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PISA 2012 Financial Literacy Framework

PISA 2012 is the first large-scale international study to assess the financial literacy of young people. This framework is the first step in constructing a financial literacy assessment of international scope by providing an articulated plan for developing items, designing the instrument and providing a common language for discussion of financial literacy. This framework provides a working definition for financial literacy and organises the domain around the content, processes and contexts that are relevant for the assessment of 15-year-old students. Content areas described by the framework include *money and transactions*, *planning and managing finances*, *risk and reward* and *financial landscape*. The framework covers *identify financial information*, *analyse information in a financial context*, *evaluate financial issues*, *apply financial knowledge and understanding*, and the *education and work*, *home and family*, *individual* and *societal* contexts. These areas are illustrated with 10 items. Additionally, the framework discusses the relationship of financial literacy to non-cognitive skills and to both mathematics and reading literacy, and the measurement of students' financial behaviour and experience.



INTRODUCTION

The importance of financial literacy

In recent years, developed and emerging countries and economies have become increasingly concerned about the level of financial literacy of their citizens. This has stemmed in particular from shrinking public and private support systems, shifting demographic profiles including the ageing of the population, and wide-ranging developments in the financial marketplace. Concern was also heightened by the challenging economic and financial context with the recognition that lack of financial literacy was one of the factors contributing to ill-informed financial decisions and that these decisions could, in turn, have tremendous negative spill-overs (OECD INFE, 2009; OECD, 2009a; see also Gerardi et al., 2010, for empirical analysis of financial literacy and mortgage delinquency). As a result, financial literacy is now globally acknowledged as an important element of economic and financial stability and development; this is reflected in the recent G20 endorsement of the OECD/INFE (International Network on Financial Education) High-level Principles on National Strategies for Financial Education (G20, 2012; OECD INFE, 2012).

A series of tangible trends underpin the rising global interest in financial literacy as a key life skill. These are summarised below.

Risk shift

There has been a widespread transfer of risk from both governments and employers to individuals. Many governments are reducing or have reduced state-supported pensions, and some are reducing healthcare benefits. Defined-contribution pension plans are quickly replacing defined-benefit pension plans, shifting onto workers the responsibility to save for their own financial security after retirement. Traditional pay-as-you-go (PAYG) pension schemes are supplemented by new schemes in which the individual is subject to both revenue and investment risk. Most surveys show that a majority of workers are unaware of the risks they now have to face, and do not have sufficient knowledge or skill to manage such risks adequately, even if they are aware of them (OECD, 2008). Furthermore, the array of risks with financial implications is increasing: for example, individuals face the risks associated with longevity, credit, financial markets, and out-of-pocket healthcare.

Increased individual responsibility

The number of financial decisions that individuals have to make is increasing as a consequence of changes in the market and the economy. For instance, longer life expectancy means individuals need to ensure that they accumulate savings to cover much longer periods of retirement. People also need to assume more responsibility for funding personal or family healthcare needs. Moreover, increasing education costs make it important for parents to plan and invest adequately for their children's education. Even when individuals use the services of financial intermediaries and advisors, they need to understand what is being offered or advised. The individual is responsible for the financial product he or she decides to purchase, and the individual will face all the consequences of the choice. Individuals everywhere need to be financially literate to make informed and responsible decisions.

Increased supply of a wide range of financial products and services

In addition, in all countries, growing numbers of consumers have access to a wide range of financial products and services from a variety of providers and delivered through various channels. Improved levels of financial inclusion in emerging economies, developments in technology and deregulation have resulted in widening access to all kinds of financial products, from current accounts and remittances products to revolving credit and equity portfolios. The products available are also becoming more complex, and individuals are required to make comparisons across a number of factors such as the fees charged, interest rates paid or received, length of contract and exposure to risk. They must also identify appropriate providers and delivery channels from the vast array of possibilities, including community groups, traditional financial institutions, online banks and mobile phone companies.

Increased demand for financial products and services

Economic and technological developments have brought greater global connectedness and massive changes in communications and financial transactions, as well as in social interactions and consumer behaviour. Such changes have made it more important that individuals be able to interact with financial providers. In particular, consumers often need access to financial services (including banks and other providers such as post offices) in order to make and receive electronic payments like income, remittances and online transactions, as well as to conduct face-to-face transactions in societies where cash and cheques are no longer favoured. Those who cannot access such services often pay more for cash transactions, using informal financial services such as moneylenders or cheque cashers (see, for example, Kempson et al., 2005).



All of these trends have transferred the responsibility of major financial decisions to individuals. At the same time, they have both enlarged the options for the majority of the population (including new financial consumers) and increased the level of complexity they face. Against this backdrop, individuals are expected to be sufficiently financially literate to take the necessary steps to protect themselves and their relatives and ensure their financial well-being.

Expected benefits of financial education and improved levels of financial literacy

Existing empirical evidence shows that adults in both developed and emerging economies who have been exposed to financial education are subsequently more likely than others to save and plan for retirement (Bernheim et al., 2001; Cole et al., 2011; Lusardi, 2009). This evidence suggests a possible causal link between financial education and outcomes and indicates that improved levels of financial literacy can lead to positive behaviour change.

Other research, stemming largely from developed countries, and the United States in particular, indicates a number of potential benefits of being financially literate. There is mounting evidence that those with higher financial literacy are better able to manage their money, participate in the stock market and perform better on their portfolio choice, and that they are more likely to choose mutual funds with lower fees (Hastings and Tejada-Ashton, 2008; Hilgert et al., 2003; Lusardi and Mitchell, 2008, 2011; Stango and Zinman, 2009; van Rooij et al., 2011; Yoong, 2011). Moreover, those who have greater financial knowledge are more likely to accumulate higher amounts of wealth (Lusardi and Mitchell, 2011).

Higher levels of financial literacy have been found to be related not only to asset building but also to debt and debt management, with more financially literate individuals opting for less costly mortgages and avoiding high interest payments and additional fees (Gerardi et al., 2010; Lusardi and Tufano, 2009a, 2009b; Moore, 2003).

In addition to the benefits identified for individuals, financial literacy is important to economic and financial stability for a number of reasons. Financially literate consumers can make more informed decisions and demand higher quality services, which will encourage competition and innovation in the market. They are also less likely to react to market conditions in unpredictable ways, less likely to make unfounded complaints and more likely to take appropriate steps to manage the risks transferred to them. All of these factors will lead to a more efficient financial services sector and potentially less costly financial regulatory and supervisory requirements. They can also ultimately help in reducing government aid (and taxation) aimed at assisting those who have taken unwise financial decisions – or no decision at all.

OECD activities in relation to financial education

In 2002, the OECD initiated a far-reaching financial education project to address governments' emerging concern about the potential consequences of low levels of financial literacy. This project is serviced by the OECD Committee on Financial Markets (CMF) and the Insurance and Private Pensions Committee (IPPC) in coordination with other relevant bodies including the Education Policy Committee. The project takes a holistic approach to financial-consumer issues that highlights how, alongside improved financial access, adequate consumer protection and regulatory frameworks, financial education has a complementary role to play in promoting the outcome of financial literacy.

