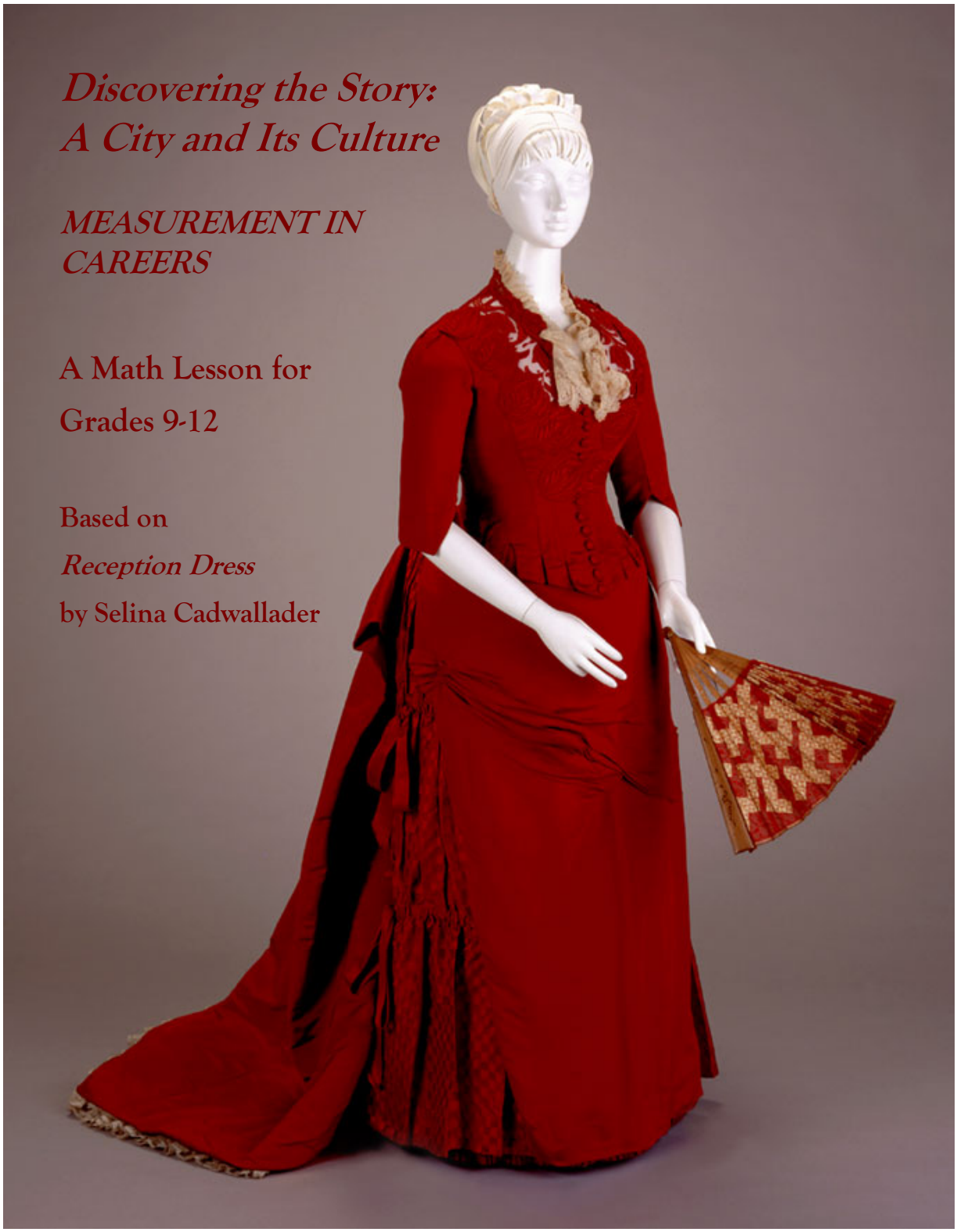


Selina Cadwallader (active 1870-1886)
Reception Dress, 1886
Gift of Wilmar Antiques c/o Mr. Maurice Oshry, 1971.550 a-c

Discovering the Story: A City and Its Culture
MEASUREMENT IN CAREERS

A Math Lesson for Grades 9-12
Based on *Reception Dress* by Selina Cadwallader

Concept

The teacher will facilitate student exploration of the varied tools and measuring methods for cloth and fabric in clothing construction, and for individual fit to various body specifications. The students will gain a first-hand application of measurement functions through inquiry and observation, and mock construction and dressing of a mannequin armature. The students will gain insight to the importance of measurement skills and knowledge for Cincinnati dressmakers of the 1800s.

Objectives

- Students will solve problems by using measurement and logical reasoning.
- Students will develop an understanding for the need of measurement and standard units of measure, and application in careers in clothing/fashion design.
- Students will utilize measurement tools to model and emulate mathematical calculations used by Selina Cadwallader in the design and making of the *Reception Dress*.
- Students will become familiar with the function and role of Cincinnati dressmakers through study of the Selina Cadwallader *Reception Dress*.

"Every child is an artist. The problem is how to remain an artist once he grows up."

