

Three to One

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Summary	Children discuss and produce verbal and mathematical statements on the proportion, $S:L :: 1:3$, that is, on the function $f(x) = 3x$ and on its inverse $f^{-1}(x) = \frac{1}{3}x$
Goals	<ol style="list-style-type: none">1. To further develop children's understanding of multiplicative relations and their multiple representations.2. We focus on common multiples of two lengths in the ratio (e. g., $1 \times L = 3 \times S$, $2 \times L = 6 \times S$).
Materials	Overheads, Handouts
Keywords	Contextualized Situations Describing Magnitudes Fractions Full Class Discussion Interpretation of Equations Interpretation of Stories Linear Functions Production of Equations Ratios Small Group Work

Activity Plan:

1. Expanded review of proportional relationships (Whole Class)

Show the overhead on Page 1 and discuss each item with the children, as they decide on whether or not the equations are true or false. Try

to elicit children's explanations for why they think each equation is true or false.

Pay special attention to the last three items:

$$J \times 2 = T \times 6 \quad (\text{true})$$

$$J \times 2 = T \times 4 \quad (\text{false})$$

$$J + 6 = T + 2 \quad (\text{true})$$

2. Expanding children's understandings (Group Work)

Distribute the handout on Page 2 and ask the children to work in groups of two or three.

Show the second overhead (Page 2) and ask a few children to show and explain their answers.

Explore children's answers in depth, discussing them with the whole class. Pay special attention to the last two items.

3. Homework (Page 3)

Children will be asked to judge and to produce verbal and mathematical statements on the relationships between two lengths.

Solve some of the homework questions in the classroom.

Talita and Jose collect seashells on the beach.

Jose collected three times as many seashells as Talita.

T means the number of seashells Talita has.

J means the number of seashells Jose has.

True or False?

$J = 3 \times T$	True	False
$T = \frac{1}{3} J$	True	False
$J = \frac{1}{3} \times T$	True	False
$T = J \div 3$	True	False
$T = \frac{J}{3}$	True	False
$J \times 2 = T \times 6$	True	False
$J \times 2 = T \times 4$	True	False
$J \div 6 = T \div 2$	True	False

Name: _____ Date: _____

L <input style="width: 100px; height: 15px;" type="text"/> S <input style="width: 60px; height: 15px;" type="text"/>	The length of L is three times the length of S .
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Formula	Statement	True or False	Explain why you think it is true or false
$L = 3 \times S$			
	The length of S is equal to the length of L divided by three		
$L \times 2 = S \times 6$			
	Four times the length of S is equal to two times the length of L		

Name: _____ Date: _____

L <input style="width: 300px; height: 15px;" type="text"/> S <input style="width: 100px; height: 15px;" type="text"/>	The length of S is one third of the length of L .
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Formula	Verbal Statement	True or False	Explain why you think it is true or false
	The length of L is equal to 3 times the length of S		
$S = L + 3$			
	The length of L multiplied by 2 is equal to the length of S multiplied by 6		
$4S = 2L$			