Problem-Based Task: Rain Forest Discoveries

Coaching Sample Responses

a. How many members of the wiggly bug species are present after 6 months?

Because x represents the number of months, replace x with 6 to calculate the number of wiggly bugs after 6 months.

$w(t) = 2^t$

$w(6) = 2^{(6)} = 64$ wiggly bugs

b. How many members of the swimmer ant species are present after 6 months?

We can follow the same process for the function modeling swimmer ants as we did for the function modeling wiggly bugs.

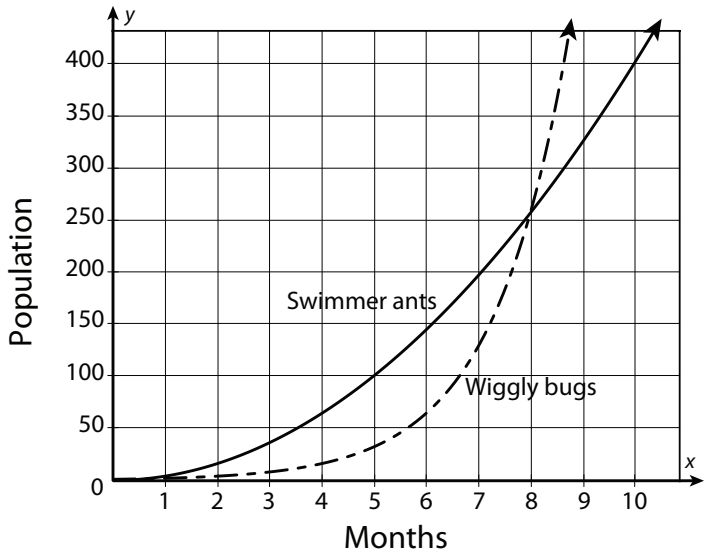
$s(t) = 4t^2$

$s(6) = 4(6)^2 = 144$ swimmer ants

c. Is there ever a time when the number of wiggly bugs is equal to the number of swimmer ants? If so, when does this happen?

To look for a time when the population of wiggly bugs and swimmer ants are equal, we can create a table and graph.

Months	Wiggly bugs	Swimmer ants
1	2	4
2	4	16
3	8	36
4	16	64
5	32	100
6	64	144
7	126	196
8	256	256
9	512	324
10	1,024	400



Based on both the table and the graph, the population of wiggly bugs and swimmer ants are equal at 8 months.

d. What happens after a very large number of months?

Because the model for wiggly bugs is exponential, its rate of change grows much faster than the rate of change of the swimmer ants. This means the population of wiggly bugs will greatly exceed that of swimmer ants after a very large number of months.

Recommended Closure Activity

Select one or more of the essential questions for a class discussion or as a journal entry prompt.