

WORKED EXAMPLES

Savings accounts: which is the best deal?

All bank names and interest rates are made up.

Two ways of paying interest

Simple interest

Interest is worked out on the amount you first paid in, every year.

£200 at 10% simple interest:

Compound interest

Interest is worked out on the amount in the account, so we earn interest on our interest.

£200 at 10% compound interest:

Two ways of paying interest

Simple interest

Interest is worked out on the amount you first paid in, every year.

£200 at 10% simple interest:

Year 1	£20	£220
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Compound interest

Interest is worked out on the amount in the account, so we earn interest on our interest.

£200 at 10% compound interest:

Year 1	£20.00	£220.00
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Two ways of paying interest

Simple interest

Interest is worked out on the amount you first paid in, every year.

£200 at 10% simple interest:

Year 1	£20	£220
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Year 2	£20	£240
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Compound interest

Interest is worked out on the amount in the account, so we earn interest on our interest.

£200 at 10% compound interest:

Year 1	£20.00	£220.00
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Year 2	£22.00	£242.00
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Two ways of paying interest

Simple interest

Interest is worked out on the amount you first paid in, every year.

£200 at 10% simple interest:

Year 1	£20	£220
Year 2	£20	£240
Year 3	£20	£260

Compound interest

Interest is worked out on the amount in the account, so we earn interest on our interest.

£200 at 10% compound interest:

Year 1	£20.00	£220.00
Year 2	£22.00	£242.00
Year 3	£24.20	£266.20

Two ways of paying interest

Simple interest

Interest is worked out on the amount you first paid in, every year.

£200 at 10% simple interest:

Year 1	£20	£220
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Year 2	£20	£240
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Year 3	£20	£260
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The interest is £20 every year.

Compound interest

Interest is worked out on the amount in the account, so we earn interest on our interest.

£200 at 10% compound interest:

Year 1	£20.00	£220.00
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Year 2	£22.00	£242.00
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Year 3	£24.20	£266.20
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The interest grows each year.

The two formulas. P is the amount paid in, r is the interest rate written as a decimal and n is the number of years.

simple interest: total = $P(1 + rn)$

compound interest: total = $P(1 + r)^n$

Coventree Standard Saver: 5% simple interest

Fay puts in £250 and leaves it for 3 years.

5% of £250 is £12.50, and the account pays that *every* year.

	interest	total
Start		£250.00



Coventree Standard Saver: 5% simple interest

Fay puts in £250 and leaves it for 3 years.

5% of £250 is £12.50, and the account pays that *every* year.

	interest	total
Start		£250.00
Year 1	£12.50	£262.50



Coventree Standard Saver: 5% simple interest

Fay puts in £250 and leaves it for 3 years.

5% of £250 is £12.50, and the account pays that *every* year.

	interest	total
Start		£250.00
Year 1	£12.50	£262.50
Year 2	£12.50	£275.00



Coventree Standard Saver: 5% simple interest

Fay puts in £250 and leaves it for 3 years.

5% of £250 is £12.50, and the account pays that *every* year.

	interest	total
Start		£250.00
Year 1	£12.50	£262.50
Year 2	£12.50	£275.00
Year 3	£12.50	£287.50



Coventree Standard Saver: 5% simple interest

Fay puts in £250 and leaves it for 3 years.

5% of £250 is £12.50, and the account pays that *every* year.

	interest	total
Start		£250.00
Year 1	£12.50	£262.50
Year 2	£12.50	£275.00
Year 3	£12.50	£287.50

Using the formula

$$\text{interest} = P \times r \times n$$

$$= £250 \times 0.05 \times 3 = £37.50$$

$$\text{total} = £250 + £37.50 = £287.50$$



Simple interest gives a **straight line**.

Amara puts in £120 and leaves it for 4 years.

How much interest each year?

How much interest altogether?

Total at the end?

Amara puts in £120 and leaves it for 4 years.

How much interest each year? **£12**

How much interest altogether? **£48**

Total at the end? **£168**

	interest	total
Start		£120

Amara puts in £120 and leaves it for 4 years.

How much interest each year? **£12**

How much interest altogether? **£48**

Total at the end? **£168**

	interest	total
Start		£120
Year 1	£12	£132

Amara puts in £120 and leaves it for 4 years.

How much interest each year? **£12**

How much interest altogether? **£48**

Total at the end? **£168**

	interest	total
Start		£120
Year 1	£12	£132
Year 2	£12	£144

Amara puts in £120 and leaves it for 4 years.

How much interest each year? **£12**

How much interest altogether? **£48**

Total at the end? **£168**

	interest	total
Start		£120
Year 1	£12	£132
Year 2	£12	£144
Year 3	£12	£156

Amara puts in £120 and leaves it for 4 years.

How much interest each year? **£12**

How much interest altogether? **£48**

Total at the end? **£168**

	interest	total
Start		£120
Year 1	£12	£132
Year 2	£12	£144
Year 3	£12	£156
Year 4	£12	£168

Amara puts in £120 and leaves it for 4 years.

