NCETM: KS3 Multiplicative Reasoning Project

National Centre for Excellence in the Teaching of Mathematics

Slides for LESSONS 2e and 2f (including the Pre-task)

Lesson 2e, Pre-task: **Painting fence posts**

Kelly works at a large garden centre.
Today her job is to paint fence posts.

After 8 minutes Kelly has painted 3 posts.

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a. Predict how many posts Kelly will have painted after 20 minutes.
   Give a reason for each prediction.

Lesson 2e, Pre-task: Painting fence posts

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After 8 minutes Kelly has painted 3 posts.

a. Predict how many posts Kelly will have painted after 20 minutes.
   Give a reason for each prediction.

b. It turns out that after 20 minutes Kelly has painted 9 posts.
   Explain how this number might have come about.

Lesson 2e, Pre-task: Painting fence posts

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a. Predict how many posts Kelly will have painted after 20 minutes.
   Give a reason for each prediction.

b. It turns out that after 20 minutes Kelly has painted 9 posts.
   Explain how this number might have come about.

c. After half an hour Kelly has painted 14 posts.
   Explain how this number might have come about.

Lesson 2e, Pre-task: **Painting fence posts**

Kelly works at a large garden centre.
Today her job is to paint fence posts.

After 8 minutes Kelly has painted 3 posts.

a. Predict how many posts Kelly will have painted after 20 minutes.
   Give a reason for each prediction.

b. It turns out that after 20 minutes Kelly has painted 9 posts.
   Explain how this number might have come about.

c. After half an hour Kelly has painted 14 posts.
   Explain how this number might have come about.

d. Predict how many posts Kelly will have painted after 1 hour.
   Give a reason for each prediction.

Lesson 2e, Stage 1:

Zoom Taxis

Tariff

£3 basic fare
plus
£2 per mile

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1 a) i. What does a 6 mile journey cost with *Zoom Taxis*?

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1 a) i. What does a 6 mile journey cost with *Zoom Taxis*?

ii. What does a 4 mile journey cost?

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£3 basic fare
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1 a) i. What does a 6 mile journey cost with *Zoom Taxis*?

ii. What does a 4 mile journey cost?

iii. What does a 5 mile journey cost?

Lesson 2e, Stage 1:

Zoom Taxis

Tariff

£3 basic fare
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miles	£
4	11
5	13
6	15

1 b) Compare the three representations.

Lesson 2e, Stage 1:

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4	11
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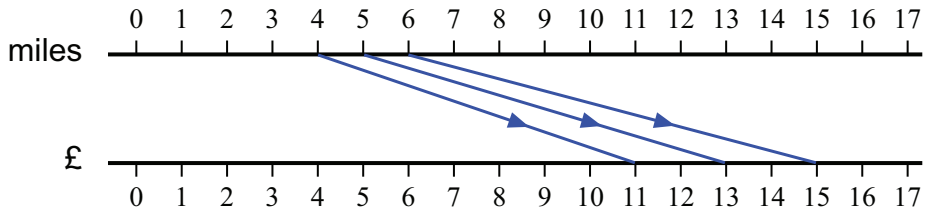
1 b) Compare the three representations.