One of the first milestones of the financial education project was the adoption of the *Recommendation on Principles and Good Practices for Financial Education and Awareness* by the OECD council (OECD, 2005a). Alongside these recommendations, the publication *Improving Financial Literacy: Analysis of Issues and Policies* details the reasons for focusing on financial education, and provides a first international overview of financial education work being undertaken in various countries (OECD, 2005b). This book also includes principles and good practices for policy makers and other stakeholders seeking to improve levels of financial literacy in their country. It is complemented by a global clearinghouse on financial education, the OECD International Gateway for Financial Education (<http://www.financial-education.org/home.html>), which gathers data, resources, research and news on financial education issues and programmes from around the world.

Recognising the increasingly global nature of financial literacy and education issues, in 2008 the OECD created the International Network on Financial Education (INFE) to benefit from and encompass the experience and expertise of developed and emerging economies. Currently more than 220 public institutions from more than 100 countries have joined the INFE. Members meet twice yearly to discuss the latest developments in their country and to collect evidence, develop analytical and comparative studies, methodologies, good practice, policy instruments and practical guidance on key priority areas. In this context, both financial education programmes in schools and the international measurement of financial literacy have been identified by the OECD and its INFE as top priority issues for which dedicated expert subgroups have been created to launch focused data collection and development work.



Financial education for youth and in schools

The focus on financial education for youth and in schools more specifically is not new. As mentioned, financial literacy is increasingly considered to be an essential life skill, and as early as 2005, the OECD Recommendation advised that “financial education should start at school. People should be educated about financial matters as early as possible in their lives” (OECD, 2005a). Two main reasons underpin this recommendation: the importance of focusing on youth, and the efficiency of providing financial education in schools. The OECD and its INFE have also developed guidelines for financial education in schools and guidance on learning frameworks on financial education which have been supported by the Ministers of Finance of the Asia-Pacific Economic Cooperation (APEC) in August 2012 and should be released by the end of 2012.¹

Focus on youth

Younger generations are not only likely to face ever-increasing complexity in financial products, services and markets, but they are more likely to have to bear more financial risks in adulthood than their parents. In particular, they are likely to bear more responsibility for the planning of their own retirement savings and investments, and the coverage of their healthcare needs; and they will have to deal with more sophisticated and diverse financial products.

Because of the changes in the marketplace and social welfare systems (and particularly pension systems), current generations are unlikely to be able to learn from past generations. They will have to rely on their own knowledge or, given the complexities of new systems, make informed use of professional financial advice. Efforts to improve financial knowledge in the workplace or in other settings can be severely limited by a lack of early exposure to financial education and by a lack of awareness of the benefits of continuing financial education. It is therefore important to provide early opportunities for establishing the foundations of financial literacy.

In addition to preparing young people for their adult life, financial education in schools can also address the immediate financial issues facing young people. Children are often consumers of financial services from a young age. It is not uncommon for them to have accounts with access to online payment facilities or to use mobile phones (with various payment options) even before they become teenagers, and it is clear that financial literacy skills would be of benefit to them when using such products. Before leaving school, they may also face decisions about such issues as car insurance, savings products and overdrafts.

In many countries, at around the age of 15 to 18, young people (and their parents) face one of their most important financial decisions: that is, whether or not to invest in tertiary education. The gap in wages between college and non-college educated workers has widened in many economies. At the same time, the education costs borne by students and their families have increased, often leading to a reliance on credit (OECD, 2011). Figures published in March 2010 in the United Kingdom suggest that half of all British students expected to leave university owing over GBP 15 000 (Smithers, 2010).

It is important for people to be financially literate before they engage in major financial transactions and contracts. High-quality financial education programmes for young people can be essential in nurturing sound financial knowledge and behaviour in students from a young age, which they can draw on in the coming years (Ministerial Council for Education, Early Childhood Development and Youth Affairs [Australia], 2011).

Efficiency of providing financial education in schools

Research suggests that there is a link between financial literacy and family economic and educational background: those who are more financially literate disproportionately come from highly educated and families that hold a wide range of financial products (Lusardi et al., 2010). In order to provide equality of opportunity, it is important to offer financial education to those who would not otherwise have access to it. Schools are well positioned to advance financial literacy among all demographic groups and reduce financial literacy gaps and inequalities (including across generations).

Recognising both the importance of financial literacy for youth and the unique potential of school programmes to create more skilled and knowledgeable future generations, an increasing number of countries have embarked on the development of financial education programmes. These are either dedicated to youth generally or delivered through schools, and include those at national, regional and local levels as well as pilot exercises. A survey of individual financial literacy schemes supported by the European Commission (Habschick et al., 2007) found that most were directed at children and young people, and a broad stock-take exercise launched by the INFE subgroup on financial education in schools demonstrated that amongst the 32 countries/jurisdictions contributing to the survey, 21 had some programmes in schools (OECD, forthcoming).



The need for data

Policy makers, educators and researchers need high-quality data on levels of financial literacy in order to inform financial education strategies and the implementation of financial education programmes in schools by identifying priorities and measuring change across time.

Several countries have undertaken national surveys of financial literacy across their adult population and the OECD has recently piloted a questionnaire designed to capture levels of financial literacy amongst adults at an international level (Atkinson and Messy, 2012; OECD INFE, 2011). However, there are currently few data collection efforts on the levels of financial literacy amongst young people under the age of 18, and none that can be compared across countries. This is a serious omission as young people will soon be adults having to make ever more complex yet critical financial decisions, and the availability of data on their ability to address these challenges is essential to advance our knowledge on how well prepared the young are to face new and changing economic environments.

A robust measure of financial literacy amongst young people will provide information at a national level that can indicate whether the current approach to financial education is effective. In particular, it can help to identify issues that need addressing through schools or extra curricula activities or programmes that will enable young people to be properly and equitably equipped to make financial decisions in adulthood. It can also be used as a baseline from which to measure success and review school and other programmes in future years.

An international study provides additional benefits to policy makers and other stakeholders. Comparing levels of financial literacy across countries makes it possible to see which countries have the highest levels of financial literacy and begin to identify particularly effective national strategies and good practices. It will also be possible to recognise common challenges and explore the possibility of finding international solutions to the issues faced.

Against this backdrop, it is anticipated that the collection of robust and internationally comparable financial literacy data in the student population will provide policy makers, educators, curriculum and resource developers, researchers, and others with:

- information about gaps in financial knowledge amongst young people that can inform the development of more targeted programmes and policies;
- an indication of whether existing financial education in schools, where provided, is associated with higher levels of financial literacy;
- a means of comparing financial education strategies across countries;
- an opportunity to explore good practice by looking at the ranking of countries in terms of levels of financial literacy; and, ultimately,
- comparable data over time, allowing the assessment of the impact of financial education initiatives in schools and the identification of options for ongoing efficiency improvements.

There are other advantages to be gained from an international measurement exercise on financial literacy. In particular, the development of a financial literacy assessment framework that is applicable across countries provides national authorities with detailed guidance about the scope and operational definition of financial literacy without having to fund national studies. As noted in the article “Financial Literacy and Education Research Priorities”, there is a gap in the research on financial literacy “related to the lack of consistency among researchers in how to define and measure programme success. There is a need for researchers to develop a clear understanding of what it means to be ‘financially educated’” (Schuchardt et al., 2009).

