awareness of the importance of preservation efforts. He also was a teacher of great persuasiveness who advocated the exact control of tonal quality through what he called the “zone system.”

In Europe this approach of favouring extremely sharp definition was known as Neue Sachlichkeit (“New Objectivity”). Its outstanding proponents were the German photographers Karl Blossfeldt and Albert Renger-Patzsch. Blossfeldt made highly detailed and magnified images of plants, removed from their natural habitat. Renger-Patzsch, a professional photographer in Essen, was fascinated by the formal qualities of everyday objects, both organic and manufactured. Like those of his American counterparts, his images featured strong design components and stressed the materiality of substances rather than the maker's emotional attitude toward the subject. He too believed that the final image should exist in all its completeness before the exposure was made and that it should be an unmanipulated record. His ideas and images, published in 1928 in Die Welt ist schön (“The World Is Beautiful”) and translated into a number of languages, exerted considerable influence on European photography of the time. Hans Finsler, of Swiss origin and working in Germany, Piet Zwart in the Netherlands, and Emmanuelle Sougez and Florence Henri in France were among the many producing highly defined close-ups of objects and people in a style similar to that of the Neue Sachlichkeit.

A similarly objective approach characterized the work of photographers interested in the artistic ideas embodied in Constructivism; the movement proposed that photographs could be a means to present the commonplace from fresh vantage points and thereby reawaken interest in routine objects and processes. This idea, which originated in the Soviet Union and spread quickly to Germany and central European countries during the late 1920s and early 1930s, granted greater latitude for experimentation with form. Its foremost spokesman was Russian painter and ideologue Aleksandr Rodchenko, who employed distinctly unusual vantage points in order to give the mundane world a new appearance. The visual ideas underpinning Constructivism appealed to Hungarian photographer László Moholy-Nagy, who reinterpreted them during his tenure first at the Bauhaus in Weimar, then in Dessau, Germany, and later at the School of Design in Chicago, where they influenced several generations of American photographers.

Similar ideas were utilized by photographers in Japan, especially following the earthquake of 1923. Among those whose imagery reflected the new sharper style, with its emphasis on form rather than atmosphere, was Yasuzō Nojima, who gained a reputation for his incisive portraits, groundbreaking nudes, and landscapes. Shin'zō Fukuhara's photographs, particularly his landscapes, were also highly regarded.

**Experimental approaches**

By 1916 abstract ideas were appealing to a number of other photographers. Photo-Secessionist Alvin Langdon Coburn, living in England, created a series of photographs known as vortographs, in which no subject matter is recognizable. During the late 1910s, students and faculty at the Clarence H. White School of Photography (started by another former colleague of Stieglitz), in particular Bernard S. Horne and Margaret Watkins, also produced works that displayed the influence of Modernist abstraction.

Between the two World Wars, an experimental climate—promoted by Constructivist ideology and by Moholy-Nagy and the Bauhaus—admitted an entire range of new directions in photography. One aspect of this experimentalism involved eschewing subject matter and instead creating photographs that more closely resembled abstract paintings. Photographers again manipulated images, experimented with processes, and used multiple images or exposures. Sometimes, rather than experimenting with the camera itself, they experimented with light and sensitized paper. For a brief time this direction was allied with Dadaist ideas about accident, chance, and the subconscious. One important exponent of photographic experimentalism was the American expatriate Dada artist Man Ray, whose “rayographs,” photographs that appeared as series of swirling abstract shapes, were created without a camera by exposing objects placed on sensitized paper to light.

Cameraless photography, which came to be called “light graphics,” also appealed to Moholy-Nagy and his wife, Lucia Moholy, who called the products of their experimentation “photograms.” Photographs made by using this kind of manipulation of light could have completely abstract shapes or forms or feature recognizable objects. A number of artists in central Europe also manipulated light and objects to produce abstract images; among them were Jaroslav Rössler and Gyorgy Kepes, who eventually taught at the Chicago...
Institute of Design. There Kepes was instrumental in introducing its methods to American photographers, among them Carlotta Corpron, who produced a series of abstractions by using a device, called a light modulator, favoured at the Bauhaus. The manipulative strategies of photocollage and montage had considerable appeal during the interwar period in part because—by appropriating “content” from other sources—they could deal with complex political or psychological feelings and ideas. Czech and German artists were especially drawn to this type of experimentation. Herbert Bayer, Raoul Hausmann, John Heartfield, and Hannah Höch were unusually adept in their innovative use of collage and montage to make ironic comments on a range of political and social issues in German society. Heartfield, whose work appeared on book jackets and posters, savaged the political thuggery behind the rise of Nazism by juxtaposing political imagery—for example, a stock photograph of Hitler—with unexpected, provocative imagery. Höch concentrated on portraying the role of the “new woman” emerging in the chaos of postwar German society; for example, the title of one work by Höch, The Cut with the Kitchen Knife, suggests a female domain, yet the image shows women freed from housewifely duties, cavorting among machinery and political figures as part of the world at large. Similarly, montage enabled Soviet Constructivists to suggest complex ideas, as in El Lissitzky’s self-portrait, which integrates drafting tools and geometric shapes to suggest that the artist himself was an architect of society.