Zoom Taxis

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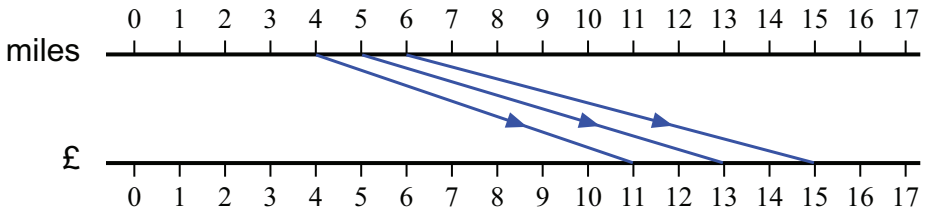
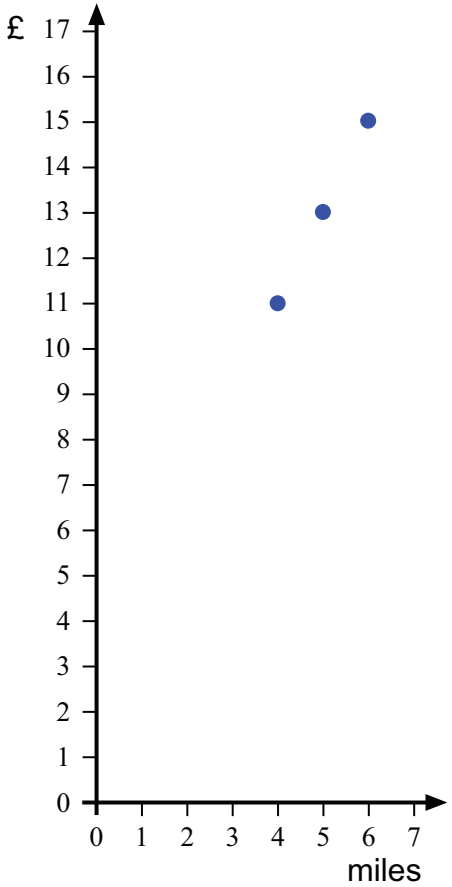
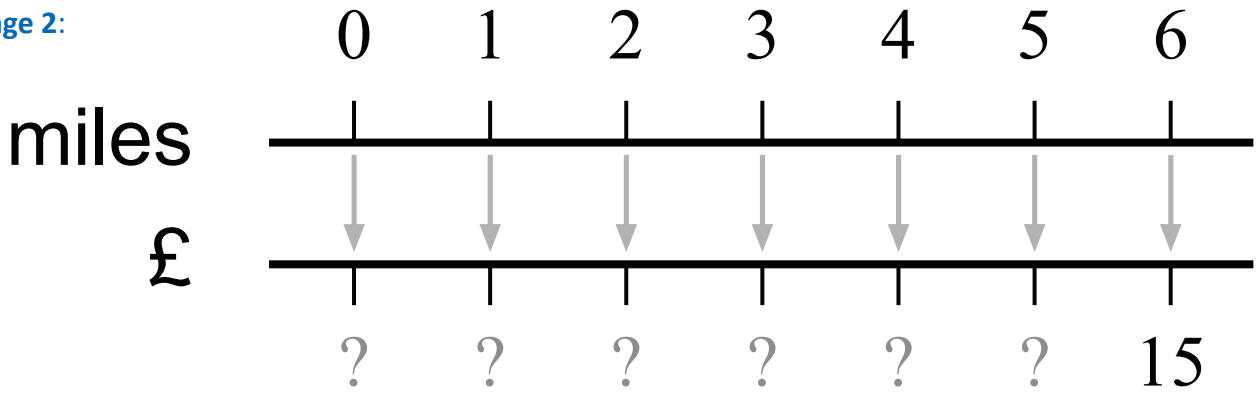




Lesson 2e, Stage 2:

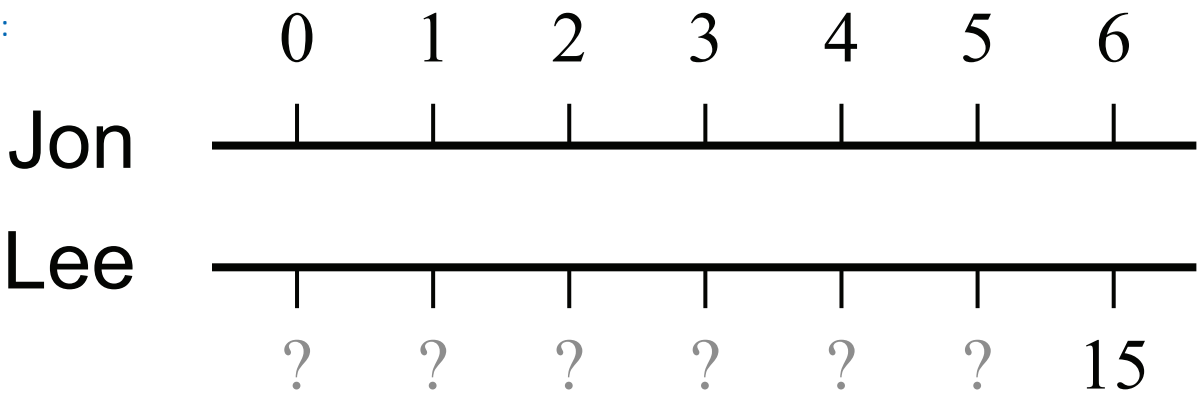


2 This DNL represents journeys with Zoom Taxis.

Number the bottom axis.