The measurement of financial literacy in PISA

PISA 2012 is the first large-scale international study to assess the financial literacy of young people. PISA assesses the readiness of students for their life beyond compulsory schooling, and, in particular, their capacity to use knowledge and skills, by collecting and analysing cognitive and other information from 15-year-olds in many countries and economies. It is thus able to provide a rich set of comparative data that policy makers and other stakeholders can use to make evidence-based decisions. International comparative data on financial literacy can answer questions such as, “How well are young people prepared for the new financial systems that are becoming more global and more complex?” and “Who are the leaders in terms of financial literacy amongst youth?”

As with the core PISA domains of reading, mathematics and science, the main focus of the financial literacy assessment in PISA is on measuring the proficiency of 15-year-old students in demonstrating and applying knowledge and skills.



And like other PISA domains, financial literacy is assessed using an instrument designed to provide data that are valid, reliable and interpretable.

The first step in constructing an assessment that satisfies these three broad criteria is to develop an assessment framework. The main benefit of constructing an assessment framework is improved measurement, as it provides an articulated plan for developing the individual items and designing the instrument that will be used to assess the domain. A further benefit is that it provides a common language for discussion of the domain, and thereby increases understanding of what is being measured. It also promotes an analysis of the kinds of knowledge and skills associated with competency in the domain, thus providing the groundwork for building a described proficiency scale or scales that can be used to interpret the results.

The development of the PISA frameworks can be described as a sequence of the following six steps:

- development of a working definition for the domain and a description of the assumptions that underlie that definition;
- identification of a set of key characteristics that should be taken into account when constructing assessment tasks for international use;
- operationalisation of the set of key characteristics that will be used in test construction, with definitions based on existing literature and experience in conducting other large scale assessments;
- evaluation of how to organise the set of tasks constructed in order to report to policy makers and researchers on achievement in each assessment domain for 15-year-old students in participating countries;
- validation of the variables and assessment of the contribution each makes to understanding task difficulty across the various participating countries; and
- preparation of a described proficiency scale for the results.

DEFINING FINANCIAL LITERACY

In developing a working definition of financial literacy that can be used to lay down the groundwork for designing an international financial literacy assessment, the expert group looked both to existing PISA domain definitions of literacies, and to articulations of the nature of financial education.

PISA conceives of literacy as the capacity of students to apply knowledge and skills in key subject areas and to analyse, reason and communicate effectively as they pose, solve and interpret problems in a variety of situations. PISA is forward looking, focusing on young people's ability to use their knowledge and skills to meet real-life challenges, rather than merely on the extent to which they have mastered specific curricular content (OECD, 2010a).

In its *Recommendation on Principles and Good Practices for Financial Education and Awareness*, the OECD defined financial education as “the process by which financial consumers/investors improve their understanding of financial products, concepts and risks and, through information, instruction and/or objective advice, develop the skills and confidence to become more aware of financial risks and opportunities, to make informed choices, to know where to go for help, and to take other effective actions to improve their financial well-being” (OECD, 2005a).

The FEG agreed that “understanding”, “skills” and the notion of applying understanding and skills (“effective actions”) were key elements of this definition. It was recognised, however, that the definition of financial education describes a process – education – rather than an outcome. What was required for the assessment framework was a definition encapsulating the outcome of that process in terms of competency or literacy.

The working definition of financial literacy for PISA 2012 is as follows:

Financial literacy is knowledge and understanding of financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life.

This definition, like other PISA domain definitions, has two parts. The first part refers to the kind of thinking and behaviour that characterises the domain. The second part refers to the purposes for developing the particular literacy.

In the following paragraphs, each part of the PISA 2012 definition of financial literacy is considered in turn to help clarify its meaning in relation to the assessment.



Financial literacy...

Literacy is viewed as an expanding set of knowledge, skills and strategies, which individuals build on throughout life, rather than as a fixed quantity, a line to be crossed, with illiteracy on one side and literacy on the other. Literacy involves more than the reproduction of accumulated knowledge, although measuring prior financial knowledge is an important element in the assessment. It also involves a mobilisation of cognitive and practical skills, and other resources such as attitudes, motivation and values. The PISA 2012 assessment of financial literacy draws on a range of knowledge and skills associated with development of the capacity to deal with the financial demands of everyday life in contemporary society.

...is knowledge and understanding of financial concepts and risks...

Financial literacy is thus contingent on some knowledge and understanding of fundamental elements of the financial world, including key financial concepts as well as the purpose and basic features of financial products. This also includes risks that may threaten financial well-being as well as insurance policies and pensions. It can be assumed that 15-year-olds are beginning to acquire this knowledge and gain experience of the financial environment that they and their families inhabit and the main risks they face. All of them are likely to have been shopping to buy household goods or personal items; some will have taken part in family discussions about money and whether what is wanted is actually needed or affordable; and a sizeable proportion of them will have already begun to earn and save money. Some students already have experience of financial products and commitments through a bank account or a mobile phone contract. A grasp of concepts such as interest, inflation, and value for money are soon going to be, if they are not already, important for their financial well-being.

...and the skills...

These skills include such generic cognitive processes as accessing information, comparing and contrasting, extrapolating and evaluating – applied in a financial context. They include basic skills in mathematical literacy such as the ability to calculate a percentage or to convert from one currency to another, and language skills such as the capacity to read and interpret advertising and contractual texts.

...motivation and confidence...

Financial literacy involves not only the knowledge, understanding and skills to deal with financial issues, but also non-cognitive attributes: the motivation to seek information and advice in order to engage in financial activities, the confidence to do so and the ability to manage emotional and psychological factors that influence financial decision making. These attributes are considered as a goal of financial education, as well as being instrumental in building financial knowledge and skills.

...to apply such knowledge and understanding in order to make effective decisions...

PISA focuses on the ability to activate and apply knowledge and understanding in real-life situations rather than the reproduction of knowledge. In assessing financial literacy, this translates into a measure of young people's ability to transfer and apply what they have learnt about personal finance into effective decision-making. The term "effective decisions" refers to informed and responsible decisions that satisfy a given need.

...across a range of financial contexts...

Effective financial decisions apply to a range of financial contexts that relate to young people's present daily life and experience, but also to steps they are likely to take in the near future as adults. For example, young people may currently make relatively simple decisions such as how they will use their pocket money or, at most, which mobile phone contract they will choose; but they may soon be faced with major decisions about education and work options with long-term financial consequences.

...to improve the financial well-being of individuals and society...

Financial literacy in PISA is primarily conceived of as personal financial literacy, distinguished from economic literacy, which includes both broader concepts such as the theories of demand and supply, market structures and so on. Financial literacy is concerned with the way individuals understand, manage and plan their own and their households' – which often means their families' – financial affairs. It is recognised, however, that good understanding, management and planning on the part of individuals has some collective impact on the wider society, in contributing to national and even global stability, productivity and development.



...and to enable participation in economic life.

Like the other PISA literacy definitions, the definition of financial literacy implies the importance of the individual's role as a thoughtful and engaged member of society. Individuals with a high level of financial literacy are better equipped to make decisions that are of benefit to themselves, and also to constructively support and critique the economic world in which they live.