How much interest each year? **£12**

How much interest altogether? **£48**

Total at the end? **£168**

Using the formula

$$\text{interest} = P \times r \times n$$

$$= £120 \times 0.10 \times 4 = £48$$

$$\text{total} = £120 + £48 = £168$$

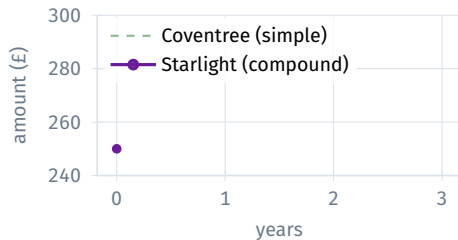
	interest	total
Start		£120
Year 1	£12	£132
Year 2	£12	£144
Year 3	£12	£156
Year 4	£12	£168

Starlight Bank Steady Saver: 5% compound interest

Fay puts in £250 and leaves it for 3 years.

We multiply by 1.05 each year.

	interest	total
Start		£250.00

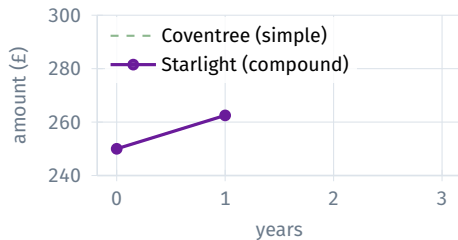


Starlight Bank Steady Saver: 5% compound interest

Fay puts in £250 and leaves it for 3 years.

We multiply by 1.05 each year.

	interest	total
Start		£250.00
Year 1	£12.50	£262.50

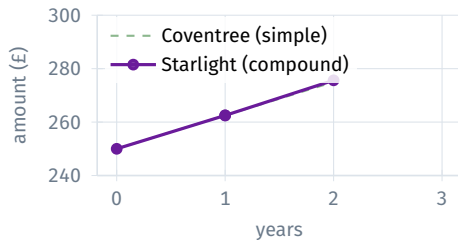


Starlight Bank Steady Saver: 5% compound interest

Fay puts in £250 and leaves it for 3 years.

We multiply by 1.05 each year.

	interest	total
Start		£250.00
Year 1	£12.50	£262.50
Year 2	£13.13	£275.63

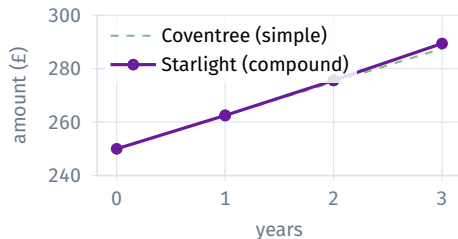


Starlight Bank Steady Saver: 5% compound interest

Fay puts in £250 and leaves it for 3 years.

We multiply by 1.05 each year.

	interest	total
Start		£250.00
Year 1	£12.50	£262.50
Year 2	£13.13	£275.63
Year 3	£13.78	£289.41



Starlight Bank Steady Saver: 5% compound interest

Fay puts in £250 and leaves it for 3 years.

We multiply by 1.05 each year.

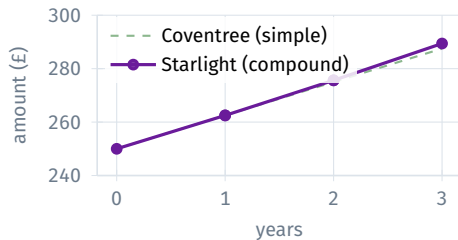
	interest	total
Start		£250.00
Year 1	£12.50	£262.50
Year 2	£13.13	£275.63
Year 3	£13.78	£289.41

Using the formula

$$\text{total} = P(1 + r)^n$$

$$= £250 \times 1.05^3 = £289.41$$

$$\text{interest} = £289.41 - £250 = £39.41$$



Same rate, same start — but the line **bends upwards**.

Ben puts in £200 and leaves it for 2 years.

What do we multiply by each year?

How much after 1 year?

How much after 2 years?

Ben puts in £200 and leaves it for 2 years.

What do we multiply by each year? **1.04**

How much after 1 year? **£208**

How much after 2 years? **£216.32**

	interest	total
Start		£200.00

Ben puts in £200 and leaves it for 2 years.

What do we multiply by each year? **1.04**

How much after 1 year? **£208**

How much after 2 years? **£216.32**

	interest	total
Start		£200.00
Year 1	£8.00	£208.00

Ben puts in £200 and leaves it for 2 years.

What do we multiply by each year? **1.04**

How much after 1 year? **£208**

How much after 2 years? **£216.32**

	interest	total
Start		£200.00
Year 1	£8.00	£208.00
Year 2	£8.32	£216.32

Ben puts in £200 and leaves it for 2 years.