[Reminder: the tariff is £3 plus £2 per mile.]

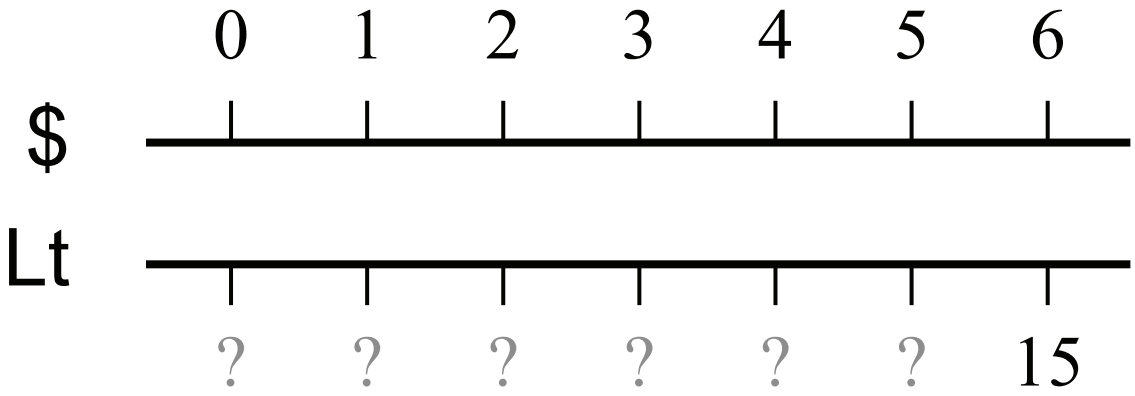
Lesson 2e, Stage 2:



3 a) When Jon was 6 years old, his cousin Lee was 15 years old.

Number the axis showing Lee's age.

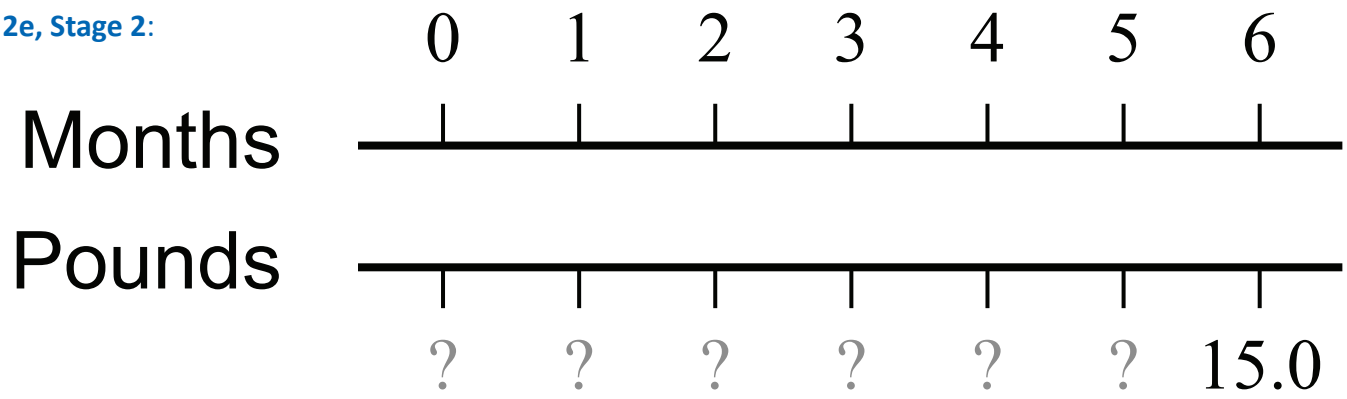
Lesson 2e, Stage 2:



3 b) Six US dollars ($) are worth 15 Lithuanian litai (Lt).

Number the Lt axis.