**Documentary photography**

Working mainly in the opening years of the 20th century, French photographer Eugène Atget documented shop fronts, architectural details and statuary, trees and greenery, and individuals who made their living as street vendors, producing some 10,000 photographs of Paris and its environs. Unlike many of the architectural photographers before him, Atget showed a remarkable attention to composition, the materiality of substances, the quality of light, and especially the photographer’s feelings about the subject matter. His work was bought mainly by architects, painters, and archivists. The visually expressive force of Atget’s work, produced with a large-format camera, is a testament to the capacity of documentation to surpass mere record making to become inspiring experience.

In like manner, although not as extensively, Czech photographer Josef Sudek created an artistic document of his immediate surroundings. He was particularly fascinated with his home and garden, often shooting the latter through a window.

Lewis W. Hine created a similarly thorough document of a subject, in his case immigrant and working-class life in the United States. One of the first to refer to himself as a social photographer, Hine began his documentation of immigrants at Ellis Island while still a teacher at the Ethical Culture School in New York. Eventually he gave up teaching to work for the National Child Labor Committee, an organization of progressives seeking to make the American industrial economy more aware of its effects on individual workers. From 1908 to 1916 Hine concentrated on photographing child workers, producing thousands of individual portraits and group scenes of underage children employed in textile mills, mines, canning establishments, and glass factories and in street trades throughout the United States. His work was effective in prompting first state regulation and eventually federal regulation of child labour.

Documentary photography experienced a resurgence in the United States during the Great Depression, when the federal government undertook a major documentary project. Produced by the Farm Security Administration (FSA) under the direction of Roy E. Stryker, who earlier had come in contact with Hine’s work, the project comprised more than 270,000 images produced by 11 photographers working for varying lengths and at different times in different places. All worked to show the effects of agricultural displacement caused by the economic downturn, lack of rain, and wasteful agricultural practices in the American South and midlands. In this project, documentation did double duty. One task was to record conditions both on nonfunctioning farms and in new homesteads created by federal legislation. Another was to arouse compassion so that problems addressed by legislative action would win support. A portrait of a migratory pea picker’s wife, made by California portraitist turned documentarian Dorothea Lange, became an icon of the anxiety generated by the Great Depression.

Walker Evans was another photographer whose work for the FSA transformed social documentation from mere record making into transcendent visual expression. On leave from the FSA, Evans worked with James Agee on Let Us Now Praise Famous Men (1941; reissued 1966), a compelling look at the lives of a family of Southern sharecroppers. Although unaffiliated with the FSA, Margaret Bourke-White, formerly one of the era’s foremost industrial photographers, also worked in the South. With her husband, writer Erskine Caldwell, she produced You Have Seen Their Faces (1937), one of the first photographic picture books to appear in softcover.

Documentary projects underwritten by other federal agencies also existed. One of more significant projects was executed by Berenice Abbott. Inspired in part by Atget’s studies of Paris, she endeavoured to photograph the many parts of New York City and to create “an
intuition of past, present, and future." She was able to interest the Works Projects Administration (WPA) in underwriting an exhibit and publication along these lines entitled Changing New York (1939). Other urban documentary projects were undertaken under the aegis of the Photo League, an association of photographers of varying background and class who set out to document working-class neighbourhoods in New York.

The German portraitist August Sander, intent on creating a sociological document of his own, generated a portrait of Germany during this period. His focus was on the individuals composing German society, documenting a class structure with workers and farmers on the bottom. Sander’s inclusion of types not considered Aryan by German authorities brought him into conflict with the Nazi regime, which destroyed the plates for a proposed book entitled Antlitz der Zeit (“Face of Our Time”).

Among the many other amateur and professional photographers who interested themselves in the documentation of everyday life were Sergey Prokudin-Gorsky, who portrayed everyday life in Russia; Manuel Álvarez Bravo, who created images that offer a psychologically nuanced glimpse of Mexican life; and Robert Doisneau and Brassai, both of whom captured vibrant images of everyday life in Paris. Perhaps the most extensive ethnographic documentation was that of Edward S. Curtis, who produced 20 volumes of studies of Native American tribespeople over the course of some 20 years. The enormous interest in how people outside Western culture appeared and behaved was a factor in the increasing popularity of National Geographic during this period.

**Photojournalism**

Toward the end of the 19th and into the early 20th century, greater numbers of magazines were published throughout the world. The enlarged demand for photographic illustration, along with the appearance of lighter, easier-to-use camera equipment, led to an increase in images of war for reproduction. The Spanish-American War was documented by Jimmy Hare, the South African War by Horace W. Nicholls, the Russo-Japanese War by Luigi Barzini, and the Mexican Revolution by Augustin Victor Casasola. Although strict censorship prevailed with regard to the photographic record of World War I, the prominence of picture magazines from the 1920s through the 1950s ensured the continuance of war reportage.

