

Google Earth™ & GPS

Classroom Activities

Intermediate Science: Grades 5–8

*The following
pages contain a
sample section
from the book.*

Student Activity

Population Density

Grade Level: Content Area(s):
Intermediate Science (5-8)

On CD-Rom:
PopulationSAS.pdf
Population.kmz
Population.pdf
(20 individual .kmz and.pdf files)



Lesson Overview:

Students will count the number of houses in a half mile square sample to compare it to the population census of a selected city.

Software or Special Materials/Supplies:

Google Earth
PopulationSAS.pdf (one per student)
Population.kmz file

Standards:

NSES 5-8 Content Standard A and B

- Scientific investigations sometimes result in new ideas and phenomena for study, generate new methods or procedures for an investigation, or develop new technologies to improve the collection of data. All of these results can lead to new investigations.
- Different kinds of questions suggest different kinds of scientific investigations. Some investigations involve observing and describing objects; some involve collecting specimens; some involve seeking more information; some involve discovery of new objects and phenomena.
- Mathematics is important in all aspects of scientific inquiry.
- Technology used to gather data enhances accuracy and allows scientists to analyze and quantify results of investigations.

ISTE Standards

- 3.b: Students apply digital tools to gather, evaluate, and use information. Students locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
- 4.b: Students use critical thinking skills to plan and conduct research, manage projects, solve problems and make informed decisions using appropriate digital tools and resources. Students collect and analyze data to identify solutions and/or make informed decisions.
- 4.c: Students use critical thinking skills to plan and conduct research, manage projects, solve problems and make informed decisions using appropriate digital tools and resources. Students collect and analyze data to identify solutions and/or make informed decisions.

Ecology

Procedures:

This activity should only be attempted after students have completed the introductory mini-lessons on Google Earth. This assignment can be easily completed in small groups or as individuals.

1. Explain to students that they will be determining if a population sample of a specified city is representative of the entire city's population.
2. Show students a sample of a city, and PopulationSAS.pdf. Demonstrate how to count houses and report data.
3. Assign a city to students and print the maps as references for students
4. Students will open the two sample .kmz files for their assigned city. The CD contains individual .kmz and .pdf files for each city.
5. In each sample, students will count the number of houses. Arriving at a system for counting all of the houses is part of the decision-making skills used.
6. You may distribute printed copies of the sample to allow students to mark areas already counted.
7. Using PopulationSAS.pdf, students will determine if the population samples are reasonably representative of the population of the entire city.

Name: _____ Class Period: _____

Select one of the cities from the following list. Put a star by the name of your city in the chart below. Open the sample .kmz files for that city. Each of the sample .kmz files are 1/2 square mile. Count the number of houses in each sample.

	* Population in 2000	* Average people per household	* Average people per square mile	* Land area (sq. miles)
Apache Junction, AZ	31814	2.29	929.3	34
Arlington, TX	332969	2.65	3475	96
Boise, ID	185787	2.44	2913	64
Durham, NC	187035	2.37	1976	95
Oakdale, MN	26653	2.59	2408	11

* 2000 U.S. Census Bureau numbers

Sample #1: If this sample represented the city...

How many houses were in Sample #1? _____

How many houses would be in a square mile?
(multiply by 4) _____

Approximately how many people would live in this square mile?
(multiply by average people per household) _____

Approximately how many people would live in the city?
(multiply by average people per household) _____

How accurate is your number? Divide the estimated number
by the actual number. _____

Sample #2: If this sample represented the city...

How many houses were in Sample #2? _____

How many houses would be in a square mile?
(multiply by 4) _____

Approximately how many people would live in this square mile?
(multiply by average people per household) _____

Approximately how many people would live in the city?
(multiply by average people per household) _____

How accurate is your number? Divide the estimated number
by the actual number. _____