

# AERIAL PHOTOGRAPHS Science Page

An aerial photograph—or airphoto—is a picture of the Earth taken from above the ground. Airphotos are valuable tools for studying both natural features, such as forests, waterways, and soil, and human-made

features, such as roads and buildings. You can see how land use and communities change over time by studying a series of airphotos taken of the same place at different times.



Here is an aerial photograph of Prospect Park in Brooklyn, New York, taken in 1989.

## HOW TO 'READ' AIRPHOTOS

When you view the Earth from overhead, as if from an airplane, objects look different from normal. These clues will help you recognize features in the airphoto.

### Tone: the blackness or whiteness of an object

1. Large black areas are water.
2. The tiny white spots are roofs of houses.
3. Light cement sidewalks border dark asphalt streets.

### Texture: how coarse or smooth an area appears

4. Grassy areas have a smooth texture.
5. Forests have a coarse texture.

### Size

6. Highways are wider than streets.
7. Museums, factories, churches, schools, stores, and apartment buildings are larger than houses.

### Shape

8. The circle at the end of the park is a traffic circle.

### Location

9. The white circles in grassy areas are ball fields. Circles at the end of a road are traffic circles.

## SCALE

An aerial view close to the ground shows lots of detail. The further away from Earth a photograph is taken, the smaller the features appear on the photo. The scale of an airphoto indicates how much smaller an object in the photo is compared to its actual size. The photo on the right has a larger scale than the photo shown above. Sometimes people confuse large scale and small scale. Remember that features on large scale photos appear large, and features on small scale photos appear small.



The scale of the airphoto above is 1:24,000. This means that one centimeter on the photo is equal to 24,000 centimeters—or 240 meters—on the ground. The airphoto on the left is a section of the above photo, and is shown at a scale of 1:12,000. This larger scale photo shows features in more detail. Look carefully at the large scale airphoto. Can you find this area on the small scale airphoto above?



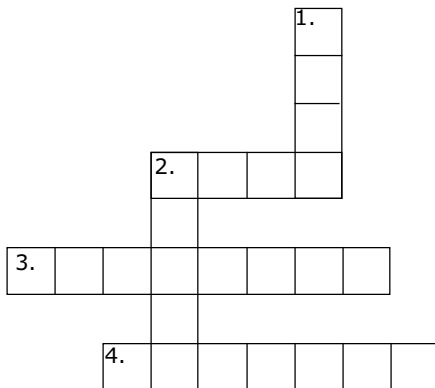
## CROSSWORD PUZZLE

### Across

- How you can tell a factory from a house.
- What clue helps you to tell the difference between a circle in a park from a circle along a road?
- How coarse or smooth an object appears.

### Down

- Blackness or whiteness of an object.
- How you can tell a football field from a baseball diamond.



## TRY THIS

### INTERPRETING AN AIRPHOTO

Here are some questions about the small scale airphoto of Prospect Park. Use clues such as tone, texture, size, shape, and location to answer as many questions as you can. Write your answers on a separate sheet of paper.

- Near what number on the airphoto does the park have dense woods? What clues did you use to figure this out?
- What are the white, winding lines in the park? What clues did you use to guess?
- How many blocks is it from the large traffic circle at the top end of the park to the small traffic circle on the left side of the park (near number 8)?
- Are there any buildings in the park? How can you tell?
- The area near number 2 is a residential neighborhood. What do you think some of the larger buildings could be?
- Measure the length of the park on the airphoto in centimeters. Then multiply this length by 240 to get the actual length of the park in meters.



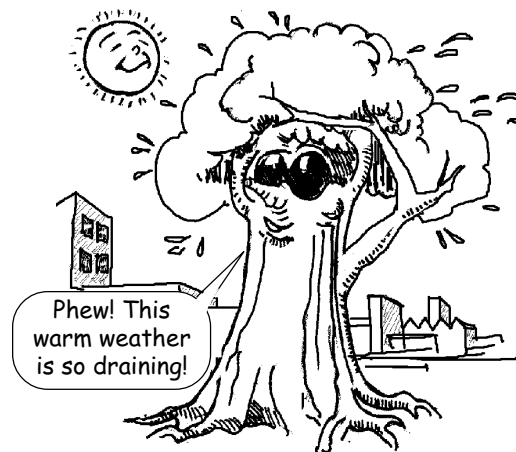
## SPOTLIGHT ON RESEARCH

### Satellite images show that vegetation can cool cities

Satellite images are similar to airphotos in that they are taken looking down on Earth from above. Scientists can use satellite images to help understand our environment. For example, scientists wondering about the effect of plants and pavement on air temperatures examined two different kinds of images of Rochester, NY. One was a thermal image, which showed warmer areas in lighter tones and cooler areas in darker tones. The other was a color composite image, which showed different kinds of surfaces in different colors. For example, vegetation appeared green, bare soil was pink, and pavement and rooftops were blue.

When the scientists compared the two images, they discovered that the cooler areas in the city were over vegetation. They hypothesized that areas over vegetation were cooler because of water moving out of plants into the air, or "transpiration." Through transpiration, plants give off lots of water. As the water moves from plants to air, heat is taken from the air. The more plants there are, the more water they give off and the cooler the air.

Source: Lougeay, R. (1996). Land use, land cover, and local climate. *Applications in Remote Sensing*. Vol. 4. Remote Sensing Core Curriculum Project, Department of Geography at the State University of New York at Geneseo. <<http://www.research.umbc.edu/~tbenja1/lougeay1/>>



## RIDDLE

Why are airphotos like fish?

*Answer: They both have scales.*