

Rounding and estimation

Introduction

We round numbers when we don't need to be accurate. It makes large numbers easier to read, and it makes calculations easier without a calculator. If you do use a calculator, it's a good idea to use estimation to check the size of the answer.



This activity looks at rounding and estimation. You will learn:

- how to round numbers to different degrees of accuracy
- how to estimate answers using approximate calculations.



Rounding and estimation

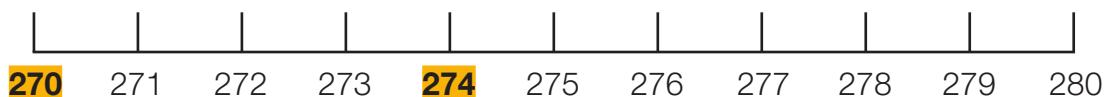
Rounding to the nearest 10 or 100

If you are deciding if you can afford to buy a camera, you might say it costs £180 when the actual price is £179. You have rounded the price to the nearest £10. Or you might say it costs £200. You have rounded the price to the nearest £100.

To round to the nearest 10, look at the **units** digit to decide which **ten** is nearest.

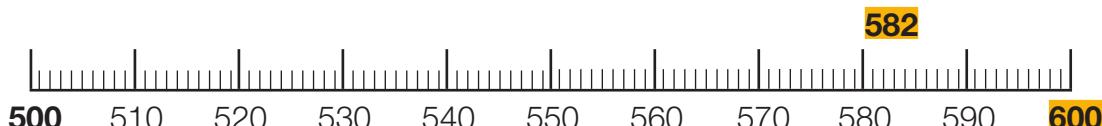
To round to the nearest 100, look at the **tens** digit to decide which **hundred** is nearest.

274 rounded to the **nearest 10** is 270.



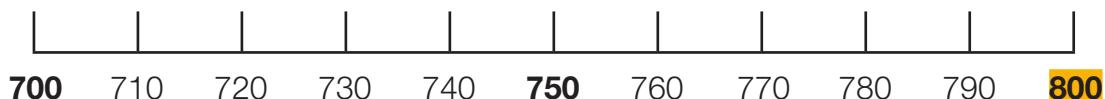
274 is between 270 and 280. It is closer to 270.

582 rounded to the **nearest 100** is 600.



582 is between 500 and 600. It is closer to 600.

750 rounded to the **nearest 100** is 800.



750 is exactly halfway between 700 and 800. **Round up** numbers that are halfway.

Practice 1

- 1 Round these numbers to the nearest ten:
 - a. 26
 - b. 72
 - c. 358
 - d. 607
 - e. 125

- 2 Round these numbers to the nearest hundred:
 - a. 503
 - b. 892
 - c. 729
 - d. 1750
 - e. 2953



Rounding and estimation

Rounding large numbers

Use the same method to round numbers to the nearest thousand, ten thousand, hundred thousand and million. It's important to use the correct digit to decide whether to round up or down. Here are some examples.

To round to the **nearest thousand**, look at the number in the **hundreds** column.

1 537 469 rounded to the nearest 1000 is 1 537 000
 ↑
 4 hundred, round down

To round to the **nearest ten thousand**, look at the number in the **thousands** column.

1 537 469 rounded to the nearest 10 000 is 1 540 000
 ↑
 7 thousand, round up

To round to the **nearest hundred thousand**, look at the number in the **ten thousands** column.

1 537 469 rounded to the nearest 100 000 is 1 500 000
 ↑
 3 ten thousands, round down

To round to the **nearest million**, look at the number in the **hundred thousands** column.

1 537 469 rounded to the nearest 1 000 000 is 2 000 000
 ↑
 5 hundred thousand, round up

- Find the digit in the place you want to round to. Look at the next digit to the right to decide whether to round up or down.



Rounding and estimation

Degrees of accuracy

Rounding a number gives you an **approximation** of the number. The larger the place value you round to, the less accurate the approximation becomes.