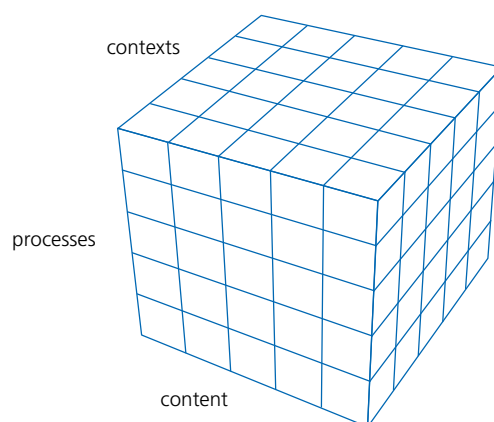
ORGANISING THE DOMAIN

How the domain is represented and organised determines the assessment design, including item development and, ultimately, the evidence about student proficiencies that can be collected and reported. Many elements are part of the concept of financial literacy, not all of which can be taken into account and varied in an assessment such as PISA. It is necessary to select the elements that will best ensure construction of an assessment comprising tasks with an appropriate range of difficulty and a broad coverage of the domain.

A review of approaches and rationales adopted in previous large-scale studies, and particularly in PISA, shows that most consider the relevant content, processes and contexts for assessment as they specify what they wish to assess. Content, processes and contexts can be thought of as three different perspectives on the area to be assessed, as shown in Figure 5.1.

■ Figure 5.1 ■

A model for organising the domain for an assessment framework



Content comprises the areas of knowledge and understanding that are essential in the area of literacy in question.

Processes describes the mental strategies or approaches that are called upon to negotiate the material.

Contexts refers to the situations in which the domain knowledge, skills and understandings are applied, ranging from the personal to the global.

The steps of identifying and weighting the different elements or categories within each perspective, and then ensuring that the set of tasks in the assessment adequately reflects these categories, are used to ensure coverage and validity of the assessment. The three perspectives are also helpful in thinking about how achievement in the area is to be reported.

The following section presents a discussion of each of the three perspectives and the framework categories into which they are divided. The section includes the types of tasks that a student may be asked to complete. Examples of items drawn from the PISA 2012 field trial are included to illustrate the perspectives and categories. While they are representative of those used in the main survey, these particular items are not used in the assessment instrument: only secure, unpublished items are used for this purpose, to protect the integrity of the data that is collected to measure student proficiency.

Content

The content of financial literacy is conceived of as the areas of knowledge and understanding that must be drawn upon in order to perform a particular task. A review of the content of existing financial literacy learning frameworks from a wide range of countries (Australia, Brazil, England, Japan, Malaysia, the Netherlands, New Zealand, Northern Ireland, Scotland, South Africa and the United States) indicated that there is some consensus on the financial literacy



content areas (OECD, forthcoming). The data analysis notably showed that the content of financial education in schools was – albeit with cultural differences – relatively similar, and that it was possible to identify a series of topics commonly included in these frameworks. These form the four content areas for PISA financial literacy: *money and transactions*, *planning and managing finances*, *risk and reward*, and *financial landscape*.

Money and transactions

This content area includes the awareness of the different forms and purposes of money and handling simple monetary transactions such as everyday payments, spending, value for money, bank cards, cheques, bank accounts and currencies. Tasks in this content area can, for example, ask students to show that they:

- Are aware of the different forms and purposes of money:
 - recognise bank notes and coins;
 - understand that money is used to exchange goods and services;
 - can identify different ways to pay for items, in person or via the Internet;
 - recognise that there are various ways of receiving money from other people and transferring money between people or organisations; and
 - understand that money can be borrowed or lent, and the reasons for paying or receiving interest.
- Are confident and capable at handling and monitoring transactions:
 - can use cash, cards and other payment methods to purchase items;
 - can use cash machines to withdraw cash or to get an account balance;
 - can calculate correct change;
 - can work out which of two consumer items of different sizes would give better value for money, taking into account the individual’s specific needs and circumstances; and
 - can check transactions listed on a bank statement and note any irregularities.


The following example from the unit *AT THE MARKET* illustrates a task that requires students to apply the concept of value for money. In this question, and in many others, the unit of currency is the imaginary Zed. PISA questions often refer to situations that take place in the fictional country of Zedland, where the Zed is the unit of currency. This artifice (about which students are informed at the beginning of the testing session) has been introduced to enhance comparability across countries.

Illustrative PISA Financial literacy item 1 – AT THE MARKET


■ Figure 5.2 ■

Item for the unit AT THE MARKET

You can buy tomatoes by the kilogram or by the box.



2.75 zeds per kg



22 zeds for a 10 kg box

QUESTION



The box of tomatoes is better value for money than the loose tomatoes.

Give a reason to support this statement

.....

.....



Using an everyday context, shopping for groceries, this item addresses the basic concept of value for money. Questions about the buying of goods are generally categorised as being in the content area of money and transactions. To gain credit for this item, students have to show they have compared the two ways of buying tomatoes using a common point of comparison. Examples of answers that would receive credit are:

- It is 2.75 zeds/kg for loose tomatoes but only 2.2 zeds/kg for boxed tomatoes.
- Because 10 kg of loose tomatoes would cost 27.50 zeds.
- You get more tomato for each zed you spend when buying the box.

In the field trial, three-quarters of all students were able to analyse the information and explain that the price per kilogram of the boxed tomatoes is less than the price per kilogram of the loose tomatoes.

Planning and managing finances

Income and wealth need planning and managing over both the short term and long term. This content area includes:

- Knowledge and ability to monitor income and expenses:
 - identify various types of income and measures of income (e.g. allowances, salary, commission, benefits, hourly wage, and gross and net income); and
 - draw up a budget to plan regular spending and saving.
- Knowledge and ability to make use of income and other available resources in the short and long terms to enhance financial well-being:
 - understand how to manipulate various elements of a budget, such as identifying priorities if income does not meet planned expenses, or finding options for reducing expenses or increasing income in order to increase levels of savings;
 - assess the impact of different spending plans and be able to set spending priorities in the short and long term;
 - plan ahead to pay future expenses: for example, working out how much needs to be saved each month to make a particular purchase;
 - understand the purposes of accessing credit and the ways in which expenditure can be smoothed over time through borrowing or saving;
 - understand the idea of building wealth, the impact of compound interest on savings, and the pros and cons of investment products;
 - understand the benefits of saving for long term goals or anticipated changes in circumstance (such as living independently); and
 - understand how government taxes and benefits impact on planning and managing finances.

The example *SPENDING CHOICES* presented below illustrates an item addressing *planning and managing finances* in a context that is relevant to 15-year-olds as they think about their lives in the near future.

Illustrative PISA Financial literacy item 2 – SPENDING CHOICES

■ Figure 5.3 ■

Item for the unit *SPENDING CHOICES*

Claire and her friends are renting a house.
They have all been working for two months.
They do not have any savings.
They are paid monthly and have just received their wages.
They have made this “To do” list.

To do

- Get cable TV
- Pay the rent
- Buy outdoor furniture



QUESTION

Which of the tasks on the list are likely to need prompt attention from Claire and her friends?

Circle “Yes” or “No” for each task.

