

# Reasoning and Problem Solving

## Decimals – Year 6

### About This Resource

This resource is aimed at Year 6 Secure and has been designed to give children the opportunity to consolidate the skills they have learned in Spring Block 1 Decimals.

The questions are based on a selection of the same 'small steps' that are addressed in the block, but are presented in a different way so children can work through the pack independently and demonstrate their understanding and skills.

### Small Steps

Three decimal places

Multiply by 10, 100 and 1,000

Divide by 10, 100 and 1,000

Multiply decimals by integers

Divide decimals by integers

Division to solve problems

Decimals as fractions

Fractions to decimals

### National Curriculum Objectives

Mathematics Year 6: (6F9a) [Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places.](#)

Mathematics Year 6: (6F9b) [Multiply one-digit numbers with up to two decimal places by whole numbers.](#)

Mathematics Year 6: (6F9c) [Use written division methods in cases where the answer has up to two decimal places.](#)

Mathematics Year 6: (6F10) [Solve problems which require answers to be rounded to specified degrees of accuracy.](#)

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## Enter the Enterprise Race!

The school Easter Fayre planning is well under way and year 6 are being offered the chance to enter an enterprise competition.

Each entrant can develop a business idea for a stall to be run at the fayre.

You make choices along the way, competing with your friends in YOUR class to see who has the most profit at the end of this pack. Take care with your calculations, one decimal out of place could be the difference between GLORY and DISASTER!

### Make Your Choice...

Which enterprise would you like to run? Read each description carefully.



#### Henna Tattoos

Your stall will offer whole hand, ring and bracelet patterns or small arm decorations.

Tick to show your choice

#### Design T-Shirts

Children can have their name put on the local football team's shirt. The football club have donated last seasons shirts.

Tick to show your choice

#### Handmade Soap

You will make and sell handmade soaps in a range of soothing scents.

Tick to show your choice

#### Vinyl Vases

Your eco friendly stall will recycle old vinyl records, melting them to shape into bowls, vases and bookends to sell.

Tick to show your choice

Now you have your choice, you will need to complete calculations using the details for your stall. Take note of your stall colour and work your way through the pack, take care every decision from what you spend to how much you charge will impact on your final score!!

**GOOD LUCK!**

Here's hoping you can beat the competition and come out on top!

**YOUR ENTERPRISE ADVENTURE STARTS HERE!**

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## Reasoning and Problem Solving – Decimals – Year 6

1. Last year's budget has been increased by a huge 10x the amount! Last year each class was awarded £342.95 per class. In your class there are 30 children. Calculate your personal budget (rounding to the nearest pence).

2. Costs are listed below. Decide how to spend your budget dependant on the costs outlined for your choice of stall. There are expected to be one customer per 0.1 of an hour. You can run your stall for 4 hours. The head teacher has advised you account for  $\frac{1}{4}$  extra customers in case of an unexpected rush. How many customers will you need to cater for?

3. You have been supplied with the following supply lists. Decide how much to order and calculate your costs. Make sure you remain within budget.

Henna Tattoos	
Henna pouches	£1.35
Baby wipes 1000	£1.49
Pattern Overlays	
Ring	£0.50
Bracelet	£0.75
Hand	£0.99
Arm	£0.64

Design T-Shirts	
Sticky alphabet letters	£1.50
100 per pack	
Sticky Number packs	
1 – 15	£0.75

Handmade Soap	
Oils	£2.56
Scents	£1.75
Moulds	£2.54
Bags	£3.99
Oats	£0.93

Vinyl Vases	
Records 2 <sup>nd</sup> hand	
Pack of 10	£2.34
Pack of 100	£4.50
Pack of 1000	£7.43



4. Now work out the cost to you per customer.

You have a choice of three price levels: bargain, basic or gold.

£3.50

£5.49

£5.99

Decide which you think will benefit your project the most, tick your choice.

Remember price might affect whether customers choose to come to your stall, as well as your profit.

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5. The aim of your stall is to repay the original budget and make more money beyond that. How many customers will you need to pay back your loan amount?

The stalls are all set up and ready to run time to roll up your sleeves!  
Make sure your customers get a good service!

6. For the last half hour of the fayre you decide to reduce your price by  $\frac{1}{10}$  to get rid of all your stock and make as much money as you can in the last half hour.

Calculate your new price.



7. Time to count up your takings!

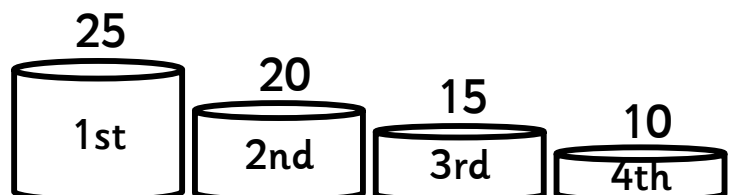
Remember your price level? Time to find out how your choice affected your takings. Use your cost per customer and price, plus the customer numbers below to calculate your profit...