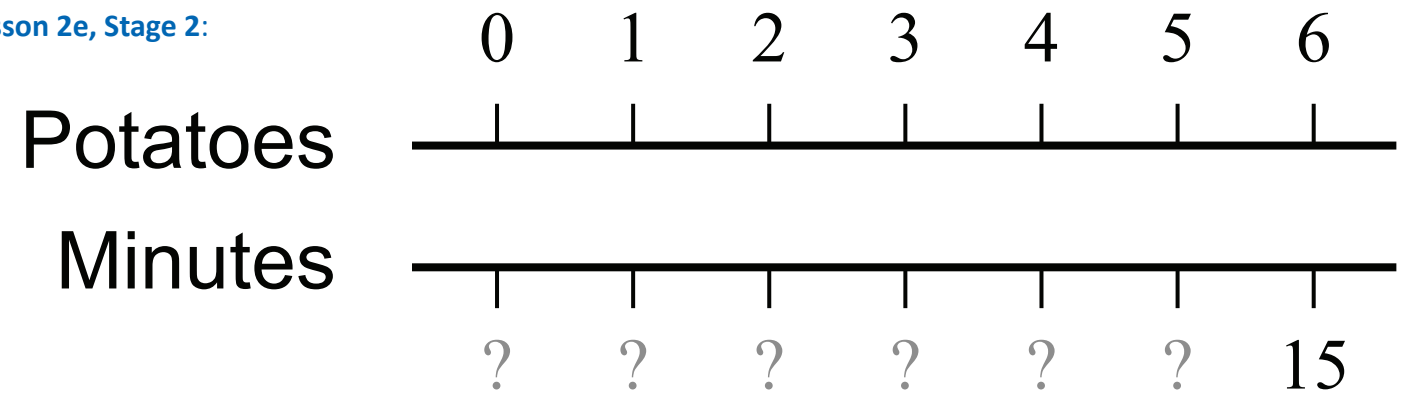
Lesson 2e, Stage 2:



3 c) This DNL records the weight of baby Meg for her first 6 months.

Write down possible numbers for the pounds axis.

Lesson 2e, Stage 2:

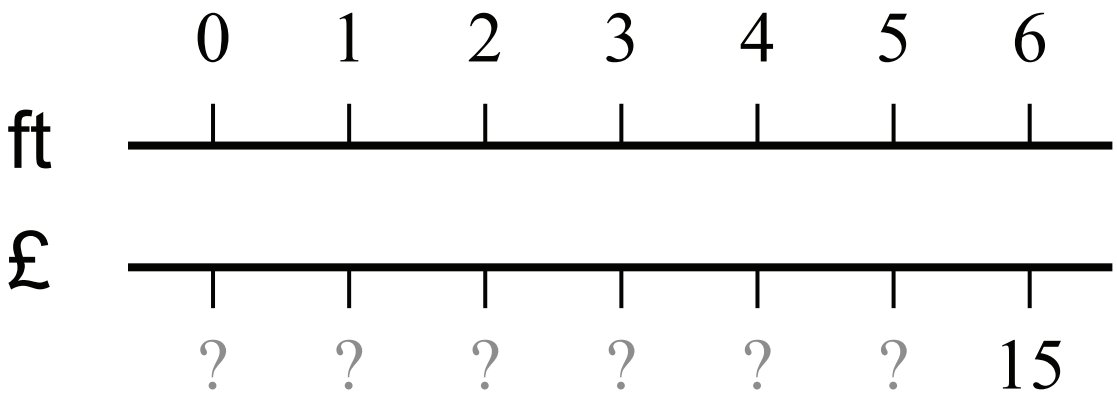


3 d) Some medium size potatoes are put in a large pan of boiling water.

It takes 15 minutes to cook 6 potatoes.

Write down numbers for the minutes axis.

