**Populations and Limiting Factors Practice** Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per:\_\_\_\_\_

**Activity 1:** Read each situation in the chart below. Then, state if it is a density-independent limiting factor or a density-dependent limiting factor. Then, state the specific limiting factor that is occurring. The first one is done for you as an example.

|  |  |  |
| --- | --- | --- |
| **Situation**  | **Density-independent, or density-dependent?** | **Limiting Factor:** |
| Ms. Paxson has 32 students assigned to her Environmental Science class, but she only has room for 28. Because the room is so crowded, the extra 4 students leave the room to go to Guidance and have their schedules changed. |  |  |
| Northern pike (it’s a fish) feed on another fish, the yellow perch. An increase in the yellow perch population causes an increase in the northern pike population. |  |  |
| The BP oil spill in the Gulf of Mexico has harmed many aquatic organisms that live in the Gulf region. |  |  |
| A new strain of influenza (the flu) breaks out in New York City. |  |  |
| A population of rabbits and a population of deer are both feeding off the same plants in the same habitat. |  |  |
| Hurricane Katrina forced thousands of people to leave New Orleans. |  |  |
| 65 million years ago, a large asteroid collided with the Earth. As a result, large amounts of ash were ejected into Earth’s atmosphere. |  |  |
| Due to humans putting increasing amount of greenhouse gases into the atmosphere and cutting down trees that would normally take up some of those gases, the Earth slowly gets warmer and changes climates around the globe. |  |  |

**Activity 2:** Study the graph below



a. Which country looks like it is experiencing exponential growth? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. Which country looks like it has reached its carrying capacity? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Because it has reached its carrying capacity, describe the relationship between its birth rates
and death rates in the space below:

c. Describe what is happening to Europe’s population size in terms of birth rates and death rates.

d. Which country or countries could be experiencing:

• emigration: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explain your answers here:

• immigration: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explain your answers here:

**Activity 3:** Read the CAUSE on the left hand side of the table below. Then, predict the EFFECT on the population that the cause might have in the right-hand column.

|  |  |
| --- | --- |
| **Cause** | **Effect** |
| During the 1920s, many Eastern Europeanpeople leave their countries to come to theUnited States. |  |
| During the 1920’s, many Eastern Europeanpeople enter the United States. |  |
| Many more babies were born in the post-World War II era than in the pre-World WarII era. |  |
| China imposed a “one child only” policy in1979 which is still in effect today. |  |
| Seals are hunted for their meat and fur in some regions, resulting in many deaths of seals. |  |

Now, describe three different scenarios that could lead to…

A population crash:

An exponential population growth:

A gradual decrease in population:

**Activity 4:** Graph I shows the growth curve for a culture of *Paramecium aurelia,* a type of microscopic, unicellular protist. Graph II shows the growth curve for a culture of *Paramecium caudatum*, a larger species of the same protist. Graph III shows the growth curves of both species when they are grown together.



a. What type of population growth is shown in Graphs I and II, when each protist is in its own jar?

Explain how you know:

b. Study Graph III (the bottom graph) very carefully. It shows what happens when you put both populations of paramecia in the same jar. Why did the population of *P. caudatum* decrease, but the population of P. aurelia increase?

Look at your answer above. Go back and add if what occurred was a density limiting factor, or a density-dependent limiting factor. Then, explain why it is the factor you chose. Record this response to the right or left of the graph.