"This is a new way to learn maths… you had to decide what maths to do with that task"

Developing financially literate children


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This article from Carly Sawatzki and Peter Sullivan encourages schools and teachers to consider ways to embed financial literacy tasks in mathematics lessons more often, and includes an authentic task to try with your students.

Most children bring significant prior understandings about money to school. This learning begins at home and in the local community from a very young age. Children observe their parents' financial values and behaviour. They influence and participate in family spending. They are privy to conversations about value for money and making savings. When given cash or gift cards on special occasions, they practice making their own purchasing decisions.

Meanwhile, what it means to be financially literate is changing. Financial products and services are increasingly complex and technological advancements are pushing us towards a cashless society. To participate confidently in the economy, young people need a greater range of knowledge, skills, and capabilities than ever before.

This article argues the importance of preparing financially literate students and encourages schools and teachers to consider ways to embed financial literacy tasks in mathematics lessons more often.

The importance of connecting mathematical and financial literacies

The OECD PISA results provide an overall picture of Australian 15-year-olds' ability to apply their learning to real-life problems and decisions. In 2015, there was a strong correlation between mathematics and financial literacy performance (OECD, 2017). This suggests that mathematics and numeracy education can contribute to improving financial literacy learning outcomes.

Consumer and financial literacy feature explicitly in the *Australian Curriculum*. Within Mathematics, the Number and Algebra content strand includes 'Money and financial mathematics' as a sub-strand from Years 1–10 (ACARA, 2019a). Within Humanities & Social Sciences (HaSS)—Economics & Business, 'Consumer and financial literacy' is one of four key organising ideas. Here, students explore how making responsible and informed decisions about consumer issues, money management, and assets can affect the individual's and the community's quality of life, sense of security and awareness of future options (ACARA, 2019b). Teaching and learning through practical financial problems connects these two learning areas.

Of course, practical financial problems also provide contexts that are meaningful for students and which allow them to apply previously learned conceptual understandings, including place value, mathematical operations, efficient calculation strategies, and reasoning.

Classroom research exploring children's financial problem-solving and decision-making has shown that students make various social and cultural arguments when faced with worded money-related mathematical problems, and these arguments can influence the way they mathematise when solving tasks (Sawatzki & Sullivan, 2017; Sawatzki & Goos, 2018). The following is an example of this approach.

The Fish 'n Chips task

The Fish 'n Chips task (see Figure 1) has been trialled and researched in a range of upper primary classroom settings in Australia and New Zealand. The idea for the lessons arose from a conversation with a teacher who commented that her Year 5 and 6 students often rode their bikes to the local shops to order and collect take-away meals for their families. The lessons were designed to prompt students to read, interpret and make decisions about tabulated price information. This is an important aspect of financial literacy, with the literacy and numeracy demands being applicable

Pricing information

Fish	
Flake	$5.00
Whiting	$6.00
Barramundi	$7.00
Snacks	
Chicken nuggets	$0.80 each
Dim sims	$1.00 each
Potato cakes	$0.80 each
Chips	$3.00 small $5.00 medium $7.50 large

Family Deal 1	
4 Flake 4 Whiting Large chips	$22.50
Family Deal 2	
6 Flake 6 Potato cakes Large chips	$30.00
Kids' Packs	
6 Chicken nuggets + small chips	$6.00 each

Sam is ordering fish and chips for a family get-together. There will be 6 people—Sam, his wife, his 2 children, and his parents. Sam's family usually order 2 flake, 2 potato cakes, small chips, and 2 kids' packs. Sam's parents share their order of 2 flake, 2 potato cakes, and small chips.

Lesson 1

Give two options how Sam might place the order. Explain which option offers the best value for money.

Lesson 2

Should Sam suggest sharing the total cost of the bill? If so, how might the bill be shared?

Figure 1. Fish 'n Chips.

to a range of financial problems—for example, making sense of more complex product and service offerings marketed by banks and mobile phone providers.

Lesson 1 requires students to give two options of how Sam might place the order—a task intended to promote the idea that most financial problems and decisions involve choices to be identified and carefully evaluated. This lesson has the potential to engage students in additive and multiplicative thinking. The requirement that students then explain which option offers the best value for money is intended to promote discussion about best buy scenarios and the social and cultural values that influence students' perceptions of these. Students have been found to estimate quantities required to meet, rather than exceed the family's needs and debate notions of affordability (Hunter & Sawatzki, 2019).

Lesson 2 requires students to consider ways that the total cost of the bill might be shared, introducing the idea that financial decisions can impact others. This engages students in productive if not heated discussion as they debate whether Sam should shout the family dinner or suggest splitting the bill equally or proportionally. In this way, the lesson has the potential to engage students in multiplicative thinking and proportional reasoning.

Specific curriculum connections included

- The Mathematics curriculum specifies that Year 6 students learn to "select and apply efficient mental and written strategies and appropriate digital technologies to solve problems involving all four operations with whole numbers" (ACMNA123).
- The Literacy capability specifies that students use literacy "to understand and interpret word problems and instructions that contain the particular language features of mathematics. They use literacy to pose and answer questions, engage in mathematical problem-solving, and to discuss, produce and explain solutions" (ACARA, 2019c).
- The Numeracy capability specifies that students learn "to apply mathematical understanding and skills in context, in other learning areas and in real-world contexts. A particularly important context for the application of Number and Algebra is financial mathematics" (ACARA, 2019d).

Fish 'n chips is intended to be taught using the three phase Launch, Explore and Summary lesson structure (Lappan et al., 2006). After the initial launch of the task, students work individually or in groups to explore

the problem, begin to mathematise it and work to construct a solution strategy. During this time, the teacher's role is to observe students' interactions, noting key insights and selecting the solution strategies to be discussed in the summary phase of the lesson. The summary phase of the lesson involves bringing all students together to share and discuss two to three purposefully selected solution strategies.

Five important pedagogical considerations

- Use stories, pictures and/or role play relevant to your local context to help students imagine and relate to the problem.
- Make sure students record their mathematical working and their explanations.
- Remind students to find, compare, and contrast different options.
- Ask students to convince you that their decision is based on sound social, cultural and mathematical thinking.
- Remind students to check the appropriateness of their solution against the problem.

What makes Fish 'n Chips effective?

Teachers have reported that lessons like Fish n Chips are challenging yet accessible for diverse students—meaning most students have eaten take-away food before and some have been involved in the process of placing and paying for orders.

The task is authentic and useful. Mathematical processes seem to be activated when students see a need to do mathematics and feel they have something to contribute to class discussion. Students see merit in learning to read and interpret tabulated pricing information. Consider these comments by upper primary students:

> This is a new way to learn maths... you had to decide what maths to do with that task...

> I think [tasks like Fish n Chips] helped my learning. Because you worked on skills that you already had, but they made you put them all together. So technically it's a new skill. Putting them together and using all of them at the same time.

Reflect and discuss with your colleagues

Purchasing take-away food is an example of an everyday situation where literacy and numeracy must be applied to make sense of tabulated price information. Can you think of other everyday situations and financial problems that your students might find authentic and useful?

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