What do we multiply by each year? **1.04**

How much after 1 year? **£208**

How much after 2 years? **£216.32**

	interest	total
Start		£200.00
Year 1	£8.00	£208.00
Year 2	£8.32	£216.32

Using the formula

$$\text{total} = P(1 + r)^n$$

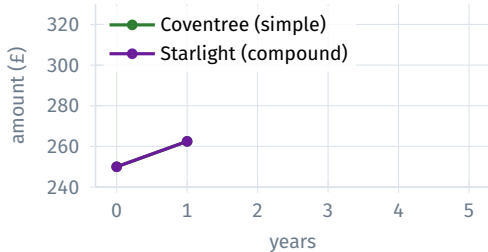
$$= £200 \times 1.04^2 = £216.32$$

The second year's interest is £8.32 rather than £8 because it is 4% of £208, not 4% of £200.

Five years: the gap opens up

£250 in each account, both paying 5%.

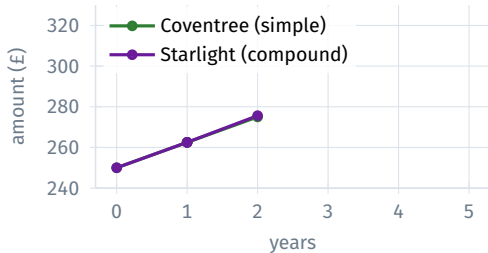
	Coventree simple	Starlight compound
Year 1	£262.50	£262.50



Five years: the gap opens up

£250 in each account, both paying 5%.

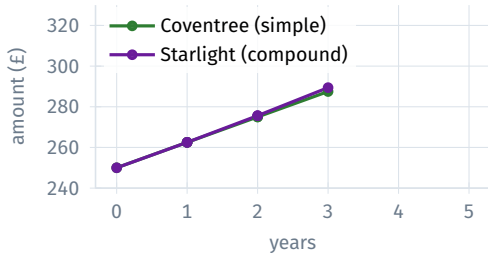
	Coventree simple	Starlight compound
Year 1	£262.50	£262.50
Year 2	£275.00	£275.63



Five years: the gap opens up

£250 in each account, both paying 5%.

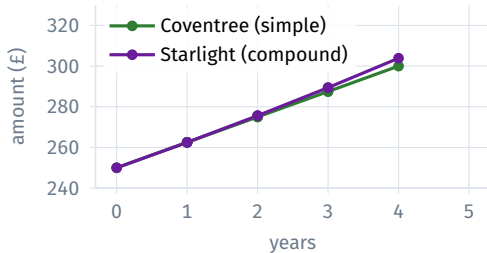
	Coventree simple	Starlight compound
Year 1	£262.50	£262.50
Year 2	£275.00	£275.63
Year 3	£287.50	£289.41



Five years: the gap opens up

£250 in each account, both paying 5%.

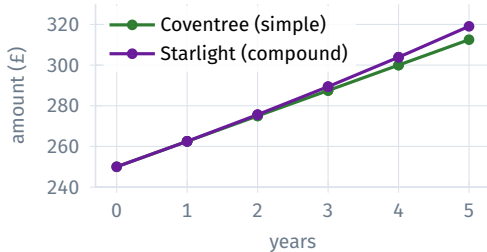
	Coventree simple	Starlight compound
Year 1	£262.50	£262.50
Year 2	£275.00	£275.63
Year 3	£287.50	£289.41
Year 4	£300.00	£303.88



Five years: the gap opens up

£250 in each account, both paying 5%.

	Coventree simple	Starlight compound
Year 1	£262.50	£262.50
Year 2	£275.00	£275.63
Year 3	£287.50	£289.41
Year 4	£300.00	£303.88
Year 5	£312.50	£319.07



Five years: the gap opens up

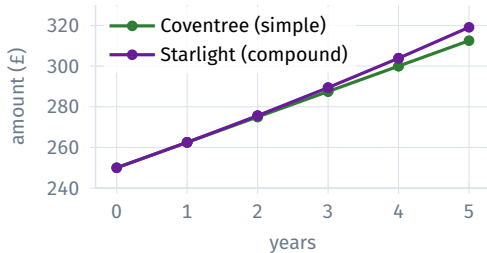
£250 in each account, both paying 5%.

	Coventree simple	Starlight compound
Year 1	£262.50	£262.50
Year 2	£275.00	£275.63
Year 3	£287.50	£289.41
Year 4	£300.00	£303.88
Year 5	£312.50	£319.07

After 5 years

simple: $£250(1 + 0.05 \times 5) = £312.50$

compound: $£250 \times 1.05^5 = £319.07$

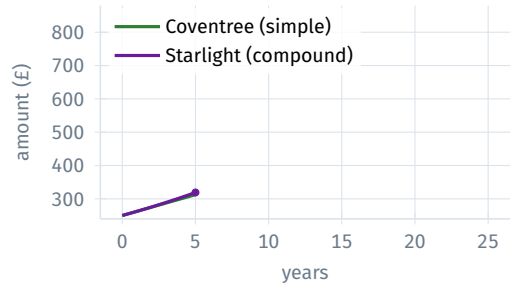


The gap gets wider every year.

