

## Bronze

1a. multiply, 5,000mm; divide, 3L;  
multiply, 7,000ml

2a.

mm	m
2,000	2
4,000	4
8,000	8
3,000	3

3a. 6,000mm; 5,000mm; 3m; 2,000mm; 1m

4a.

1,000ml	2,000mm
2m	3m
5L	1L
3,000m	5,000ml

1b.  $2L + 4,000ml = 6L$

2b. Yes,  $6m \times 1,000 = 6,000mm$ . 6,000mm is greater than 5,000mm.

3b. Yes, Jess is correct because Phoebe has 7L of water (4L + 3L). Jess has 6,000ml (5,000ml + 1,000ml).  $6,000ml \div 1,000 = 6L$  of water. 6L is less than 7L.

## Silver

5a. multiply, 2,300mm; divide, 3.2L;  
multiply, 5,700ml

6a.

$\frac{?}{1000}$	ml	L
$\frac{300}{1000}$	300	0.3
$\frac{900}{1000}$	900	0.9
$\frac{600}{1000}$	600	0.6

4b.  $0.5L + 3,700ml + 1,500ml = 5.7L$

5b. No,  $\frac{900}{1000} L = 900ml = 0.9L$ .

$0.9L \times 1,000 = 900ml$ , so all are equal.

7a. 4.2m; 4,100mm; 4m; 400mm; 0.3m

8a.

1,500ml	2,500mm
$2\frac{1}{2}m$	2,200mm
1.4L	1.5L
$2\frac{1}{5}m$	1,400ml

6b. Yes, Lily is correct because Brooke has 1,900ml ( $2,800ml \div 2$  and  $1,400ml + 500ml$ ). Lily has 800ml ( $1.2L \div 2$  and  $0.6L + 200ml$ ). Lily has 1,100ml of water less than Brooke.

## Gold

9a. multiply, 2,340mm; divide, 4.01L;  
multiply, 5,770ml

10a.

$\frac{?}{1000}$	ml	L
$\frac{350}{1000}$	350	0.35
$\frac{590}{1000}$	590	0.59
$\frac{710}{1000}$	710	0.71

7b.  $2\frac{3}{4}L + 1.75L + 1,250ml = 5.75L$

8b. Yes,  $0.15L \times 1,000 = 150ml$ .  $\frac{15}{1000} L = 15ml$ . 150ml is greater than 15ml.

11a. 4.36m, 4.26m, 460mm, 426mm, 0.29m

12a.

7,760ml	7,750mm
$7\frac{3}{4}m$	7,500mm
7.45L	7.76L
$7\frac{2}{4}m$	7,450ml

9b. Yes, Olivia is correct because Ava has 2,350ml ( $6.3L \div 3$  and  $2.1L + 250ml$ ). Olivia has 2,350ml ( $3,800ml \div 2$  and  $1,900ml + 450ml$ ). They each have 2,350ml of water in their buckets.

## Challenge

1. Albus the wizard is creating potions. His cauldron can hold 11.95L of liquid. He needs to fill his cauldron to at least 11.1L and use at least 5 different ingredients.

What combinations of ingredients could he use? You can use each ingredient more than once.

Various answers possible including:

1x Dragon oil, 1x Unicorn milk, 1x Lycan mucus, 1x Goblin vomit and 2x Ogre blood.

$3,760\text{ml} + 1,390\text{ml} = 5,150\text{ml}$ ;  $5,150\text{ml} = 5.15\text{L}$ ;  $2 \frac{3}{5} \text{L} = 2.6\text{L}$ ;  $1 \frac{3}{4} \text{L} = 1.75\text{L}$ ;  $0.81\text{L} \times 2 = 1.62\text{L}$ ;  $5.15\text{L} + 2.6\text{L} + 1.75\text{L} + 1.62\text{L} = 11.12\text{L}$ .



Ingredients	Volume
Ogre blood	0.81L
Goblin vomit	$1 \frac{3}{4} \text{L}$
Dragon oil	3,760ml
Unicorn milk	1,390ml
Mermaid tears	0.15L
Lycan mucus	$2 \frac{3}{5} \text{L}$



2. Lola is trying to build a model train track using different parts. Her track needs to measure between 8.9m and 9.71m.

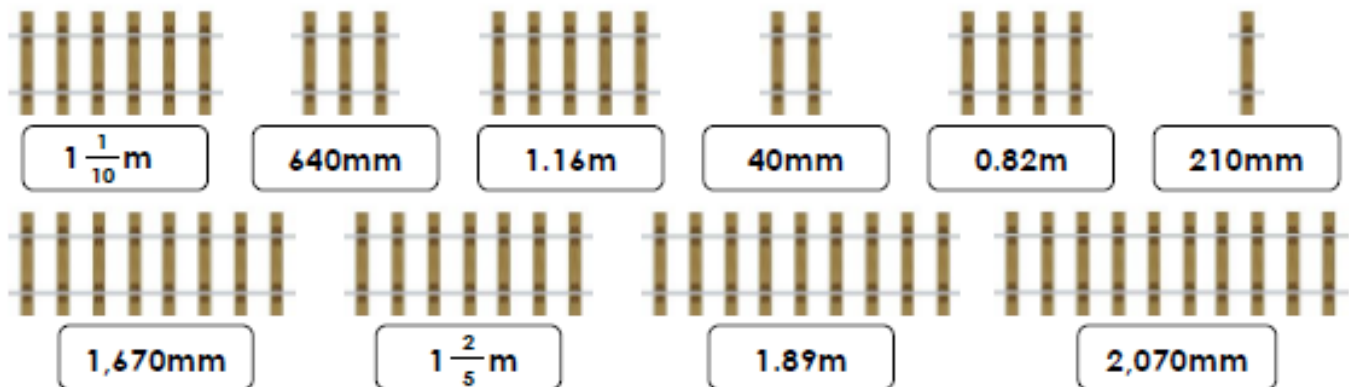
Using the different pieces below, what combinations of tracks could she use? She can only use each part twice and must use at least 5 different parts of different lengths.

What is the closest she can get to 9.71m without going over the required length?

Various possible answers, for example:

$2,070\text{mm} \times 2 = 4,140\text{mm}$ ;  $1,670\text{mm} \times 2 = 3,340\text{mm}$ ;  $640\text{mm} \times 2 = 1,280\text{mm}$ ;

$4,140\text{mm} + 3,340\text{mm} + 1,280\text{mm} + 210\text{mm} + 40\text{mm} = 9,010\text{mm}$ ;  $9,010\text{mm} = 9.01\text{m}$ .



Not drawn to scale.

