THE LYNX AND THE HARE

INTRODUCTION:

In this activity you will simulate the predator / prey relationship between a lynx and hare and analyze the relationship one species has on the other in terms of population size.

CONCEPTS:

Predator Prey Population Growth

MATERIALS PER GROUP:

Flat surface, 12" x 12" area
Cardstock squares, one-inch (snowshoe hares), 300
Cardstock square, three-inch (Canadian lynx), 1
Paper cutter or scissors
Masking Tape
Population Data Table (page 2)
Population Graph (page 3)

PREPARATION:

Use tape to make a square with 12" sides, on a table top or other flat surface. The square represents the area inhabited by a population of snowshoe hares. Cut out 300 one-inch cardstock hares and a three-inch cardstock lynx.

PROCEDURE:

1. Begin the simulation by populating the habitat with three hares—spatially dispersed within the square.
2. Toss the cardboard lynx into the square in an effort to capture (i.e., land on any portion of) as many hares as possible. In order to survive and reproduce, the lynx must capture at least three hares when tossed. Remove any hares captured (if any) and enter the tallies for the first generation on the data table on page 2.
3. The hare population doubles between generations—multiply "Hares Remaining" by two and enter the resulting number in "Number of Hares" column for the second generation. Place the required number of hares in the square. If no lynx survived the previous generation another moves into the area. Toss the newly recruited lynx—repeating step 2. Remove any captured hares and enter the new tallies.
4. By generation 5 the lynx should be able to capture three hares when tossed. If successful, the lynx survives until the next generation and also produces offspring—(one per each three hares captured). Toss the lynx square once for each lynx.
5. As the population builds it is important to separately tally each lynx's kills, removing captured hares after each lynx is tossed. Determine lynx survival and reproduction using individual lynx capture numbers. Remember, lynx produce one offspring for each three hares captured. If a lynx captures seven hares, three lynx enter the next generation—the original lynx and two offspring. Individual lynx capture numbers should be tallied on a separate sheet of paper and only totals entered in the table.
6. Between generations 9 and 11, the populations will probably crash back to, or near, zero. If and when this happens be sure to begin subsequent generations with at least three hares. Carry the simulation through to at least 20 generations, by which time the cycle will be well on its way to repeating and the next few generations can be (relatively accurately) predicted.

Name _____

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Period _____ Date _____ Seat ___

THE LYNX AND THE HARE DATA TABLE							
Generation of Hares	**Number of Lynx**	**Number of Hares**	**Hares Eaten (Total**	**Hares Remaining**	**Lynx Starved**	**Lynx Surviving**	**Lynx Offspring**
1	1	3					
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

GRAPHING:

On the graph below (page 3), make a plot of population totals for the lynx and the hare (the first two columns) versus generation number. Use a solid line for the lynx and a dashed line for the hare.

Name _____

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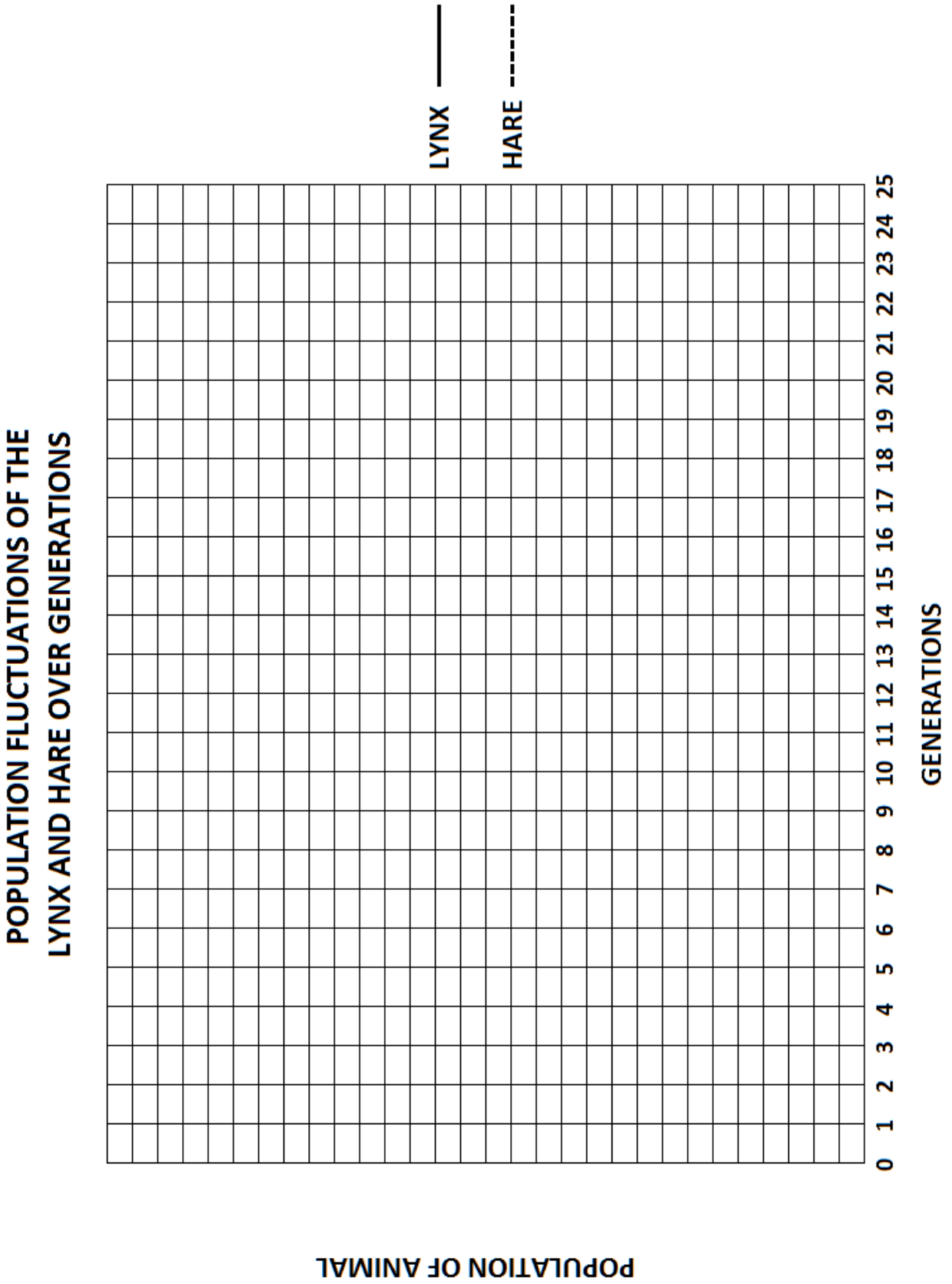

