

3.2.2 Percentage Growth

Name: _____ Class: _____ Date: _____

KEY WORDS compound interest

<!-- Session 2 native-skill companion -->

Objective

Practise percentage growth within the labelled native lessons. Public original tasks; locally authored answer guidance.

1 Key knowledge and worked examples

■ Simple interest, compound growth and decay · Foundation

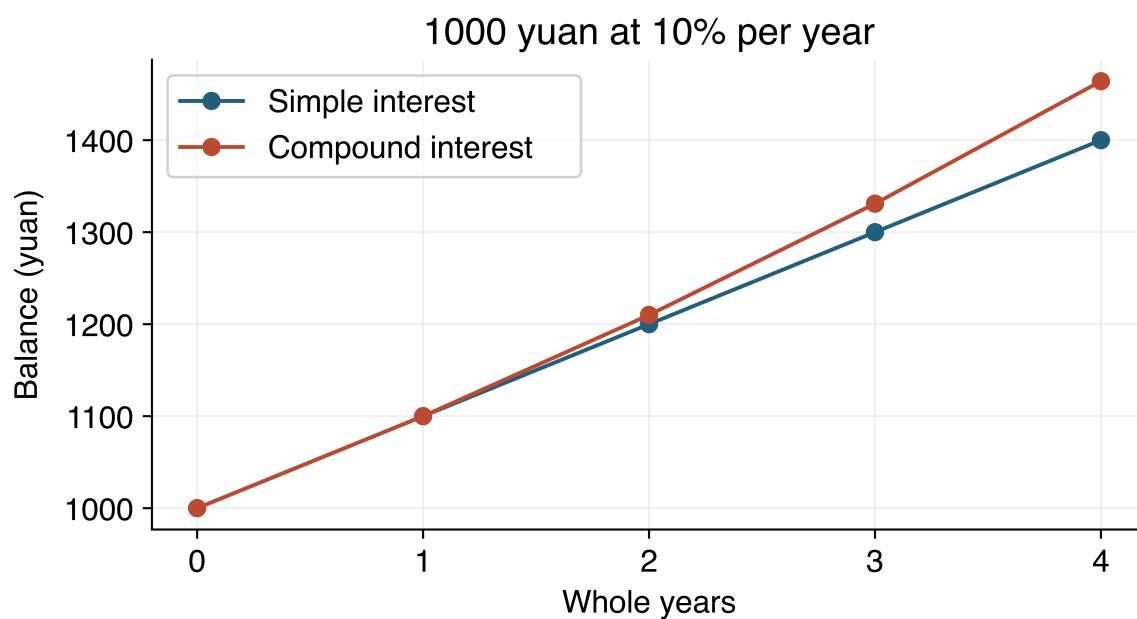
A percentage r corresponds to decimal $r/100$; increases use multiplier $1+r/100$ and decreases $1-r/100$. Simple interest on principal P for n periods at rate r is $Prn/100$, giving balance $P(1+rn/100)$. Compound balance is $P(1+r/100)^n$. Decay uses the corresponding decreasing multiplier. Use matching rate and period units, and divide by the multiplier to recover an original value.

$$B_n = P \left(1 + \frac{r}{100} \right)^n$$

At 10% per year, 1000 yuan earns simple interest 100 per year: after two years interest is 200 and balance is 1200. Compound balances are 1100 after year one and 1210 after year two. A machine worth 800 yuan losing 20% each year becomes 640 then 512, not 480: the second loss is 20% of 640. An 800-yuan sale price after a 20% reduction corresponds to original price $800/0.8=1000$. Growth from 50 to 65 is $(65-50)/50 \times 100 = 30\%$; 65 is 130% of 50. If a compound balance must first exceed 1300 at 10%, year two gives 1210 and year three 1331, so three whole years are needed.

Use the original value as the denominator for percentage change. Repeated 20% decreases do not subtract 40% of the initial amount. A rate per year cannot be treated as a rate per month without a specified conversion.

AQA R9/R16 includes percentage comparisons, original values, simple interest and repeated growth/decay. State whether the task asks for interest alone or total balance, and interpret whole-period threshold answers.



Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 (Foundation) Find a 1000-yuan balance after two years at 10% compound annual interest.

2.2 (Foundation) Find an 800-yuan value after two annual 20% reductions.

2.3 (Foundation) Find total simple interest on 1000 yuan at 10% for two years.

3 Exam-style questions

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: Simple and compound interest always give the same balance after two years.

Solutions

2.1 $1000 \times 1.1^2 = 1210$.

2.2 $800 \times 0.8^2 = 512$.

2.3 $1000 \times 0.10 \times 2 = 200$; interest is separate from balance.

3.1 False. At 10% annually on 1000, simple interest gives 1200 after two years; compound interest gives $1000 \times 1.1^2 = 1210$.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.