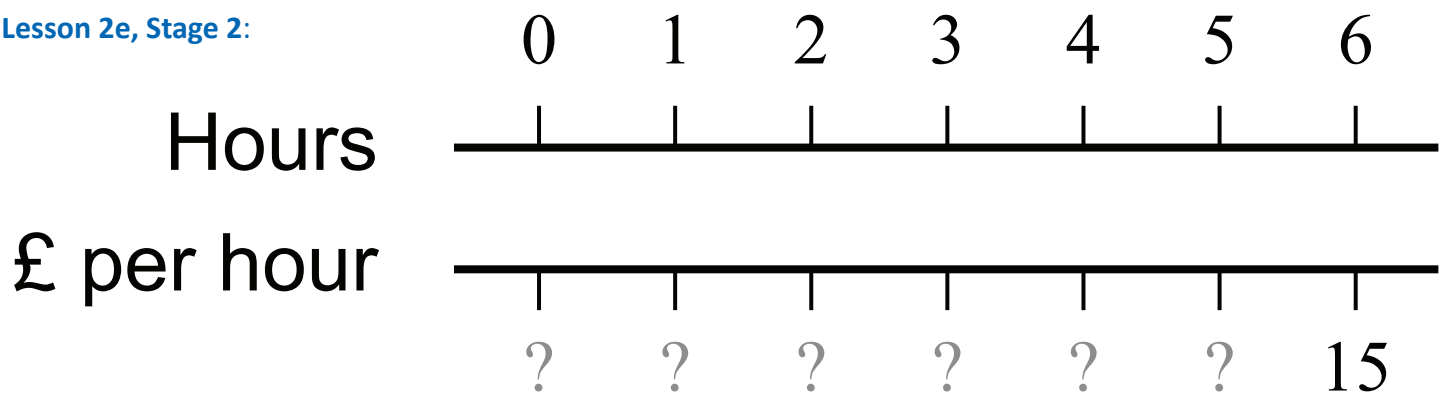
Lesson 2e, Stage 2:



3 e) A 6 ft length of fine sterling silver wire costs £15.

Number the £ axis.

Lesson 2e, Stage 2:

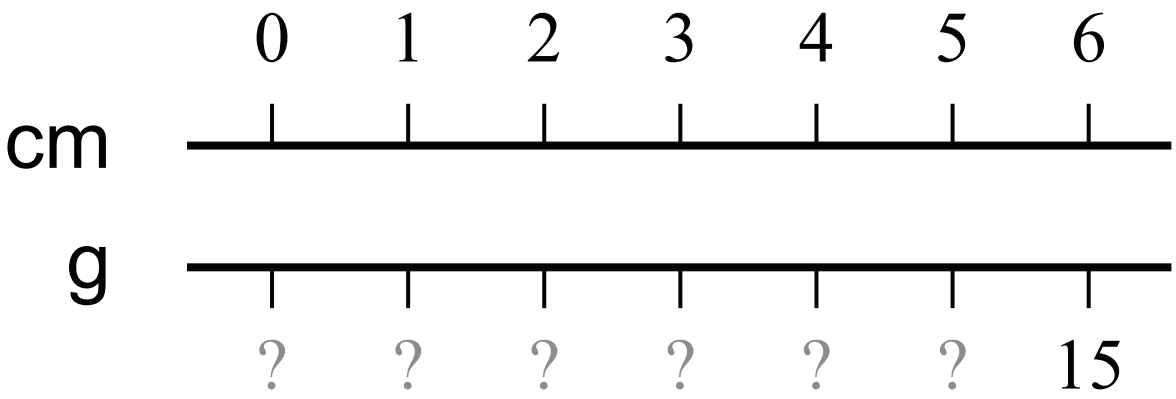


3 f) Jenny is offered £90 to tidy Mr Dobb's garden.

So if the job takes her 6 hours she would get £15 per hour.

What if it takes her less time?
Number the £ per hour axis.

