



Population Dynamics

hhmi BioInteractive

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Student Worksheet

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INTRODUCTION

In the [Population Dynamics](#) Click & Learn, you'll explore a powerful tool for learning about populations: mathematical models. As you'll see by doing the Click & Learn and this activity, you can use models to answer questions, solve problems, and make predictions about all kinds of populations — from bacteria in your body, to wildlife across the world, to our own human populations.

PART 1: Introduction to Population Dynamics

Open the [Population Dynamics](#) Click & Learn and read through the introduction on the first page.

1. Describe a specific question or problem related to population dynamics that interests you.

I would be curious about the growth and sustainability of the human population in the long term.

2. Do you think the question or problem you described could be investigated using a mathematical population model? Why or why not?

We could likely use the demographic transition model as it measures birth and death rates along with carrying capacity.

PART 2: Exploring the Exponential Growth Model

Open the "Exponential growth model" tab and read the "Introduction" section.

3. The end of the "Introduction" describes how you could use a continuous-time, exponential growth model to simulate an *E. coli* population growing in a lab. Describe another specific population and situation that you could simulate with this type of model.

Other bacteria, populations in recovery from a disaster, or populations in ideal conditions for reproduction.

4. Complete the following table to explain the *biological* meanings of the symbols in the exponential growth model. For each explanation, give a specific example using the population you described above.

Symbol	Biological Meaning	Specific Example
N	The number in the population	how many bacteria are in the population
t	Time we are using as a measure	1 day
dN/dt	The change in population size over the change in reproduction time	In one day, there was an increase from x bacteria to y bacteria
r	Rate of reproduction	1.1 bacteria per minute.
N_0	Initial population	There were initially z bacteria

5. Both dN/dt and r are types of growth rates. What are the differences between them?

While the first represents population growth rates as a whole, r is based more in birth/death rates per

Student Activity Sheet Population Dynamics Answer

G Thomas



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1990 Census Education Project ,1989 **Census '80, Projects for Students** ,1981 **Activities for a Differentiated Classroom Level 6** Wendy Conklin,2011-02-01 Easily implement grade appropriate lessons suitable for Grade 6 classrooms Based on current research these easy to use lessons are based on a variety of strategies to differentiate your instruction Activities are included to allow access to all learners Includes interactive whiteboard compatible Resource CD with sample projects templates and assessment rubrics 160pp plus Teacher Resource CD **Thinking Skills** David Cookson,2004-06 This photocopiable resource provides Thinking Skills activities for each chapter of The New Wider World Second Edition Written by members of the Thinking Through Geography team the activities are designed to integrate easily into your GCSE Geography course to motivate students and improve their performance **Resources in Education** ,1999 **Resources for Teaching Middle School Science** Smithsonian Institution,National Academy of Engineering,National Science Resources Center of the National Academy of Sciences,Institute of Medicine,1998-04-30 With age appropriate inquiry centered curriculum materials and sound teaching practices middle school science can capture the interest and energy of adolescent students and expand their understanding of the world around them Resources for Teaching Middle School Science developed by the National Science Resources Center NSRC is a valuable tool for identifying and selecting effective science curriculum materials that will engage students in grades 6 through 8 The volume describes more than 400 curriculum titles that are aligned with the National Science Education Standards This completely new guide follows on the success of Resources for Teaching Elementary School Science the first in the NSRC series of annotated guides to hands on inquiry centered curriculum materials and other resources for science teachers The curriculum materials in the new guide are grouped in five chapters by scientific area Physical Science Life Science Environmental Science Earth and Space Science and Multidisciplinary and Applied Science They are also grouped by type core materials supplementary units and science activity books Each annotation of curriculum material includes a recommended grade level a description of the activities involved and of what students can be expected to learn a list of accompanying materials a reading level and ordering information The curriculum materials included in this book were selected by panels of teachers and scientists using evaluation criteria developed for the guide The criteria reflect and incorporate goals and principles of the National Science Education Standards The annotations designate the specific content standards on which these curriculum pieces focus In addition to the curriculum chapters the guide contains six chapters of diverse resources that are directly relevant to middle school science Among these is a chapter on educational software and multimedia programs chapters on books about science and teaching directories and guides to science trade books and periodicals for teachers and students Another section features institutional resources One chapter lists about 600 science centers museums and zoos where teachers can take middle school students for interactive science experiences Another chapter describes nearly 140 professional associations

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member of his her family school and community to activities focusing on making and sustaining friendships setting and achieving realistic goals and solving conflicts where everyone is a winner **ENC Focus** ,2000 **Scholastic/Census 2000, American Samoa, For The Principal, Teaching Materials for Grades K-12** ,2000 **21st Century Education: A Reference Handbook** Thomas L Good,2008-10-02 Via 100 entries or mini chapters the SAGE 21st Century Reference Series volumes on Education will highlight the most important topics issues questions and debates any student obtaining a degree in the field of education ought to have mastered for effectiveness in the 21st Century **Upper** Sandy Sturmer,1998

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