

LEGO Castle Adventures



Overview

The lesson focuses on mathematics knowledge and skills used to engineer great castles. Measurement, geometry, and problem solving are among the areas that will be addressed. Throughout unit learning experiences, students have many opportunities to read, write, speak, listen, solve problems, and work cooperatively.

Students calculate perimeters and areas and draw the castle plan to scale. They develop a timeline outlining the construction of a castle and build catapults, a primary weapon of castle destruction. They understand the skill and effort involved not only in building castles but also in destroying them.

Education Standards

Geometry: Use spatial reasoning and geometric modeling to solve problems;

Measurement: Understand measurable attributes of objects and units of measurement and apply appropriate techniques to determine measurements.

Materials Needed

LEGOS

Drawing paper, pencils, and drafting templates

Rulers, meter sticks, tape measures

Vocabulary

Measurement: area, perimeter

Fortress: dungeon, great hall, moat

Geometric shapes: square, triangle, rectangle, circle

Geometric solids: cube, cone, pyramid, cylinder, rectangular

Student Objectives

Students will be able to explain how function can influence form in castle building.

Students will use math skills to design and plan a castle and learn how to work cooperatively to engineer a castle.

Students will identify the different parts of a castle and explain how each part added to its security.

Students will identify geometric shapes (two-dimensional) and solids (three-dimensional) used in castle design and use measurement tools and calculate scale on their design.

Activity

Background information:

The Middle Ages: A Brief History Help students gain perspective on the period in history known for castle building by using maps and time lines. The Middle Ages is the name given to a time in European history that stretches from approximately 500 to 1500 AD. It was given the name “middle” or “medieval” because of its position between the fall of the Roman Empire and the beginning of the Renaissance. This period is often broken into three parts: early, high, and late Middle Ages. Although people in various parts of the world built castles at different times for a variety of purposes, most European castles were created during this period.

Throughout the ages, the castle has been a primary setting for adventure, mystery, and wonder. Castle life was rarely as heroic or romantic as the pictures painted in story and verse. Through research, students gain a realistic view of castle society and the differing lifestyles of nobles and peasants.

The massive walls of a medieval castle, which in many cases are still standing today, highlight its role as fortress and protector. These walls also stand as symbols of determination and hope. The construction of a castle was an enormous undertaking that required not only vision but also years of labor by hundreds of workers, ranging from skilled craftsmen to unskilled peasants.

The construction of a castle also required the knowledge of math. In this lesson, students put their mathematical knowledge to work to plan and design their own castles. They will put their plans and designs into effect as they use LEGO® bricks and work cooperatively to build a castle.

Optional: Fill the classroom with a wealth of age appropriate fiction and nonfiction texts. Fiction may include folk or fairy tales and legends featuring not only King Arthur and his knights but also more humble individuals, such as Robin Hood. Include modern fantasy and fiction stories that feature medieval motifs, such as *The Hero and the Crown* (Robin McKinley), *Ella Enchanted* (Gail Carson Levine), and *The Book of Three* (Lloyd Alexander). Historical fiction is a great teaching tool because it combines an entertaining story with factual information. Older students will enjoy books by Karen Cushman and Avi.

Pre-Construction:

1. Review the different castles students have visited via story and research. Highlight the various parts of the castles.
2. Compare and contrast the castles.
3. Encourage the students to think about what they have learned about castles as they plan and build their castles.
4. Use the Castle Map (included at the end of the lesson) to measure the area and perimeter of the castle. If they decide to do their own design, then have students measure the area and perimeter of their design.

Construction:

5. Have students work together to build castles using LEGO bricks.
6. Compare and contrast the different parts of their design to that of actual Castles in Germany.
7. Take photos of the builders and castles during and after construction.

Post-Construction:

8. Display the castle research and LEGO Castle construction (or pictures of their castles) around the school for others to enjoy.
9. In journals, have students reflect on the knowledge and skills they learned through their castle building experiences. What surprised them most about castles? How did castle builders combine science and artistry?
10. Explain that building a castle took many years and much manpower. Have students think about their community. Are there projects today that are similar in scope? What are they? Who builds them? What are they used for?

Extension

Invite families and community members to an after-school “Castle Raising”, where they work together as a family to build castles of various sizes and styles.

Using $\frac{1}{4}$ -inch graph paper, have students draw a personal coat of arms for their families. It may be a picture, geometric design, or repeated pattern. Have students paint or color the coat of arms.



1 BAILEY

2 KEEP

3 GREAT HALL

4 SLEEPING ROOMS

5 KITCHEN

6 DUNGEON

7 DRAW BRIDGE

8 MOAT



