

Architectural Gems



Overview

To learn more about Russia's rich cultural history, all you need to do is look around. Russian architecture, from its signature onion dome rooftops to red-brick kremlins, tells a thousand tales about the nation's past. Students will discover the history of Russia's architectural gems while answering math problems. Each math problem will be embedded with rich, historical facts about Russia.

Breakouts are a game that will have your students thinking critically, problem-solving, troubleshooting, working collaboratively and having so much fun they won't even realize how much they're using their brains. Teachers can buy official kits with all the parts from BreakoutEDU (in resource folder), but it's definitely cheaper to buy the pieces individually at stores like Walmart, Target or Amazon.

Education Standards

Social Studies

3.13(A) explain the significance of various ethnic and/or cultural celebrations in the local community and other communities

Math

(3.2) Number and operations.

The student applies mathematical process standards to represent and compare whole numbers and understand relationships related to place value.

(A) compose and decompose numbers up to 100,000 as a sum of so many ten thousands, so many thousands, so many hundreds, so many tens, and so many ones using objects, pictorial models, and numbers, including expanded notation as appropriate.

Materials

- Box with a lock (see examples in resource folder)
- Architectural Gems Math Problems (one set per team)
- Puzzle pieces cut out (6 sets provided - only one set needed per team)
- Timer or Online Stopwatch (<https://www.online-stopwatch.com/>)
- Small prize for teams (teacher discretion: stickers, pencils, etc): place in box
- Copy of the “Breakout Flyers” - winning flyers go in box; teacher holds onto non-winning flyers

Vocabulary

3rd Mathematics Vocabulary Words

- Compare
- Expanded form
- Round
- Prism
- Symmetry

Student Objectives

In teams, students will work collaboratively to solve problems. Students will accurately solve all math problems to open the lock box. Students will need to explain how they reached their answers.

Activity

Divide students into 5-6 teams. Have the Breakout box set out for students to see. Draw the students’ attention to the box, and explain that they must become math detectives. There are a series of math problems to solve. Each team is to solve one problem at a time. After each problem, the team will check-in with the teacher. When teams answer the question correctly, the teacher will hand them a piece to their puzzle. Explain that when they have solved the final problem, they will be handed one special envelope. They will find something special inside (can point to Breakout box). This envelope will contain the last piece of their puzzle. The last piece

will have the key taped to the back side of the puzzle. They will have 45 minutes to Breakout. When they open the envelope, the timer will start.

***Tips/Suggestions:**

- Cut puzzle pieces ahead of time. Place in an envelope labeled with the name of the architectural building on the outside. Mark each envelope with Team 1, Team 2, etc on the outside. This makes it easier to keep track when distributing puzzle pieces to the team.
- Tape the key to one of the puzzle pieces and place it in a smaller envelope. This will be the last puzzle piece to give out.
- Place the Breakout Box in a visible place for students to see. This creates extra motivation for students to work as a team to solve their problems.
- More than one breakout box can be used (one for each team). Or one main box for the entire class. If one box is used, write the word "key" on the back of the last puzzle piece, and the teacher holds on to the main key for the box. Teams will have to discover the word key on the back of the puzzle and hand the puzzle piece to receive the key to unlock the box.

***Modifications:**

- Time allotted for the breakout can be adjusted depending on your class.
- Cut the number of problems for teams to solve from 9 problems to 5 problems. Adjust the number of puzzle pieces to fit the number of questions used. The last piece will have the key to the breakout box.

Extension

- Hide the key in the classroom and provide teams with clues on location.
- Hide the key in another location of the school. Teams solve problems to uncover where the key is placed.
- Use the hasp and place multiple locks on it. Write a riddle on the back of each puzzle piece for students to uncover. The riddle will provide the answer to unlock one of the locks on the Breakout box. Students must solve all the riddles to unlock all the locks to Breakout!