Twenty-five years of the same 5%

£250 in each account, still at 5%.

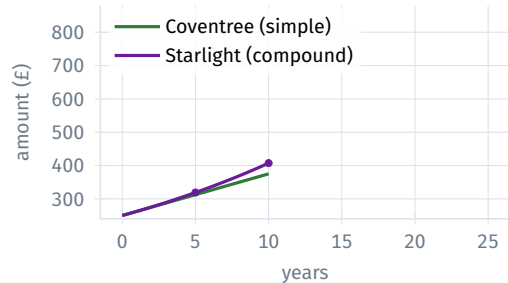
	Coventree simple	Starlight compound
Year 5	£312.50	£319.07



Twenty-five years of the same 5%

£250 in each account, still at 5%.

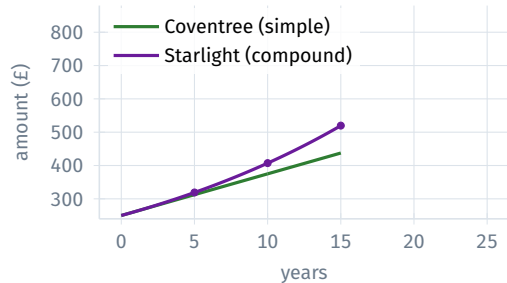
	Coventree simple	Starlight compound
Year 5	£312.50	£319.07
Year 10	£375.00	£407.22



Twenty-five years of the same 5%

£250 in each account, still at 5%.

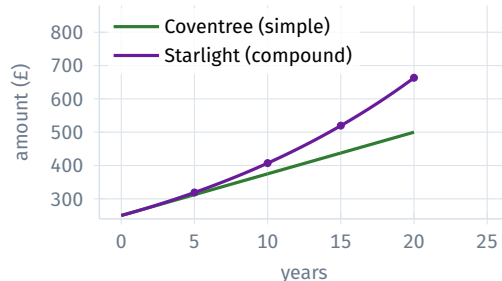
	Coventree simple	Starlight compound
Year 5	£312.50	£319.07
Year 10	£375.00	£407.22
Year 15	£437.50	£519.73



Twenty-five years of the same 5%

£250 in each account, still at 5%.

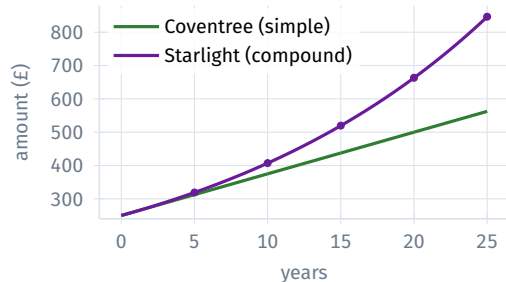
	Coventree simple	Starlight compound
Year 5	£312.50	£319.07
Year 10	£375.00	£407.22
Year 15	£437.50	£519.73
Year 20	£500.00	£663.32



Twenty-five years of the same 5%

£250 in each account, still at 5%.

	Coventree simple	Starlight compound
Year 5	£312.50	£319.07
Year 10	£375.00	£407.22
Year 15	£437.50	£519.73
Year 20	£500.00	£663.32
Year 25	£562.50	£846.59



Twenty-five years of the same 5%

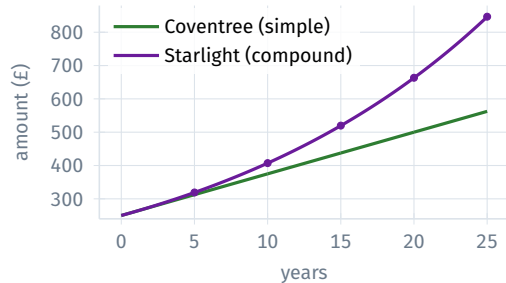
£250 in each account, still at 5%.

	Coventree simple	Starlight compound
Year 5	£312.50	£319.07
Year 10	£375.00	£407.22
Year 15	£437.50	£519.73
Year 20	£500.00	£663.32
Year 25	£562.50	£846.59

After 25 years

simple: $£250(1 + 0.05 \times 25) = £562.50$

compound: $£250 \times 1.05^{25} = £846.59$

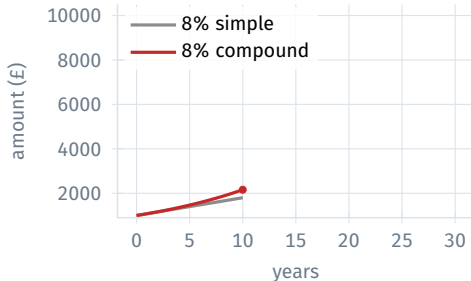


The simple interest line keeps the same gradient, while the compound curve gets steeper every year. After 25 years the difference is £284.09.