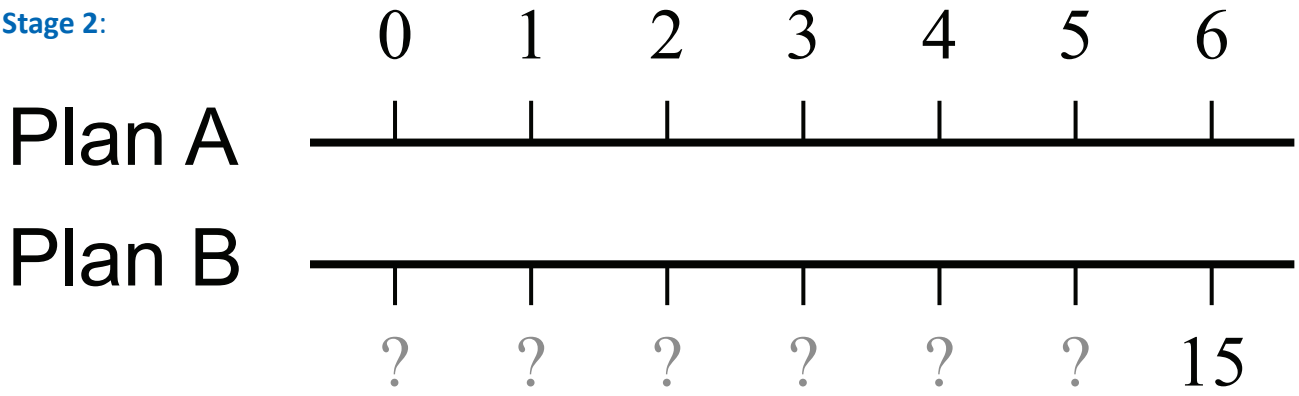
Lesson 2e, Stage 2:



3 g) This DNL is for the weight of circular discs cut from a sheet of card.

A 6 cm wide disc weighs 15 g.

Number the grams axis.

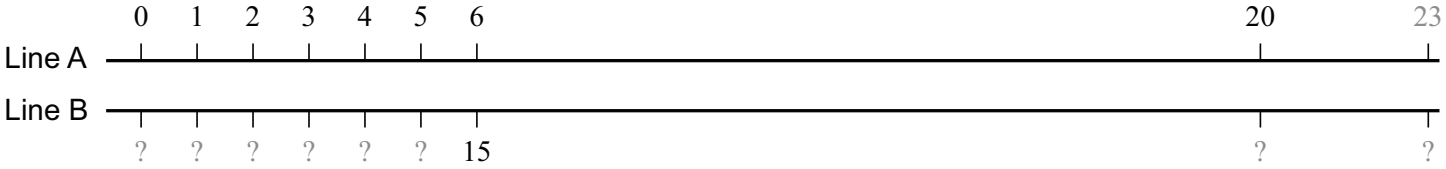


3 h) Ken has made two plan drawings of his bedroom.

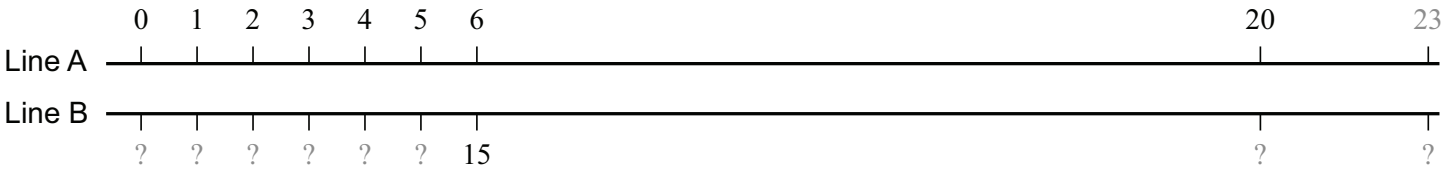
A line that is 6 cm long on plan A is 15 cm long on plan B.

Number the Plan B axis.

Lesson 2f, Stage 1:



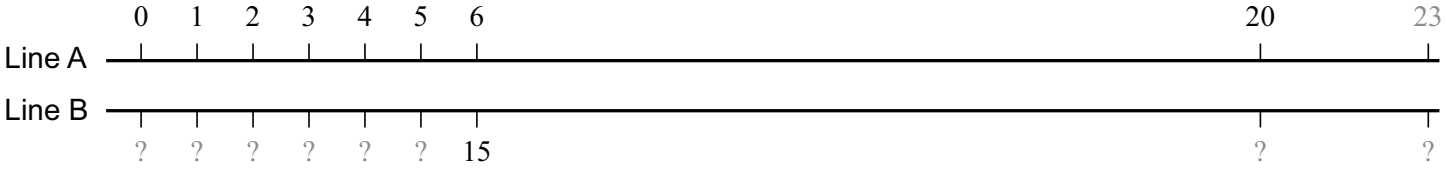
Lesson 2f, Stage 1:



1 a) i. When Jon is 20, how old is Lee?

ii. When Jon is 23, how old is Lee?

