



Assessment: Mathematical Modelling: Get it while it's hot!

Assessment task

Use mathematical modelling to solve a problem related to owning and running a pizza store. Students will formulate and solve the problem, justifying their choices.

Guidance:

Assessing student understanding of mathematical modelling can be carried out effectively by setting practical problems that require students to apply mathematical concepts, procedures or structures to find a solution and communicate these findings.

The assessment of student understanding for this task will involve students to use additive and multiplicative thinking to determine the profit made annually. They will be required to formulate a number sentence to suit the problem and choose efficient calculation strategies.

A simple calculation might look like:

$$100 \text{ pizzas} \times \text{Price of a Pizza} - \text{Cost to make pizza} = \text{Profit Margin}$$

Note, if the cost to make the pizza is greater than the price paid by customers the answer will be a negative number and Sam will be running his business at a loss.

Provide students with this task to be completed individually. Time can be given initially to clarify the scenario. Do not use this time to model or teach any mathematical skills or concepts, rather allow students to articulate any wonderings they may have aloud. If a student asks if they need to calculate the cost of ... [insert idea] respond with a question to prompt students' further thinking. Encourage students to think about how they would plan the fundraiser and focus on what maths is required.

Assess how a student approaches the task by noting if they:

- understand the context and can identify the mathematical problem
- use a strategy to approach problem solving
- apply mathematical concepts required to model a solution to the task
- evaluate the effectiveness of their approach in finding a solution
- communicate the solution to others, justifying their process

To complete the task, provide ample time for students to firstly consider the problem and then think about ways to model their solution mathematically.



Mathematical Modelling: Get it while it's hot!

Task:

Sam owns a small Italian restaurant and makes and sells his own pizza. His wife Julie helps in the restaurant serving customers. On average they sell about 100 pizzas a week.

Pizza	Small	Medium	Large
Margherita	\$5	\$8	\$12
Hawaiian	\$6	\$10	\$13
Vegetarian	\$6	\$10	\$13
Sam's Special	\$7	\$12	\$15

1. What is the most money Sam and Julie could make in a month?
2. How can you calculate the amount of money made in a year? What mathematics can you use to help you?
3. How much does it cost Sam and Julie to own and run the restaurant?
4. Is there a way you could cut down on these costs to make it more profitable?
5. Is owning the restaurant a good investment for Sam and Julie? Explain your thinking.