Profit Level	Number of Customers	Profit
Bargain	43	
Basic	54	
Gold	36	

8. Points are awarded for customer satisfaction, happy customers return for more next time! Using a questionnaire, customer satisfaction was collected for each stall. Convert the results, presented in fractions, to decimals.

Henna Tattoos	$\frac{25}{50}$	$\frac{7}{50}$	$\frac{5}{50}$
Design T Shirts	$\frac{20}{25}$	$\frac{5}{25}$	$\frac{0}{25}$
Handmade Soaps	$\frac{7}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
Vinyl Vases	$\frac{30}{50}$	$\frac{10}{50}$	$\frac{0}{50}$

Those with the most positive feedback () come first, the least 4<sup>th</sup>. Award yourself points based on your position.



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9. The next points were awarded from 3 ballots; governors, teachers and visitors voted for the winner based on stall design, popularity and professionalism.

The results are below.

Who gained the most votes?

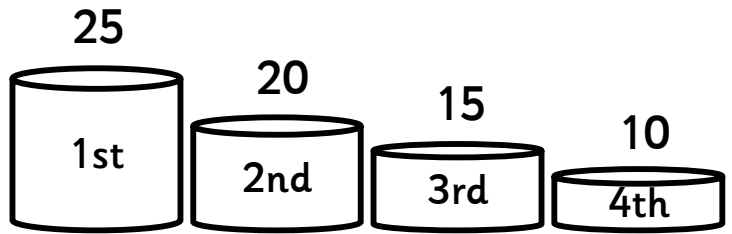
You will need to convert fractions to decimals to find out who gained the most.

FRACTIONS	Henna	Shirts	Soap	Vinyl
Governors	$\frac{2}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$
Teachers	$\frac{2}{10}$	$\frac{5}{10}$	$\frac{2}{10}$	$\frac{1}{10}$
Visitors	$\frac{4}{50}$	$\frac{4}{50}$	$\frac{9}{25}$	$\frac{18}{25}$

DECIMALS	Henna	Shirts	Soap	Vinyl
Governors				
Teachers				
Visitors				

Convert each vote to decimals to compare and order each stall 1<sup>st</sup> to 4<sup>th</sup>.

Now award points to yourself dependent on the position of your stall in question 9. Add these to your points from question 8 (e.g. 1<sup>st</sup> in q8 25, 2<sup>nd</sup> in q9 20, overall points 45.)



### Final results!

10. To calculate your final score in the competition multiply your profit by the sum of your scores in question 8 and 9 this is your final score.



Compare with your classmates and see who has run the most successful stall. Good luck hope you come out on top!

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Please note: Children's answers may vary as this resource encourages decision making which will then impact on the final score. Children can compete within the class to see who makes the best entrepreneur.

1. £114.32
2. 50 customers
3. Calculations will depend on the choices made by each child, total of spend should not exceed budget in question 1. Ensure answer rounded to 2 decimal places and presented as a cost in £ and p.
4. Will vary dependent on answers to qu 2 and 3. Answer = question 3 total spend ÷ 50.
5. Will vary dependent on answers to qu 4. Answer = 114.32 ÷ value in question 4 ensure answer rounded to whole customers!
6. Three possible answers dependant on choice in question 4:  
BARGAIN = £3.15    BASIC = £4.94    GOLD = £5.39 (answers rounded to nearest pence)
7. Four possible versions dependant on choices in previous sections. Answer calculated as follows:  
(Price x number of customers) – (cost per customer in Qu 4 x number of customers)

8.

	😊		😐		☹️	
Henna Tattoos	$\frac{25}{50}$	0.5	$\frac{7}{50}$	0.14	$\frac{5}{50}$	0.1
Design T Shirts	$\frac{20}{25}$	0.8	$\frac{5}{25}$	0.2	$\frac{0}{25}$	0
Handmade Soaps	$\frac{7}{10}$	0.7	$\frac{1}{10}$	0.1	$\frac{1}{10}$	0.1
Vinyl Vases	$\frac{30}{50}$	0.6	$\frac{10}{50}$	0.2	$\frac{0}{50}$	0

Order of stalls: Design T-shirts 1<sup>st</sup>; Handmade Soaps 2<sup>nd</sup>; Vinyl Vases 3<sup>rd</sup>; Henna Tattoos 4<sup>th</sup>

9.

	Henna	Shirts	Soap	Vinyl
Governors	0.4	0.2	0.2	0.2
Teachers	0.2	0.5	0.2	0.1
Visitors	0.08	0.08	0.36	0.72
total	0.68	0.78	0.76	1.02

10. Order of stalls question 9: Vinyl 1<sup>st</sup>, Shirts 2<sup>nd</sup>, Soaps 3<sup>rd</sup>, Tattoos 4<sup>th</sup>

Profit calculated in question 7 (dependant on child's choice of spending) will be multiplied by the following to calculate final score:

Henna	x20
Shirts	x45
Soaps	x30
Vinyl	x50