

Climate and construction

Objective

Students will learn to recognize three primary structural forms of architecture: post and beam constructions, rounded arches, and Gothic arches. They will look for these forms in their community buildings and will set up experiments to test the strength of these forms.

Warm-up Activity

The ancient Greek civilization is credited with producing an architectural style which relies on the post and beam support. The Parthenon in Athens, Greece is an excellent example of post and beam architecture. Illustrate this construction technique on the board or overhead.

Main Lesson

Back in the classroom, children will test the strength of post and beam and arch construction. Materials needed include: wooden blocks or two books, sheets of construction paper, Styrofoam blocks or connection blocks, and uniform weights (large nails, pennies, sinkers, smaller blocks work well.)

Share with the class a picture of the architecture of the Coliseum in Rome, an ancient example of a multi-story building which uses arches. The ancient Romans pioneered the use of the rounded arch which allowed structures to have more than one story. Ask if any students have seen the Bank of Montreal at Portage & Main in Winnipeg which is a modern example of the Roman technique. Rounded arches are referred to as Roman or Italianate arches.

Gothic arches are pointed arches and were developed during the Middle Ages (1000-1500 A.D.) and were most often associated with Western Europe's great cathedrals such as Notre Dame. In Canada, many public buildings, churches and houses were built in the Gothic Revival style in the 1800s. (If possible, share pictures of buildings which display the Gothic arch.)

Divide the class into groups. Each group should first set up a post and beam structure. The posts will be made from the blocks or books, the beam from paper. Students should then proceed to record how many pennies, for example, their structure will bear until the beam collapses. They should next create an arch and repeat the experiment. After all groups have finished, compare the results. What conclusions can be drawn regarding how much stress each type of structure will hold?

Extending Activities

- Each different design can be tested again putting the posts at different distances. What new conclusions can be drawn?
- Have students compile a booklet from travel brochures, magazines, and newspapers showing different kinds of structural forms. Look at buildings from other regions of Canada and other countries. If different forms are obvious, consult a book on styles for more information.
- While touring your community with your class, look for examples of post and beam construction and different arches in the buildings. Are there more examples of one form than another?

Grade Level: 4-8