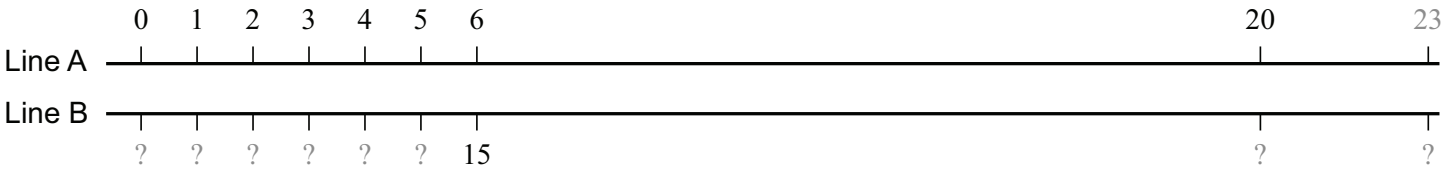
Lesson 2f, Stage 2:



b) i. How many litai are $20 worth?

ii. How many litai are $23 worth?

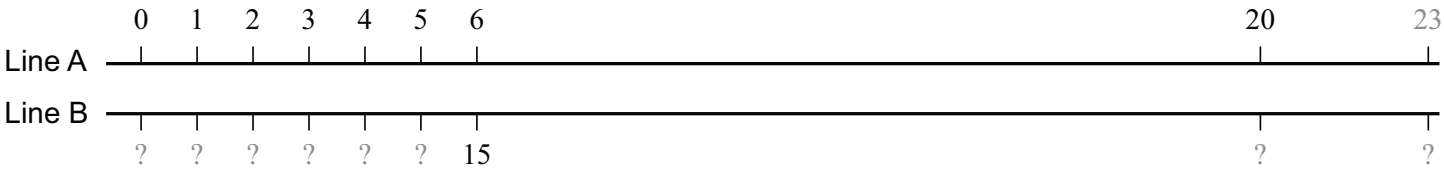
Lesson 2f, Stage 2:



c) i. How many pounds does Meg weigh when she is 20 months old?

ii. How many pounds does Meg weigh when she is 23 months old?

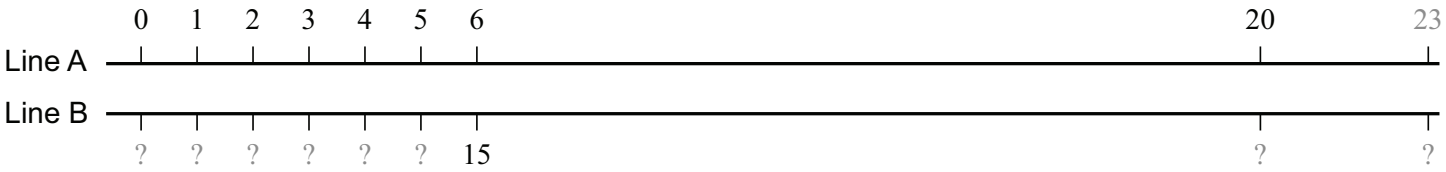
Lesson 2f, Stage 2:



d) i. How long does it take to cook 20 medium size potatoes?

ii. How long does it take to cook 23 medium size potatoes?

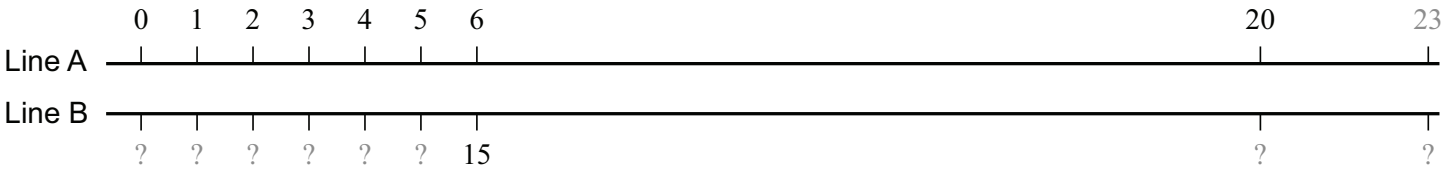
Lesson 2f, Stage 2:



e) i. What would a 20 ft length of the sterling silver wire cost?

ii. What would a 23 ft length of the sterling silver wire cost?