Task	Is the task likely to need prompt attention?
Get cable TV	Yes / No
Pay the rent	Yes / No
Buy outdoor furniture	Yes / No

This question in *SPENDING CHOICES* asks students to evaluate spending priorities for the home when working within a budget, distinguishing between wants and needs. It therefore falls under the content area of *planning and managing finances*. Over three-quarters of all students in the field trial scored full credit on this item by circling “No”, “Yes” and “No” in that order, thus identifying that, of the three tasks, only paying the rent requires prompt attention for Claire and her housemates.

Another instance from the *planning and managing finances* content category is provided later, in the example *TRAVEL MONEY* which asks students to plan spending and saving in order to pay a future expense.

Risk and reward

Risk and reward is a key area of financial literacy, incorporating the ability to identify ways of managing, balancing and covering risks and an understanding of the potential for financial gains or losses across a range of financial contexts. There are two types of risk of particular importance in this domain. The first relates to financial losses that an individual cannot bear, such as those caused by catastrophic or repeated costs. The second is the risk inherent in financial products, such as credit agreements with variable interest rates, or investment products.

This content category includes:

- Recognising that certain financial products (including insurance) and processes (such as saving) can be used to manage and offset various risks (depending on different needs and circumstances):
 - knowing how to assess whether insurance may be of benefit.
- Applying knowledge of the ways to manage risk including the benefits of diversification and the dangers of default on payment of bills and credit agreements to decisions about:
 - limiting the risk to personal capital;
 - various types of investment and savings vehicles, including formal financial products and insurance products, where relevant; and
 - various forms of credit, including informal and formal credit, unsecured and secured, rotating and fixed term, and those with fixed or variable interest rates.
- Knowing about and managing risks and rewards associated with life events, the economy and other external factors, such as the potential impact of:
 - theft or loss of personal items, job loss, birth or adoption of a child, deteriorating health;
 - fluctuations in interest rates and exchange rates; and
 - other market changes.
- Knowing about the risks and rewards associated with substitutes for financial products; in particular:
 - saving in cash, or buying property, livestock or gold; and
 - borrowing from informal lenders.

An illustration from the *risk and reward* content category is provided in the example *MOTORBIKE INSURANCE*.



Illustrative PISA Financial literacy item 3 – MOTORBIKE INSURANCE

■ Figure 5.4 ■

Item for the unit **MOTORBIKE INSURANCE**

Last year, Steve’s motorbike was insured with the PINSURA insurance company.
The insurance policy covered damage to the motorbike from accidents and theft of the motorbike.

QUESTION

Steve plans to renew his insurance with PINSURA this year, but a number of factors in Steve’s life have changed since last year. How is each of the factors in the table likely to affect the cost of Steve’s motorbike insurance this year?

Circle “Increases cost”, “Reduces cost” or “Has no effect on cost” for each factor.

Factor	How is the factor likely to affect the cost of Steve’s insurance?
Steve replaced his old motorbike with a much more powerful motorbike	Increases cost / Reduces cost / Has no effect on cost
Steve has painted his motorbike a different colour	Increases cost / Reduces cost / Has no effect on cost
Steve was responsible for two road accidents last year	Increases cost / Reduces cost / Has no effect on cost

Motorbike insurance falls under the content area of *risk and reward* because insurance is a product designed specifically to protect individuals against risks and financial losses that they would not otherwise be able to bear. The question relies on students understanding that the higher their risk exposure is with regards to measurable criteria, the more it will cost them to buy appropriate insurance. Half of all students scored full credit on this question in the field trial by recognising that the first and third factors increase the cost of the insurance while the second factor has no effect.

Another illustration of the *risk and reward* content category is provided in the example *SHARES*, which requires students to be familiar with how a potentially risky product works.

Financial landscape

This content area relates to the character and features of the financial world. It covers knowing the rights and responsibilities of consumers in the financial marketplace and within the general financial environment, and the main implications of financial contracts. Information resources and legal regulation are also topics relevant to this content area. In its broadest sense, *financial landscape* also incorporates an understanding of the consequences of changes in economic conditions and public policies, such as changes in interest rates, inflation, taxation or welfare benefits. Tasks associated with this content area include:

- Knowledge of rights and responsibilities, and ability to apply it:
 - understand that buyers and sellers have rights, such as being able to apply for redress;
 - understand that buyers and sellers have responsibilities, such as:
 - . consumers/investors giving accurate information when applying for financial products;
 - . providers disclosing all material facts; and
 - . consumers/investors being aware of the implications of one of the parties not doing so.
 - recognise the importance of the legal documentation provided when purchasing financial products or services and the importance of understanding the content.
- Knowledge and understanding of the financial environment, including:
 - identifying which providers are trustworthy, and which products and services are protected through regulation or consumer protection laws;
 - identifying whom to ask for advice when choosing financial products, and where to go for help in relation to financial matters; and
 - awareness of financial crimes such as identity theft and scams, and knowledge of how to take appropriate precautions.



- Knowledge and understanding of the impact of financial decisions including on others:
 - understand that individuals have choices in spending and saving and each action can have consequences for the individual and for society; and
 - recognise how personal financial habits, actions and decisions impact at individual, community, national and international level.
- Knowledge of the influence of economic and external factors:
 - aware of the economic climate and understand the impact of policy changes such as reforms related to the funding of post-school training;
 - understand how the ability to build wealth or access credit depends on economic factors such as interest rates, inflation and credit scores; and
 - understand that a range of external factors, such as advertising and peer pressure, can affect individuals' financial choices.

An illustration of an item that reflects financial landscape by focusing on financial crimes is presented in the example *BANK ERROR*.

Illustrative PISA Financial literacy item 4 – BANK ERROR

▪ Figure 5.5 ▪

Item for the unit BANK ERROR

David banks with ZedBank. He receives this e-mail message.

Dear ZedBank member,

There has been an error on the ZedBank server and your Internet login details have been lost.

As a result, you have no access to Internet banking.

Most importantly your account is no longer secure.

Please click on the link below and follow the instructions to restore access.

You will be asked to provide your Internet banking details.

<https://ZedBank.com>

QUESTION

Which of these statements would be good advice for David?

Circle “Yes” or “No” for each statement.

Statement	Is this statement good advice for David?
Reply to the e-mail message and provide his Internet banking details	Yes / No
Contact his bank to inquire about the e-mail message	Yes / No
If the link is the same as his bank's website address, click on the link and follow the instructions	Yes / No

Internet banking is part of the broader *financial landscape* in which students are likely to participate, either now or in the near future. In this environment they may be exposed to financial fraud. *BANK ERROR* investigates whether they know how to take appropriate precautions. In this question, students are asked to respond appropriately to a financial scam e-mail message. They must evaluate the presented options and recognise that the second piece of advice is the only one that can be considered good advice. In the field trial, just over 40% of the students gained full credit for this item, by responding “No”, “Yes”, “No” in that order.

