

Unit Transfer Method

Primary 5

Before & After

Lesson 2: Total Unchanged

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LESSON 2: TOTAL UNCHANGED QUANTITIES

DEFINITION

The **total quantity** remains unchanged.

Before: Ali has \$10 and Ben has \$35.

Change: Ali gives \$3 to Ben.

After: Does their Total money Before and After changes? (Yes / No)

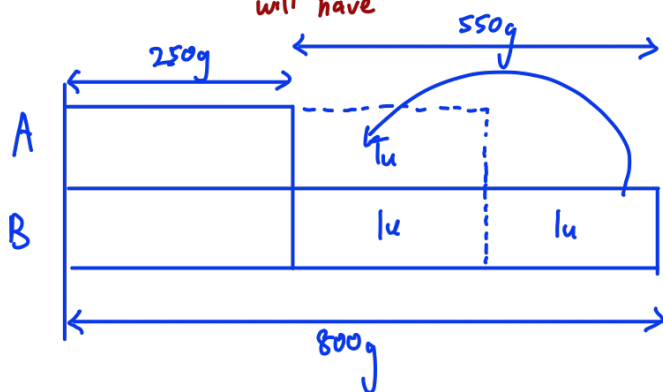
	Ali	Ben	Total
Before	10	35	45
[Change	↓ -3	↓ +3]	
After	7	38	45

Conclusion:
 Same no., opposite signs
 ∴ Total Unchanged

* Internal transfer

GUIDED EXAMPLE 1

- B [There was 250 g of flour in Container A and 800 g of flour in Container B.]
 C [How much flour must be poured from Container B into Container A]
 A [so that both containers ~~had~~ ^{will have} the same amount of flour?]



$$800 - 250 = 550$$

$$550 \div 2 = 275$$

Ans : 275g

GUIDED EXAMPLE 2

- B ² [Wendy had $\frac{2}{3}$ as many stickers as Sharon.]
- C [After Wendy gave 56 stickers to Sharon,]
- A ² ₅ [Wendy had $\frac{2}{5}$ as many stickers as Sharon.]

How many stickers did Wendy have at first?

	W	S	Total
B	2×7 $14u$	3×7 $21u$	5×7 $35u$
C	-56	$+56$	
A	2×5 $10u$	5×5 $25u$	7×5 $35u$
Total Unchanged			

$$25u - 21u = 56 \quad \text{or} \quad 14u - 10u = 56$$

$$4u = 56$$

$$1u = 56 \div 4$$

$$= 14$$

$$14u = 14 \times 14$$

$$= 196$$

Ans : 196

GUIDED EXAMPLE 3

- B [Wahid and Aron had a total of 1760 marbles.]
 C [When Wahid gave 120 marbles to Aron,]
 X [he would have 3 times as many marbles as Aron.]
 How many marbles did Wahid have at first?

	W	A	Total
B	1440		1760
C	-120	+120	
A	3 × 440 1320	1 × 440 440	4 × 440 1760

Total unchanged

$$1320 + 120 = 1440$$

Ans : 1440

GUIDED EXAMPLE 4

B Herman and Andy collected some coins.
C Andy collected 25% more coins than Herman.
A If Herman gives 26 coins to Andy,
 he will have $\frac{1}{2}$ as many coins as Andy in the end.
 How many coins did Andy have at first?

$$25\% = \frac{25}{100} \div 25 = \frac{1}{4}$$

	A	H	Total
B	5 $5u$	4 $4u$	9 $9u$
[C	+26	-26	
A	2×3 $6u$	1×3 $3u$	3×3 $9u$

↙ Total Unchanged

$$\begin{aligned}
 6u - 5u &= 26 \\
 1u &= 26 \\
 5u &= 5 \times 26 \\
 &= 130
 \end{aligned}$$

Ans : 130

GUIDED EXAMPLE 5

- B [John and Sean had the same amount of money at first.]
 C [If John gives \$94 to ~~John~~, Sean]
 A [the ratio of John's money to Sean's money became 7 : 11.]
How much money did they have altogether?