Virgo Money 8% compound over thirty years

Dev pays in £1000 and leaves it alone.
The second column is the same £1000 at
8% *simple* interest.

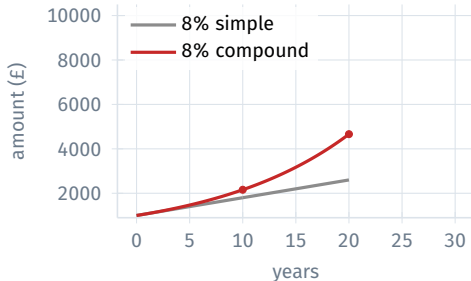
	simple	compound
Year 10	£1800	£2158.92



Virgo Money 8% compound over thirty years

Dev pays in £1000 and leaves it alone.
The second column is the same £1000 at
8% *simple* interest.

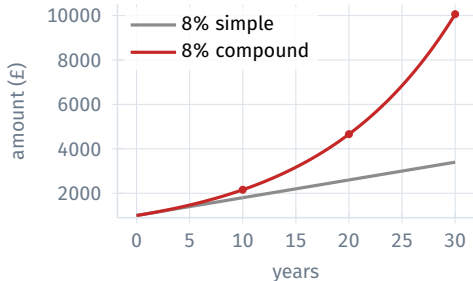
	simple	compound
Year 10	£1800	£2158.92
Year 20	£2600	£4660.96



Virgo Money 8% compound over thirty years

Dev pays in £1000 and leaves it alone.
The second column is the same £1000 at
8% *simple* interest.

	simple	compound
Year 10	£1800	£2158.92
Year 20	£2600	£4660.96
Year 30	£3400	£10062.66



Virgo Money 8% compound over thirty years

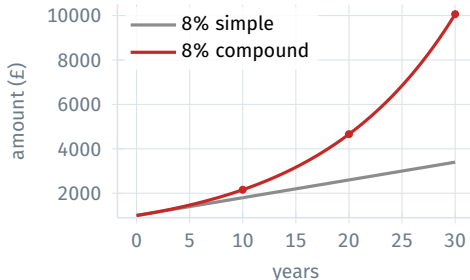
Dev pays in £1000 and leaves it alone.
The second column is the same £1000 at 8% *simple* interest.

	simple	compound
Year 10	£1800	£2158.92
Year 20	£2600	£4660.96
Year 30	£3400	£10062.66

After 30 years

simple: $£1000(1 + 0.08 \times 30) = £3400$

compound: $£1000 \times 1.08^{30} = £10062.66$



The compound total doubles roughly every 9 years: about £2000 at 9 years, £4000 at 18 years and £8000 at 27 years.

Starlight Bank also offers 6% compound interest per year.

Priya pays in £500 and leaves it there.

What do we multiply by each year?

How much after 10 years?

After how many whole years is there more than £1000?

Starlight Bank 6% compound interest per year. **Priya pays in £500.**

What do we multiply by each year? **1.06**

How much after 10 years? **£895.42**

After how many whole years is there more than £1000? **12 years**

	total
Year 10	£895.42

Starlight Bank 6% compound interest per year. **Priya pays in £500.**

What do we multiply by each year? **1.06**

How much after 10 years? **£895.42**

After how many whole years is there more than £1000? **12 years**

	total
Year 10	£895.42
Year 11	£949.15

Starlight Bank 6% compound interest per year. **Priya pays in £500.**

What do we multiply by each year? **1.06**

How much after 10 years? **£895.42**

After how many whole years is there more than £1000? **12 years**

	total
Year 10	£895.42
Year 11	£949.15
Year 12	£1006.10

Starlight Bank 6% compound interest per year. **Priya pays in £500.**

What do we multiply by each year? **1.06**

How much after 10 years? **£895.42**

After how many whole years is there more than £1000? **12 years**

At 6% *simple* interest the same £500 does not pass £1000 until year 17, because
 $£500(1 + 0.06 \times 17) = £1010$.

	total
Year 10	£895.42
Year 11	£949.15
Year 12	£1006.10

$$£500 \times 1.06^{12} = £1006.10$$

Compound interest doubles the money in 12 years, simple interest in 17.

Tesbury Bank 6% simple — but locked in for 2 years

Chloe puts in £400 and leaves it for 4 years.

6% of £400 is £24 every year.

	interest	total
Start		£400

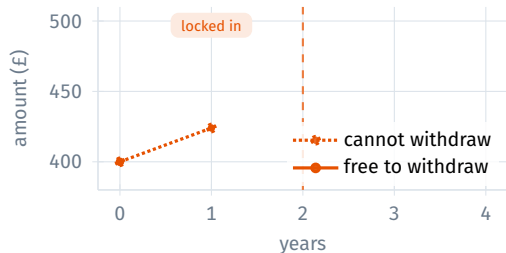


Tesbury Bank 6% simple — but locked in for 2 years

Chloe puts in £400 and leaves it for 4 years.