Look what happens when you round **1 537 469** to different degrees of accuracy.

rounded to	approximation	difference
the nearest ten	1 537 470	1
the nearest hundred	1 537 500	31
the nearest thousand	1 537 000	469
the nearest ten thousand	1 547 000	9531
the nearest hundred thousand	1 500 000	37 469
the nearest million	2 000 000	462 531

You can see that it's important to decide how accurate you need to be.

Practice 2

Round these football attendance figures to the nearest 1000 and the nearest 10 000.

FA cup final			
Year	Attendance	To nearest 1000	To nearest 10 000
1914	72 778		
1988	98 203		
1989	82 802		
1992	79 544		
1996	79 007		
2006	71 140		



Rounding and estimation

Practice 3

Round these population figures to the nearest million (1 000 000).

Estimated population figures for the UK		
Year	Population	To nearest million
2004	59 835 000	
2011	61 892 000	
2021	64 727 000	
2031	67 013 000	

Estimation

You can estimate answers to calculations by doing an approximate calculation using rounded numbers. Deciding what place value to round to, and whether to round up or down, depends on the numbers you're working with and how accurate you want your estimate to be.

Here are some examples.

A carpenter wants to make two shelves, one 985 mm long and one 685 mm long. He has a plank of wood 1750 mm long. Is this long enough for the two shelves?

985 mm is approximately 1000 mm. 685 mm is approximately 700 mm.

$$1000 \text{ mm} + 700 \text{ mm} = 1700 \text{ mm.}$$

Yes, the plank of wood is long enough.

A return plane ticket including airport taxes and insurance is £109 per person. What is the estimated cost for six people?

$$6 \times £110 = £660$$

A job is advertised at a salary of £12,500 per year. What is the approximate pay per week?

$$£12000 \div 50 = £240$$



Rounding and estimation

Practice 4

1 Estimate the answer to these calculations:

- a. 18×41
- b. $512 \div 21$
- c. $1981 + 734$
- d. $24\,109 - 19\,056$

Look at this job advert.

Photographic Technician

annual salary: £15,250

2 What is the best estimate of the pay per month?

- a. £1250
- b. £1000
- c. £2000

3 What is the best estimate of the pay per week?

- a. £400
- b. £300
- c. £500



Rounding and estimation

Check your skills

- 1 A company has 1756 employees. How many employees are there to the nearest 10?
 - A. 1800
 - B. 1700
 - C. 1750
 - D. 1760

- 2 An agency sells 1520 theatre tickets for £18 each. Which approximate calculation gives the most accurate estimate of ticket sales?
 - A. 20×1000
 - B. 20×2000
 - C. 20×1500
 - D. 10×1520

- 3 A second hand car has done 103 958 miles. What is this to the nearest 100 miles?
 - A. 104 958
 - B. 104 000
 - C. 103 900
 - D. 103 950

- 4 A garage sells 12 new cars priced at £7195 each. Which of these calculations gives the most accurate estimate of total sales?
 - A. 12×7000
 - B. $10 \times 10\,000$
 - C. 20×7000
 - D. 10×7200

- 5 In 2001, Glasgow was the fourth largest city in Britain, with a population of 577 869. What is this to the nearest thousand?
 - A. 578 000
 - B. 577 000
 - C. 580 000
 - D. 600 000

Turn to page 8 to check your answers.



Rounding and estimation

Answers

Practice 1

- | | | | | |
|---------|---------|---------|----------|----------|
| 1a. 30 | 1b. 70 | 1c. 360 | 1d. 610 | 1e. 130 |
| 2a. 500 | 2b. 900 | 2c. 700 | 2d. 1800 | 2e. 3000 |

Practice 2

Year	Attendance	To nearest 1000	To nearest 10 000
1914	72 778	73 000	70 000
1988	98 203	98 000	100 000
1989	82 802	83 000	80 000
1992	79 544	80 000	80 000
1996	79 007	79 000	80 000
2006	71 140	71 000	70 000

Practice 3

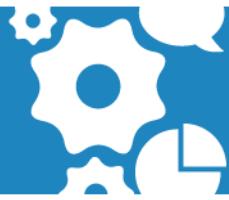
Year	Population	To nearest million
2004	59 835 000	60 000 000
2011	61 892 000	62 000 000
2021	64 727 000	65 000 000
2031	67 013 000	67 000 000