	J	S	Total
B	$1 \times u$ u	$1 \times u$ u	$2 \times u$ $2u$
C	-94	$+94$	
A	7 $7u$	11 $11u$	18 $18u$

Total Unchanged

$$\begin{aligned}
 9u - 7u &= 94 \\
 2u &= 94 \\
 1u &= 94 \div 2 \\
 &= 47 \\
 18u &= 18 \times 47 \\
 &= 846
 \end{aligned}$$

Ans : \$846

GUIDED EXAMPLE 6

- B [Mr. Ong had a total number of 576 toys in both shops.]
 C [He transferred 90 toys from second shop to first shop.]
 A [As a result, there was 8 times as many toys in the first shop as the second shop.]
 How many toys were there in the first shop at first?

	1st shop	2nd shop	Total
B			576
[C]	+90	-90	
A	8 × 64 512	1 × 64 64	9 × 64 576

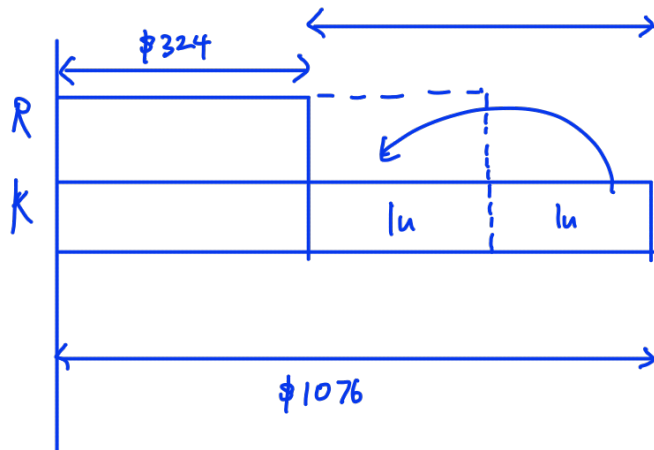
↙ Total Unchanged

$$512 - 90 = 422$$

Ans : 422

BUILD YOUR UNDERSTANDING

1. B [Ryan had \$324 and Kenneth had \$1076.]
 C [How much money must Kenneth give to Ryan so that they would have an equal amount of money in the end?] A



$$1076 - 324 = 752$$

$$752 \div 2 = 376$$

$$\text{Ans} = \underline{\$376}$$

2. ⁹ ⁴
 B A carton contained peaches and oranges in the ratio 9 : 4.
 C The shopkeeper sold 60 peaches in the carton.
 C He then added 60 oranges to the carton.
 A As a result, there was an equal number of peaches and oranges in the carton.
 How many peaches were left in the carton?

	P	Or	Total
B	9×2 $18u$	4×2 $8u$	13×2 $26u$
C	-60	+60	
A	1×13 $13u$	1×13 $13u$	2×13 $26u$

Total Unchanged

$$18u - 13u = 60$$

$$5u = 60$$

$$1u = 60 \div 5$$

$$= 12$$

$$13u = 13 \times 12$$

$$= 156$$

$$\text{Ans : } \underline{156}$$

3. $\left. \begin{array}{l} \text{B} \\ \text{C} \\ \text{A} \end{array} \right\} \begin{array}{l} \text{Tank A and Tank B had 10.8 litres of water.} \\ \text{After 1.045 litres of water was poured from Tank A to Tank B,} \\ \text{Tank A had three times as much water as Tank B.} \end{array}$
 How much water was in Tank A at first?

	A	B	Total
B			10.8
C	-1.045	+1.045	
A	3×2.7 8.1	1×2.7 2.7	4×2.7 10.8

Total Unchanged

$$8.1 + 1.045 = 9.145$$

Ans : 9.145 l

4. ³
 B The number of people in Camp A is $\frac{3}{7}$ that of Camp ⁷B.
 C After 30 people moved from Camp A to Camp B,
 A the number of people in Camp ²A is $\frac{2}{5}$ that of Camp ⁵B.
 Find the total number of people attending both camps.

$$40\% = \frac{40}{100} = \frac{2}{5}$$

	A	B	Total
B	$3 \times 7 \downarrow$ $21u$	$7 \times 7 \downarrow$ $49u$	10×7 $70u$
[C	-30	+30]	
A	$2 \times 10 \downarrow$ $20u$	$5 \times 10 \downarrow$ $50u$	7×10 $70u$

Total Unchanged

$$21u - 20u = 30$$

$$1u = 30$$

$$70u = 70 \times 30$$

$$= 2100$$

$$\text{Ans : } \underline{2100}$$

5. Lucas and Dinesh had some marbles.

The ratio of Lucas's marbles to Dinesh's was 5 : 3.