6% of £400 is £24 every year.

	interest	total
Start		£400
Year 1	£24	£424

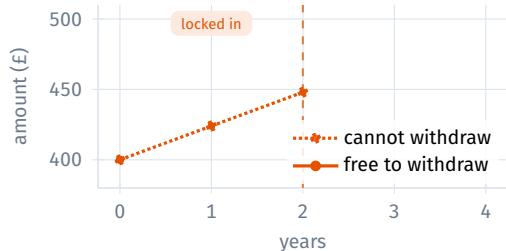


Tesbury Bank 6% simple — but locked in for 2 years

Chloe puts in £400 and leaves it for 4 years.

6% of £400 is £24 every year.

	interest	total
Start		£400
Year 1	£24	£424
Year 2	£24	£448

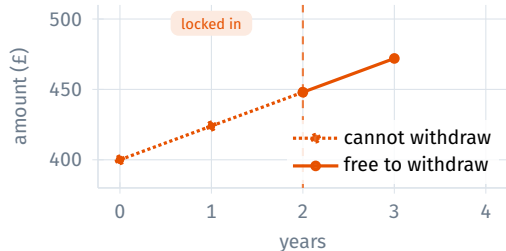


Tesbury Bank 6% simple — but locked in for 2 years

Chloe puts in £400 and leaves it for 4 years.

6% of £400 is £24 every year.

	interest	total
Start		£400
Year 1	£24	£424
Year 2	£24	£448
Year 3	£24	£472

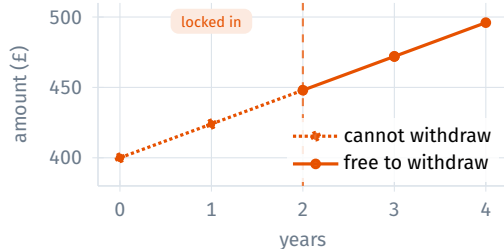


Tesbury Bank 6% simple — but locked in for 2 years

Chloe puts in £400 and leaves it for 4 years.

6% of £400 is £24 every year.

	interest	total
Start		£400
Year 1	£24	£424
Year 2	£24	£448
Year 3	£24	£472
Year 4	£24	£496



Tesbury Bank 6% simple — but locked in for 2 years

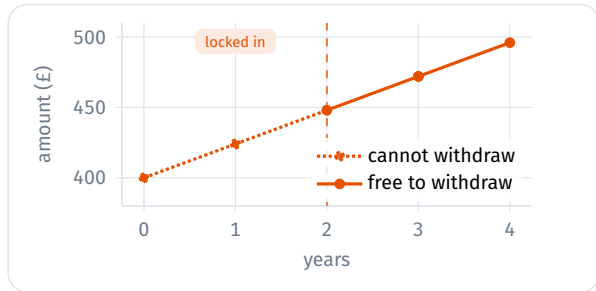
Chloe puts in £400 and leaves it for 4 years.

6% of £400 is £24 every year.

	interest	total
Start		£400
Year 1	£24	£424
Year 2	£24	£448
Year 3	£24	£472
Year 4	£24	£496

Using the formula

$$\begin{aligned}\text{total} &= P(1 + rn) \\ &= £400(1 + 0.06 \times 4) = £496\end{aligned}$$



The **dotted** part is while the money is locked in.

Erin has £600 to save for 2 years.

Virgo Money 8% **compound** per year

Tesbury Bank 6% **simple** per year

Which gives her more, and what is the difference?

Erin has £600 to save for 2 years.

Virgo Money 8% **compound** per year

Tesbury Bank 6% **simple** per year

	Virgo	Tesbury
Start	£600.00	£600

Erin has £600 to save for 2 years.

Virgo Money 8% **compound** per year

Tesbury Bank 6% **simple** per year

	Virgo	Tesbury
Start	£600.00	£600
Year 1	£648.00	£636

Erin has £600 to save for 2 years.

Virgo Money 8% **compound** per year

Tesbury Bank 6% **simple** per year

Virgo pays her £27.84 more.

	Virgo	Tesbury
Start	£600.00	£600
Year 1	£648.00	£636
Year 2	£699.84	£672

Erin has £600 to save for 2 years.

Virgo Money 8% **compound** per year

Tesbury Bank 6% **simple** per year

Virgo pays her £27.84 more.

Using the formulas

Virgo: $£600 \times 1.08^2 = £699.84$

Tesbury: $£600(1 + 0.06 \times 2) = £672$

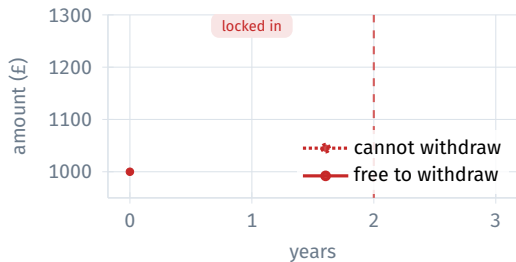
	Virgo	Tesbury
Start	£600.00	£600
Year 1	£648.00	£636
Year 2	£699.84	£672

Santandra 8% compound — locked in for 2 years

Dev puts in £1000 and leaves it for 3 years.

