Faculty of Education
The University of Hong Kong

HKU USP – NCS Primary Mathematics 2017–19

Division Algorithm: Students' Difficulties and Teaching Ideas

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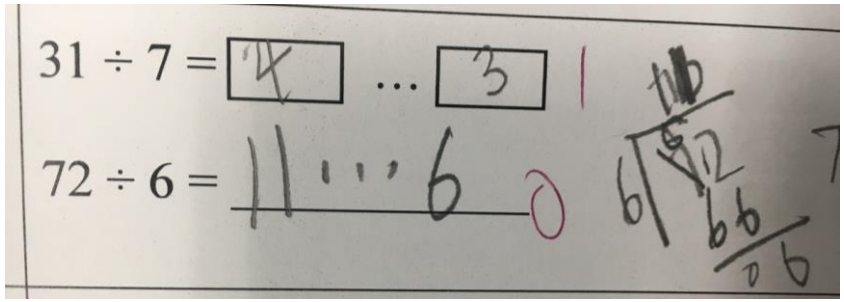
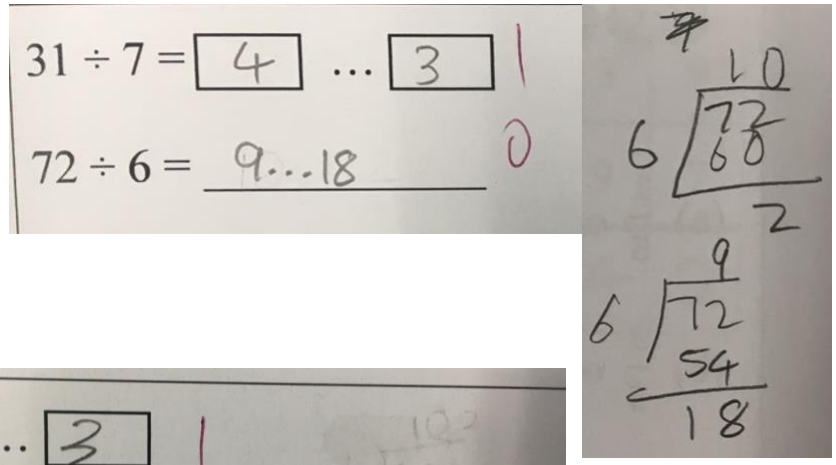
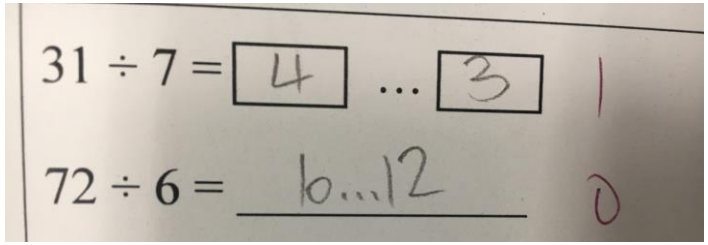
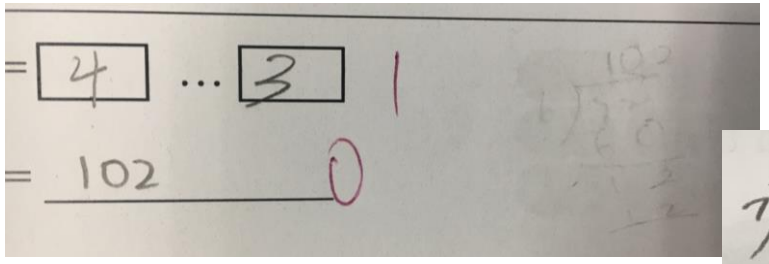
Students’ Difficulties

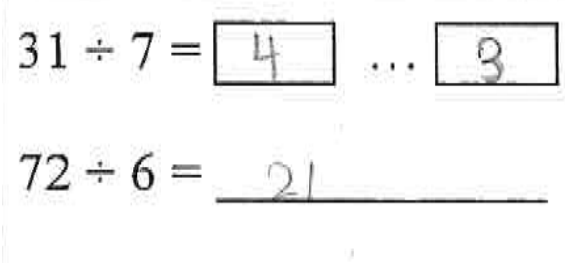
On Division Algorithm:
P.2 ✓ P.3 ×











On Division Algorithm:
P.2 × P.3 ✓

7 | $31 \div 7 =$ 31 … 7 ×

$72 \div 6 =$ 12 ✓

$$\begin{array}{r} 12 \\ 6\overline{)72} \\ 6 \\ \hline 12 \\ 12 \\ \hline \end{array}$$

$$\begin{array}{r} 31 \\ 7\overline{)31} \\ 21 \\ \hline 10 \\ 7 \\ \hline 7 \end{array}$$

