Introduction

Where should financial literacy instruction fall in our middle and high school curricula? Is it the responsibility of the social studies teachers? The mathematics teachers? Should it be taught as a special course for all students? With college student loan debt at an all-time high (70 percent of college students graduate with debt averaging $35,000 [Fidelity Investments 2013]), more than 1.1 million property foreclosure filings in the United States in 2014 (RealtyTrac 2015), and more than half of consumers carrying forward credit card debt within a year's time (Statistic Brain Research Institute 2015), perhaps the answer to the question should be "All of the above"! If you are like many adults, you *wish* that your own education had included more instruction in how to make decisions about auto insurance, ways to save for retirement, options for getting short- and long-term loans, and so on. More than half of today's teens (52%) wish they knew more about how to manage their money. In particular, they want to learn more about budgeting (80%), saving (75%), and investing (67%) (Capital One 2012). All of these topics involve a significant amount of knowledge about mathematics and about finances.

Why Teach Financial Literacy?

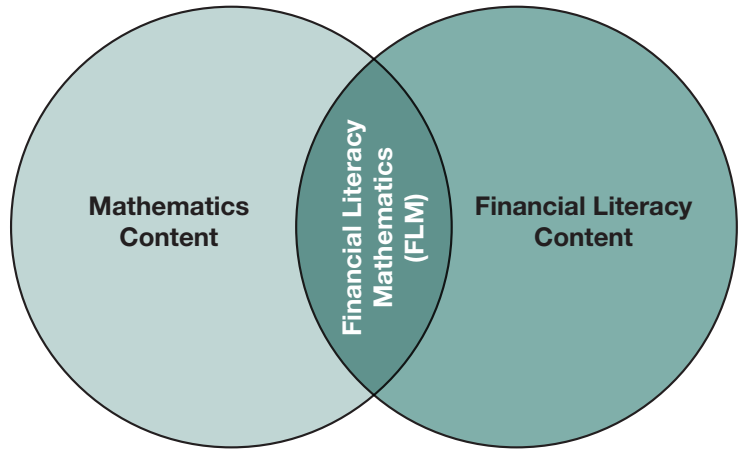
At the same time that K–12 schools are being asked to infuse financial literacy into their curricula, mathematics teachers are trying to implement the Common Core State Standards (CCSS), or similar rigorous standards for mathematics. It is already a major undertaking just to teach the content deeply and to engage students in ways that will develop the mathematical proficiencies outlined in the Common Core's Standards for Mathematical Practice. So why invest in financial literacy? Here are a few reasons to consider:

- Students who learn about financial literacy make better financial decisions. They are more likely to save; they are less likely to max out credit cards (and, in fact, are more likely to pay them off in full); and they are less likely to buy things compulsively (Gutter, Copur, and Garrison 2010).
- A major contributor to financial illiteracy is mathematical innumeracy. For example, adults often mistake sales promotions of "Additional 20% off of 40% off" as equivalent to 60% off. They frequently do not understand compound interest, therefore believing that paying off the minimum balance on a credit card will pay off their purchases with little long-term consequence.
- Explicitly teaching how to manage finances is a social justice issue! Financial illiteracy is a barrier for low-income households. In particular, financial illiteracy commonly results in acquiring high-cost mortgages, paying the minimum balance on credit cards, and being delinquent on debt (President's Advisory Council on Financial Capability 2013).
- Mathematics *is* useful. Students often do not see this. Connecting mathematics to finance, especially when finance is a central focus of lessons, can help students see the power of mathematics.
- Financial literacy, if taught outside a mathematics course, often doesn't address the mathematical aspects of financial literacy, including the common misconceptions just mentioned. Mathematics teachers can help bridge the fields of mathematics and finance.

How Do You Teach Financial Literacy in Mathematics?

If you are convinced it is important to include financial literacy in mathematics lessons, the question becomes *how*? There are numerous financial literacy resources to use, many of them readily available online. The Jump$tart Coalition for Personal Financial Literacy's *National Standards in K–12 Personal Finance Education* (2015) is an excellent resource for deciding what is important for students to learn. Practical Money Skills for Life (http://www.practicalmoneyskills.com), whose motto is "financial literacy for everyone," also provides excellent background in financial literacy, as well as lessons and other resources for teachers. A real issue when figuring out how to incorporate financial literacy into instruction is finding time to do so in a tight curriculum. The key is to *infuse* financial literacy ideas within curriculum content goals, rather than to merely *insert* more topics into the curriculum. It follows, then, that teachers need lessons that infuse financial literacy into instruction while at the same time meeting the mathematics goals outlined in the standards for their grade or course. That is what *On the Money* is designed to do! We have prepared fourteen lessons—Financial Literacy Mathematics (FLM) lessons—that include important content from both mathematics and financial literacy. Many of the lessons can span several days or be taught in a single day.

An FLM lesson does more than just use money as a context for a mathematical problem or discussion. It also has goals and outcomes related to financial literacy. Conversely, a financial literacy lesson is not a mathematics lesson unless it includes goals and outcomes related to mathematics. Consider an FLM lesson as a lesson that addresses content in the overlapping region of a Venn diagram:



As this visual implies, not all mathematics is directly related to financial literacy (e.g., angle measures in geometric shapes) and many aspects of financial literacy are not directly related to mathematics (e.g., summarize major consumer protection laws). But there is a significant amount of overlap in the two domains. The content for the lessons in this book lies in the intersection of these two areas of study. We studied both financial literacy and mathematics standards, seeking authentic ways to engage in *both* financial literacy and mathematics. Each lesson includes goals and outcomes for mathematics (from the CCSSM standards) and for financial literacy (from the Jump$tart Standards). Higher-level questions are targeted at the mathematics content (and the Standards for Mathematical Practice) and at personal finance. Each chapter includes the following elements:

- A "Bottom Line" summary of what students will do and learn in the chapter
- A listing of the specific Common Core content standards and mathematical practices and the Jump$tart financial literacy standards met by the lesson

- A "Balance Sheet" summary of the mathematical and financial literacy knowledge being engaged, as well as a consideration of what students may bring to (and take away from) the lesson
- A full lesson plan—complete with sections on the "Sales Pitch," "Opening," "Fine Print," and "Closing the Deal"—designed to meet one or more particular learning targets
- References to downloadable activity sheets and other material available at this book's page on NCTM's More4U website
- "Growth Opportunities" that can be used as suggestions for extended learning, and a listing of references and resources

If you are a teacher of mathematics, we hope that you will look at your mathematics curriculum, consider where one or more of these lessons provide a good fit, and incorporate them to strengthen your students' mathematics content knowledge, as well as their financial literacy. The lessons may be used to replace or extend textbook lessons or used as additional or enrichment experiences (such as for students who have an additional period of mathematics or are engaged in after-school enrichment).

If you are a teacher of financial content, we hope you will incorporate these FLMs to develop the mathematics related to the financial literacy standards you are teaching. (Twenty-two states require students to take an economics course and seventeen require a personal finance course requirement for graduation [Council for Economic Education 2014]). Many financial literacy resources do not include a strong mathematics component, and, as noted above, mathematical numeracy is central to financial literacy.

Few skills are more central to being a successful citizen than being financially literate. Middle school is not too soon to begin emphasizing financial literacy within the mathematics curriculum. With repeated experiences throughout each year and across the mathematics curriculum, students can begin to understand how to manage their money, make good financial decisions, and prepare for their futures, while also learning how to use mathematics and see its value and power.

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