A new approach to photojournalism began to emerge with the appearance of the Ermanox in 1924 and the Leica in 1925. These two German-made miniature cameras, fitted with wide-aperture lenses, required extremely short exposure times for outdoor work and were even able to photograph indoor scenes with available light. The Leica had the added advantage of using 35-mm roll film that could be advanced quickly, allowing a succession of exposures to be made of the same subject. This capability led to photographs whose informality of pose and sense of presence were remarkable.

Owing to these developments, the photojournalist was able to perceive a significant moment in a fraction of a second and to use the camera with such speed and precision that the instantaneous perception would be preserved forever. This is evident in the work of the Hungarian André Kertész in Paris during the 1920s. The Frenchman Henri Cartier-Bresson began about 1930 to develop the style that he later called the search for the “decisive moment.” To him the camera was an “extension of the eye.” Preferring the miniature 35-mm-film camera, he worked unobtrusively, making numerous exposures that usually included one in which all the elements come together to form a compelling psychological and visual statement.

In 1928–29 two of the largest picture magazines in Europe, the Münchner Illustrierte Presse and the Berliner Illustrirte Zeitung, began to print the new style of photographs. Erich Salomon captured revealing candid portraits of politicians and other personalities by sneaking his camera into places and meetings officially closed to photographers. Felix H. Man, encouraged by Stefan Lorant, editor of the Münchner Illustrierte, made sequences of photographs at interviews and cultural and social events, which Lorant then laid out in imaginative picture essays.

The example of the German picture magazines was followed in other parts of Europe and in the United States. One was the short-lived Vu, established in Paris in 1928. An issue of Vu devoted entirely to the Spanish Civil War contained memorable photographs by Robert Capa. In 1936 both Life and Look were conceived in the United States, and a formula evolved in which the picture editor, photographer, researcher, and writer constituted a team.

Among Life’s first photographers were Bourke-White, already famous for her industrial photographs made largely for the magazine Fortune; Alfred Eisenstaedt, an experienced photo reporter for the Keystone Picture Agency in Germany; Hansel Mieth, also from
Germany, who at times worked with her husband, Otto Hagel; and Peter Stackpole, whose photographs of the Golden Gate Bridge in San Francisco attracted much attention. The concept of Life from the start, according to its founder, Henry Luce, was to replace haphazard picture taking and editing with the “mind-guided camera.” Photographers were briefed for their assignments and encouraged to take great quantities of photographs so that the editors might have a large selection. (The fact that selection and sequencing were a function of the editors led to objections on the part of some photographers, notably W. Eugene Smith, who left the employ of Life at one point in order to gain greater control over his own work.) The visual organization of the picture story was carefully planned for maximum reader impact. The opening photograph of the photo-essay established the situation, and as with written narration there was a visual climax and a definite conclusion.

Initially Life and Look preferred to use pictures of great sharpness and depth. Thus, instead of unobtrusive miniature cameras, American photographers used large-format cameras requiring slow lenses, large plates, and additional flash light. This way of photographing was challenged by Lorant, who had left the Münchner Illustrierte Presse after being forced to leave Germany in 1934. He eventually settled in London, where he established the magazines Weekly Illustrated (1934) and Picture Post (1938). Staff photographers on both magazines included old colleagues also forced from Germany, such as Man and Kurt Hutton. They and other contributors were encouraged to develop the technique and pictorial style of taking photographs by using available light—i.e., not using a flash. Their pictures had a remarkable naturalness that brought great reader appeal—so much so that Life began to publish similar photographs and in 1945 hired a former Picture Post photographer, Leonard McCombe, with an extraordinary clause in his contract: he was forbidden to use a flash.

The photojournalistic style popularized by Life and Look influenced other activity in the field, in particular the exhibition “Family of Man,” which was mounted by Steichen at the Museum of Modern Art in New York City in 1955. This highly popular exhibition presented over 500 photographs—mostly photojournalistic and documentary work—alongside texts of different sizes and formats, somewhat in the manner of a three-dimensional magazine.

Memorable groups of photographs were taken for the major picture magazines. Examples are Man’s A Day with Mussolini, first published in the Münchner Illustrierte Presse (1931) and then, with a brilliant new layout, in Picture Post; Smith’s Spanish Village (1951) and Nurse Midwife (1951) in Life; and Eisenstaedt’s informal, penetrating portraits of famous Britons, also in Life. Images by Eisenstaedt of the Italian incursion into Ethiopia and by David Seymour (“Chim”) and Capa of the Spanish Civil War made visible events leading up to World War II. This conflict was thoroughly documented for the Western allies by military personnel as well as by Capa, Bourke-White, Dmitry Baltermants, Yevgeny Khaldey, and Constance Stuart Larrabee on the North African, eastern European, and western European fronts and by Smith in the South Pacific. Heinrich Hoffman portrayed the war at home and at the front for Germany, and Yosuke Yamahata documented the role of the Japanese army in the South Pacific.