Practice 4

- | | | |
|--------------------------------|------------------------|-------------------------|
| 1a. $20 \times 40 = 800$ | 1b. $500 \div 20 = 25$ | 1c. $2000 + 700 = 2700$ |
| 1d. $24\ 000 - 19\ 000 = 5000$ | | |
| 2a. £1250 | | |
| 3b. £300 | | |

Check your skills

- 1 D
- 2 C
- 3 B
- 4 A
- 5 A



Talgrynnu ac Amcangyfrif

Cyflwyniad

Byddwn yn talgrynnu rhifau pan nad oes angen i ni fod yn fanwl gywir. Mae'n ei gwneud yn haws darllen rhifau mawr, ac mae'n haws cyfrifo heb gyfrifiannell. Os ydych chi'n defnyddio cyfrifiannell, mae'n syniad da i amcangyfrif er mwyn gwirio'r ateb.



Mae'r gweithgaredd hwn yn edrych ar dalgrynnu ac amcangyfrif.

Byddwch yn dysgu:

- sut i dalgrynnu rhifau i wahanol raddau o gywirdeb
- sut i amcangyfrif atebion gan ddefnyddio bras gyfrifiadau.



Talgrynnu ac Amcangyfrif

Talgrynnu i'r 10 neu'r 100 agosaf

Wrth benderfynu a allwch chi fforddio prynu camera, fe allech chi ddweud ei fod yn costio £180 er mai'r union bris yw £179. Rydych chi wedi talgrynnu'r pris i'r £10 agosaf. Neu fe allech chi ddweud ei fod yn costio £200. Rydych chi wedi talgrynnu'r pris i'r £100 agosaf.

I dalgrynnu i'r 10 agosaf, edrychwch ar yr **unedau** i benderfynu pa ddeg sydd agosaf.

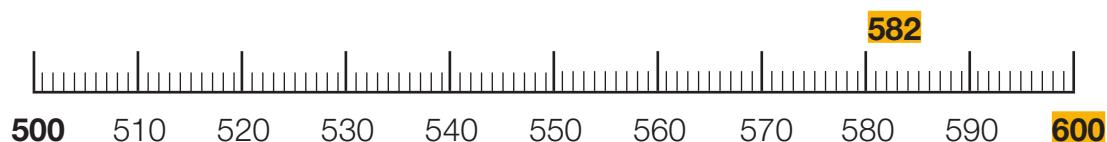
I dalgrynnu i'r 100 agosaf, edrychwch ar y **degau** i benderfynu pa gant sydd agosaf.

Mae 274 wedi ei dalgrynnu i'r **10 agosaf** yn 270.



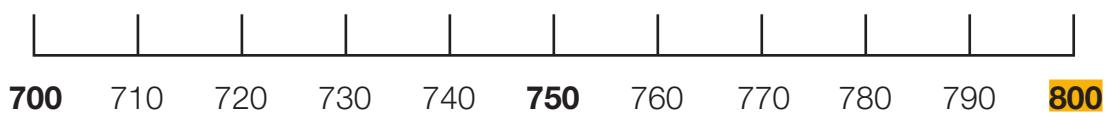
Mae 274 rhwng 270 a 280. Mae'n agosach at 270.

Mae 582 wedi ei dalgrynnu i'r **100 agosaf** yn 600.



Mae 582 rhwng 500 a 600. Mae'n agosach at 600.

Mae 750 wedi ei dalgrynnu i'r **100 agosaf** yn 800.



Mae 750 union hanner ffordd rhwng 700 ac 800. **Talgrynnwch i fyny** rifau sydd hanner ffordd.