Name _____

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QUESTIONS:

1. Between which generations did the population of lynx crash to a low point?
   Why did this occur?

2. Why does the lynx population lag behind the hare population during times of population growth and population crash?

3. What are some assumptions made in execution this simulation?

4. There are many variables that occur in real lynx and hare populations that were not included in this simulation. List five real-life variables that the simulation did not incorporate.

5. At what generation (beyond 25) do you expect the hare population to crash again? How did you determine this?

6. How would the introduction of coyotes into lynx territory affect the lynx population (assume coyotes and lynx do not eat each other)?

7. Assume a disease exterminated all lynx on planet Earth. How would this affect the hare population?

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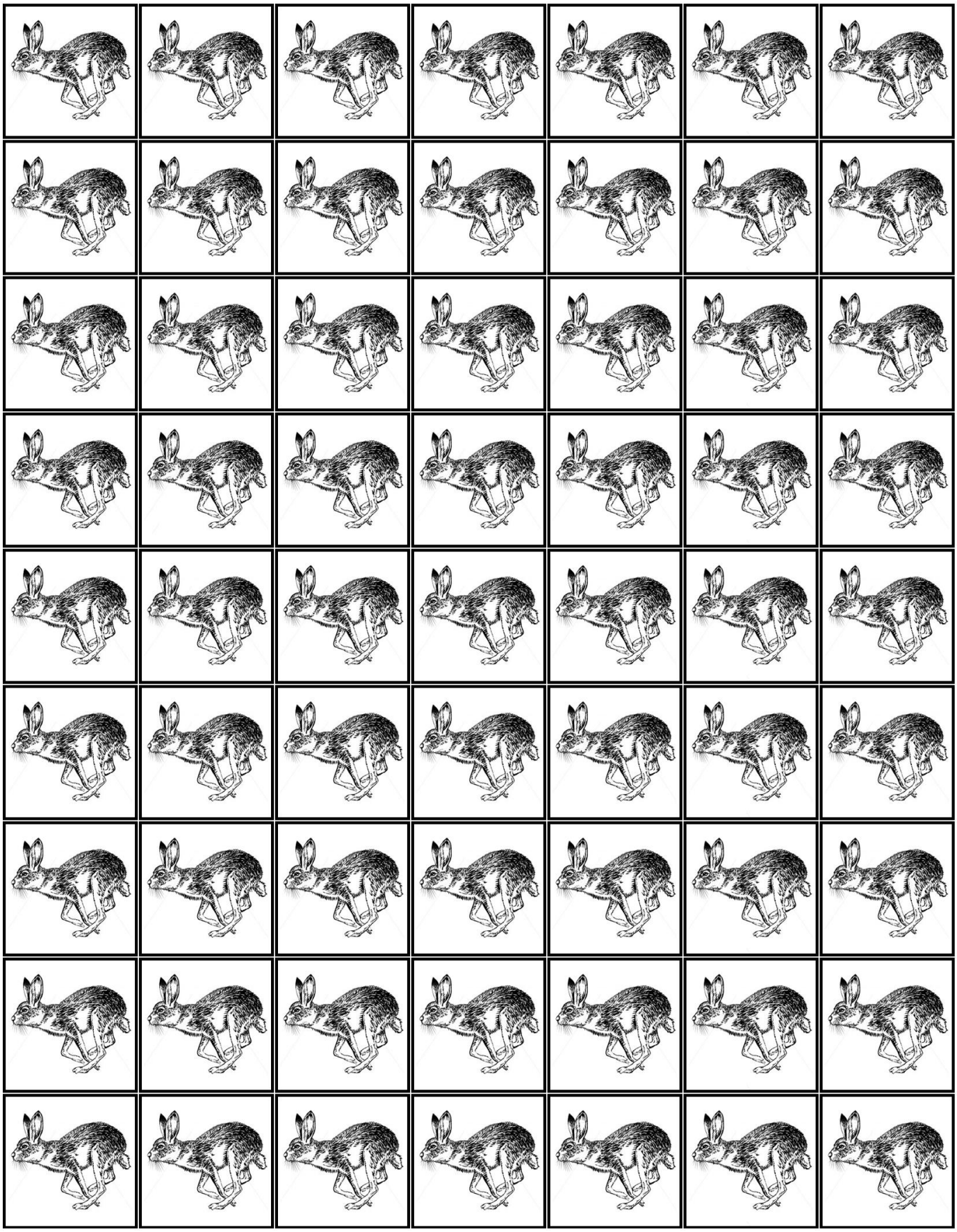

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