**Colour photography**

The Autochrome process, introduced in France in 1907 by Auguste and Louis Lumière, was the first practical colour photography process. It used a colour screen (a glass plate covered with grains of starch dyed to act as primary-colour filters and black dust that blocked all unfiltered light) coated with a thin film of panchromatic (i.e., sensitive to all colours) emulsion, and it resulted in a positive colour transparency. Because Autochrome was a colour transparency and could be viewed only by reflected light, however, researchers continued to look for improvements and alternative colour processes.

In 1935 Leopold Godowsky, Jr., and Leopold Mannes, two American musicians working with the Kodak Research Laboratories, initiated the modern era of colour photography with their invention of Kodachrome film. With this reversal (slide) film, colour transparencies could be obtained that were suitable both for projection and for reproduction. A year later the Agfa Company of Germany developed the Agfacolor negative-positive process, but owing to World War II the film did not become available until 1949. Meanwhile, in 1942 Kodak introduced the Kodacolor negative-positive film that 20 years later—after many improvements in quality and speed and a great reduction in price—would become the most popular film used for amateur photography.

**Contemporary Photography, C. 1945–Present**

**Postwar developments**

“Elmer Thompson: The Inventor” Activities and Lessons North Dakota Museum of Art
With the improvement in colour materials and processes, photographers became more interested in its creative possibilities. Beginning in the 1940s, American photographer Eliot Porter produced subtle studies of birds and nature in which colour allowed him to render an unparalleled level of nuance. Appreciated for both their scientific and their aesthetic value, these photographs embodied the potential of colour. Austrian photojournalist Ernst Haas first used colour in the photo-essay New York for Life magazine in 1953. Through this and similar projects he challenged the standard of using only black and white in photojournalism, and his use of colour added vibrancy to images of everyday life. While these and other experiments achieved some success, it was not until later in the century that colour dominated photographic output and was incorporated into daily newspapers.

In the period after World War II, as the United States entered a period of domestic peace and prosperity, many photographers there moved away from documentary realities and focused instead on the intrinsic qualities of photography; such experiments paralleled the ascendancy of the Abstract Expressionist art movement, which similarly looked at the intrinsic quality of painting. Minor White combined ideas about photography’s incomparable descriptive power, taken from Edward Weston, with those about its emotional expressiveness, taken from Alfred Stieglitz. Through his long career as an influential teacher and founding editor of Aperture, White developed the idea that a photograph should contain an inner message that might not be immediately visible on the surface.

Other American photographers influenced by the Abstract Expressionist style of the era included Aaron Siskind, who found formal configurations in graffiti, weathered wood and plaster, and torn billboards (what he called the “detritus of the world”), and Harry Callahan, whose work demonstrated a highly developed sense of linear form. Siskind and Callahan inspired a generation of young photographers through their teachings at the Institute of Design, the school that had been started in 1937 in Chicago by Moholy-Nagy as the New Bauhaus. Barbara Crane, Ken Josephson, and Garry Winogrand were among students who later achieved fame. In England Bill Brandt created expressive photographs of nudes, shooting his subject matter at such close range that the human body took on the appearance of series of patterns and abstract designs. In Germany Otto Steinert led the Fotoform group of photographers, who created close-up views of nature that were also nearly abstract in their effects.

By the 1960s similar styles and ideas in photography had spread to Asia, in part because photographic magazines became widely available. Japanese photographers had been aware of Modernist currents before World War II, but afterward they pursued them more openly. Among the important photographers of this generation were Shōmei Tomatsu, who made vivid images on the streets of Tokyo; Eikoh Hosoe, who captured intimate social documentation in the postwar period used the medium to examine contemporary society from a distance. Such efforts had various labels, including “social landscape.” Inspired by Swiss-born émigré Robert Frank, who during the 1950s viewed American culture with an ironic eye, American photographers such as Bruce Davidson, Lee Friedlander, and William Klein were among those whose work suggested the effects of contemporary culture on people in industrialized societies. Often utilizing 35-mm cameras, these photographers caught seeming mundane everyday moments in works that resembled snapshots. Beneath this seeming spontaneity lay an element of critique, however, that in some cases paralleled Pop art’s examination of the banality of contemporary consumer culture.

Several important photographers defied categorization. In the early 1960s the photographer Seydou Keïta, working as a commercial portraitist in Mali, allowed his sitters to arrange and costume themselves. The resulting photographs created an extensive and compelling documentation of his country’s people. In the same period, influenced by the mordant eye of the earlier Austrian émigré photographer Lisette Model, Diane Arbus created challenging portraits of people living outside prescribed ideas of “normalcy,” such as transvestites and the intellectually disabled.

