



# Cambridge IGCSE™

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**COMPUTER SCIENCE**

**0478/23**

Paper 2 Problem-solving and Programming

**May/June 2020**

PRE-RELEASE MATERIAL

No additional materials are needed.

**This material should be given to the relevant teachers and candidates as soon as it has been received at the centre.**

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## INSTRUCTIONS

- You should use this material in preparation for the examination.
- You should attempt the practical programming tasks using your chosen high-level, procedural programming language.

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Your preparation for the examination should include attempting the following practical tasks by **writing and testing a program or programs**.

A school snack shop sells the following items:

Category	Item code	Description	Price (\$)	Healthy?
Fruit	FR1	Apple	1.00	Yes
Fruit	FR2	Banana	1.25	Yes
Fruit	FR3	Orange	1.00	Yes
Fruit	FR4	Peach	1.30	Yes
Sandwich	SN1	Cheese	1.75	Yes
Sandwich	SN2	Cheese and Tomato	2.20	Yes
Sandwich	SN3	Chicken	2.00	Yes
Sandwich	SN4	Chicken Salad	2.35	Yes
Sandwich	SN5	Salad (Vegetarian)	2.00	Yes
Crisps	CR1	Salted	1.00	No
Crisps	CR2	Cheese and Onion	1.00	No
Crisps	CR3	Barbecue	1.00	No
Crisps	CR4	Prawn Cocktail	1.00	No
Confectionery	CN1	Biscuits	0.95	No
Confectionery	CN2	Chocolate Bar	1.05	No
Confectionery	CN3	Toffee and Chocolate Bar	1.25	No
Confectionery	CN4	Chocolate Wafers	1.30	No
Drink	DR1	Cola	1.20	No
Drink	DR2	Lemon and Lime Soda	1.20	No
Drink	DR3	Orange Soda	1.20	No
Drink	DR4	Orange Juice	1.50	Yes
Drink	DR5	Apple Juice	1.50	Yes

Write and test a program or programs for this snack shop.

- Your program or programs must include appropriate prompts for the entry of data; data must be validated on entry.
- Error messages and other output need to be set out clearly and understandably.
- All arrays, variables, constants and other identifiers must have meaningful names.

You will need to complete these **three** tasks. Each task must be fully tested.

**Task 1** – Setting up the system to show the items for sale and to allow items to be selected

Write a program to:

- use arrays to store the item code, description, price and whether or not the item is healthy
- allow a customer to choose an item to purchase
- output the description of each chosen item, its price and whether or not it is healthy
- allow the customer to choose additional items until they decide to stop
- calculate and output the total price of the chosen items.

**Task 2** – Specifying quantities and introducing restrictions

Extend **Task 1** to:

- allow the customer to input the quantity of each item they would like to purchase
- count the number of healthy and unhealthy items chosen by the customer. For example, two apples and a peach count as three healthy items
- check that the customer has chosen at least one healthy item for every two unhealthy items. If so, allow the customer to make the purchase. Otherwise, the purchase cannot proceed, a message is output to say the purchase is cancelled and the customer has to start again.

**Task 3** – Offering discounts

Extend the program to:

- **either** apply a 10% discount to the total price, when purchasing both healthy **and** unhealthy items, only if the number of healthy items matches or exceeds the number of unhealthy items
- **or** apply a 20% discount to the total price if all the items purchased are healthy items
- calculate then output the new total price and the amount of money saved.

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