Which savings plan wins over time?

Suggested MYP Years 4-5 | 45 minutes | Linear and exponential models

Name: _____ Class: _____ Date: _____

Inquiry question

Does a plan that grows by a fixed amount always beat one that grows by a fixed percentage?

Two fictional accounts start with 100 currency units at year 0. Account A adds a fixed bonus of 20 at each year end. Account B grows by 15% at each year end. There are no deposits, withdrawals, taxes or fees; keep full precision until reporting.

You need: Calculator; optional spreadsheet

1. Compare balances for whole years 0 through 8. Predict when one plan overtakes the other.

2. Write expressions for both balances after n years and identify the domain.

3. Find the first whole year when B exceeds A and check the years immediately before and after.

4. Explain why this fictional comparison is insufficient for choosing a real savings account.

Record your investigation

Use the space below and extra paper for diagrams, tables, calculations and your conclusion.

Exit response: What did you revise, and what evidence changed your mind?

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Teaching purpose

Students compare two kinds of growth and must report a result that matches a discrete time model.

Expected findings / checked solution

A(n) = 100 + 20n and B(n) = 100(1.15)^n for whole n >= 0. They are equal at n = 0. At n = 4, A = 180 and B = 174.900625. At n = 5, A = 200 and B = 201.13571875. B first exceeds A at year 5. Compare years 1-3 as well to establish that it is the first crossing in the discrete domain. Real choices also depend on rates, fees, risk and terms.

Neutral teacher prompt

What is the percentage applied to each year, and why does that change the size of the increase?

Support

Build the first three years by repeated addition and multiplication.

Extension

Change the fixed bonus and percentage, then investigate which assumptions control the crossing year.

Suggested lesson rhythm

Launch for 5 minutes; explore for 30 minutes; compare approaches for 7 minutes; finish with a 3-minute exit response.

Formative evidence

Look for chosen methods, defined variables, independent checks and explanations. These are teaching activities, not IB-issued assessments or automatic criterion scores. Use current school assessment guidance for summative work.

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