

*Doorway from the Isaac Gillet House, Painesville, Ohio*

**Academic Content Standards**

Grades K-4: Geometry and Spatial Sense

**Common Core Standards**

Grades K-5: Geometry

*Crown*

**Academic Content Standards**

All grades: Geometry and Spatial Sense Standard  
Grades 5-7: Patterns, Functions, and Algebra Standard

**Common Core Standards**

Grades K-5, 8: Geometry  
High School: Geometry: Congruence

*Cartonnage Mummy Case*

**Academic Content Standards**

All grades: Geometry and Spatial Sense Standard  
Grades 5-7: Patterns, Functions, and Algebra Standard

**Common Core Standards**

Grades K-5, 8: Geometry  
High School: Geometry: Congruence

*Interior of the Pantheon, Rome*

**Academic Content Standards**

Grade 12: Patterns, Functions, and Algebra

**Common Core Standards**

High School: Functions: Interpreting Functions  
High School: Algebra: Seeing Structure in Expressions

*Turned Armilla*

**Academic Content Standards**

High School: Number, Number Sense, and Operations Standard  
High School: Measurement Standard  
Grade 12: Patterns, Functions, and Algebra Standard

**Common Core Standards**

High School: Functions: Interpreting Functions  
High School: Algebra: Seeing Structure in Expression

