

Stimulus question 87

Discount Vouchers

A large department store sends vouchers to its account customers, offering discounts when they spend certain amounts of money. The cards have to be used during a special sale period that lasts only four days, and you are not allowed to use more than one voucher in one transaction. The vouchers are:

<p>£2 OFF</p> <p>WHEN YOU SPEND £20 OR MORE IN STORE.</p> <p>You must pay using your store card, from October 28th to November 1st.</p>	<p>£3 OFF</p> <p>WHEN YOU SPEND £30 OR MORE IN STORE.</p> <p>You must pay using your store card, from October 28th to November 1st.</p>	<p>£5 OFF</p> <p>WHEN YOU SPEND £50 OR MORE IN STORE.</p> <p>You must pay using your store card, from October 28th to November 1st.</p>
<p>£10 OFF</p> <p>WHEN YOU SPEND £80 OR MORE IN STORE.</p> <p>You must pay using your store card, from October 28th to November 1st.</p>	<p>AUTUMN CLEARANCE</p>	<p>£20 OFF</p> <p>WHEN YOU SPEND £100 OR MORE IN STORE.</p> <p>You must pay using your store card, from October 28th to November 1st.</p>
<p>£30 OFF</p> <p>WHEN YOU SPEND £150 OR MORE IN STORE.</p> <p>You must pay using your store card, from October 28th to November 1st.</p>	<p>£40 OFF</p> <p>WHEN YOU SPEND £200 OR MORE IN STORE.</p> <p>You must pay using your store card, from October 28th to November 1st.</p>	<p>£50 OFF</p> <p>WHEN YOU SPEND £250 OR MORE IN STORE.</p> <p>You must pay using your store card, from October 28th to November 1st.</p>

Discount Vouchers

You want to buy 5 items that cost: £14.99, £52.99, £39.99, £8.99 and £10.99. What discount should you achieve?
How much should you spend? Show your working.

Discount Vouchers scoring

Full credit

States that £22 of vouchers may be used.

Gives a total spend of £127.95 - £22 = £105.95

Working:

Estimates the total amount to be about £128, so tries to identify ways of using £120 worth of vouchers.

Organises two total purchases.

Either £52.99, £39.99, and £8.99, totalling £101.97 and £14.99 and £10.99, totalling £25.98.

Or £52.99, £39.99, and £10.99, totalling £103.97 and £14.99 and £8.99, totalling £23.98.

In each case, the £20 voucher may be used for the first shop and the £2 voucher for the second.

Partial Credit

Offers the answer £20, by not considering the opportunity to split the shopping.

All calculations are otherwise correct, and amounts of money are written correctly.

No credit

Any other response

Support

- Calculators only if necessary – this should be mental work.
- Do you have to do all your shopping at one time?

Teachers may wish to explore real-life vouchers with their classes. This example was based on a well-known department store, but many fast food outlets (pizzas, burgers etc.) offer discount vouchers, which an online search would reveal.

Extension questions (Calculators will be needed here).

- a) What percentage discount are you achieving?
- b) What is the maximum percentage discount you could achieve in this offer?
- c) You see another item in the store that is priced at £24.99. You are not sure whether to buy it at that price, but how much extra would it cost you on your total shopping?

Extension solutions:

- a) $(22 / 127.95) \times 100 = 17.2\%$
- b) 20%
- c) You would be able to use the £30 discount voucher, as the total shop would cost more than £150, saving an extra £8. This means that the other item will only cost an additional £16.99.

GCSE Subject Content		
Foundation	Intermediate	Higher
Addition, subtraction, multiplication and division of whole numbers, decimals, fractions and negative numbers.		
Finding a fraction or percentage of a quantity.		
Expressing one number as a fraction or percentage of another.		
Estimating and approximating solutions to numerical calculations.		
Interpretation and use of mathematical information presented in written or visual form when solving problems.		
Money: The basic principles of personal and household finance, including discount.		

Developing numerical reasoning

Identify processes and connections

- Prioritise and organise the relevant steps needed to complete the task or reach a solution
- Choose an appropriate mental or written strategy and know when it is appropriate to use a calculator
- Identify, measure or obtain required information to complete the task
- Identify what further information might be required and select what information is most appropriate
- Select appropriate mathematics and techniques to use
- **Develop and evaluate mathematical strategies and ideas creatively**

Represent and communicate

- Explain results and procedures precisely using appropriate mathematical language
- Use appropriate notation, symbols and units of measurement, including compound measures

Review

- Select and apply appropriate checking strategies
- Interpret answers within the context of the problem and consider whether answers are sensible
- **Explain and justify strategies, methods, reasoning and conclusions in a variety of different ways**