**Developments from the 1970s to the present**

Continuing the example set by Arbus, a gritty sort of social documentation emerged beginning in the 1970s and ’80s, when photographers such as Larry Clark and Nan Goldin documented alternative lifestyles involving drug addiction, transvestism, and casual sex. In particular, Goldin created an elaborate series titled The Ballad of Sexual Dependency, through which she compiled an evolving record of the people she and her camera encountered. Such direct, unflinching photographs established intimate documentary work as an important genre in the late 20th century. Photographers such as Sally Mann and Tina Barney extended this genre to portray intimate, sometimes unsettling images of their own families.

Goldin usually photographed in colour, which added to the harsh sense of reality in their work; this represented a general move toward colour among photographers of their generation. William Eggleston pushed the artistic boundaries of colour by using it to
explore the banality of small-town existence; along these same lines, Candida Höfer used colour to emphasize the tedium of institutional life. Richard Misrach created a massive project, known as the Desert Cantos, in which he photographed desert scenes in colour, sometimes juxtaposed against sinister elements such as nuclear sites. Barbara Norfleet, Joel Meyerowitz, Stephen Shore, Barbara Kasten, and Franco Fontana were among the other prominent photographers of the period who used colour expressively in landscapes, interiors, still lifes, and street scenes.

From the 1970s on, as the advent of television news began to affect the popularity of picture magazines, many photojournalists whose work had been published in magazines began to take advantage of a burgeoning interest in photographic picture books. These, often produced in conjunction with exhibits, comprised photographs of newsworthy events or topics of social interest along with informative texts. Working in black and white, Swiss-born photographer Claudia Andujar (working in Brazil) and Mexican photographer Graciela Iturbide portrayed indigenous peoples—groups they believed were becoming marginalized by society—and their customs. Other important figures included English photographer Don McCullin, who portrayed the devastation brought about by wars in Vietnam and in Africa; French photojournalist Raymond Depardon, who worked in Asia, Africa, and Europe; American Mary Ellen Mark, who photographed street performers and prostitutes in India, depicted street children in Seattle, Washington, and spent time documenting the inmates of a mental hospital; and Brazilian photographer Sebastião Salgado, who examined work and workers throughout the world, exhibiting and publishing a number of books on that topic. For his ability to make world events come pictorially alive, American James Nachtwey was three times the winner of the International Center of Photography’s photojournalism awards. By the end of the century, the technology used by these photojournalists had changed. Digital cameras sent images directly to computers, and programs allowed images to be altered seamlessly, making newspaper and magazine darkrooms obsolete.

The documentation of artifacts, begun in the 19th century, continued to interest late 20th-century photographers. Italian photographer Gabriele Basilico and American photographer Lewis Baltz concentrated on architecture and the built environment. The German duo Bernd and Hilla Becher produced an extensive portrayal of industrial buildings such as mine tipples and factories, which they usually displayed in carefully planned arrangements of multiple prints. This sort of project combined traditional documentary conventions with postmodern concepts about typologies.

Fashion photographers found their role redefined at the end of the century. As giants of fashion photography from earlier in the century such as Irving Penn and Richard Avedon became the subjects of major museum retrospectives, fashion and celebrity photography, initially meant to illustrate fashion magazines such as Harper's Bazaar and Vogue, became fully recognized as an art form. Photographers David LaChapelle, Annie Leibovitz, Helmut Newton, Mario Testino, and Bruce Weber were among those whose work was esteemed enough to be exhibited in both gallery and museum shows and published in popular monographs.

Throughout most of the 20th century, the art world was dominated by painting and sculpture, with photography seen as a separate but not necessarily equal art form. In the 1980s and ‘90s, however, as new media such as video, performance, and installation blurred definitions of “art,” photography became one of the art world’s most prominent media. During this period a generation of prominent photographers, many of them American, helped break down these barriers between photography and “art.” American Robert Mapplethorpe received a maelstrom of attention for his masterfully executed photographs, which ranged from still lifes to portraits to, most controversially, sadomasochistic and homoerotic themes. American photographer Cindy Sherman became an international art star for her elaborately staged self-portraits in which she posed in a variety of stereotypical feminine roles and, in so doing, critiqued these clichés. Barbara Kruger, also American, gained prominence for her modern-day montages, in which she juxtaposed photographic images with text containing social critique—perhaps most famously, the phrases “I Shop, Therefore I Am” and “Your Body Is a Battleground.” A similar use of photography in mixed-media was pursued by American Carrie Mae Weems, who reproduced 19th-century photographs of slaves on a series of banners and scrims, presenting them in a three-dimensional arrangement that commented on the visual representation of African Americans throughout history.

**Into the 21st century: the digital age**

The transformation of photography from an analog medium relying on chemically developed light-sensitive emulsions to one using digital technologies for image capture and storage began in the late 1980s with the introduction of the first consumer digital cameras and in 1990 the first version of Adobe Photoshop, a program for adjusting and manipulating digital image files. Conceived as an extension of the conventional darkroom, the program adopted many of the traditional tools of black-and-white film photography but let photographers go even further. By giving photographers the ability to easily change the structure of an image, and even its
contents, it called into question long-held assumptions about photographic veracity or documentary “truth value.” To some minds, it changed the very nature of the medium.