*Louis XV Savonnerie Carpet with Royal Arms*

**Academic Content Standards**

Grades 4-5, 7-9: Measurement  
Grades 4-8: Patterns, Functions, and Algebra

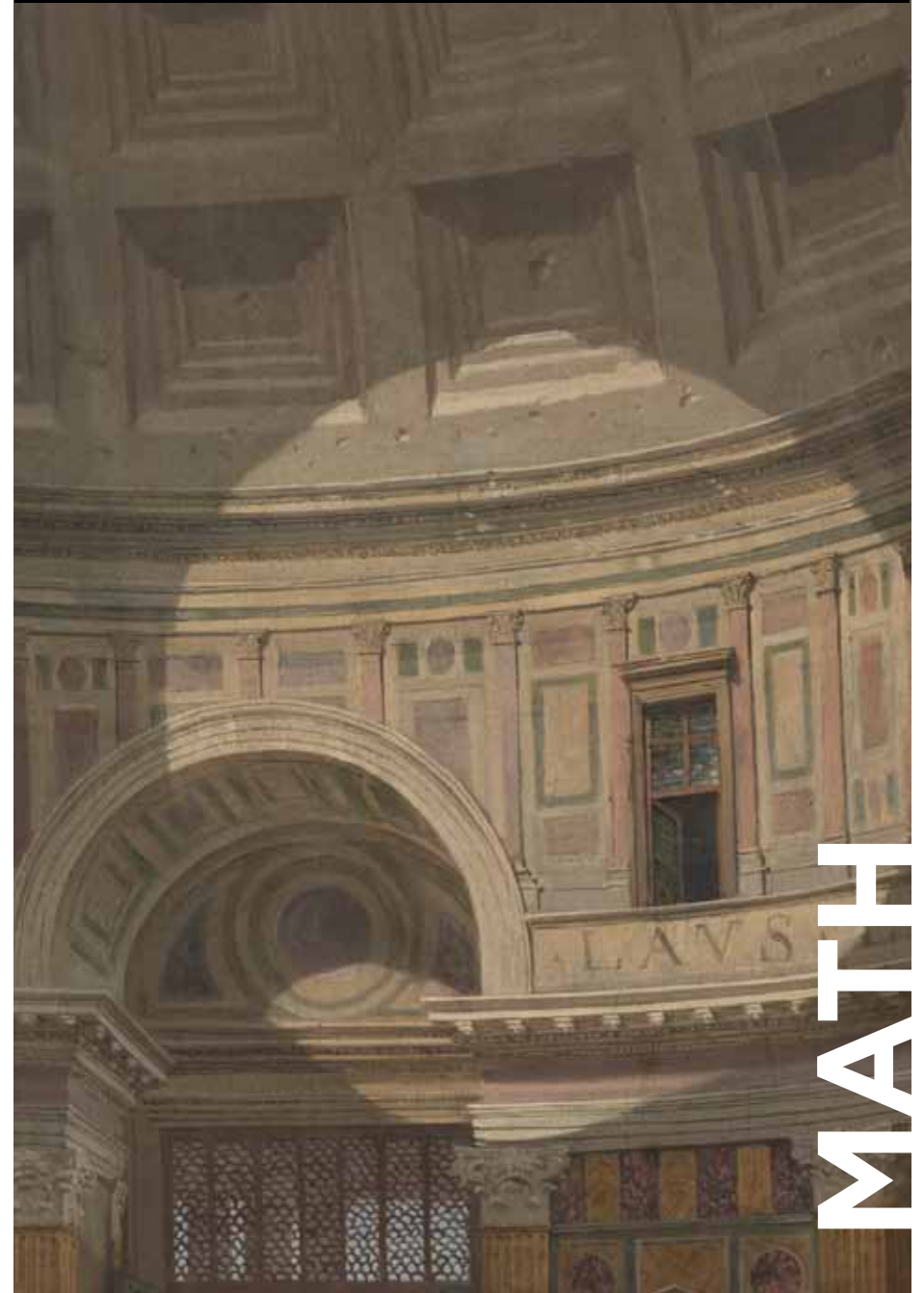
**Common Core Standards**

Grades 6-7: Ratios & Proportional Relationships



COVER: *Interior of the Pantheon, Rome, 1747*; Giovanni Paolo Panini, 1974, 39

# CURRICULUM LINKS



## EXPLORE MATH CONCEPTS



*Doorway from the Isaac Gillet House, Painesville, Ohio, 1827.* Jonathan Goldsmith (American, 1783–1847) and Lewis Firm (American). Gift of Mrs. A. Dean Perry 1959.342

Jonathan Goldsmith, an architect from Northeast Ohio, used elements from both Greek and Roman architecture in this elaborate doorway. The flat window tracery serves as a good example of geometric design in 18th-century decorative arts. Ask younger students to identify polygons, vertical and horizontal lines, right angles, and parallel and perpendicular lines.



*Interior of the Pantheon, Rome, 1747.* Giovanni Paolo Panini (Italian, 1691–1765). Purchase from the J. H. Wade Fund 1974.39

Explore the Golden Ratio and perspective with this painting. Roman architecture often followed the principles of the Golden Ratio, and some aspects of the Pantheon correspond to those ratios. Panini's view of the interior also shows his use of linear perspective, which was defined during the Renaissance.



*Crown (detail), 1900s.* Guinea Coast, Nigeria, Yoruba. Andrew R. and Martha Holden Jennings Fund 1995.22

This beaded crown was worn by a Yoruba king, and the birds on top represent his ability to cross boundaries and connect with the spiritual world. Geometric patterns are used in various types of African art to symbolize power, deities, and other spiritual ideas. Explore patterns on this crown, including regular tessellations and non-regular tessellations.



*Turned Armilla, c. 1500 BC.* Hungary. Purchase from the J. H. Wade Fund 1988.5

This artist mimics the spiral pattern of a nautilus shell, where the radius of each chamber grows at a rate determined by a specific proportion to the previous one. The Fibonacci Sequence can be used to measure spiral patterns such as this. Named for Leonardo de Pisa (known as Fibonacci) in the 13th century, this sequence of numbers was also recorded in ancient Indian mathematics.



*Cartonnage Mummy Case (detail), c. 50 BC–AD 50.* Egypt. Gift of the John Huntington Art and Polychrome Trust 1914.715

This mummy case is made of cartonnage, a material similar to papier-mâché but using layers of linen rather than paper. On the bottom, the artist portrayed the mummy's sandals with scorpions on each side for protection. Notice the pattern on the sandals, an example of a regular tessellation composed of squares.



*Louis XV Savonnerie Carpet with Royal Arms, c. 1740–50.* Manufactured by Savonnerie Factory (French); designed by Pierre Josse Perrot (French, active 1724–1735). John L. Severance Fund 1950.8

Tapestry and carpet manufacturers worked from the cartoons of artists, designs drawn on a much smaller scale than the finished product. Using a grid system, the weavers, like those at the French Savonnerie manufactory, were able to reproduce the small drawing onto a final, grand-scale carpet.