Reasoning and Problem Solving – Mixed Problems

1. Jardeen is an area manager. He has asked his store managers to offer discounts on pet food in their stores.

20% off SUPER SALE

Liverpool store

To… jardeen@superstore.co.uk

Subject Discounts

Hi Jardeen,

We're offering discounts of $\frac{1}{10}$ off all of our pet food.

Thanks,
Michelle, Store Manager, Bradford

Woofies
Was: £6
Now: £4.50

Halifax store

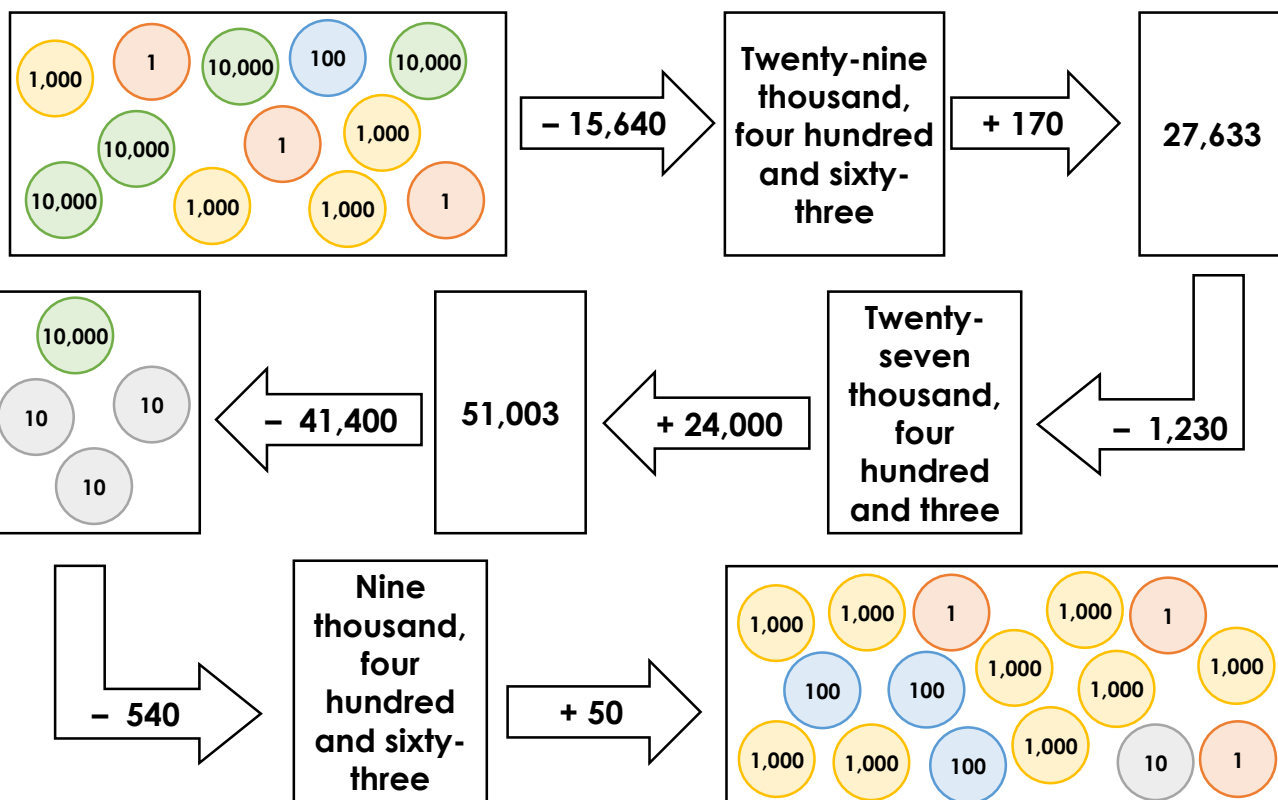$\frac{1}{3}$ off BIG DISCOUNT Sale

Manchester store

I've only paid 70% for my Woofies compared to before the discount!

Customer, Leeds

Order the stores' discounts on Woofies pet food from lowest to highest.

