



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

Population Dynamics Answer Key

Rachel S Tattersall



Population Dynamics Answer Key:

The Top Books of the Year Population Dynamics Answer Key The year 2023 has witnessed a noteworthy surge in literary brilliance, with numerous compelling novels captivating the hearts of readers worldwide. Lets delve into the realm of top-selling books, exploring the fascinating narratives that have enthralled audiences this year. The Must-Read : Colleen Hoover's "It Ends with Us" This heartfelt tale of love, loss, and resilience has gripped readers with its raw and emotional exploration of domestic abuse. Hoover skillfully weaves a story of hope and healing, reminding us that even in the darkest of times, the human spirit can prevail. Uncover the Best : Taylor Jenkins Reids "The Seven Husbands of Evelyn Hugo" This spellbinding historical fiction novel unravels the life of Evelyn Hugo, a Hollywood icon who defies expectations and societal norms to pursue her dreams. Reids compelling storytelling and compelling characters transport readers to a bygone era, immersing them in a world of glamour, ambition, and self-discovery. Discover the Magic : Delia Owens "Where the Crawdads Sing" This evocative coming-of-age story follows Kya Clark, a young woman who grows up alone in the marshes of North Carolina. Owens crafts a tale of resilience, survival, and the transformative power of nature, entrancing readers with its evocative prose and mesmerizing setting. These popular novels represent just a fraction of the literary treasures that have emerged in 2023. Whether you seek tales of romance, adventure, or personal growth, the world of literature offers an abundance of compelling stories waiting to be discovered. The novel begins with Richard Papen, a bright but troubled young man, arriving at Hampden College. Richard is immediately drawn to the group of students who call themselves the Classics Club. The club is led by Henry Winter, a brilliant and charismatic young man. Henry is obsessed with Greek mythology and philosophy, and he quickly draws Richard into his world. The other members of the Classics Club are equally as fascinating. Bunny Corcoran is a wealthy and spoiled young man who is always looking for a good time. Charles Tavis is a quiet and reserved young man who is deeply in love with Henry. Camilla Macaulay is a beautiful and intelligent young woman who is drawn to the power and danger of the Classics Club. The students are all deeply in love with Morrow, and they are willing to do anything to please him. Morrow is a complex and mysterious figure, and he seems to be manipulating the students for his own purposes. As the students become more involved with Morrow, they begin to commit increasingly dangerous acts. The Secret History is a masterful and thrilling novel that will keep you speculating until the very end. The novel is a cautionary tale about the dangers of obsession and the power of evil.

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