Digital photography’s full impact was not felt until the first decade of the new century. Even as late as 2001, news events—most significantly, the September 11 terrorist attacks in New York City and Washington, D.C.—were photographed primarily with film cameras. But because digital images could be transmitted and edited much more quickly, by decade’s end nearly all newspapers and magazines had transitioned to a digital workflow process, and their photographers were using digital cameras designed for professionals.

The transgressive aspect of digital photography was apparent even before its widespread adoption, as in 1982 when the august National Geographic magazine published an altered image of the Egyptian pyramids. Because the magazine’s cover required a vertical image, editors used early computer software to push the pyramids closer together than they appeared in the original film photograph. The manipulation of visual fact for increased visual impact extends back before computers into the 19th century, notably during the Crimean War and American Civil War, but a spate of incidents of digital alteration of news photographs in the first decade of the 21st century created an uproar and led to the establishment of journalistic codes of ethics intended to regulate the alteration of digital images. Several photojournalists lost their jobs after their published pictures were found to have been digitally doctored.

Whereas photojournalists and documentarians reacted with caution to what came to be called digital imaging, other types of photographers were generally enthusiastic about its possibilities. Many artists using photography as their medium developed creative approaches that took advantage of the seamless mutability of digitally altered images, extending a long history of photographic collage, double printing, and other pre-digital forms of manipulation. Among the early adopters were Aziz + Cucher (Anthony Aziz and Sammy Cucher), Andreas Gursky, and Loretta Lux, all of whom stretched the limits of what is believable about a photographic image. Digital alteration also influenced the spheres of fashion and celebrity, as photographers such as Inez van Lamsweerde and Vinoodh Matadin (working together as Inez & Vinoodh) remade the looks of models and movie stars. Magazines began to regularly send their cover photographs to digital retouchers to eliminate blemishes and minimize their models’ waistlines.

Arguably the most-profound impact of digital photography has been the proliferation of picture taking and picture sharing. Since 2007, the year Apple introduced its first iPhone, so-called smartphones have become ubiquitous, as have picture-sharing applications like Facebook, Twitter, and Instagram that enable users to upload pictures from phone to Internet in a matter of seconds. One result has been an almost unfathomable archive of images of mundane events and everyday places, a virtual map of the world that finds its commercial equivalent in Google Earth, which incorporates both satellite views and Google Street View, an assemblage of ground-level pictures of human habitation.

At the same time, commercial, governmental, and military uses of photography have expanded to include 24-hour surveillance of public sites and businesses, the remote targeting of drone missile strikes, databases of digital fingerprints, portraits on identification cards, and the development of face-recognition software to aid in the identification of criminals and terrorists. Debates about the impact of the camera on civil liberties have intensified as a result.

Photographers have reacted to digital photography’s omnipresence in a variety of ways. Some—such as Chuck Close, Sally Mann, Deborah Luster, and Jerry Spagnoli—have journeyed back to photographic processes of the 19th century, making daguerreotypes or working with wet-collodion plates, or—like Chris McCaw and Alison Rossiter—have taken to printing on outdated enlarging paper from the mid-20th century. Photographic books, predicted to be made obsolete by readily viewable online images, have experienced a resurgent popularity, not only because digital printing has reduced the cost of publication but also because books allow photographers to control the narrative sequence and context in which their images are seen.

Others have seized an opportunity to critically reflect on the new image environment in which they live. Trevor Paglen, for example, has photographed the light trails of spy satellites as they cross the night sky. In addition, the convergence of still digital photographs and moving video images and the popularity of Web design tools that allow for animation, motion control, and audio editing have produced a creative arena in which photography is but one tool in the production of multimedia experiences. In the 21st century, photography has been absorbed into both the contemporary art world and that of online digital communication, blurring its formerly distinct identity but vastly enhancing its importance as a visual medium.
Activity/Lesson Thirteen: Looking at Landscapes

Grade Level: (K-12)
Subjects: English–Language Arts and Visual Arts

Learning Objectives
Students will practice their speaking skills while describing a landscape scene for a partner to draw. Students use landscape vocabulary to describe images. Students translate their peers’ verbal descriptions of an image into visual form.

Materials
Paper and pencils
Looking at Landscapes Vocabulary

Artworks
Artwork in the exhibition Elmer Thompson: The Inventor or their own art

Procedure

Divide students into pairs.

1. Make sure everyone has a blank piece of paper and a pencil.

2. Explain to students that one person in the pair will draw, and the other will describe.

3. The person drawing must be facing away from the image and the person describing will be facing the image.

4. Explain that the describer should try to describe everything in the image to the drawer, including using the new vocabulary words. You may also wish to incorporate the “Elements of Art” and “Principles of Design” as well (available at the end of this lesson/activity book). As the describer speaks, the drawer will begin to sketch the scene exactly according to the description.

