Understanding Population Dynamics

Concepts:

As the population of a region grows, the population density increases. Populations of high density require more cooperation and coordination of activities.

Objectives:

Students will be able to:

◆ List situations where population density is an advantage or disadvantage.
◆ Understand how behavior changes as population density changes.

Subjects:

Social Studies, Science, Health, Geography, Physical Education

Skills:

Observing, brainstorming, critical thinking, using reference materials

Method:

Students briefly demonstrate the effects of crowding in a "jumping jack" activity and discuss the pros and cons of population density.

The More the Merrier?

Introduction:

Human population growth has a variety of consequences, both direct and indirect. This introductory activity looks at one of the consequences easiest to see in daily life — crowding. With population growth, the average population density will increase, even if the population is denser in some places than others. Visualizing increased population density in a variety of environments can help us plan for the future. For example, in a place already densely populated, an increase can result in more crowding, traffic, waiting in lines, waiting lists, tighter clusters of houses, compact apartments, less space and a general sense of stress. In a mostly unpopulated place, a slight increase in population density can interrupt a previously uninterrupted horizon, reduce or fragment open space, and require new electrical wires and other services.

In the discussion following the brief demonstration, students can weigh the pros and cons of higher population densities. They will explore the services that are enhanced by a higher population density as well as the challenges posed by increased crowding.

Materials:

Yarn

Procedure:

1. Have students imagine that the number of students in your classroom has doubled. Have them list the effects of this. Make sure that both positive and negative impacts are discussed.

   Answers could include more friends, more ideas, more sharing, less space, crowding, more noise, competition for chairs and books, less attention from the teacher.

2. Have students vote by secret ballot on whether they would like to have more, fewer or the same number of students in the class as they have now. Tally and announce the results to the class.

3. Mark off an area in the classroom with yarn, chalk or furniture (about a 10 ft. x 10 ft. area). Select two students to stand in the area and do jumping jacks.

4. Keep doubling the number of students doing jumping jacks in the area until it becomes impossible to add more. If you find they have coordinated their arm movements, secretly ask one of the students to get out of sync.

5. Solicit observations from the original pair on how their environment and behavior changed.

Discussion Questions:

1. Did the students jump in sync? Why did this happen? How did this happen? Can you think of things people do differently when they are among lots of other people?

   Coordination of movement is necessary in crowded situations in the real world, too. People get in lines at crowded events, they obey traffic signals and laws, etc.

2. What happened when one person was out of sync? What would happen if that occurred in the real world?

   Have them imagine a person who always disobeyed traffic signals, wouldn't wait his/her turn, or wouldn't share.

3. List situations, events and activities for which it is better to have a lot of people around, and those for which solitude is better.

   Possible activities for large groups include parties, fiestas, family reunions, sports events, competitions, dances, walking on dark streets. It is often less desirable to have big crowds for classes, bicycling, shopping, driving, walking, thinking, drawing, studying, reading, sleeping, waiting for the bus and private conversations.

4. If you were raising money for a school project by selling candy bars to your neighbors, would you want it to be in an area with high population density or low population density?

   In highly populated areas it would be easier to sell more candy in a shorter amount of time, and therefore make more money. If the households were scattered farther apart you might enjoy more fresh air and open scenery on your walk but you would not be able to visit as many neighbors in the same amount of time.

5. What other services are easier to provide for an area of high population density?

   Possible answers might include mail delivery; electricity; telephone, cable, water and sewer connections; public transit; museums; stadiums; theaters. Additionally, services centered in one building, like community hospitals, schools, libraries, etc., can be more convenient to people who live close.

6. What qualities are desirable about areas of lower population density?

   Possible answers include more peaceful, open space, more space to plant gardens, fresher air, more nature, less noise, more space to cut loose or to get away.

7. If you had a cold, would more people be likely to catch it where population density was high or low?

   Colds, like other contagious diseases, can pass more easily in areas of high population density. In the densely populated city of Tokyo, Japan, people wear face masks when they have a cold so as not to spread it.

8. If population continues to grow locally, what is the impact on population density?

If population grows the density will become higher and/or some people may migrate to other areas.

9. Human migration can change the population density of an area relative to neighboring areas, as people move into or out of it. What might make a particular place more crowded and what might make a particular place less crowded, in the long term and in the short term?

Job possibilities, nice retirement areas, healthy climate for allergy sufferers, entertainment and cultural variety, better quality of life and affordable housing are some reasons that areas become more crowded. Places where a major industry goes bust, where civil war breaks out, where job possibilities decline or where taxes are too high, tend to lose people.

Follow-up Activities:

1. This activity shows that population densities impact crowding, amount of open space, delivery of services and contagious disease. As follow-up it is important to discuss the secondary consequences of population density and the idea that populations require more resources than just land area to support them. When population density outstrips the ability of existing local resources to meet the needs of the population, people may want to leave in search of better places. This, in turn, changes the population density of both the place they leave and the new place in which they settle.

2. Have students look in an almanac or atlas for a list of the world's largest cities (such as Tokyo, Sao Paulo, Mexico City or New York). Instruct them to select one of the cities and to find three facts about how population density shapes the lifestyle in that place. They could find this information in an encyclopedia or travel guide. (Example: In Tokyo, the average highway speed is 10 miles per hour due to heavy traffic.)