Pablo Picasso

Teacher Preparation

Class Periods Required

1 to 2 (30-50 min.) periods for Pre-Lesson Activities
1 (50-min.) class period for Videoconference
1 to 3 class periods for Post-Lesson Activities

Background Information

Background Information, which contains additional details on the *Reception Dress* and the artist who created it, has been written for teachers to review before the lesson and then share with students. It can be found on the *Discovering the Story* website at http://www.discoveringthestory.org/goldenage/dress/background.asp.

Video

Share the dressmaker video with your students prior to the videoconference. The video, which is at http://www.discoveringthestory.org/goldenage/dress/video.asp, depicts Museum curator, Cynthia Amneus, as she prepares the *Reception Dress* for exhibition. While she works, she speaks at length on the *Reception Dress*. This video is an excellent resource that will help to prepare students for the videoconference.

Video Duration – 6 minutes.

"Art takes nature as its model."

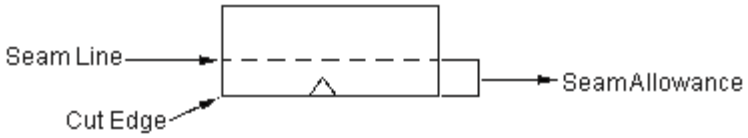
Aristotle

Pre- Videoconference

Vocabulary

Definitions can be found in the *Discovering the Story* Glossary
http://www.discoveringthestory.org/goldenage/bed/glossary.asp.

Area
Circumference
Seam Allowance – A seam allowance is the distance between the seam line (where you stitch to join two or more pieces of fabric) and the cut edge of the fabric.



Guiding Questions

- What is measurement?
- Why do we measure?
- How do we measure?
- What information does measurement give us?
- Why is accurate or correct measurement important for the placement or alignment of garments to fit our bodies?
- How did the Museum solve their problem of having the *Reception Dress* but not the right-sized mannequin for display of the garment?

Materials

- Museum photograph of the *Reception Dress* at http://www.cetconnect.org/discoveringthestory/goldenage/images/dress_full.jpg
- Cloth measuring tape
- Yardstick
- Tailoring chalk (used for marking placement on fabric)
- Pins
- Approximately one yard of fabric (optional)

PROCEDURE

Teacher will:

- Introduce students to a visual of the *Reception Dress* and share the following facts for discussion.
  - Selina Cadwallader was a dressmaker or "seamstress."
  - She lived in the late 1800s in Cincinnati, Ohio.
  - The *Reception Dress* was designed for a special purpose. (Explain purpose and relationship to the design of the dress.)
  - Attributes of the dress include the use of red silk and lace, covered buttons, pleats, etc.
  - The *Reception Dress* was designed and fitted for a particular person, therefore the woman had to be measured and fitted for the dress construction.
- View with students the *Reception Dress* video, with follow-up discussion on the use of measurement for the making of the dress and the fitting of the dress on the Museum mannequin.
- Engage students in the discussion of the making of clothing, and the role of measurement for sizing and display of a garment within a Museum setting or at a clothing store.
- Identify with students the need for mathematical calculations implied and discussed in the video for proper dressing of the mannequin.
- Demonstrate measurement techniques using a cloth measuring tape and yardstick to measure fabric (one yard of fabric equals the length of a yardstick instrument), and how to measure the waist for a finished dress (measuring circumference). The teacher will also introduce the tools – tailoring chalk, pins and a buttonhole guide — used for accurate placement for garment embellishments.
- Ask students to write out one question they want to ask the Cincinnati Art Museum Staff about the dress. Email questions to the Museum prior to the videoconference.

"The arts must be at the heart of every child's learning experience if…they are to have a chance to dream and to create, to have beliefs, to carry a sense of cultural identity."

James D. Wolfensohn
former chairman
The Kennedy Center

VIDEOCONFERENCE

OBJECTIVES

- Students will interact with the Cincinnati Art Museum staff through a sixty-minute videoconference. Information is at http://www.discoveringthestory.org/videoconference/.
- Students will learn about Cincinnati history from 1850 to 1900.
- Students will use Museum objects to reinforce activities completed in preparation for this videoconference.

CONCEPT

A videoconference conducted by the Cincinnati Art Museum staff extends student learning through emphasis on the viewing and discussion of art objects. During this videoconference with the Museum, students will explore Cincinnati art history and the methods and practices of many of the artists working in the city.

SCHEDULE

- **5 minutes** Introduction to CAM staff *(This is also buffer time in case of connection complications)*
- **10 minutes** Brief discussion of student pre-videoconferencing activities.
- **10 minutes** Museum staff will lead an interactive discussion with students on the history of Cincinnati from 1850-1900
- **20 minutes** Museum staff will lead students in an in-depth investigation of selected Museum objects.

