**World Population: History of Global Population Growth**

**Activity 1: Film Analysis**

1. What was the sound in World Populaton? What did this sound symbolize?
2. In approximately what year did you begin to notice a large increase in population growth? What historical events, scientific advances or societal changes at that time period may have contributed to that population growth?
3. Were there any points in the film when you noticed slight decreases in populations? If so, what part(s) of the world did you notice decreasing populations? What historical events in those time periods may have contributed to the population decreases?
4. In which time period did the most population growth occur? During that time period, which parts of the world experienced the most growth?
5. Are there any areas of the world which are likely to remain relatively unpopulated by the year 2030? Why would this be so?
6. Won’t advances in science and technology enable our planet to accommodate a growing population?

**Activity 2: Population Riddles**

World population doubled from 3 to 6 billion people between 1960 and 1999, as human numbers grew exponentially. Starting with a small number and doubling it over and over soon means doubling ever-larger numbers. These riddles help to illustrate the concept of exponential growth, a constant rate of growth applied to an increasing base.

1. Calendar Riddle

A father complained that his son’s allowance of $5 per week was too much. The son replied, “Okay, Dad. How about this? You give me a penny for the first day of the month, 2 cents for the next, 4 cents for the next, 8 cents for the next and so on for every day of the month.” The father readily consented.

1. Who was the cleverer one?
2. What would the son’s allowance be on day 31?
3. Lily Pad Riddle

Lily pads can grow fast. Imagine that you discover a variety of lily pads that can double in number every day. It takes 10 days for them grow to cover a pond halfway.

1. How many more days will it take for the lily pads to completely cover this pond?
* About 10 more days
* About 5 days
* Tomorrow
* Never, since the lily pads won't ever fill up the pond completely
1. Why do you think this?

**Activity 3: Growth of the Lily Pad Population**

Procedures:

1. Work in groups of 3 to 4 students. Imagine that your lab table or desk is the surface of the pond in your backyard. Using a ruler, measure a square, 48" X 48" on your desk or lab table. Place masking tape down to mark the edges of your "pond."
2. Get 64 index cards (3" X 5") from your teacher. Pretend that each card is a lily pad.
3. Lay one card in the corner of the "pond" to represent the first lily pad.
4. Now pretend that a day has passed. Double the number of lily pads in your pond.
5. Carefully counting up how many lily pads are present in each generation. Use Table I below to keep track of your data.
6. Pretend another day has passed and double your lily pad population again.
7. Keep on doubling the population until half of the entire surface of the pond has been filled.
8. Now make a graph of your results, using Figure 1 as a guide. Generations should be along the x-axis and total number of lily pads in the population should be on the y-axis.

Table 1: Lily Pad Population

|  |  |  |
| --- | --- | --- |
| **Generation****(Number of Days)** | **Number of New Lily Pads** | **Number of Lily Pads in the Population** |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |
| 7 |  |  |

Figure 1: Growth Curve



Analysis Questions:

1. How many lily pads does it take to fill half of your pond?
2. How many days passed before half of the pond was filled with lily pads?
3. How many more days will pass before the entire pond has been filled?
4. Is this graph linear, or does it increase more or less rapidly than a linear graph?

**Activity 4: Earth – The Apple of Our Eye**

An apple will be used to demonstrate the planet Earth.

1. An apple was sliced into quarters. Three quarters were set aside. What do these represent?
2. What fraction do we have left?
3. This quarter represents land.
4. Slice the remaining quarter into two pieces. One of the pieces represents the land area that is inhospitable to people: the polar areas, deserts, swamps, very high or rocky mountains.
5. What fraction do we have left? This piece represents the land area where people live, but do not necessarily grow the foods needed for life.
6. Slice the remaining piece into four sections. Set aside three of these.
7. What fraction do you have left? This represents the areas too rocky, too wet, too cold, too steep, or with soil too poor to actually produce food. They also contain the cities, surburban sprawl, highways, shopping centers, schools, parks, factories, parking lots and other places where people live but do not necessarily grow food.
8. Carefully peel the slice of the earth. This tiny bit of peeling represents the surface, the very thin skin of the earth’s crust, or topsoil upon which humankind depends. It is finite and irreplaceable amount of land, which averages only a few feet in depth. Due to erosion and overfarming, we lose 25 billion tons of it per year. It can take hundreds of years for one inch of topsoil to form.

**Activity 5: Making Connections – Everything is Connected**

“Everything is connected to everything else” is often called the First Law of Ecology. This is an activity that encourages participants to consider the connections between different things in the natural environment and between the environment and human society. The size of the human population affects virtually every environmental condition facing our planet. As our population grows, what effect will that have on the earth’s resources?

1. Complete the concept map below. (Make a minimum of 10 connections)

**Activity 6: Take a Stand**

Sometimes it is easier to think through a difficult issue if one is asked to “take a stand” on it. This activity was designed with that in mind. There is no answer key with this activity because there are no right or wrong answers.

Respond to each statement as it is read aloud, if you agree “thumbs up” and if you disagree “
thumbs down.”

1. In a real crunch, jobs are more important than environmental quality.
2. Arable land should not be used for housing, shopping centers, or otherwise developed.
3. As one of the richest countries in the world, the United States should welcome all those from other nations who wish to live here.
4. To lower our use of energy and levels of air pollution, we should spend more money on improving our public transportation systems than our highways.
5. To reduce teen pregnancy in the United States, school health services should offer contraceptives to all students who want them.
6. The next century is likely to be a better time to live than the present.