2. Dennis has created this maths puzzle but has made five mistakes. Find and correct them. The arrows should not change.
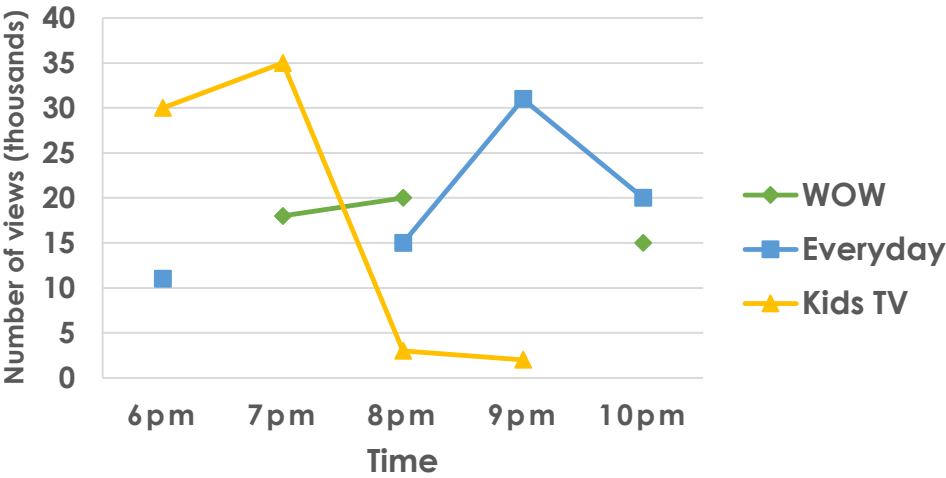
Counters: 1,000 1 10,000 100 10,000 10,000 1 1,000 10,000 1,000 1,000 1

− 15,640 → Twenty-nine thousand, four hundred and sixty-three **+ 170** → 27,633

− 1,230 ← Twenty-seven thousand, four hundred and three

Counters: 10,000 10 10 10   **− 41,400** ← 51,003 **+ 24,000** ←

− 540 → Nine thousand, four hundred and sixty-three **+ 50** →

Counters: 1,000 1,000 1 1,000 1 100 100 1,000 1,000 1,000 1,000 1,000 100 1,000 10 1

3. A production company gathered information about the viewing figures of their TV channels on a Thursday evening. The table shows the total viewing figures across the three channels.

TV Channel Viewing Figures

Time	Total viewing figures
6pm	56,000
7pm	67,000
8pm	
9pm	41,000
10pm	36,000

A. Fill in the missing parts of the line graph and table.
B. How many fewer people were watching WOW than Everyday at 10pm?
C. What could have happened at 9pm?

4. Darlene is a scientist and has measured the mass or capacity of some objects before and after a chemical reaction.

Object	Mass/capacity before	Mass/capacity after
Wax	600g	1.1lbs
Coal	1.5kg	3.7lbs
Sulphur	0.5lbs	250g
Water	2.6 pints	1.5L
Nitric acid	150ml	$\frac{1}{4}$ pint

Sort the objects into those which gained mass and those which lost mass/capacity.
Use 1 pint ≈ 568ml and 1kg = 2.2lbs.

Gained mass/capacity	Lost mass/ capacity

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5. Julie wants to go to the zoo with her family for her 7th birthday. The prices depend on their ages.

Ticket type	Price
Adult	£24.99
Junior (6-12 years)	£18.49
Infant (1-5 years)	£11.99
OAP (65 years +)	£22
Baby (< 12 months)	Free

Freddie
28
weeks

Polly
71
months

Jim
73
years

Henry
11 years
5 months

Jack
36
years

Archie
27
months

Sarah
86
months

Barb
38
years

Julie's mum, Barb, buys five of the tickets and spends £83.97. Whose tickets could she have bought?

6. Wilma the witch orders ingredients to make potions.

Number of packs bought	Ingredient			
	Beetle wings (pack of 6)	Bee wings (pack of 8)	Snot (one 10ml bottle)	Frog legs (pack of 9)
1-11	£2	£2.30	£18	£38
12-23	£1.50	£1.90	£15.70	£35
24 or more	£1	£1.25	£12.30	£32

A. She needs 1,153 beetle wings, 185 frog legs and 106ml of snot for a potion. What is the least expensive way to buy the ingredients? Explain your answer.

B. She currently buys 9 packs of bees wings every month for a ritual. She thinks she could save over £50 a year if she bought the same number of beetle wings each month instead. Is she correct? Explain your answer.