The multiplier is 1.08, once for each year.

	interest	total
Start		£1000.00

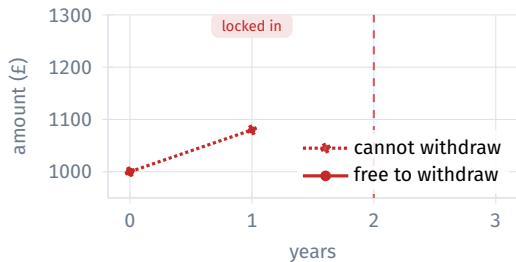


Santandra 8% compound — locked in for 2 years

Dev puts in £1000 and leaves it for 3 years.

The multiplier is 1.08, once for each year.

	interest	total
Start		£1000.00
Year 1	£80.00	£1080.00

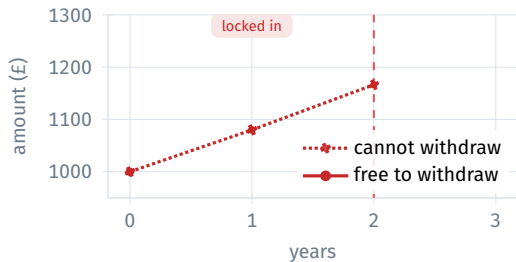


Santandra 8% compound — locked in for 2 years

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The multiplier is 1.08, once for each year.

	interest	total
Start		£1000.00
Year 1	£80.00	£1080.00
Year 2	£86.40	£1166.40

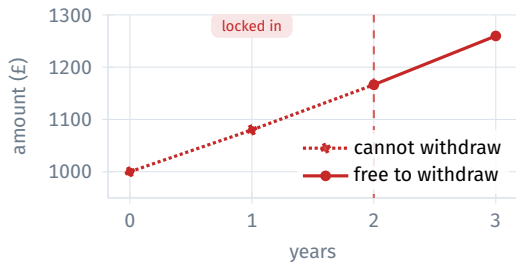


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	interest	total
Start		£1000.00
Year 1	£80.00	£1080.00
Year 2	£86.40	£1166.40
Year 3	£93.31	£1259.71



Santandra 8% compound — locked in for 2 years

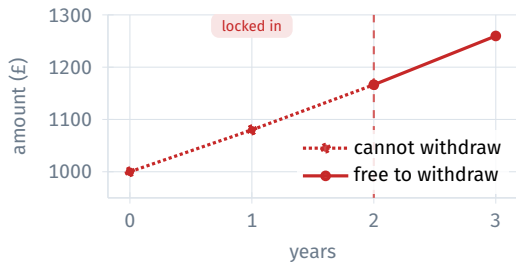
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	interest	total
Start		£1000.00
Year 1	£80.00	£1080.00
Year 2	£86.40	£1166.40
Year 3	£93.31	£1259.71

Using the formula

$$\begin{aligned}\text{total} &= P(1 + r)^n \\ &= £1000 \times 1.08^3 = £1259.71\end{aligned}$$



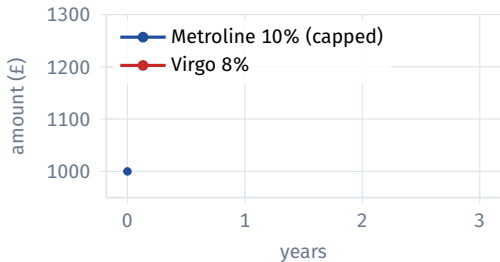
Dev's money is locked in for the first 2 years, so this account is no use to him if he needs the cash sooner.

Read the small print

Metroline Bank pays 10%, the highest rate on the sheet, but takes £300 maximum. **Dev has £1000 to save for 3 years.**

Only £300 is allowed in the account.

after 3 years	in account	total
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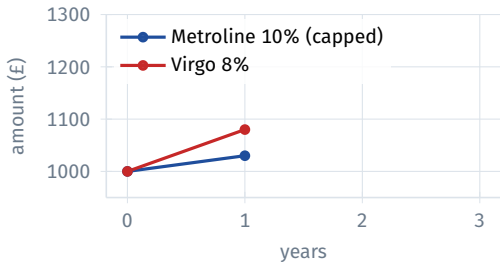


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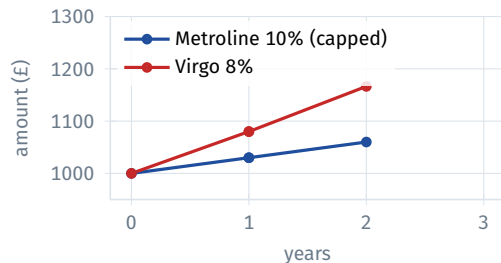


