



“It’s all in the cellar”

Subject: Math/Grade 7
Skills: Computation and estimation, measurement, geometry
Strategies: Use of real-life data
Time: 5 to 7 class periods

Objectives: SOL Math 7.4, 7.6, 7.7, 7.17
Students will:

1. solve practical problems using rational numbers and percents
2. use proportions to solve practical problems, including scale drawings that contain rational numbers and percents
3. apply perimeter and area formulas in practical situations
4. collect, analyze, display, and interpret data in a variety of graphical methods

Background: After much research and preliminary testing, archaeologists pinpoint the location of a site and begin its excavation. As they dig a site, archaeologists must create an overall map of all its features. Features consist of building foundations, fence posts, pits, wells, cellars, and anything else that the inhabitants dug deeply into the ground. In order to create the map, archaeologists establish a grid across the surface of the site using a tool called a surveyor’s transit. The points on the grid are oriented to compass points such as North, South, and so on.

From that grid, the archaeologists compose a plan map of the site by measuring from grid points to coordinates that when connected denote a particular feature. From here, a process of triangulation is used to create what is called a *site plan* map. The site plan is the most important illustration of an archaeological site.

Procedure:

1. Access students’ prior knowledge of archaeology and Jamestown Settlement.
2. Discuss the role of **site plan maps** in archaeology.
3. Review students’ knowledge of **mapping techniques** and calculation of percentages.
4. Students will **create** a plan site **map** of a cellar excavated at Jamestown.
5. Students will calculate the **area** and **perimeter** of the cellar.

6. Discuss the categories of artifacts found in terms of how the artifacts functions in Jamestown Settlement life.
7. Students will calculate the **percentage** each category comprises of the total number of artifacts found in the feature.
8. Students will **graph** the results.
9. Students will write a very **brief analysis** of the data.

Archaeologists at the Jamestown Rediscovery Project have excavated and mapped many features from the original Jamestown settlement of the early 1600's. One such feature was a cellar containing thousands of artifacts.

On the graph paper provided are **grid points A, B, C, and D**. Using a **scale of 1" = 10'** you will complete a scale map of the cellar. By the process of triangulation, archaeologists have established the coordinates for each of the cellar's corners. Two of those corners have already been drawn and connected, establishing one of the cellar's 6 sides.

Using a compass, you will now be shown how to map another corner of the feature.

Corner III Grid Point B = 41'
Grid Point D = 10'

Placing the point of your compass on Grid Point B, set the compass to 41' by using the 1" = 10' scale. With the pencil-end, draw an arc between Corner II and Grid Point D. Next, place the compass point on Grid Point D and set the compass to 10'. With the pencil-end, draw an arc that intersects with your first arc.

The point where the two arcs intersect is the location of Corner III. Connect this point with Corner II. You have now mapped the second side of the cellar.

Follow the same process for establishing the additional four sides of the feature using the grid point coordinates provided for the remaining cellar corners. Connect all corners into what will resemble a backwards capital "L".

Corner IV Grid Point C = 22'
Grid Point D = 14'

Corner V Grid Point C = 25'
Grid Point D = 18'

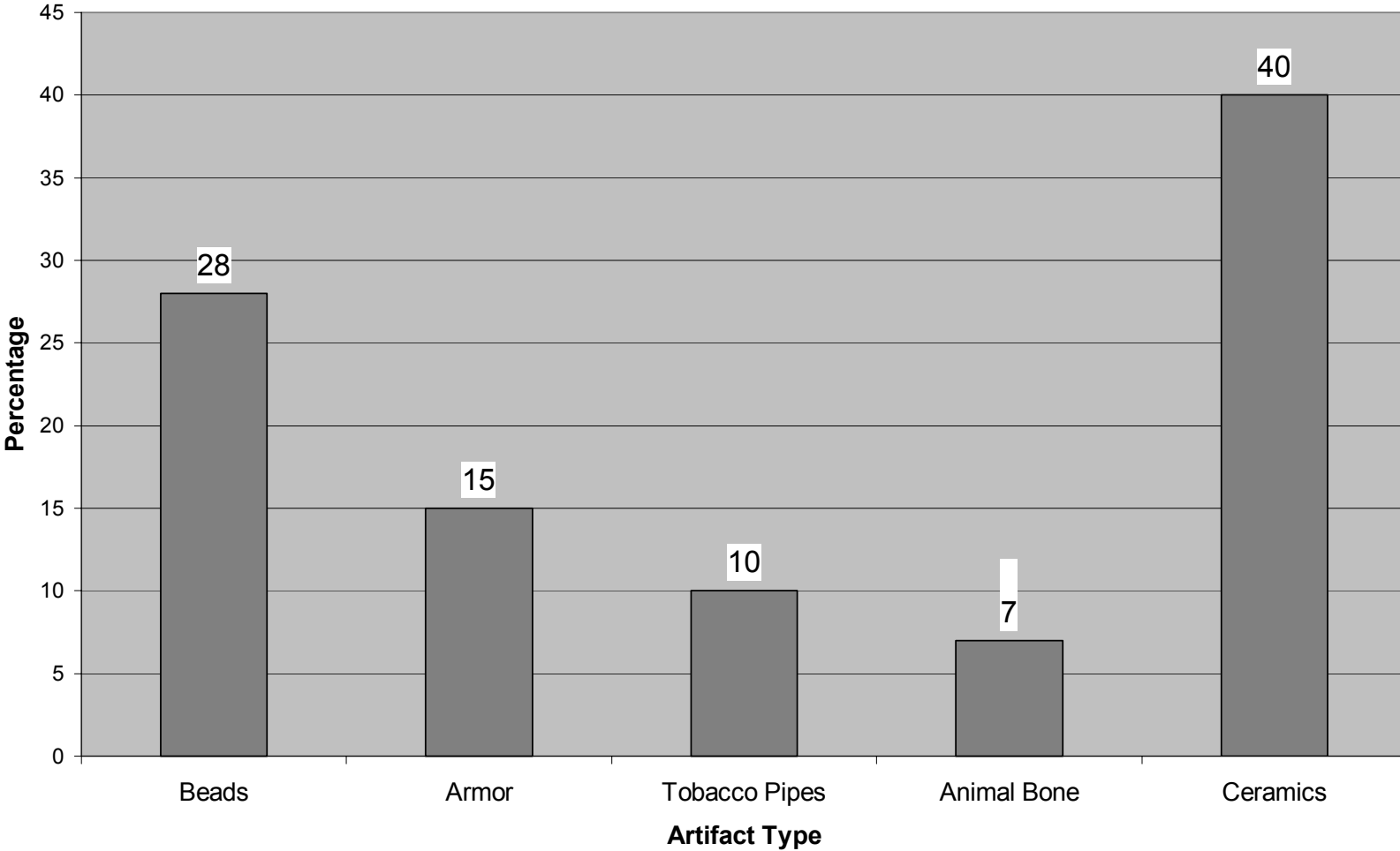
Corner VI Grid Point A = 18'
Grid Point B = 11'