Reasoning and Problem Solving – Mixed Problems – Year 5 Expected

Reasoning and Problem Solving – Mixed Problems

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Subject	Discounts

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Woofies
Was: £6
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Halifax store

$\frac{1}{3}$ off BIG Sale

Manchester store

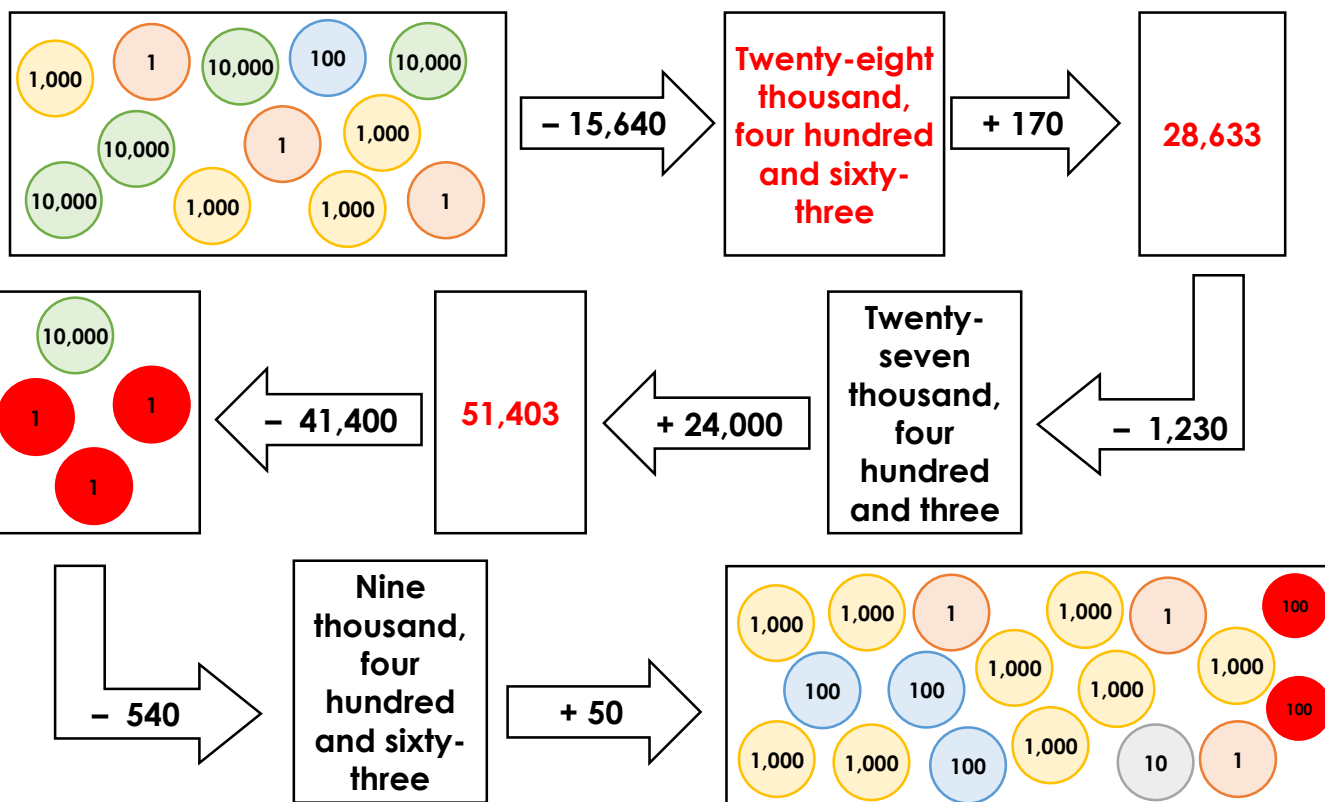I've only paid 70% for my Woofies compared to before the discount!

Customer, Leeds

Order the stores' discounts on Woofies pet food from lowest to highest.