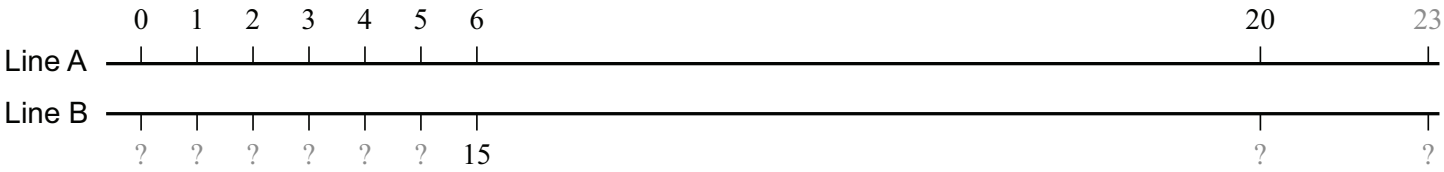
Lesson 2f, Stage 2:



f) i. What would Jenny be paid per hour if the £90 job took 20 hours?

ii. What would Jenny be paid per hour if the £90 job took 23 hours?

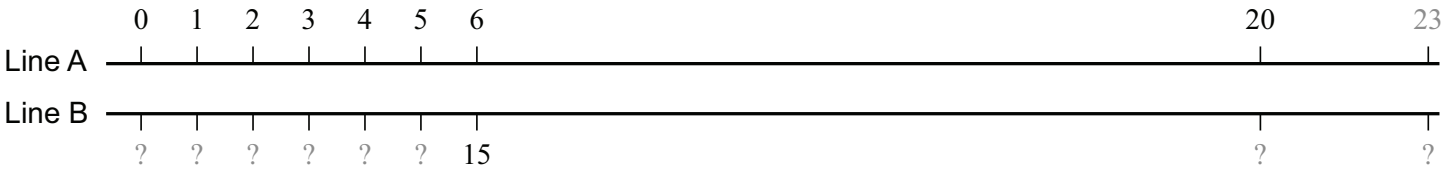
Lesson 2f, Stage 2:



g) i. What does a 20 cm wide cardboard disc weigh?

ii. What does a 23 cm wide cardboard disc weigh?

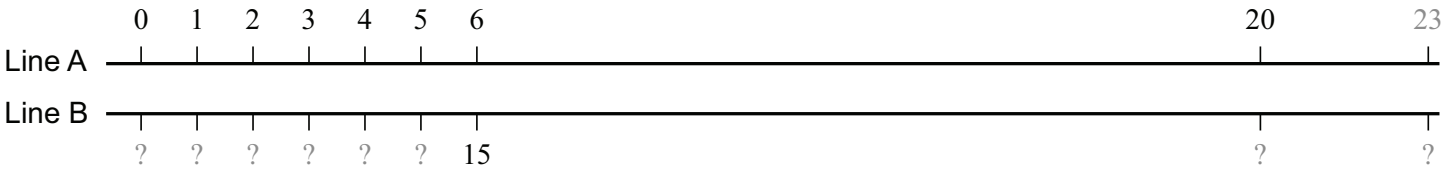
Lesson 2f, Stage 2:



h) i. How long is a line on Plan B that is 20 cm long on Plan A?

ii. How long is a line on Plan B that is 23 cm long on Plan A?

Lesson 2f, Stage 2:



2 a) For which of the situations can a mapping (eg 20 → ?) be solved just by multiplying by a specific number, whatever the input?

b) Make up other ‘stories’ where this is true.

Consider the statement below.

(Assume it is factually correct.)

Next month, passengers will see season tickets going up three times faster than their wages.

Chief Executive, Campaign for Better Transport

23 December 2013

http://www.bettertransport.org.uk/media/23-dec-rail-fares-formula-must-change

Campaign for Better Transport

Why is the statement not very helpful?

(Even if it is factually correct.)

Next month, passengers will see season tickets going up three times faster than their wages.

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Campaign for Better Transport