

Unit Transfer Method

Primary 5

Before & After

Lesson 1: Single Unchanged

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Before You Begin

BEFORE YOU BEGIN

(Whole Number)

Units Allocation. W, F, D, P, R

1. Tom has 5 times as many stickers as Mary

Tom → (5) units
Mary → (1) units

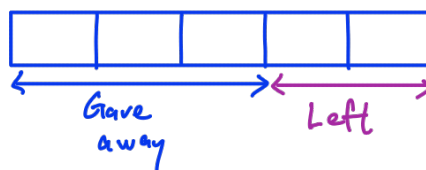
2. Tom has 5 times more stickers than Mary

Tom → (6) units
Mary → (1) units

(Fraction)

3. Tom gave away $\frac{3}{5}$ of his stickers.

Total → (5) units
Gave → (3) units
Left → (2) units



4. Tom's stickers increased by $\frac{3}{5}$.

Before → (5) units
Change → (+3) units
After → (8) units

5. Tom's stickers decreased by $\frac{3}{5}$.

Before → (5) units
Change → (-3) units
After → (2) units

6. Tom has $4\frac{3}{5}$ as many stickers as Mary.

$$4\frac{3}{5} = \frac{23}{5}$$

Tom → (23) units
Mary → (5) units

7. Tom has $\frac{3}{5}$ as many stickers as Mary.

Tom → (3) units
Mary → (5) units

Before You Begin

8. Tom has $\frac{3}{5}$ more stickers than Mary.

Tom → (8) units

Mary → (5) units

9. Tom has $\frac{3}{5}$ fewer stickers than Mary.

Tom → (2) units

Mary → (5) units

Before You Begin

* Convert Decimals & percentages into fractions first *

(Decimal)

10. Tom gave away 0.6 of his stickers.

Total \rightarrow (5) units
 Gave \rightarrow (3) units
 Left \rightarrow (2) units

$$\begin{aligned} 0.6 &= 6 \text{ tenths} \\ &= \frac{6}{10} \div 2 \\ &= \frac{3}{5} \end{aligned}$$

11. Tom's stickers increased by 0.6 times.

Before \rightarrow (5) units
 Change \rightarrow (+3) units
 After \rightarrow (8) units

12. Tom's stickers decreased by 0.6 times.

Before \rightarrow (5) units
 Change \rightarrow (-3) units
 After \rightarrow (2) units

13. Tom has 1.5 times as many stickers as Mary.

Tom \rightarrow (3) units
 Mary \rightarrow (2) units

$$1.5 = \left| \frac{5 \div 5}{10 \div 5} \right| \frac{1}{2} = \frac{3}{2}$$

14. Tom has 0.6 times as many stickers as Mary.

Tom \rightarrow (3) units
 Mary \rightarrow (5) units

15. Tom has 0.6 times more stickers than Mary.

Tom \rightarrow (8) units
 Mary \rightarrow (5) units

16. Tom has 0.6 times fewer stickers than Mary.

Tom \rightarrow (2) units
 Mary \rightarrow (5) units

Before You Begin

per|cent
 ↑
 hundred
 in Latin / French
 for every

(Percentage)

17. Tom gave away 60% of his stickers.

Total → (5) units
 Gave → (3) units
 Left → (2) units

$$60\% = \frac{60}{100} \div 20 = \frac{3}{5}$$

18. Tom's stickers increased by 60%.

Before → (5) units
 Change → (+3) units
 After → (8) units

19. Tom's stickers decreased by 60%.

Before → (5) units
 Change → (-3) units
 After → (2) units

20. Tom has 150% as many stickers as Mary.

Tom → (3) units
 Mary → (2) units

$$150\% = \frac{150}{100} \div 50 = \frac{3}{2}$$

21. Tom has 60% as many stickers as Mary.

Tom → (3) units
 Mary → (5) units

22. Tom has 60% more stickers than Mary.

Tom → (8) units
 Mary → (5) units

23. Tom has 60% fewer stickers than Mary.

Tom → (2) units
 Mary → (5) units

24. (Ratio)
 Tom and Mary have stickers in the ratio 3:5.

Tom → (3) units
 Mary → (5) units

LESSON 1: SINGLE UNCHANGED QUANTITIES

DEFINITION

[One of the given quantities remains unchanged.]

For instance,

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

Change: Ali donates \$3 to a charity.

After: Does Ali's money Before and After changes?
Does Ben's money Before and After changes?