Processes

The process categories relate to cognitive processes. They are used to describe students' ability to recognise and apply concepts relevant to the domain, and to understand, analyse, reason about, evaluate and suggest solutions. In PISA financial literacy, four process categories have been defined: *identify financial information*, *analyse information in a financial context*, *evaluate financial issues* and *apply financial knowledge and understanding*. While the verbs used here



bear some resemblance to those in Bloom's taxonomy of educational objectives (Bloom, 1956), an important distinction is that the processes in the financial literacy construct are not operationalised as a hierarchy of skills. They are, instead, parallel essential cognitive approaches, all of which are part of the financially literate individual's repertoire. The order in which the processes are presented here relates to a typical sequence of thought processes and actions, rather than to an order of difficulty or challenge. At the same time, it is recognised that financial thinking, decisions and actions are most often dependent on a recursive and interactive blend of the processes described in this section. For the purposes of the assessment, each task is identified with the process that is judged most central to its completion.

Identify financial information

This process is engaged when the individual searches and accesses sources of financial information, and identifies or recognises its relevance. In PISA 2012 the information is in the form of printed texts such as contracts, advertisements, charts, tables, forms and instructions. A typical task might ask students to identify the features of a purchase invoice, or recognise the balance on a bank statement. A more difficult task might involve searching through a contract that uses complex legal language to locate information that explains the consequences of defaulting on loan repayments. This process category is also reflected in tasks that involve recognising financial terminology, such as identifying "inflation" as the term used to describe increasing prices over time.

Example 5, *PAY SLIP*, shows an item that focuses on identifying and interpreting financial information.

Illustrative PISA Financial literacy item 5 – PAY SLIP

■ Figure 5.6 ■

Item for the unit *PAY SLIP*

Each month, Jane's employer pays money into Jane's bank account.

This is Jane's pay slip for July.

EMPLOYEE PAY SLIP: Jane Citizen		
Position: Manager	1 July to 31 July	
Gross salary	2 800 zeds	
Deductions	300 zeds	
Net salary	2 500 zeds	
Gross salary to date this year	19 600 zeds	

QUESTION

How much money did Jane's employer pay into Jane's bank account on 31 July?

- A. 300 zeds
- B. 2 500 zeds
- C. 2 800 zeds
- D. 19 600 zeds

Students are asked to *identify financial information* in a simple pay slip. The correct answer, 2 500 zeds, was selected by just over half of all students in the field trial.



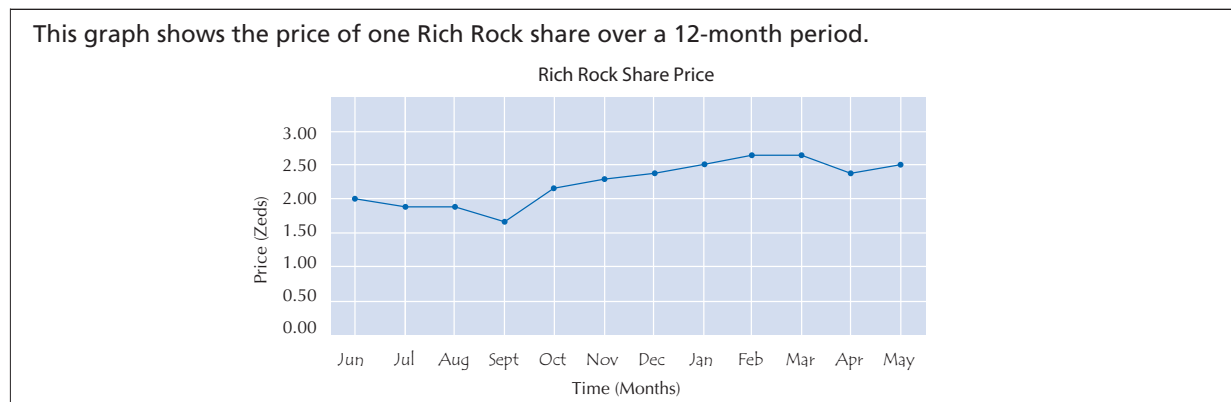
Analyse information in a financial context

This process covers a wide range of cognitive activities undertaken in financial contexts, including interpreting, comparing and contrasting, synthesising, and extrapolating from information that is provided. Essentially it involves recognising something that is not explicit: identifying the underlying assumptions or implications of an issue in a financial context. For example, a task may involve comparing the terms offered by different mobile phone contracts, or working out whether an advertisement for a loan is likely to include unstated conditions. An example in this process category is provided below, in the unit *SHARES*.

Illustrative PISA Financial literacy item 6 – SHARES

■ Figure 5.7 ■

Item for the unit *SHARES*



QUESTION

Which statements about the graph are true?

Circle “True” or “False” for each statement.

Statement	Is the statement true or false?
The best month to buy the shares was September.	True / False
The share price increased by about 50% over the year.	True / False

There are two parts to this question, which asks students to *analyse information in a financial context* by considering the information in a line graph about an investment product. The graph shows how the price of shares has changed over a year. The first part of the question assesses a student’s understanding that shares should be bought when the price is low (in this case, September). The second part of the question assesses whether students can correctly identify the increase in share prices and calculate the percentage change over time. Just over half of all students correctly answered both parts of the question in the field trial, by circling “True” for the first statement and “False” for the second.

Evaluate financial issues

In this process the focus is on recognising or constructing financial justifications and explanations, drawing on financial knowledge and understanding applied in specified contexts. It involves such cognitive activities as explaining, assessing and generalising. Critical thinking is brought into play in this process, when students must draw on knowledge, logic and plausible reasoning to make sense of and form a view about a finance-related problem. The information that is required to deal with such a problem may be partly provided in the stimulus of the task, but students will need to connect such information with their own prior financial knowledge and understandings. In the PISA context, any information that is required to understand the problem is intended to be within the expected range of experiences of a 15-year-old – either direct experiences or those that can be readily imagined and understood. For example, it is assumed that 15-year-olds are likely to be able identify with the experience of wanting something that is not essential (such as a new sound system). A task based on this scenario could ask about the factors that might be considered in deciding on the relative financial merits of making a purchase or deferring it, given specified financial circumstances.



The next example task *AT THE MARKET*, based on the same stimulus as the illustrative PISA financial literacy item 1, asks students to evaluate information by drawing on everyday prior knowledge.

Illustrative PISA Financial literacy item 7 – AT THE MARKET

■ Figure 5.8 ■

Item for the unit AT THE MARKET

QUESTION

Buying a box of tomatoes may be a bad financial decision for some people.

Explain why

The purpose of this question is to recognise that buying in bulk may be wasteful for some people, or unaffordable in the short term. Students evaluate a financial issue in the situation presented and score full credit if they can explain that buying more tomatoes at a cheaper price may not always be a good financial decision. Answers such as the following, which refer to waste, received full credit:

- The tomatoes might rot before you use them all.
- Because you may not need 10 kg of tomatoes.

Another kind of answer that received full credit focused on individuals being unable to afford bulk buying:

- You have to spend 22 zeds (rather than 2.75 or 5.50 for 1 or 2 kg) and you might not have that amount to spend.
- You might have to go without something else that you need to pay for the box of tomatoes.

In the field trial, over 80% of students gained credit for this item, by referring to either waste or affordability.

NEW OFFER provides an example of a more demanding task that falls within the *evaluate financial issues* category.

Illustrative PISA Financial literacy item 8 – NEW OFFER

■ Figure 5.9 ■

Item for the unit NEW OFFER

Mrs Jones has a loan of 8 000 zeds with FirstZed Finance. The annual interest rate on the loan is 15%. Her repayments each month are 150 zeds.