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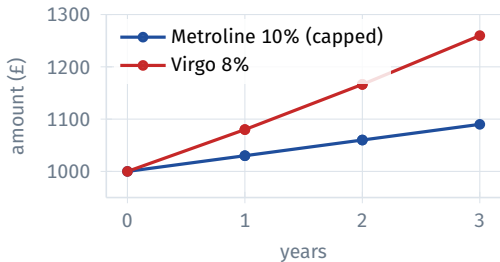


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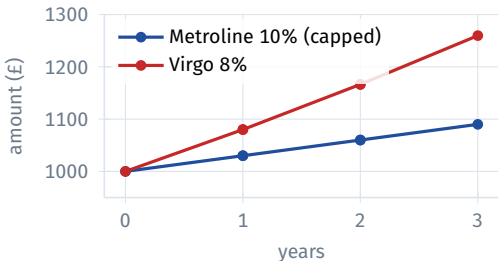
Only £300 is allowed in the account.

after 3 years	in account	total
Metroline	£390.00	£1090.00
Virgo (8%)	£1259.71	£1259.71

Using the formulas

Metroline: $£300(1 + 0.10 \times 3) = £390$,
and the £700 left at home makes
£1090

Virgo: $£1000 \times 1.08^3 = £1259.71$



The biggest percentage is not always the best deal.

Halifield Half-Year Saver: 2% compound interest every six months.

Aisha puts in £500 for one year.

How much after 6 months?

How much after 12 months?

Is 2% twice a year the same as 4% once a year?

Halifield Half-Year Saver: 2% compound interest every six months. **Aisha puts in £500 for one year.**

How much after 6 months? **£510**

How much after 12 months? **£520.20**

Is 2% twice a year the same as 4% once a year?

	interest	total
Start		£500.00

Halifield Half-Year Saver: 2% compound interest every six months. **Aisha puts in £500 for one year.**

How much after 6 months? **£510**

How much after 12 months? **£520.20**

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	interest	total
Start		£500.00
6 months	£10.00	£510.00

Halifield Half-Year Saver: 2% compound interest every six months. **Aisha puts in £500 for one year.**

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No — £520.20 against £520.

	interest	total
Start		£500.00
6 months	£10.00	£510.00
12 months	£10.20	£520.20

Halifield Half-Year Saver: 2% compound interest every six months. **Aisha puts in £500 for one year.**

How much after 6 months? **£510**

How much after 12 months? **£520.20**

Is 2% twice a year the same as 4% once a year?

No — £520.20 against £520.

Using the formula

Here $n = 2$, because the interest is added twice:

$$\text{total} = £500 \times 1.02^2 = £520.20$$

	interest	total
Start		£500.00
6 months	£10.00	£510.00
12 months	£10.20	£520.20

$1.02 \times 1.02 = 1.0404$, so it works out as 4.04% for the year.

Nationworth Loyalty Saver: 6% simple interest, £2 fee every month.

Sofia puts in £250 for 2 years.

How much interest in 2 years?

How much do the fees cost?

What is she left with?

Nationworth Loyalty Saver: 6% simple interest, £2 fee every month. **Sofia puts in £250 for 2 years.**

How much interest in 2 years? **£30**

How much do the fees cost? **£48**

What is she left with? **£232**

Paid in	£250

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How much interest in 2 years? **£30**

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Paid in	£250
Interest (2 years)	+ £30

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Fees (24×2)	— £48

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Interest (2 years)	+ £30
Fees (24×2)	— £48
Total	£232

She ends up with less than she started with.

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How much interest in 2 years? **£30**

How much do the fees cost? **£48**

What is she left with? **£232**

Using the formula

$$\text{interest} = P \times r \times n$$

$$= £250 \times 0.06 \times 2 = £30$$

How much would she need to pay in before this account stops losing her money?

Paid in	£250
Interest (2 years)	+ £30
Fees (24 × 2)	— £48
Total	£232

She ends up with less than she started with.

Choosing an account

- **Simple** interest is the same amount every year. **Compound** interest grows.

The two formulas

simple: $\text{total} = P(1 + rn)$

compound: $\text{total} = P(1 + r)^n$

P is the amount paid in, r is the interest rate written as a decimal and n is the number of years.

Choosing an account

- **Simple** interest is the same amount every year. **Compound** interest grows.
- At the same rate, compound interest always pays at least as much, and the gap grows the longer the money is left.

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- A **locked** account is no use if you need the money sooner.

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- A big percentage is no use if there is a **maximum** you can pay in.
- A **locked** account is no use if you need the money sooner.
- A **fee** can swallow the interest completely.

The two formulas

simple: $\text{total} = P(1 + rn)$

compound: $\text{total} = P(1 + r)^n$

P is the amount paid in, r is the interest rate written as a decimal and n is the number of years.

**Work out the total,
then check the small print.**