SPINOFFS

Spinoffs are relatively short learning modules inspired by the LTAs. They can be easily implemented to support student learning in courses ranging from prealgebra through calculus. The Spinoffs typically give students an opportunity to use mathematics in a real world context.

LTA - SPINOFF 6A	Design of a Lunar Base Station Biomass Production Chamber
LTA - SPINOFF 6B	Developing a Biomass Production Chamber
LTA - SPINOFF 6C	Correlation and Regression Applied to Biomass in a Lunar Base Station
LTA - SPINOFF 6D	Analysis of Biomass Production in a Lunar Base Station

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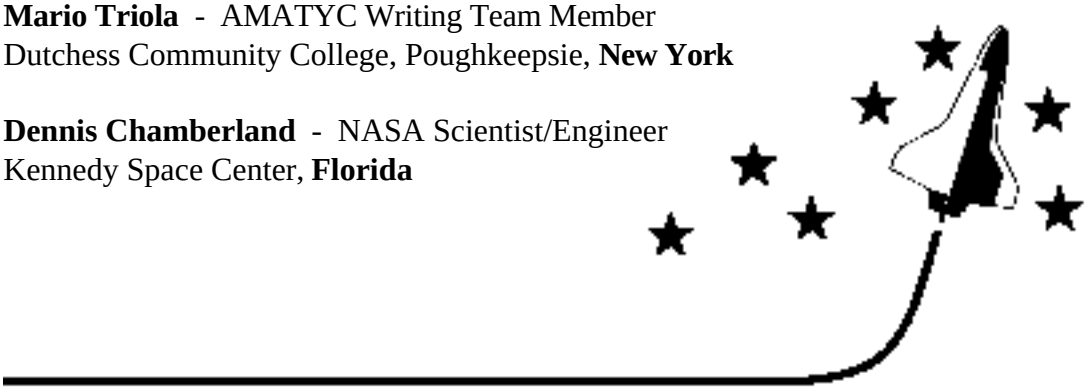

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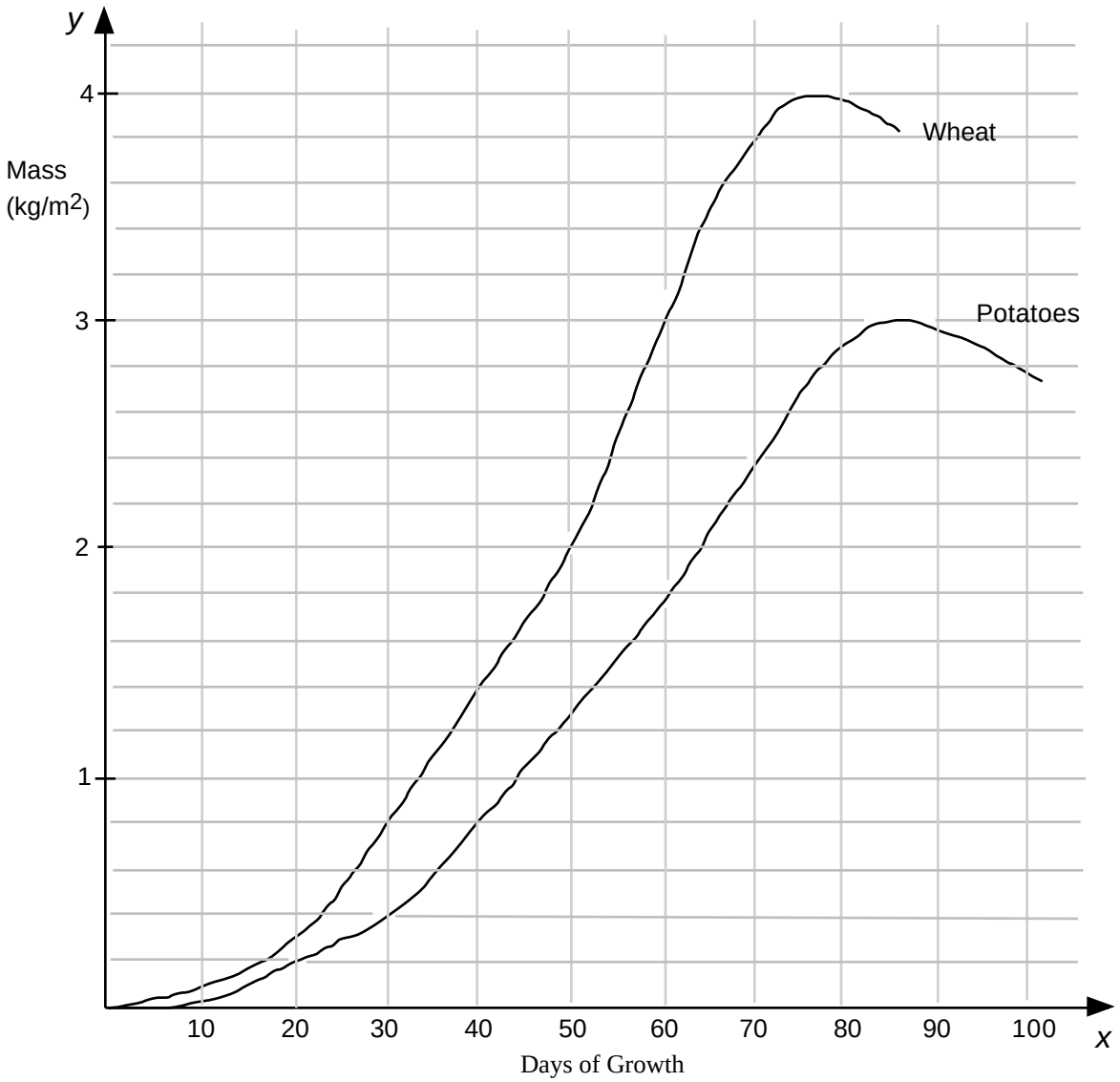
SPINOFF 6D

Analysis of Biomass Production in a Lunar Base Station

In the lunar base station, there is a Biomass Production Chamber in which several food items are grown, including wheat and potatoes. These food items are used to feed the lunar base station inhabitants. In addition to being a source of food, the wheat and potatoes also provide oxygen and water. For wheat, 40% of the mass is edible. For potatoes, 2/3 of the mass is edible. The inedible portions are recycled. The graphs shown below describe the biomass production levels of wheat and potatoes. Use these graphs to answer the following questions. Some of the answers will need to be approximated since precise answers may not be determined.



1) How much wheat is present at the end of 10 days? 15 days?

2) How long does it take to grow two kilograms of potatoes?

3) When does wheat reach its maximum mass?

4) When do the potatoes reach their maximum mass?

5) When does wheat grow at the fastest rate?

6) When do the potatoes grow at the fastest rate?

7) Which crop yields more edible food? Explain your choice.

8) Estimate the slopes of the wheat curve at days 10, 20, 30, 40, 50, 60, 70, and 80. What unit of measurement is used to describe these slopes?

9) Using the x-axis to represent days and using the y-axis to represent the slopes found in Exercise 8, draw a graph to describe the relationship between slope and time of the wheat curve.

10) What feature of the slope curve can be used to identify the maximum mass of the wheat?