5. The drawer is not allowed to look at the image! The describer is not allowed to point to the drawer’s paper. If any instructions are provided, they must be given verbally.

6. Give students enough time to complete their descriptions and drawings. When finished, they can compare their drawings to the image.

7. If you have time, you may choose new images to draw and have the pairs reverse their roles.

8. Have students share their drawings and their impressions of the activity. Ask them if this exercise was difficult or easy. Why?

Tips for Teaching about Landscapes
Listed below are some general questions that you might ask when looking at any landscape. Landscapes are great images to look at when you want to evoke thought and expression about the five senses. It is helpful to have students imagine they are in the landscape. It’s amazing how all our senses come alive when we immerse ourselves in a visual image and feel like we are actually there.

• What do you think of this place?
• Does it seem like a place you would like to visit?
• If you were in this landscape, where would you be?
• What would you be doing?
• What would you see, hear, smell, and feel in this place?
• Where did the artist sit while making this image?
Looking at Landscapes Vocabulary

Landscape
A picture of natural scenery and an art genre in which the land or natural environment is the subject

Point of view
The place from which the viewer sees the landscape, or the place where the artist was sitting or standing when the landscape was made

Foreground
The part of a scene that is nearest to and in front of the viewer

Middle ground
The middle distance; what is between the foreground and the background

Background
The part of a scene that lies behind the foreground and middle ground that appears most distant from the viewer

Representational Art
Art in which the subject portrayed resembles the object it depicts

Scale
Size in relation to a standard

Overlap
Relational state between two or more objects in which one is in front of another

Non-Objective Art
Art without a recognizable subject; non-representational

Abstract
Process of drawing or extracting from reality; paintings which use a visual vocabulary--color, line, shape, texture, space--to express moods, ideas, and feelings.

Color
Is light reflected off objects. Color has three main characteristics: hue (red, green, blue, etc.), value (how light or dark it is), and intensity (how bright or dull it is). Colors can be described as warm (red, yellow) or cool (blue, gray), depending on which end of the color spectrum they fall.

- The primary colors are red, blue, yellow; secondary colors, formed by combining any two primary colors, are orange, green, violet.

- Analogous colors are beside each other in the color wheel, e.g. blue/green.

- Complementary colors are opposite each other on the color wheel, e.g. red/green. Warm colors (red, orange, yellow) remind us of fire, sunsets, heat; cool colors (blue, green, violet) remind us of sky, water, or mountains.

- Achromatic means to be without color, e.g. black, white, gray.

- Monochromatic uses a single color with variations; polychromatic includes many colors.
Activity/Lesson Fourteen: Narrative Art — Creating Your Own Story

Grade Level: (K-12)
Subjects: English–Language Arts and Visual Arts

Learning Objectives
Students will think about a dramatic moment in their lives and imagine how to translate it into a work of art.
Students write their own personal experiences as a story.
Students describe a visual image of their personal experiences and/or story.
Students practice public speaking skills with the class.

Materials
• Paper and pencils

Artworks
Images in the exhibition Elmer Thompson: The Inventor

Procedure
After viewing the exhibition:

1. Ask students to think about a dramatic moment in their lives.

2. Ask them to close their eyes and visualize that moment. Where were they? Who were they with? How was the weather? What time of day was it? What actions were happening around them?


4. Have students answer the questions on the sheet.

5. Give students enough time to work on their answers.

6. When they are finished, ask them to each create a story based on their answers.

7. Invite students to share their stories with the class.

SUGGESTED ACTIVITY
Give students time to draw a moment from their story. When sharing, have them explain why they chose that specific moment to depict.
Creating Your Own Narrative Art

Think about a dramatic moment in your life. If you were to paint or draw this moment in your life, what would the image look like? What moment would it depict?

Use the following questions to guide you:

What is the setting?

What is the time of day?

What is in the foreground, middle ground, and background of the painting?

What are you doing?

How are you posed?

What is your attire?

What does your facial expression indicate?

Who else is in the painting or drawing with you?

What are they doing?

How are they posed?

What are they wearing?

What do their facial expressions communicate?

What is the mood of the painting or drawing? How is that communicated?

What size is the painting or drawing? Small? Large? Why?
The Seven Elements of Art

The “elements of art” are the building blocks for achieving the “principles of art.”

The elements of art are components or parts of a work of art that can be isolated and defined. They are the building blocks used to create a work of art.

Line, Shape, Form, Space, Color, Value, and Texture:

A line is an identifiable path created by a point moving in space. It is one-dimensional and can vary in width, direction, and length. Lines often define the edges of a form. Lines can be horizontal, vertical, or diagonal, straight or curved, thick or thin. They lead your eye around the composition and can communicate information through their character and direction.

Shape is a closed line. Shapes can be geometric, like squares and circles; or organic, like free-form or natural shapes. Shapes are flat and can express length and width.

Forms are three-dimensional shapes expressing length, width, and depth. Balls, cylinders, boxes, and pyramids are forms.

