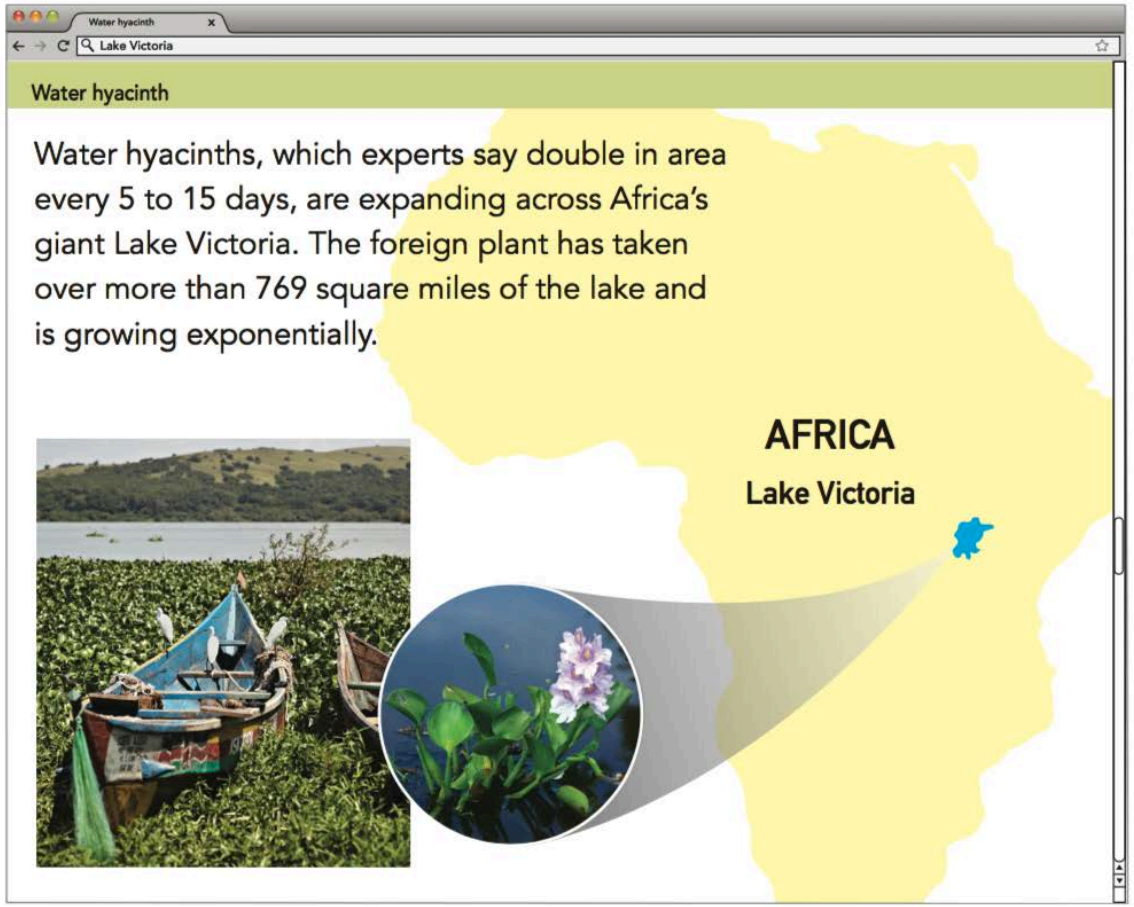
Grade 8 Student Work

Growing, Growing, Growing Problem 2.1

2.1 Killer Plant Strikes Lake Victoria

y-Intercepts Other Than 1

Exponential functions occur in many real-life situations. For example, consider this story:



Little progress has been made to reverse the effects of the water hyacinths. Plants like the water hyacinth that grow and spread rapidly can affect native plants and fish. This in turn can affect the livelihood of fishermen. It can also impede rescue operations in case of a water disaster. To understand how such plants grow, you will look at a similar situation.