(Yes / No)
(Yes / No)

	Ali	Ben
Before	10	35
[Change	-3	
After	7	35

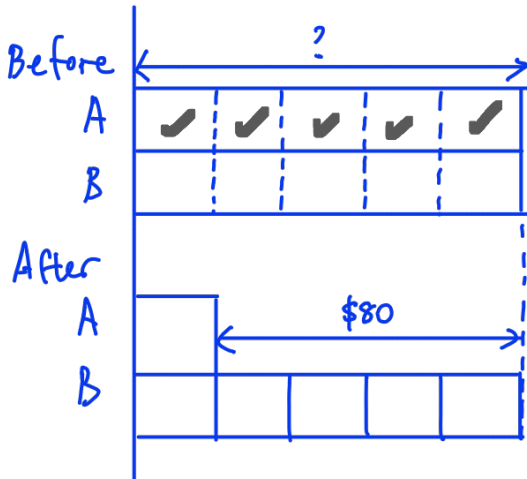
Conclusion:

At least one item remains unchanged.

GUIDED EXAMPLE 1 * make them the same is the name of the game *

[Abel and Benny had the same amount of money at first.] Before
 [After Abel spent \$80,] Change
 [Benny had 5 times as much money as Abel.] After
 How much money did each of them have at first?

1) Model



$$80 \div 4 = 20$$

$$5 \times 20 = 100$$

2) UTM

	A	B
B	1x5 5u	1x5 5u
C	-80	
A	1 1u	5 5u

Benny unchanged

$$5u - 1u = 80$$

$$4u = 80$$

$$1u = 80 \div 4$$

$$= 20$$

$$5u = 5 \times 20$$

$$= 100$$

Ans: \$100

GUIDED EXAMPLE 2

At first, Ismail had a total of 167 stamps from Singapore and Malaysia.] Before
 After his father gave him 183 stamps from Singapore,] Change
 the number of stamps from Malaysia was $\frac{1}{9}$ the number of stamps from Singapore.] After
How many stamps from Singapore did he have at first?

	S	M	Total
B	(?)		167
C	+183		+183
A	$9u \times 35$ 315 ↓	$1u \times 35$ 35 ↓	$10u \times 35$ 350 ↓

* Total increases by same no. as SG stamps*

Work backwards

$$315 - 183 = 132$$

Ans : 132

$$10 \times \underline{\quad} = 350$$

$$\underline{\quad} = 350 \div 10$$

$$= 35$$

GUIDED EXAMPLE 3

There are blue and red pens in a box.

[The number of red pens is $\frac{6}{7}$ of the blue pens.] *Before*

[6 more blue pens are added into the box.] *Change*

[The number of red pens is now $\frac{2}{3}$ of the blue pens.] *After*

Find the number of red pens.

⑥
2, 4, ⑥

	Red	Blue
B	⑥ 6u	7 7u
C		+6
A	② × 3 6u	3 × 3 9u

Red unchanged

$$9u - 7u = 6$$

$$2u = 6$$

$$1u = 6 \div 2$$

$$= 3$$

$$6u = 6 \times 3$$

$$= 18$$

Ans : 18

GUIDED EXAMPLE 4

$\left[\begin{matrix} 2 & 2 \\ \text{Marcus had twice as many beads as Kate at first.} \end{matrix} \right]$ Before 2, 4, (6)
 $\left[\text{After Kate lost 12 of her beads,} \right]$ Change
 $\left[\begin{matrix} 3 & 3 \\ \text{Marcus had 3 times as many beads as Kate.} \end{matrix} \right]$ After 3, (6)

How many beads did they have altogether at first?

	M	K	Total
B	$\textcircled{2} \times 3$ bu ↓	1×3 $3u$ ↓	$9u$ //
C		-12	
A	$\textcircled{3} \times 2$ bu	1×2 $2u$ ↓	

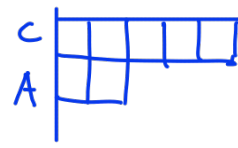
$\left[\begin{matrix} \text{C} \\ \text{A} \end{matrix} \right]$
 ↘ Marcus unchanged

$$\begin{aligned}
 3u - 2u &= 12 \\
 1u &= 12 \\
 9u &= 9 \times 12 \\
 &= 108
 \end{aligned}$$

Ans : 108

GUIDED EXAMPLE 5

[At a carnival, the ratio of the number of children to the number of adults was 5 : 2.] *Before*
 [When 133 more children joined in,] *Change*
 [the number of children was 6 times of the number of adults.] *After*
 How many children were at the carnival at first?