Real space is three-dimensional. Space in a work of art refers to a feeling of depth or three dimensions. It can also refer to the artist's use of the area within the picture plane. The area around the primary objects in a work of art is known as negative space, while the space occupied by the primary objects is known as positive space.

Color is light reflected off objects. Color has three main characteristics: hue (red, green, blue, etc.), value (how light or dark it is), and intensity (how bright or dull it is). Colors can be described as warm (red, yellow) or cool (blue, gray), depending on which end of the color spectrum they fall.

Value refers to the lightness or darkness of a color. Value becomes critical in a work which has no colors other than black, white, and a gray scale. For a great example of value in action, think of a black and white photograph. You can easily visualize how the infinite variations of gray suggest planes and textures.

Texture is the surface quality of an object that we sense through touch. All objects have a physical texture. Artists can also convey texture visually in two dimensions.
The Nine Principles of Design

The “principles of design” describe the ways that artists use the “elements of art” in a work of art.

Balance, Emphasis, Movement, Pattern, Repetition, Proportion, Rhythm, Variety, and Unity

**Balance** is the distribution of the visual weight of objects, colors, texture, and space. If the design was a scale, these elements should be balanced to make a design feel stable. In symmetrical balance, the elements used on one side of the design are similar to those on the other side; in asymmetrical balance, the sides are different but still look balanced. In radial balance, the elements are arranged around a central point and may be similar.

**Emphasis** is the part of the design that catches the viewer’s attention. Usually the artist will make one area stand out by contrasting it with other areas. The area could be different in size, color, texture, shape, etc.

**Movement** is the path the viewer’s eye takes through the work of art, often to focal areas. Such movement can be directed along lines, edges, shape, and color within the work of art.

**Pattern** is the repeating of an object or symbol all over the work of art.

**Repetition** works with pattern to make the work of art seem active. The repetition of elements of design creates unity within the work of art.

**Proportion** is the feeling of unity created when all parts (sizes, amounts, or number) relate well with each other. When drawing the human figure, proportion can refer to the size of the head compared to the rest of the body.

**Rhythm** is created when one or more elements of design are used repeatedly to create a feeling of organized movement. Rhythm creates a mood like music or dancing. To keep rhythm exciting and active, variety is essential.

**Variety** is the use of several elements of design to hold the viewer’s attention and to guide the viewer’s eye through and around the work of art.

**Unity** is the feeling of harmony between all parts of the work of art, which creates a sense of completeness.
Elmer Thompson (1891 – 1984), Highland Lutheran Church, Digital scan of a glass plate negative.
**Activity/Lesson Fourteen: Introducing Line**

Learning about the elements of art? Begin by discovering lines in works of art. Look closely at the types of lines in the picture on page 32, *McCanna House Kitchen*. How many different lines do you see? Notice length, direction, width, distance from each other, etc.

Use adjectives to describe the lines. The lines look...

Experiment with creating your own lines and building your vocabulary.

<table>
<thead>
<tr>
<th>Thin Lines</th>
<th>Thick Lines</th>
<th>Squiggly Lines</th>
<th>Straight Lines</th>
<th>Curved Lines</th>
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<th>Vertical Lines</th>
<th>Horizontal Lines</th>
<th>Diagonal Lines</th>
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<tr>
<th>Crosshatched Lines</th>
<th>Parallel Lines</th>
<th>Spirals</th>
<th>Dotted Lines</th>
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Elmer Thompson (1891 – 1984), Blacksmithing at the State Normal & Industrial School, Ellendale, Digital scan of a glass plate negative.
Activity/Lesson Fifteen: Introducing Shape

Learning about the elements of art? Continue by discovering shapes in works of art. Identify the different shapes you see in the image to the left. How many shapes can you see? How do the shapes work together to move your eyes around the image?

Draw or list the shapes you see below:

Build a vocabulary of words to describe shapes. Geometric shapes have sharp angles and straight lines. Organic shapes are free-form and flow in appearance. Organic shapes typically reference shapes found in nature.

<table>
<thead>
<tr>
<th>Geometric Shapes</th>
<th>Organic Shapes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangle</td>
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<tr>
<td>Square</td>
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<td>Rectangle</td>
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<tr>
<td>Circle</td>
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<tr>
<td>Oval</td>
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</tbody>
</table>

Using the shapes that you drew above, create a drawing in the box below.
Teacher Evaluation of these Activities/Lesson Plans

We want to know what you think. Please take the time to complete this evaluation or send an email to:

North Dakota Museum of Art
261 Centennial Drive Stop 7305
Grand Forks, ND 58202
–or–
manderson@ndmoa.com

1. Are these lesson plans appropriate for your class level? Please list your class level and explanation of your reasoning.

2. Is it helpful to have the Common Core Standards in the Lesson Plans or is it more applicable for you to find the standard that best lines up to your curriculum?

3. What can we do better in writing these Lesson Plans/Activities?