Problem 2.1

Ghost Lake is a popular site for fishermen, campers, and boaters. In recent years, a certain water plant has been growing on the lake at an alarming rate. The surface area of Ghost Lake is 25,000,000 square feet. At present, the plant covers 1,000 square feet of the lake. The Department of Natural Resources estimates that the area covered by the water plant is doubling every month.

A 1. Write an equation that represents the growth pattern of the plant.

2. Explain what information the variables and numbers in your equation represent.

3. Compare this equation to the equations in Investigation 1.

B 1. Make a graph of the equation.

2. How does this graph compare to the graphs of the exponential functions in Investigation 1?

3. Recall that for each value of the independent variable, there is exactly one value for the dependent variable. Is the plant growth relationship a function? Justify your answer using a table, graph, or equation.

C 1. How much of the lake's surface will be covered at the end of a year by the plant?

2. How many months will it take for the plant to completely cover the surface of the lake?

Student A

Problem 2.1

A.1. $Y = 1000 \cdot 2^x$

2. Y is the area covered by plants
1000 is How much area is already covered
2 is the growth Factor
X is the number of months

3. Its pretty much the same. But now we have a Y-intercept And we didn't used to get one.

B.1. Okay ✓

2. They are the same. except the graphs in investigation 1 don't have a Y intercept. But in this one they do.

C.1. 2,048,000 square feet.

2. about 15.5 months.

Base is the Growth Factor.

multiply Y-intercept by the number of Xs

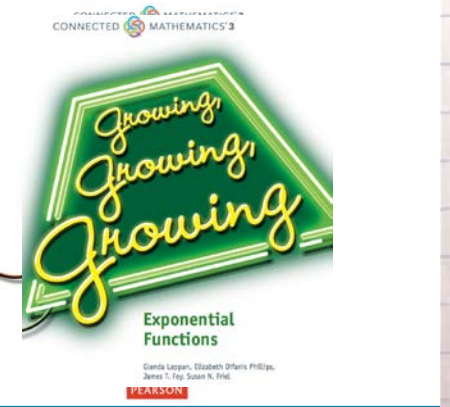
time	sq Feet
0	1000
1	2000
2	4000
3	8000
4	16,000
5	32,000

Y-intercept starting value

1 2 3 4 5

5 25

$1000 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$



2.1.

Ghost Lake

50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0

0 1 2 3 4 5

Months

Student B

Problem 2.1.

A1. 1,000 ft. per month. $y=1{,}000^x$
2. each month it doubles exponetial function.
3. both exponetional.

B2 Some less hockey shaped.

C1. 1×10^{36}
2. 15

Student C

Problem 2.1

x	y
0	1000
2	2000
3	4000
4	8000
5	16000

A1. $y = 1000(2^x)$ or $a = 1{,}000(2^n)$
2 is growth factor or base

A2. It starts out as 1,000 and multiplys by 2 y or a is area & N would be nomber of months

A3. In problem 1.3 its and expodential function and its the same. There is somthing infront of the exporiet varible. There is a growth factor.

2 is growth factor

B1. On graph

B2. The other expodential graphs made a curve going ~~down~~ up. This one dose the same thing