After one year Mrs Jones still owes 7 400 zeds.

Another finance company called Zedbest will give Mrs Jones a loan of 10 000 zeds with an annual interest rate of 13%. Her repayments each month would also be 150 zeds.

QUESTION

What is one possible negative financial consequence for Mrs Jones if she agrees to the Zedbest loan?.....

.....

NEW OFFER asks students to reflect on and evaluate the consequences of changing from one set of loan conditions to another – a context that is less likely to be familiar to 15-year-olds than the context provided in *AT THE MARKET*. In the case of *NEW OFFER*, all of the necessary information is provided in the question, but to gain credit students need to identify what is relevant and reflect on the consequences of taking a particular action. There are a number of kinds of responses that are awarded full credit. In the field trial, the most common credited response was that Mrs Jones would have more debt. Equally acceptable are responses that refer to specific conditions of the loan such as that the total interest paid (over the course of the loan) will be greater, that the length of the loan will be greater, and that there are possible fees associated with switching loan companies.

Just over 40% of students in the field trial gained credit for this item.



A third example of a task that fits within the *evaluate* process category is provided in the illustrative PISA financial literacy item 2, *SPENDING CHOICES* where students should draw on plausible reasoning in a financial context to assess which of the tasks listed require prompt attention.

Apply financial knowledge and understanding

The fourth process picks up a term from the definition of financial literacy: “to apply such [financial] knowledge and understanding”. It focuses on taking effective action in a financial setting by using knowledge of financial products and contexts, and understanding of financial concepts. This process is reflected in tasks that involve performing calculations and solving problems, often taking into account multiple conditions. An example of this kind of task is calculating the interest on a loan over two years. This process is also reflected in tasks that require recognition of the relevance of prior knowledge in a specific context. For example, a task might require the student to work out whether purchasing power will decline or increase over time when prices are changing at a given rate. In this case, knowledge about inflation needs to be applied.

The following example, *TRAVEL MONEY*, falls into the process category *apply financial knowledge and understanding*.

Illustrative PISA Financial literacy item 9 – TRAVEL MONEY

■ Figure 5.10 ■

Item for the unit TRAVEL MONEY

Natasha works in a restaurant 3 evenings each week.
 She works for 4 hours each evening and she earns 10 zeds per hour.
 Natasha also earns 80 zeds each week in tips.
 Natasha saves exactly half of the total amount of money she earns each week.

QUESTION

Natasha wants to save 600 zeds for a holiday.

How many weeks will it take Natasha to save 600 zeds?.....

This task requires students to consider a set of conditions and constraints, while planning ahead to pay for future expenses – working out how long it will take to save for a holiday, given a fixed amount of savings each week. The correct answer is “6 weeks”. Fewer than half of the field trial sample gained credit for this item.

Contexts

In building a framework, and developing and selecting assessment items based on this framework, attention is given to the breadth of contexts in which the domain literacy is exercised. Decisions about financial issues are often dependent on the contexts or situations in which they are presented. By situating tasks in a variety of contexts the assessment offers the possibility of connecting with the broadest possible range of individual interests across a variety of situations in which individuals need to function in the 21st century.

Certain situations will be more familiar to 15-year-olds than others. In PISA, assessment tasks are framed in situations of general life, which may include but are not confined to school contexts. The focus may be on the individual, family or peer group, on the wider community, or even more widely on a global scale.

As a starting point, the FEG looked at the contexts used in the Programme for the International Assessment of Adult Competencies (PIAAC) literacy framework: *education and work*, *home and family*, *leisure and recreation*, and *community and citizenship* (OECD, 2009b). For the purposes of the financial literacy domain, the heading *leisure and recreation* was replaced by *individual* to reflect the fact that many of the financial interactions that young people have are related to themselves as individual consumers, using products such as mobile phones or laptops, as well as accessing leisure facilities or funding recreation. It was further decided to replace *community and citizenship* with *societal*. While *community and citizenship* captures the idea of a perspective wider than the personal, it was felt that the term *community* was not wide enough. *Societal*, by contrast, implicitly encompasses national and global situations as well as the more local, thus better fitting the potential reach of financial literacy. The contexts identified for the PISA financial literacy assessment are, then, *education and work*, *home and family*, *individual* and *societal*.



Education and work

The context of *education and work* is of great importance to young people. The educational context is obviously relevant to PISA students, since they are by definition a sample of the school-based population; indeed, many of them will continue in education or training for some time. However, many other 15-year-olds move from school into the labour force within one to two years, and many 15-year-old students are engaged in casual employment outside school hours. Therefore, both currently and for the medium term, the occupational context is also relevant for PISA students. Virtually all 15-year-olds will be starting to think about financial matters related to both education and work, whether they are spending existing earnings, considering future education options or planning their working life.

Typical tasks within this context could include understanding payslips, planning to save for tertiary study, investigating the benefits and risks of taking out a student loan, and participating in workplace savings schemes.

Item 5, in *PAY SLIP*, and item 9, in *TRAVEL MONEY*, illustrate the kind of task designed to reflect the *education and work* context category. Specifically, they are examples the *work* context, asking students to address financial problems related to earned income; the first asking them to identify information on a payslip, and the second using the context of income to make a savings plan.

Home and family

Home and family includes financial issues relating to the costs involved in running a household. Family is the most likely household circumstance for 15-year-olds; however, this category also encompasses households that are not based on family relationships, such as the kind of shared accommodation that young people often use shortly after leaving the family home. Tasks within this context may include buying household items or family groceries, keeping records of family spending and making plans for family events. Decisions about budgeting and prioritising spending may also be framed within this context.

The two items from the *AT THE MARKET* unit, items 1 and 7 are categorised as home and family, since grocery shopping is usually done for a household. Item 2, in *SPENDING CHOICES*, is also in this context category: the setting is shared accommodation, and the choices to be made will affect the household (in this case, friends rather than a family sharing accommodation).

Individual

The context of the *individual* is important within personal finance since there are many decisions that a person takes entirely for personal benefit or gratification, and many risks and responsibilities that must be borne by individuals. Decisions taken that fit within this context include choosing personal products and services such as clothing, toiletries or haircuts, or buying consumer goods such as electronic or sports equipment, as well as commitments such as season tickets or a gym membership. These decisions span essential personal needs, as well as leisure and recreation. Although the decisions made by an individual may be influenced by the family and society, when it comes to opening a bank account or getting a loan it is the individual who has the legal responsibility for such decisions. The context *individual* therefore includes contractual issues around events such as opening a bank account, purchasing consumer goods, paying for recreational activities, and dealing with relevant financial services that are often associated with larger consumption items, such as credit and insurance.

NEW BANK CARD is an example of an item from the *individual* context category.

Illustrative PISA Financial literacy item 10 – NEW BANK CARD

■ Figure 5.11 ■

Item for the unit *NEW BANK CARD*

Lisa lives in Zedland. She receives this new bank card.





QUESTION

The following day, Lisa receives the Personal Identification Number (PIN) for the bank card.

What should Lisa do with the PIN?

- A. Write the PIN on notepaper and keep this in her wallet.
- B. Tell the PIN to her friends.
- C. Write the PIN on the back of the card.
- D. Memorise the PIN.

