

# KEYSKILLS

APPLICATION OF NUMBER

LEVEL ONE

## ESTIMATING AND CHECKING ANSWERS

*After completing this unit, you will be able to:*

- *Estimate amounts to carry out quick calculations*
- *Use reverse operations to check answers*
- *Use estimation to check answers*

### USE ESTIMATION TO CARRY OUT QUICK CALCULATIONS

#### Examples

1.

Suppose you spend the following at a shop and want to know if you have enough cash to pay for it.

Beers	£5.20
Milk	£0.90
TV magazine	£1.25
Chocolate biscuits	£0.75

You need to work out the estimated total by rounding each amount off say to the nearest pound (£) and then adding them together.

This gives you

$$£5.00 + £1.00 + £1.00 + £1.00 = \underline{£8.00}.$$

2.

Suppose you want to buy some new carpet for a rectangular room and need to work out roughly how much you need.

You need to measure the length and the width first to work out the floor area.

Suppose the length is 6.88 metres and the width is 4.06 metres.

So the area = 6.88 m X 4.06 m.

# KEYSKILLS

To calculate this approximately,  
*round 6.88 and 4.06 to the nearest metre.*

6.88 m = 7 m and 4.06 m = 4 m, to the nearest metre.

So, the estimated area = 7 m X 4 m = 28 metres squared.

## *Self assessment one*

### *Estimating to carry out quick calculations*

1. Round each of the following numbers off to the nearest whole number and then carry out an estimation of the calculation required (the first one is done as an example).

2.05 X 3.89	2 X 3 =	6
3.99 X 4.21		
4.56 + 2.89 + 1.3		
9.78 - 4.49		
19.51 ÷ 3.95		
4.75 X 2.15 X 5.5		

2. Joe wants to renew the floor covering of an office. The floor is 4.77m wide and 6.9 m long. He uses a calculator to find the area and wants to check that he is about right. Which of these quick checks should he use ?

A 4 X 6                      B 4 X 7                      C 5 X 6                      D 5 X 7

3. Ali spends £2.49, £2.50, £2.51 and £2.95 on four items. Rounding each of these amounts to the nearest pound (£), how much roughly has he spent ?

*Now check your answers*

## USE REVERSE OPERATIONS TO CHECK ANSWERS

To understand this, let's start with something simple.

Consider  $6 - 2 = 4$ .

*The opposite of subtract is add. This is called the reverse operation.*

To check this answer is correct, you can use this reverse operation as follows:

$4 + 2 = 6$ , so the answer is correct.

## EXAMPLES

1.  $1269 - 813 = 456$ .

*To check that this answer is correct, work out*

$456 + 813$ .

This indeed equals 1269 so the answer is correct.

2.  $1213 + 799 = 2012$ .

To check,  $2012 - 799 = 1213$  so the answer is correct.

3. A college pays £0.28 per mile for travel expenses. John travels 40 miles in one month and the college pays him £11.20.

This is worked out as  $£0.28 \times 40$ .

Therefore to check this is correct he must work out

$£11.20 \div 40$  and see if the answer equals £0.28.

## *Self assessment two*

### *Using reverse operations to check calculations*

1. Indicate in the space provided which answers are correct by checking using reverse operations.

	Working out	Correct
$2354 + 234 = 3588$		
$1208 - 899 = 309$		
$4.21 \times 3 = 15.23$		
$166 - 57 = 111$		
$\text{£}4.55 \times 3 = \text{£}13.65$		
$68\text{p} + 189\text{p} = 247\text{p}$		
$4\text{p} \times 350 = \text{£}14$		

2. Chris works out  $\text{£}226 - \text{£}39$  in his head.  
He gets  $\text{£}187$ .  
Which of these can he use to check his answer ?
- A  $39 + 226$    B  $187 + 39$    C  $187 + 226$    D  $226 + 39 + 187$
3. Narinder worked out the following calculation.  
 $4269 \text{ mm} + 1094 \text{ mm} = 5363 \text{ mm}$   
Which of these could she use to check her answer ?
- A  $1094 - 4269$   
B  $1094 - 5363$   
C  $5363 + 1094$   
D  $5363 - 4269$
4. Jake is a home worker and gets paid 35p for each item he makes.  
He made 800 items in one week and was paid  $\text{£}280$  for it.  
He wants to check that this amount was correct.  
Which of these should he use ?
- A  $28000 \div 35$   
B  $280 - 0.35$