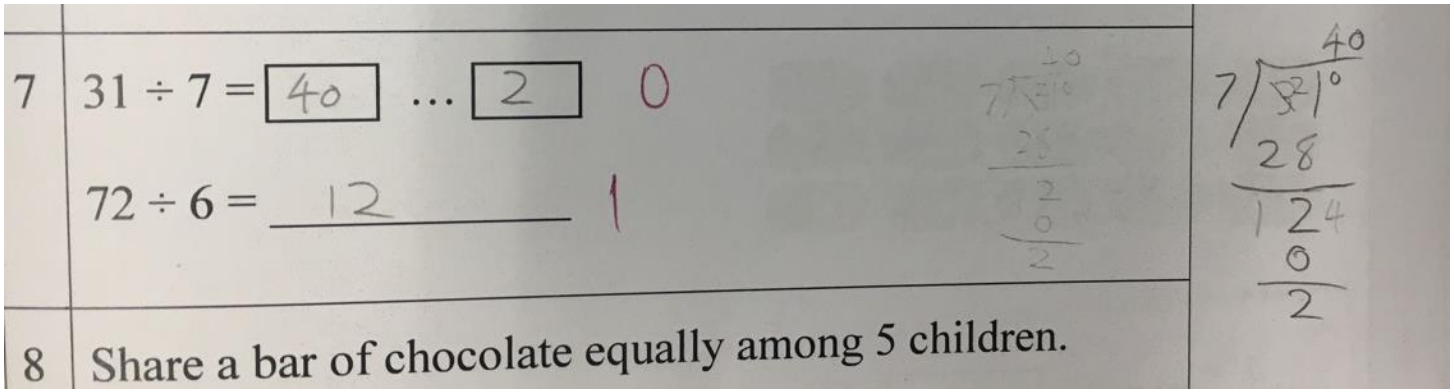
7 | $31 \div 7 =$ 31 … 77 ×

$72 \div 6 =$ 12 ✓

$$\begin{array}{r} 12 \\ 6\overline{)72} \\ 6 \\ \hline 12 \\ \hline \end{array}$$

$$\begin{array}{r} 31 \\ 7\overline{)31} \\ 21 \\ \hline 11 \\ 7 \\ \hline 77 \end{array}$$

On Division Algorithm:
P.2 × P.3 ✓



7	$31 \div 7 =$ 40 … 2	0
	$72 \div 6 =$ 12	1
8	Share a bar of chocolate equally among 5 children.	

