

# Using Aerial Photographs to Teach Math Skills

## Lesson Overview

Students use aerial photos to discuss the geography of their town or neighborhood and practice using geometry, scale, ratio, and proportion.

## Grade Level

6-8 (The lesson may be used in lower grades if students have studied the related terminology.)

## Duration

1 class period

## Geography Theme

Location

- The location of places can be described using relative terms
- Reasons can be identified for the location of places

Place

- Places have physical and human characteristics

## Geography Standards

The geographically informed person knows and understands...

(#1) how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

(#4) the physical and human characteristics of places.

(#18) how to apply geography to interpret the present and plan for the future.

## Materials Needed

For Students:

- One aerial photo of the local area for each group of four students. Laminated photos that the students can write on are preferable or use plastic overlay sheets so the students can write on the photos. Note that the photos *must* have a scale. See ordering information in [Using Aerial Photos to Teach Geography Concepts](#).
- Math compass, ruler, colored pencils

## Main Objectives of the Lesson

Students are expected to:

1. Use an aerial photo to identify features of a place.
2. Describe the relative location of objects in the photo in both geographical and mathematical terms.

3. Use a scale and compass rose to explain location and place.
4. Evaluate allocations of land for various uses in a community and suggest alternatives for the future.

## Suggested Teaching Procedure

### Opening the Lesson

1. Before distributing the aerial photo ask students to do the following:
  - a. use directional terms to specify the location of their homes relative to other places;
  - b. estimate the distance from students' homes to the school or other place;
  - c. specify whether the street patterns are rectangular, diagonal or other; whether any intersect at 90° or different angles;
  - d. name the streets that are perpendicular and parallel to others.
2. Distribute the photos to student groups of four, and select and use some of the less complex questions listed in [Using Aerial Photos to Teach Geography Concepts](#). Have the students supply a direction indicator if one does not appear on the photo, and then use directions to state the location of landmarks in relative terms.

### Developing the Lesson

Ask students to use the aerial photo to do the following:

1. Identify and describe places of different shapes.
2. Construct a chart that categorizes and names several objects or areas that are rectangular, triangular, round, perpendicular, and parallel.
3. Use the scale to calculate the shortest (longest, most direct, most scenic) route from one place to another.
4. List several places that are 5 miles from the school.
5. Estimate size ratios of the following:
  - a selected apartment building to a house;
  - a school to a house;
  - a commercial or industrial buildings to residences (either houses or apartment buildings);
  - a parking lot to a selected building.

### Concluding the Lesson

1. Use the aerial photo to estimate the percentage of land used for industrial, residential, commercial, transportation, and recreational purposes; land left in semi-natural states such as forest preserves. Ask students to evaluate the land use allocations in the community from the stand point of business people, their parents, elderly or younger community members.
2. Suggest whether predominating land use or features will shrink or grow by the year 2000 and give reasons.

### Extending the Lesson

1. Have students draw a legend and construct a map from the aerial photograph, using only geometrical shapes.
2. Have students calculate the area and perimeter of the school property or another place in the community.
3. Take a walking tour. Have each student draw a map of a place observed, making the map drawn to scale.

## Special Information

See [Using Aerial Photos to Teach Geography Concepts](#) for purchase information on aerial photographs.

Check with a local school administrator to see if aerial photos of the school district are available.