# KEYSKILLS

---

C  $280 \div 35$

D  $35 \div 28$

*Check your answers*

## USE ESTIMATION TO CHECK ANSWERS

### EXAMPLES

1. Candice has just worked out on her calculator that

$$5.42 \times 6.85 = 37.127 .$$

She wants to check this using estimation.

*5.42 rounds down to 5 to the nearest whole number.*

*6.85 rounds up to 7 to the nearest whole number.*

*So the estimated question is*

$$5 \times 7 = 35.$$

*Is 35 close to 37.127? YES, so the answer could be correct.*

2. Bob pays 5.8 pence for each unit of electricity. He uses 896 units of electricity in one month and calculates the amount due for this to be £519.68. Is he likely to be correct?

*5.8 pence is roughly 6 pence.*

*896 units is roughly 900 units.*

$$900 \times 6 \text{ pence} = 5400 \text{ pence} = \text{£}54.00.$$

*So Bob's answer needs to be somewhere near £54.*

*£519.68 is nowhere near £54, so he is WRONG.*

# KEYSKILLS

## *Self assessment three*

### *Using estimation to check calculations*

1. Use estimation to check if the following calculations are likely to be correct.

Question	answer	your estimation	Correct (yes or no)
$2.9 \times 4.2$	12.18		
$12.89 \times 9.9$	1 276.11		
$108 \div 3.6$	30		
$1.98 \div 0.99$	20		
$5.4 \times 125$	67.5		

2. Sajid works out that  $145.5 \times 9.2 = 1\,338.6$  on his calculator. Which two numbers could he multiply together in order to see if he is likely to be correct ?
3. Mary pays 4.8 pence per minute for a local call and is on the phone for 38 minutes. She calculates this is going to cost her £18.24. Use estimation to work out if she is correct or not.
4. A meal costing £279.24 is to be divided between 39 people. This is worked out as £27.16 each. Is this likely to be correct ?

*Check your answers*

# KEYSKILLS

---

## ANSWERS

### SAQ 1

1.

$3.99 \times 4.21$	$4 \times 4$	16
$4.56 + 2.89 + 1.3$	$5 + 3 + 1$	9
$9.78 - 4.49$	$10 - 4$	6
$19.51 \div 3.95$	$20 \div 4$	5
$4.75 \times 2.15 \times 5.5$	$5 \times 2 \times 6$	60

2. D 5 X 7

3. £11

### SAQ 2

1.

	Working out	Correct
$2354 + 234 = 3588$	$3588 - 234$	yes
$1208 - 899 = 309$	$309 + 899$	yes
$4.21 \times 3 = 15.23$	$15.23 \div 3$	no
$166 - 57 = 111$	$111 + 57$	no
$£4.55 \times 3 = £13.65$	$£13.65 \div 3$	yes
$68p + 189p = 247p$	$247 - 68$	no
$4p \times 350 = £14$	$1400p \div 4p$	yes

2. B

3. D

4. A

# KEYSKILLS

---

## SAQ 3

1.

Question	answer	your estimation	correct (yes or no)
$2.9 \times 4.2$	12.18	$3 \times 4 = 12$	yes
$12.89 \times 9.9$	1 276.11	$13 \times 10 = 130$	no
$108 \div 3.6$	30	$100 \div 4 = 25$	yes
$1.98 \div 0.99$	20	$2 \div 1 = 2$	yes
$5.4 \times 125$	67.5	$5 \times 130 = 650$	no

2. e.g.  $150 \times 9$ ,  $150 \times 10$ ,  $100 \times 9$ ,  $100 \times 10$

3.  $5p \times 40$

=  $200p$  = £2.00. She is not correct.

4.  $£300 \div 40 = £30 \div 4 = £7.50$ .

NO

# KEY SKILLS

---