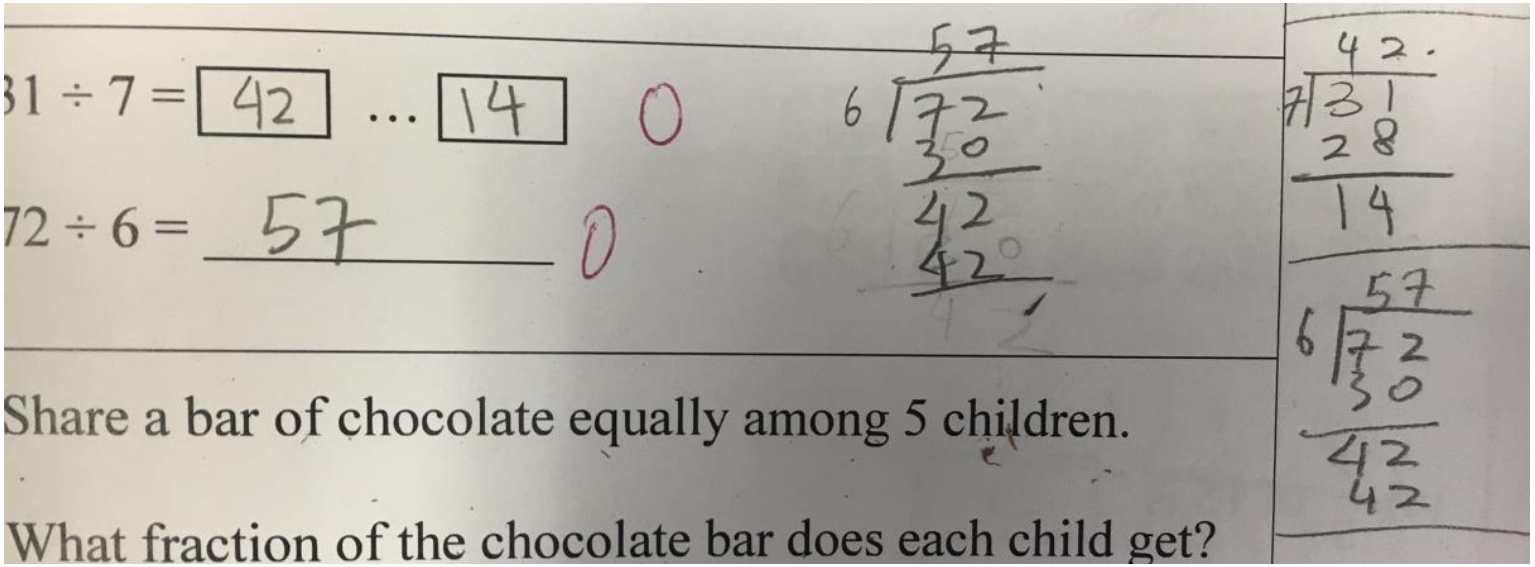
40
7 | 31
28
124
0
2

7	$31 \div 7 =$ 4 … 17	×
	$72 \div 6 =$ 12	✓

4
7 | 31
28
17

12
6 | 72
6
12
12

On Division Algorithm:
P.2 × P.3 ×



On Division Algorithm:
P.2 ✓ P.3 ✓

7 | $31 \div 7 =$ [4] ... [3] ✓

$72 \div 6 =$ 12 ✓

$$\begin{array}{r} 4 \\ 7\overline{)31} \\ 28 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 12 \\ 6\overline{)72} \\ 6 \\ \hline 12 \\ 12 \\ \hline \end{array}$$

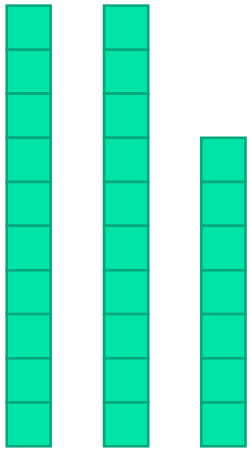
Students' Difficulties on Division Algorithm

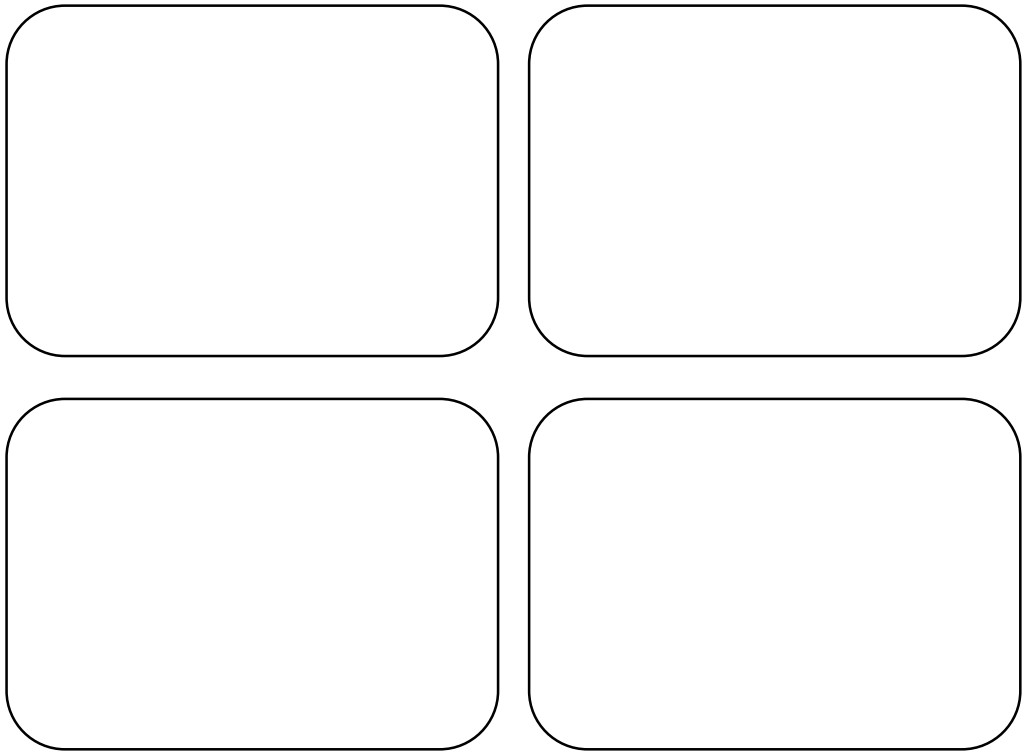
- Unable to extend the algorithm to the case dividend > 9 $\times$ divisor
- Do not understand the meaning of the place values of the digits of the quotient

Teaching Ideas

P.2: Basic Division

e.g. Share 27  equally among 4 children.