	C	A
B	5 5u	(2) 2u
[C	+133]
A	6x2 12u	(1)x2 2u

Adults unchanged

$$12u - 5u = 133$$

$$7u = 133$$

$$1u = 133 \div 7$$

$$= 19$$

$$5u = 5 \times 19$$

$$= 95$$

Ans : 95

GUIDED EXAMPLE 6

There was 1.5 times as many apples as oranges in a fruit stall.] $1.5 = \frac{3}{2}$
 After 21 apples were sold,] *Change*
 there was 3 times as many oranges as apples left.] *After*
How many fruits were there in the stall at first?

	A	O	Total
B	$3 \times 3 \downarrow$ $9u$	$(2) \times 3 \downarrow$ $6u$	$15u$
C	-21		
A	$1 \times 2 \downarrow$ $2u$	$(3) \times 2 \downarrow$ $6u$	

Oranges unchanged

$$9u - 2u = 21$$

$$7u = 21$$

$$1u = 21 \div 7$$

$$= 3$$

$$15u = 15 \times 3$$

$$= 45$$

Ans : 45

BUILD YOUR UNDERSTANDING

1. Samantha had two pieces of ribbons, A and B.
 [Ribbon A had the same length as Ribbon B.] *Before*
 [After she used 86.8 cm of Ribbon A,] *Change*
 [the length of Ribbon B was 8 times as long as the length of Ribbon A.] *After*
 Find the total length of ribbons A and B at first?

	A	B	Total
B	1×8 $8u$	1×8 $8u$	$16u$
C	-86.8		
A	1 $1u$	8 $8u$	

Rope B unchanged

$$8u - 1u = 86.8$$

$$7u = 86.8$$

$$1u = 86.8 \div 7$$

$$= 12.4$$

$$16u = 16 \times 12.4$$

$$= 198.4$$

Ans : 198.4 cm

2. $\left[\frac{1}{5} \text{ of the children in the funfair were girls and the rest were boys. } \right]$ Before 4, 8, 12
 When 8 girls left the funfair, $\left[\text{the number of girls decreased to } \frac{1}{7} \text{ of the total number of children. } \right]$ After 6, 12
 How many children were at the playground at first?

	G	B	Total
B	1×3 $3u$	4×3 $12u$	5×3 $15u$
C	-8		-8
A	1×2 $2u$	6×2 $12u$	7×2 $14u$

$$3u - 2u = 8$$

$$u = 8$$

$$15u = 15 \times 8$$

$$= 120$$

Ans : 120

Boys unchanged
 Make Boys the same

3. *Change* { Nigel and Reuben share a sum of money in the ratio of 4 : 5. } *Before*
{ After Reuben gave away \$457, he had \$1538 left. } *After*
 Find the sum of money Nigel and Reuben had at first.

	N	R	Total
B	$4u$	$5u$	$9u$
C		-457	
A		1538	

$$5u = 1538 + 457$$

$$= 1995$$

$$|u = 1995 \div 5$$

$$= 399$$

$$9u = 9 \times 399$$

$$= 3591$$

Ans : \$3591

4.

Jenna and Sandy had some stickers in the ratio of 3 : 5.] Before

After Sandy gave away 42 stickers,] Change 2
the ratio of the number of stickers between Jenna and Sandy became 2 : 1.] After

How many stickers did Jenna have?

	J	S
B	(3) × 2 6u	5 × 2 10u
[C		-42]
A	(2) × 3 6u	1 × 3 3u

J unchanged
Make J the same

$$10u - 3u = 42$$

$$7u = 42$$

$$1u = 42 \div 7$$

$$= 6$$

$$6u = 6 \times 6$$

$$= 36$$

$$\text{Ans : } \underline{36}$$

5. Mrs Lim baked 3 times as many chicken pies as apple pies.
If she had baked 60 fewer chicken pies,
she would have baked twice as many apple pies as chicken pies.
- a) How many chicken pies did she bake?
 - b) How many apple pies did she bake?

6. Mr. Lim bought a total of 126 red and blue pens.
 $\frac{1}{3}$ of them were red. Some red pens were sold
and the number of red pens remaining was $\frac{2}{7}$ the number of blue pens.
How many red pens were sold?