Bradford (10%), Liverpool (20%) Halifax (25%) Leeds (30%), Manchester (33.3%)

2. Dennis has created this maths puzzle but has made five mistakes. Find and correct them. The arrows should not change.

Box: 1,000 1 10,000 100 10,000 10,000 1 1,000 10,000 1,000 1,000 1

− 15,640 →

Twenty-eight thousand, four hundred and sixty-three

+ 170 →

28,633

Box: 10,000 1 1 1

← **− 41,400**

51,403

← **+ 24,000**

Twenty-seven thousand, four hundred and three

← **− 1,230**

− 540 →

Nine thousand, four hundred and sixty-three

+ 50 →

Box: 1,000 1,000 1 1,000 1 100 100 100 1,000 1,000 100 1,000 1,000 1,000 100 1,000 10 1
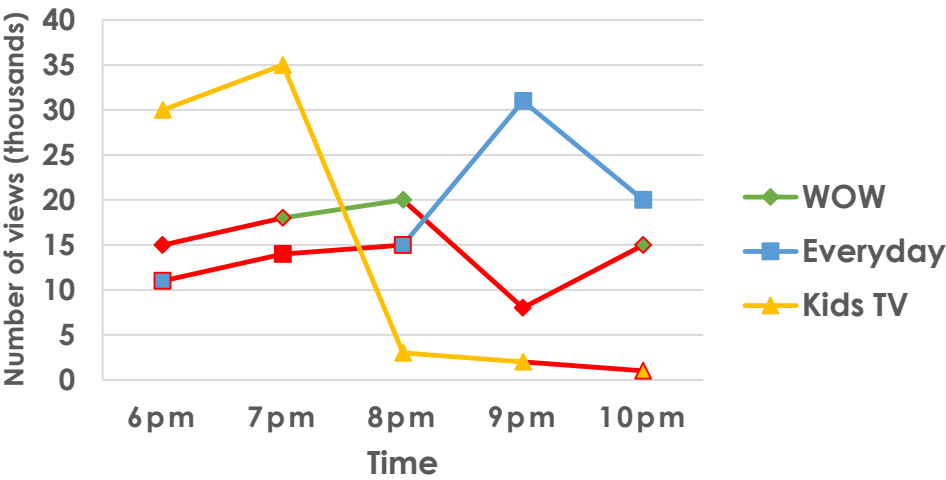
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8pm	38,000
9pm	41,000
10pm	36,000

A. Fill in the missing parts of the line graph and table.
B. How many fewer people were watching WOW than Everyday at 10pm? **5,000**
C. What could have happened at 9pm?

> Most people that were watching WOW started watching Everyday.

4. Darlene is a scientist and has measured the mass or capacity of some objects before and after a chemical reaction.

Object	Mass/capacity before	Mass/capacity after
Wax	600g	1.1lbs
Coal	1.5kg	3.7lbs
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Sort the objects into those which gained mass and those which lost mass/capacity. Use 1 pint ≈ 568ml and 1kg = 2.2lbs.

Gained mass/capacity	Lost mass/ capacity
Wax, Nitric acid	Coal, Sulphur, Water

Reasoning and Problem Solving – Mixed Problems

5. Julie wants to go to the zoo with her family for her 7th birthday. The prices depend on their ages.

Ticket type	Price
Adult	£24.99
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Infant (1-5 years)	£11.99
OAP (65 years +)	£22
Baby (< 12 months)	Free

Freddie 28 weeks Polly 71 months Jim 73 years Henry 11 years 5 months Jack 36 years Archie 27 months Sarah 86 months Barb 38 years

Julie's mum, Barb, buys five of the tickets and spends £83.97. Whose tickets could she have bought? **Various possible answers, for example:**

Her own, Julies, Jim's, Henry's and Freddie's.

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6. Wilma the witch orders potions.

Number of packs bought	Ingredient			
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12-23	£1.50	£1.90	£15.70	£35
24 or more	£1	£1.25	£12.30	£32

A. She needs 1,153 beetle wings, 185 frog legs and 106ml of snot for a potion. What is the least expensive way to buy the ingredients? Explain your answer.

She should buy 193 packs of beetle wings for £193, 21 packs of frog legs for £735 and 11 bottles of snot for £198, totalling £1,126.

B. She currently buys 9 packs of bees wings every month for a ritual. She thinks she could save over £50 a year if she bought the same number of beetle wings each month instead. Is she correct? Explain your answer.

No because she will only save £32.40 as she would spend £20.70 per month on bees wings and £18 a month on beetle wings.