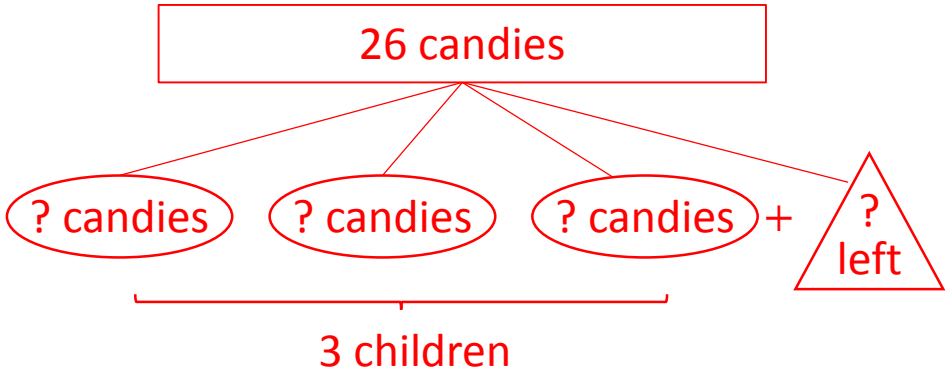




	T	U
4	2	7

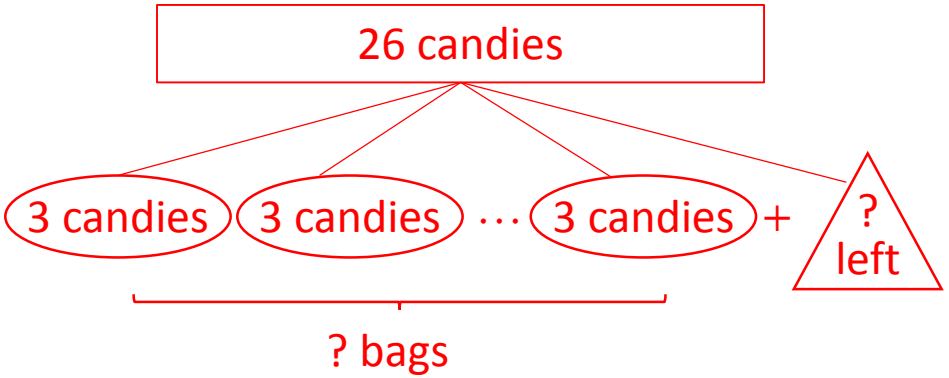
P.2: Basic Division
Sharing, Grouping and Division

Share 26 candies equally among 3 children.



$$3\overline{)26}\quad \begin{array}{r} ? \\ ? \\ \hline ? \end{array}$$

26 candies, put 3 candies into each bag.