Ymarfer 1

- 1 Talgrynnwch y rhifau hyn i'r deg agosaf:
a. 26 b. 72 c. 358 ch. 607 d. 125
- 2 Talgrynnwch y rhifau hyn i'r cant agosaf:
a. 503 b. 892 c. 729 ch. 1750 d. 2953



Talgrynnu ac Amcangyfrif

Talgrynnu rhifau mawr

Defnyddiwch yr un dull i dalgrynnu rhifau i'r fil, deng mil, can mil a miliwn agosaf. Mae'n bwysig defnyddio'r digid cywir i benderfynu a ddylid talgrynnu i fyny neu i lawr. Dyma rai enghrefftiau.

I dalgrynnu i'r **fil agosaf**, edrychwch ar y rhif yn y golofn **cannoedd**.

Mae 1 537 469 wedi ei dalgrynnu i'r 1000 agosaf yn 1 537 000



4 cant, talgrynnu i lawr

I dalgrynnu i'r **deng mil agosaf**, edrychwch ar y rhif yn y golofn **miloedd**.

Mae 1 537 469 rwedi ei dalgrynnu i'r 10 000 agosaf yn 1 540 000



7 mil, talgrynnu i fyny

I dalgrynnu i'r **can mil agosaf**, edrychwch ar y rhif yn y golofn **deng miloedd**.

Mae 1 537 469 wedi ei dalgrynnu i'r 100 000 agosaf yn 1 500 000



3 deg mil, talgrynnu i lawr

I dalgrynnu i'r **miliwn agosaf**, edrychwch ar y rhif yn y golofn **can miloedd**.

Mae 1 537 469 wedi ei dalgrynnu i'r 1 000 000 agosaf yn 2 000 000



5 can mil, talgrynnu i fyny



Chwiliwch am y digid sydd yn y lle rydych chi am dalgrynnu iddo. Edrychwch ar y digid nesaf ar y dde i benderfynu oes angen talgrynnu i fyny neu i lawr.



Talgrynnu ac Amcangyfrif

Graddau o gywirdeb

Mae talgrynnu rhif yn rhoi **brasamcan** o'r rhif. Po fwyaf yw gwerth y rhif rydych chi'n talgrynnu iddo, y lleiaf cywir fydd y brasamcan.

Edrychwrch beth sy'n digwydd wrth dalgrynnu **1 537 469** i wahanol raddau o gywirdeb.

talgrynnwyd	brasamcan	gwahaniaeth
i'r deg agosaf	1 537 470	1
i'r cant agosaf	1 537 500	31
i'r fil agosaf	1 537 000	469
i'r deng mil agosaf	1 547 000	9531
i'r can mil agosaf	1 500 000	37 469
i'r miliwn agosaf	2 000 000	462 531

Fel y gwelwch chi, mae'n bwysig penderfynu pa mor gywir mae angen i chi fod.

Ymarfer 2

Talgrynnwch niferoedd gwylwyr y gemau pêl-droed hyn i'r 1000 agosaf a'r 10 000 agosaf.

Gêm derfynol cwan yr FA			
Blwyddyn	Gwylwyr	I'r 1000 agosaf	I'r 10 000 agosaf
1914	72 778		
1988	98 203		
1989	82 802		
1992	79 544		
1996	79 007		
2006	71 140		



Talgrynnu ac Amcangyfrif

Ymarfer 3

Talgrynnwch y ffigurau poblogaeth hyn i'r miliwn agosaf (1 000 000).

Amcan o ffigurau poblogaeth y DU		
Blwyddyn	Poblogaeth	I'r miliwn agosaf
2004	59 835 000	
2011	61 892 000	
2021	64 727 000	
2031	67 013 000	

Amcangyfrif

Fe allwch chi amcangyfrif atebion drwy dalgrynnu rhifau. Mae penderfynu pa werth y dylech chi dalgrynnu iddo, ac a ddylech chi dalgrynnu i fyny neu i lawr, yn dibynnu ar y rhifau rydych chi'n gweithio â nhw a pha mor gywir mae arnoch chi eisiau i'ch brasamcan fod.

Dyma rai enghreifftiau.

Mae saer eisiau gwneud dwy silff, un 985 mm o hyd ac un 685 mm o hyd.
Mae ganddo astell bren 1750 mm o hyd. A yw'n ddigon hir ar gyfer dwy silff?