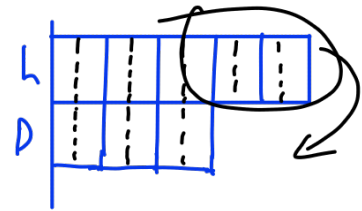
After Lucas gave half of his marbles to Dinesh,

Dinesh then had 36 marbles more than Lucas.

How many marbles did they have altogether?

make this divisible by 2

	L	D	Total
B	5×2 $10u$	3×2 $6u$	$16u$
C	$-5u$	$+5u$	
A	$5u$	$11u$	$16u$



$$11u - 5u = 36$$

$$6u = 36$$

$$1u = 36 \div 6$$

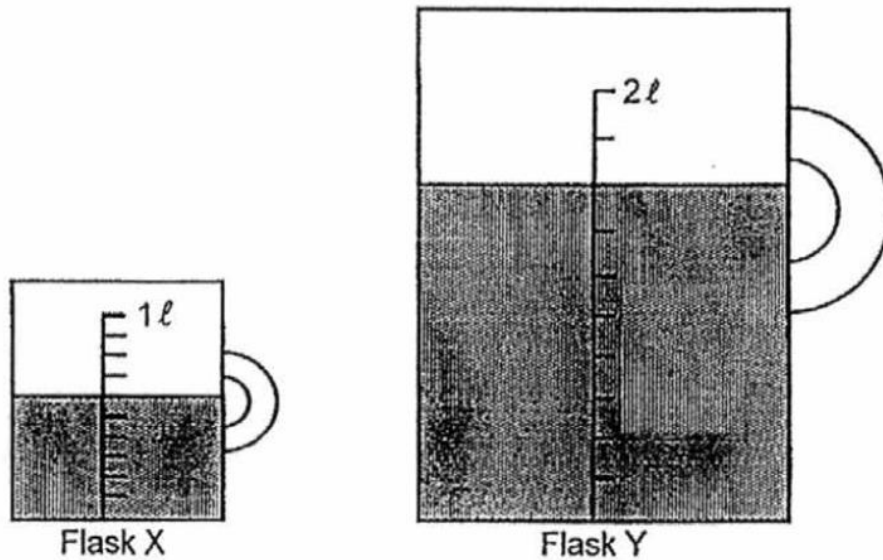
$$= 6$$

$$16u = 16 \times 6$$

$$= 96$$

Ans : 96

6. At first, Flask X and Flask Y contained water as shown below:



$$0.6\text{L} = 0.6 \times 1000\text{ml} = 600\text{ml}$$

$$\frac{8}{10} \times 2000\text{ml} = 1600\text{ml}$$

Some water from Flask Y was poured into Flask X with no water spilling over.

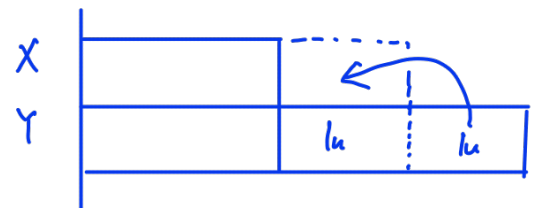
In the end, there was as much water in Flask X as in Flask Y.

How much water was poured from Flask Y into Flask X?

Give your answer in ml.

$$1600 - 600 = 1000$$

$$1000 \div 2 = 500$$



Ans : 500 ml

CHALLENGE YOURSELF

- B [At first, Ken had 150 stamps and his brother had some stamps.]
 C [After giving 40 stamps to his brother,]
 A [the ratio of the number of Ken's stamps to his brother's stamps was 5 : 3.]

- a) How many stamps did Ken have in the end?
 b) How many stamps did his brother have at first?

	K	B
B	150	(b)
C	-40	+40
A	110 ^(a) 5 ↑ x22	66 3 ↑ x22

a) $150 - 40 = 110$

b) $66 - 40 = 26$

Ans : a) 110

b) 26