C1. 4096000 $1{,}000(2^{12})$

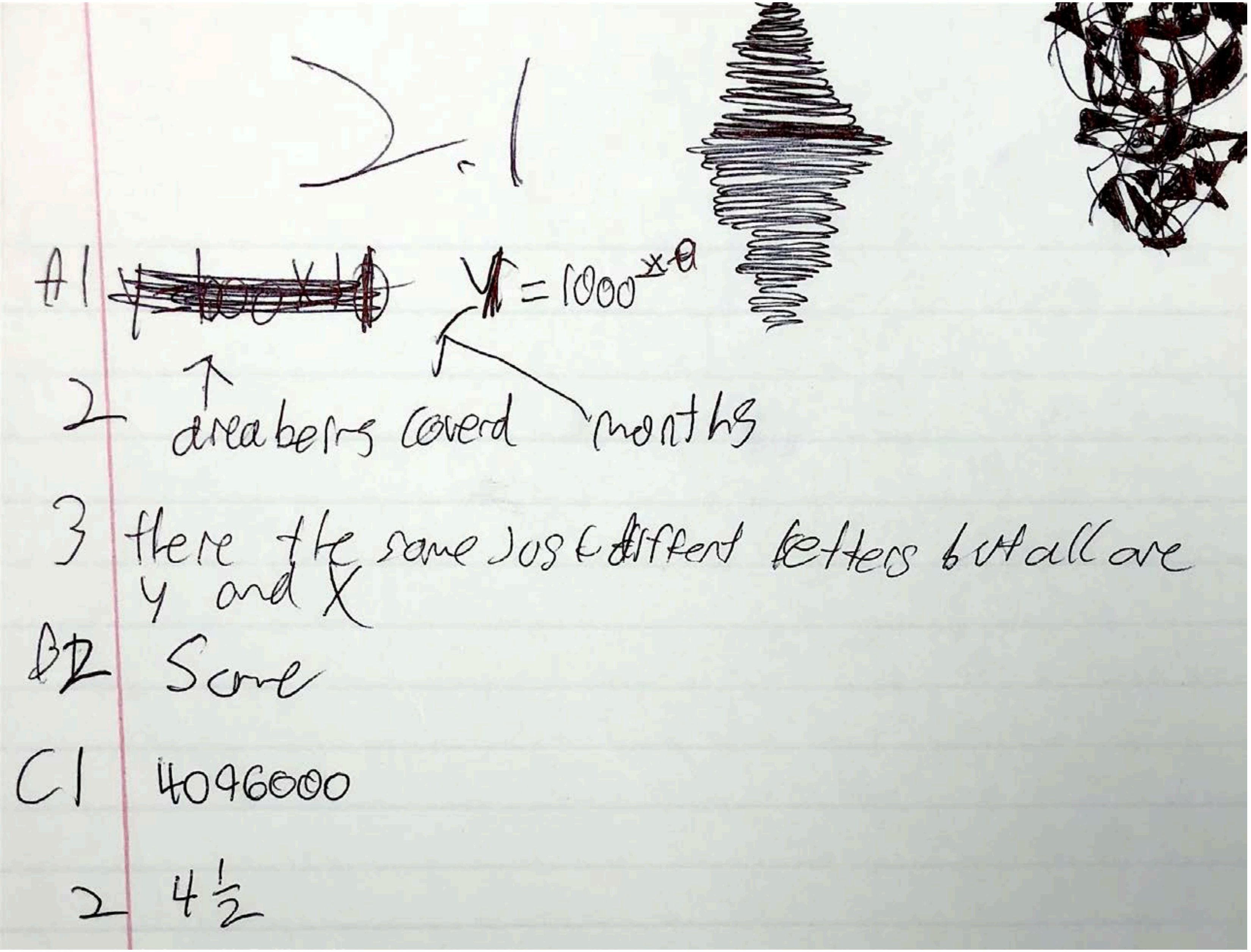
C2. Around 14 or 15 months

growth factor or base

$y = 1000(2^x)$

y-intercept

Student D


A1 Y = 1000 x2
2 areabers coverd
months
3 there the same just diffrent letters but all are
y and x
B2 Same
C1 4096000
2 4 1/2


CONNECTED MATHEMATICS 3
Growing, Growing, Growing
Exponential Functions
PEARSON

Student E

Problem 2.1

A. 1.

x	y
Month	square feet are covered by the plant
0	1000
1	2000 (×2)
2	4000 (×2)
3	8000 (×2)
4	16000 (×2)
5	32000 (×2)

1. $y=1000(2^n)$
   y-intercept, Growth factor / Base
2. Number of plant
3. This one has the y-intercept

C. 1. $1000(2^{12}) = 4096000$