Mae 985 mm tua 1000 mm. Mae 685 mm tua 700 mm.

$1000 \text{ mm} + 700 \text{ mm} = 1700 \text{ mm}$.

Ydy, mae'r astell bren yn ddigon hir.

Mae tocyn awyren dwyffordd yn cynnwys trethi maes awyr ac yswiriant yn £109 y pen.
Tua faint fydd y gost ar gyfer chwech o bobl?

$6 \times £110 = £660$

Caiff swydd ei hysbysebu ar gyflog o £12,500 y flwyddyn. Tua faint yw'r cyflog wythnosol?

$£12000 \div 50 = £240$



Talgrynnu ac Amcangyfrif

Ymarfer 4

- 1 Amcangyfrifwch yr ateb i'r cyfrifiadau hyn:
- 18×41
 - $512 \div 21$
 - $1981 + 734$
 - $24\,109 - 19\,056$

Edrychwch ar yr hysbyseb swydd isod.

Technegydd Ffotograffig

cyflog blynnyddol: £15,250

- 2 Pa un yw'r amcangyfrif gorau o'r cyflog misol?
- £1250
 - £1000
 - £2000
- 3 Pa un yw'r amcangyfrif gorau o'r cyflog wythnosol?
- £400
 - £300
 - £500



Talgrynnu ac Amcangyfrif

Profi'ch sgiliau

- 1 Mae cwmni yn cyflogi 1756 o weithwyr. Faint o weithwyr sydd yno i'r 10 agosaf?
A. 1800
B. 1700
C. 1750
Ch. 1760

- 2 Mae asiantaeth yn gwerthu 1520 o docynnau theatr am £18 yr un. Pa amcangyfrif sy'n rhoi'r brasamcan mwyaf cywir o werthiant y tocynnau?
A. 20×1000
B. 20×2000
C. 20×1500
Ch. 10×1520

- 3 Mae car ail law wedi teithio 103 958 o filltiroedd. Faint o filltiroedd yw hyn i'r 100 agosaf?
A. 104 958
B. 104 000
C. 103 900
Ch. 103 950

- 4 Mae garej yn gwerthu 12 car newydd am £7195 yr un. Pauno'r cyfrifiadau hyn sy'n rhoi'r brasamcan mwyaf cywir o gyfanswm y gwerthiant?
A. 12×7000
B. $10 \times 10\,000$
C. 20×7000
Ch. 10×7200

- 5 Yn 2001, Glasgow oedd y bedwaredd ddinas fwyaf ym Mhrydain, gyda phoblogaeth o 577 869. Faint yw hyn i'r fil agosaf?
A. 578 000
B. 577 000
C. 580 000
Ch. 600 000

Ewchi dudalen 8 i wirio'ch atebion.



Talgrynnu ac Amcangyfrif

Atebion

Ymarfer 1

- | | | | | |
|---------|---------|---------|-----------|----------|
| 1a. 30 | 1b. 70 | 1c. 360 | 1ch. 610 | 1d. 130 |
| 2a. 500 | 2b. 900 | 2c. 700 | 2ch. 1800 | 2d. 3000 |

Ymarfer 2

Blwyddyn	Gwylwyr	I'r 1000 agosaf	I'r 10 000 agosaf
1914	72 778	73 000	70 000
1988	98 203	98 000	100 000
1989	82 802	83 000	80 000
1992	79 544	80 000	80 000
1996	79 007	79 000	80 000
2006	71 140	71 000	70 000

Ymarfer 3

Blwyddyn	Poblogaeth	I'r miliwn agosaf
2004	59 835 000	60 000 000
2011	61 892 000	62 000 000
2021	64 727 000	65 000 000
2031	67 013 000	67 000 000

Ymarfer 4

1a. $20 \times 40 = 800$ 1b. $500 \div 20 = 25$ 1c. $2000 + 700 = 2700$

1ch. $24\ 000 - 19\ 000 = 5000$

2a. £1250

3b. £300

Profi'ch sgiliau

- 1 Ch
- 2 C
- 3 B
- 4 A
- 5 A