Objects Include:

- *Bedstead* by Benn Pitman, Adelaide Nourse Pitman, and Elizabeth Nourse. http://www.discoveringthestory.org/goldenage/images/bedstead_full.jpg
- *Reception Dress* by Selina Cadwallader. This image can be found at http://www.discoveringthestory.org/goldenage/images/dress_full.jpg
- *Aladdin Vase* by Maria Longworth Nichols Storer, which is available at http://www.discoveringthestory.org/goldenage/images/aladdin_full.jpg
- *Ali Baba Vase* by M. Louise McLaughlin, which is available at http://www.discoveringthestory.org/goldenage/images/alibaba_full.jpg
- *Vase and Dedication Medallion* by Tiffany & Co. This image is on the Website at http://www.discoveringthestory.org/goldenage/images/springer_full.jpg

- **10 minutes** Questions and student sharing of art projects.
- **5 minutes** Closing *(This is also buffer time in case of connection complications)*

Post- Videoconference

Materials

- Swatch of fabric at least 36 inches long for each student
- Pins
- Sharpie marker
- Ruler
- Masking tape for each student
- Pencil (optional)
- Photograph of the *Reception Dress*
- Journals and pencils for each group
- Various materials that can be used to make waist armatures for each group, such as bins of paper towel tubes, old sheets, fiberfill or cotton batting

Procedure

Teacher will:

- Have students explore the mathematical principles necessary to make an armature for the waist of a mock mannequin armature. (Reemphasize that the mannequins used by the Museum do not have waists. They are built and customized for each dress.)
- Have each group estimate in their journals how many paper towel tubes are needed to fill a "waist" with a 20-inch circumference (an ideal waist size in the late 1800s).
- Have each group estimate in their journals how much batting or fiberfill is needed to fill in the gaps between tubes to make a 20-inch circumference armature.
- Divide students into small groups and have each group construct an armature with a 20-inch waist using materials supplied by the art teacher. (The completed project will be an ovoid cylinder 20 inches in circumference. Bust and hips are not a part of this project. The height is not important.)
- Have a brief discussion about historic sizes for waists in women's clothing, since eating disorders are a serious problem in our society. Tiny waists, such as 20 inches, found in the 1860s were achieved through very tight corsets; corsets so tight that some women fainted easily and had other medical problems. Forcing their waists to such a small size was very unhealthy, just as that waist size today would be very unhealthy.

Extensions

Procedure

Teacher will:

- Discuss with students how Selina Cadwallader created pleats to cover the dress waist, as well as her use of pleats for design construction and function.
- Demonstrate with fabric how a pleat requires fabric/material three times the size of the pleat.
- Explain and model for students the making of a pleat with cloth.
    - The way to estimate the amount of material needed for pleats is:
        - Decide upon the desired width of the pleat.
        - Measure the pleat width.
        - Multiply that number by three.
        - Then multiply that number by the number of pleats needed.
    - The final measurement needs to include a seam allowance, usually 1 1/4 inches, which is added to the total pleat measurement.
- Draw an example on the board.
- Change the size of the pleat, multiply by three and demonstrate with fabric again.
- Have students calculate how many pleats would be needed to go around the 20-inch mock armature/waist if each pleat were one inch, 1 1/4 inches or 2 inches.
- Have students calculate how much fabric would be needed with different size pleats.
- Model for students how to use a ruler to measure and pin the fabric to secure the pleats. (A seamstress might enter the pin on the outside edge so that it could be easily removed when sewing with a sewing machine. Some students may need to premark the fabric with tailoring chalk or a pencil to indicate the pleat folds before pinning. Have students demonstrate the preferred method.)
- Divide class into small groups and have students construct pleats. Students will use markers to write their names on the fabric and use masking tape to secure the seam allowance and the pleats. This activity can also be done with long pieces of paper. (Or students could use a loose basting stitch to sew the pleats in place–across the top of the pleats. It is suggested to solicit the help of a parent or community member–one who actually sews garments–for assistance with task and procedure.)

Assessment Objectives

- Students demonstrated understanding of concepts and application with regards to the measurement of area and circumference for use by a fashion designer or seamstress.
- Students demonstrated use of measurement tools–yardstick, cloth tape measure, tailoring chalk, etc.
- Students were able to follow directions for construction of mock armature/waist and pleats.
- Students accurately completed measurements for design, measurement and construction of mock armature/waist.
- Students accurately completed measurements for design, measurement and construction of pleats.

Academic Content Standards

National Standards: Mathematics

Standard 4: Understands and applies basic and advanced properties of the concepts of measurement.

Grades 9-12

Benchmark 4: Solves real-world problems involving three-dimensional measures (e.g., volume, surface area).

Ohio Standards: Mathematics

Measurement: Students estimate and measure to a required degree of accuracy and precision by selecting and using appropriate units, tools, and technologies.

Grades 8-10

Benchmark A: Solves increasingly complex nonroutine measurement problems and checks for reasonableness of results.

Benchmark B: Uses formulas to find surface area and volume for specified three-dimensional objects accurate to a specified level of precision.

Benchmark C: Applies indirect measurement techniques, tools and formulas, as appropriate, to find perimeter, circumference and area of circles, triangles, quadrilaterals and composite shapes, and to find volume of prisms, cylinders and pyramids.

Benchmark E: Estimates and computes various attributes, including length, angle measure, area, surface area and volume, to a specified level of precision.

Grades 11-12

Benchmark B: Applies various measurement scales to describe phenomena and solve problems.

Benchmark C: Estimates and computes area and volume in increasingly complex problem situations.