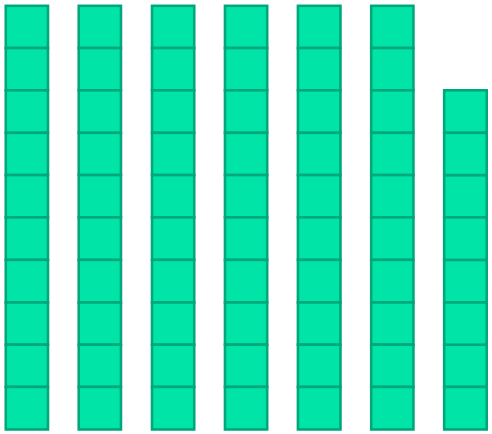


$$3\overline{)26}\quad \begin{array}{r} ? \\ ? \\ \hline ? \end{array}$$

P.3: Dividing 2 or 3 digits numbers by 1 digit number

www.mathlearningcenter.org/web-apps/number-pieces

e.g. $68 \div 3 = ?$

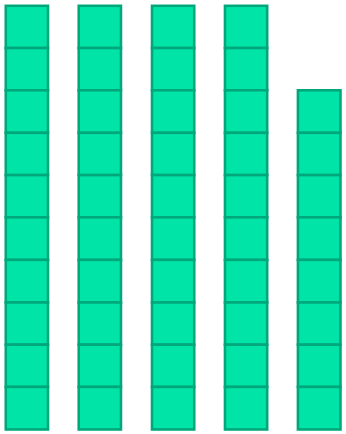


	T	U
	2	2
3)	6	8
	6	0
		8
		6
		2

P.3: Dividing 2 or 3 digits numbers by 1 digit number

www.mathlearningcenter.org/web-apps/number-pieces

e.g. $48 \div 3 = ?$

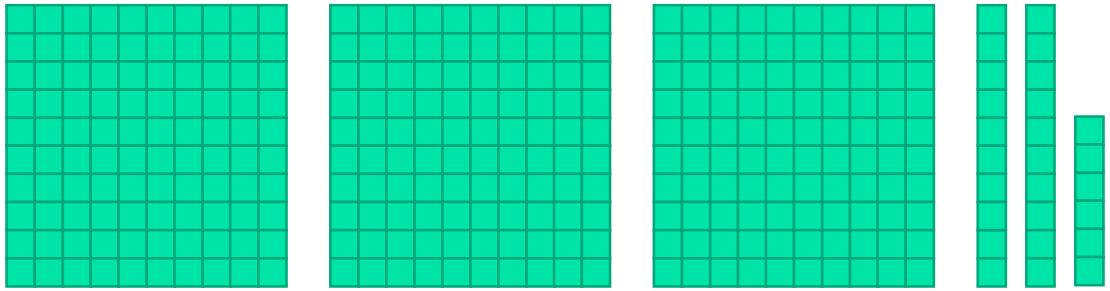


	T	U
	1	6
3)	4	8
	3	0
	1	8
	1	8

P.3: Dividing 2 or 3 digits numbers by 1 digit number

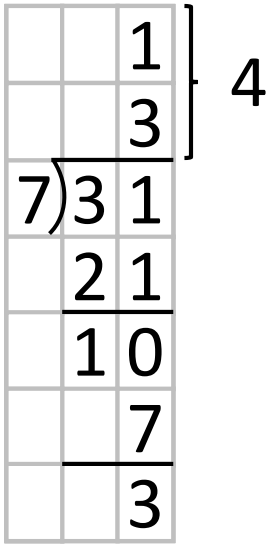
www.mathlearningcenter.org/web-apps/number-pieces

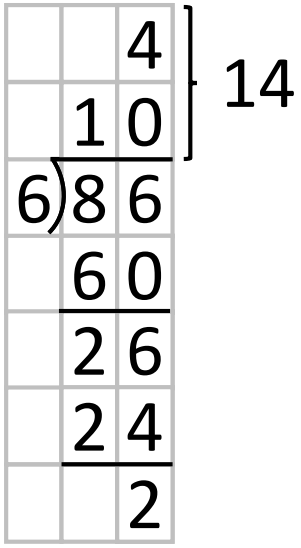
e.g. $326 \div 3 = ?$

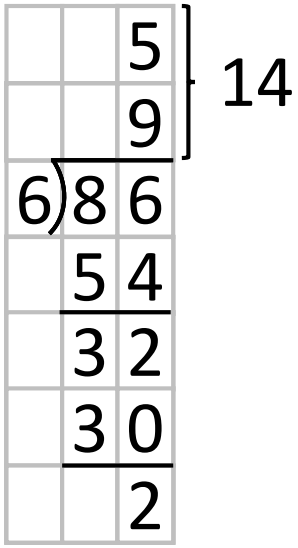


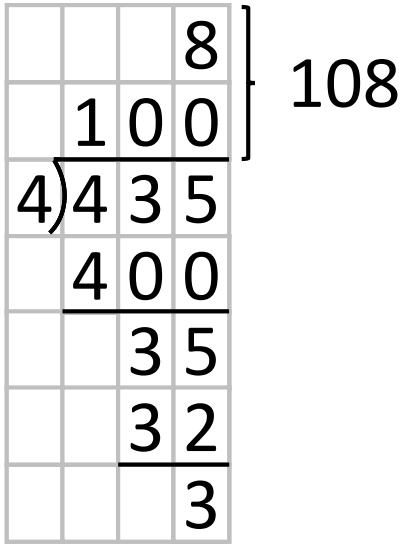
	H	T	U
	1	0	8
3)	3	2	6
	3	0	0
		2	6
		2	4
			2

Alternative Ways?









疊除法

Final Remarks