Interest Comparisons
ANSWERS

There are different formulae for calculating Simple and Compound interest:

Simple Interest

$A = P(1 + rt)$

Where:
- A = the final amount
- P = the original investment
- r = the % rate (in decimal form)
- t = the time period

Compound Interest

$A = P(1 + r)^n$

Where:
- A = the final amount
- P = the original investment
- r = the % rate (in decimal form)
- n = the number of times the interest is applied

Section A *Show which type of interest gives the largest final amount.*

1. £1000 is invested for 2 years.
Simple interest of 4%.
Compound interest of 4% per annum.

Simple interest

$A = 1000(1 + 0.04 \times 2)$
$A = £1080$

Compound interest

$A = 1000(1 + 0.04)^2$
$A = £1081.60$

2. £765 is invested for 3 years.
Simple interested of 2.5%.
Compound interest of 2.5% per annum.

Simple interest

$A = 765\ (1 + 0.025 \times 3)$
$A = £822.38$

Compound interest

$A = 765(1 + 0.025)^3$
$A = £823.82$

3. £2,400 is invested for 5 years.
Simple interest of 1.6%.
Compound interest of 0.9% per annum.

Simple interest

$A = 2400(1 + 0.016 \times 5)$
$A = £2592$

Compound interest

$A = 2400(1 + 0.009)^5$
$A = £2509.96$

4. £19,000 is invested for 7 years.
Simple interest of 2%.
Compound interest of 1.9% per annum.

Simple interest

$A = 19000(1 + 0.02 \times 7)$
$A = £21,660$

Compound interest

$A = 19000(1 + 0.019)^7$
$A = £21,675.68$

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Section B

1. Petra wants to invest £32,000 for 3 years in a bank.
She has two accounts to choose from:

Save 4 Life Compound Interest 2% per annum.	Future Planning Compound Interest 3% for the first year 1.5% for each following year

Which bank will give Petra the most interest at the end of the 3 years?
You must show how you get your answer.

Save 4 Life:

$A = 32000(1 + 0.02)^3$
$A = £33,958.66$
Interest $= 33958.66 - 32000$
$= £1958.66$

Future Planning:

$A = 32000(1 + 0.03)(1 + 0.015)^2$
$A = £33,956.22$
Interest $= 33956.22 - 32000$
$= £1956.22$

Save 4 Life will give Petra the most amount of interest after 3 years.

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2. Hamil and Seeta invest some money.
Seeta invests £1,100 in account A.
Hamil invests £1,400 in account B.

Account A Compound Interest 2.8% per annum.	Account B Compound Interest 2.3% per annum.

Calculate who will gain the most interest over a 4 year period.
You must show how you get your answer.

Seeta:

$A = 1100(1 + 0.028)^4$
$A = £1228.47$
Interest $= 1228.47 - 1100$
$= £128.47$

Hamil:

$A = 1400(1 + 0.023)^4$
$A = £1533.31$
Interest $= 1533.31 - 1400$
$= £133.31$

Hamil will have earnt the most interest after 4 years.

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3. Nuru is investing some money for 6 years and has two options:

Safe Investments 1.7% simple interest per year	Solid Investments 1.5% compound interest per annum

Which investment account should Nuru choose in order to have the most money after six years?
You must show how you get your answer.

Safe Investments:

$1.7 \times 6 = 10.2$
increase of 10.2%

Solid Investments:

$100\ (1 + 0.015)^6 = 109.34$
increase of 9.34%

Safe investments will give Nuru a higher % increase on their investment.