Once the cellar map is complete, calculate the area and perimeter of the cellar.

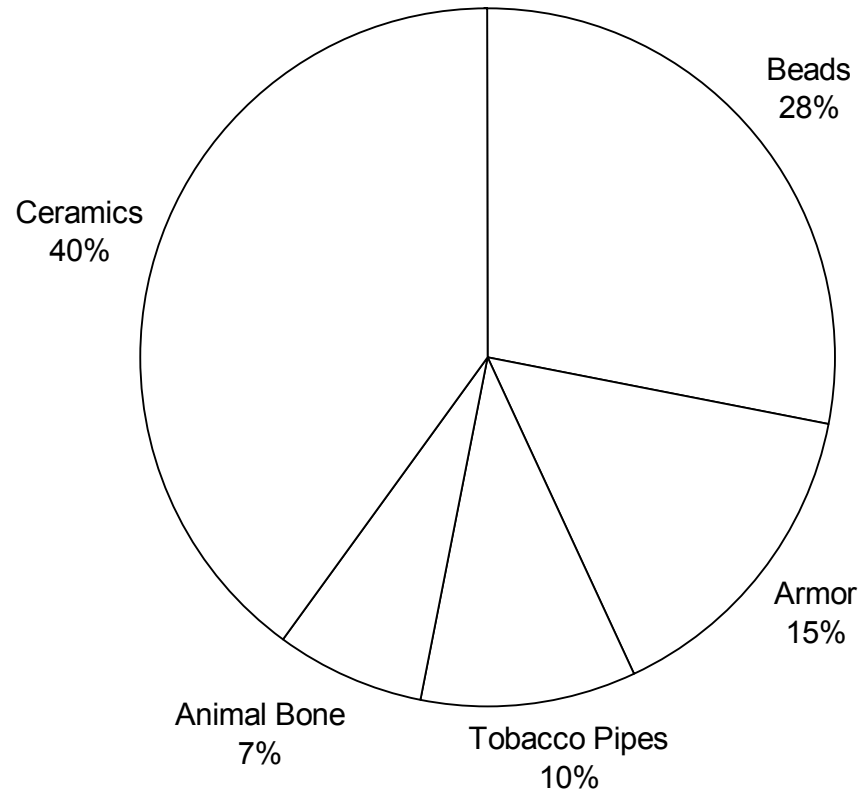
After archaeologists excavated all the contents of the cellar, they make lists of all the artifacts they found, categorize them, calculate percentages, and analyze the data. What follows is a list of just a few of the artifacts excavated from the cellar you have just mapped. Calculate the percentage each category of artifacts represents of the total number given. Graph the results, then try to analyze what these artifacts tell about the people who deposited them into the ground nearly 400 years ago. Consider the following: What use did the Jamestown settlers have with glass trade beads? Why did the settlers need armor? What do tobacco pipes, animal bones, and ceramics indicate about daily life at Jamestown?

Category of Artifact	Number of Artifacts
Beads (made of glass for trading)	52
Armor	27
Tobacco Pipes	19
Faunal (animal bones)	12
Ceramics	74

Bar Chart



Pie Chart

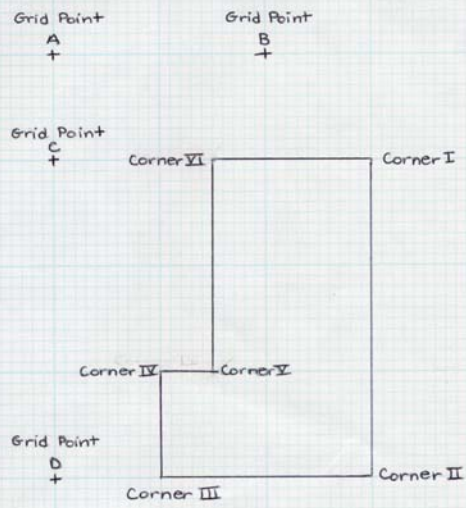


Corner Coordinates

IV: C = 22'
D = 14'

V: C = 25'
D = 18'

VI: A = 18'
B = 11'



1" = 10'

CELLAR MAP

Corner Coordinates

III: B=41'
D=10'

IV: C=22'
D=14'

V: C=25'
D=18'

VI: A=18'
B=11'

Grid Point
A
+

Grid Point
B
+


Grid Point
C
+

Grid Point
D
+

(Corner III)

Corner I

Corner II

1" = 10'


CELLAR MAP