This task assesses students' understanding of the individual's responsibility in maintaining security when accessing and using electronic banking. This question asks students to evaluate which of the four presented options is best practice when using a bank card. Over 90% of students in the field trial chose the correct option of memorising the PIN (D).

Other items from the *individual* context category, shown earlier, include item 3, in *MOTORBIKE INSURANCE*, item 6, in *SHARES*, and item 8, in *NEW OFFER*, all of which illustrate decisions that impact on the individual (renewing insurance, buying shares, refinancing a loan).

Societal

The environment young people are living in is characterised by change, complexity and interdependence. Globalisation is creating new forms of interdependence where actions are subject to economic influences and consequences that stretch well beyond the individual and the local community. While the core of the financial literacy domain is focused on personal finances, the *societal* context recognises that individual financial well-being cannot be entirely separated from the rest of society. Personal financial well-being affects and is affected by the local community, the nation and even global activities. Financial literacy within this context includes matters such as being informed about consumer rights and responsibilities, understanding the purpose of taxes and local government charges, being aware of business interests, and taking into account the role of consumer purchasing power. It extends also to considering financial choices such as donating to non-profit organisations and charities.

The task *BANK ERROR* (item 4, shown earlier) is categorised as falling within the *societal* context, since it relates to fraudulent behaviour targeted across society.

Non-cognitive factors

The PISA working definition of financial literacy includes the non-cognitive terms *motivation* and *confidence*, attitudes which, according to some, have an influence on money management behaviour (Johnson and Staten, 2010). PISA conceives of both financial attitudes and behaviour as aspects of financial literacy in their own right. Attitudes and behaviour are also of interest in terms of their interactions with the cognitive elements of financial literacy. Information collected about the financial attitudes and behaviour of 15-year-olds will also potentially constitute useful baseline data for any longitudinal investigation of the financial literacy of adults, including their financial behaviours.

The FEG identified four non-cognitive factors for inclusion in the framework: *access to information and education*, *access to money and financial products*, *attitudes towards and confidence about financial matters*, and *spending and saving behaviour*.²

Access to information and education

There are various sources of financial information available to students, including friends, parents or other family members. It is useful to know which sources of information are accessed most frequently and to ascertain whether higher levels of financial literacy are associated with particular sources of information. Policy makers can also use this information to ascertain how well messages about financial issues are being communicated, and where to target new interventions.

The education and training received by students also varies within and across countries. Information about the extent to which there is a link between levels of financial literacy and financial education inside and outside schools is likely to be particularly useful in shaping education programmes for improving financial literacy.



Access to money and financial products

Students who have had more personal experience dealing with financial matters might be expected to perform better on the cognitive assessment. Those who regularly make decisions about how to manage their own money are likely to know more about financial matters, even if they have not had specific instruction, than those who do not. That experience may come from earning money, from using financial products such as credit and debit cards, or from dealing with the banking system. A key policy question in this area is, “To what extent do real-life experiences of the financial world influence young people’s financial literacy?”

Attitudes towards and confidence about financial matters

Attitudes are considered important constituents of financial literacy. Moreover, individual preferences are important determinants of financial behaviour and can interact with financial literacy. It is hypothesised that research from behavioural psychology may yield interesting results with regard to financial literacy, and better inform policy makers trying to improve the efficiency of programmes. Areas identified for possible investigation include risk tolerance – a willingness to accept the possibility of a loss in order to achieve greater gain (Barsky et al., 1997; Holt and Laury, 2002); and time sensitivity – willingness to trade immediate reward for greater gain at a future date (Barsky et al., 1997; Holt and Laury, 2002).

Spending and saving behaviour

While items on the cognitive assessment test students’ ability to make particular spending and savings decisions, it is also useful to have some measure of what their actual (reported) behaviour is: that is, how students save and spend in practice. PISA financial literacy will provide evidence on the relationship between financial literacy knowledge and financial behaviour, by looking at the relationship between 15-year-olds’ reported behaviour and their results on the cognitive financial literacy assessment.

ASSESSING FINANCIAL LITERACY

The previous section has outlined the conceptual framework for financial literacy. The concepts in the framework must in turn be represented in tasks and questions in order to collect evidence of students’ proficiency in financial literacy. In this section we discuss the structure of the assessment, the distribution of tasks across the framework variables, and the choice of response formats. This is followed by a short discussion of the impact of knowledge and skills from other domains on financial literacy and the implications for the assessment. To conclude, we describe the method by which data about financial behaviours and experience will be collected.

The conceptual framework is concerned with mapping the domain, not just for the 2012 assessment, but more broadly. It lays out the definition and the major variables that are addressed in the assessment instrument. The key ideas have been elaborated through lists of sub-topics and examples in the preceding section. These elaborations should not be interpreted as a checklist of tasks included in the 2012 assessment. Given that only one hour of financial literacy assessment material is being administered in PISA 2012, there is not enough space to cover every detail of each variable. It is anticipated that further aspects of the domain will be included in assessment tasks in future administrations.

The structure of the assessment

The PISA paper-and-pen assessment is designed as a two-hour test comprising four 30-minute clusters of test material from one or more cognitive domains. Financial literacy was allocated two clusters (that is, 60 minutes of testing time) in the 2012 main survey. Analysis of completion rates in the field trial was used to determine that the vast majority of students could be expected to complete 20 financial literacy items within 30 minutes. Accordingly, from the 75 financial literacy tasks administered in the field trial, 40 were selected for the main survey.

In the 2012 main survey each test booklet that includes the two clusters of financial literacy items also includes one cluster of mathematics test items and one cluster of reading items. To reduce any effects from the order of the clusters within a booklet, four test booklets containing financial literacy clusters have been created, with the financial literacy, mathematics and reading clusters appearing in different positions.

As with other PISA assessment domains, financial literacy items are grouped in units comprising one or two items based around a common stimulus. The selection includes financially-focused stimulus material in diverse formats, including prose, diagrams, tables, charts and illustrations.

The assessment comprises a broad sample of items covering a range of difficulty that will enable the strengths and weaknesses of students and key subgroups to be measured and described.



Response formats and coding

Some PISA paper-and-pen items require short handwritten responses, others responses of one or two sentences, whilst others can be answered by circling an answer or ticking a box. Decisions about the form in which the data are collected – the response formats of the items – are based on what is considered appropriate given the kind of evidence that is being collected, and also on technical and pragmatic considerations. In the financial literacy assessment as in other PISA assessments, two broad types of items are used: constructed-response items and selected-response items.

Constructed-response items require students to generate their own answers. The format of the answer may be a single word or figure, or may be longer: a few sentences or a worked calculation. Constructed-response items that require a more extended answer are ideal for collecting information about students' capacity to explain decisions or demonstrate a process of analysis. Item 9, in *TRAVEL MONEY*, illustrates a constructed response item that calls for a single figure, where there is a very restricted range of credit-worthy responses. Items 1 and 7, both from the unit *AT THE MARKET*, and item 8, in *NEW OFFER*, are typical of tasks that require more extended responses, where many different kinds of answers may gain full credit.

In the scoring of the *NEW OFFER* task, for example, four different kinds of full credit responses are identified:

(i) Answers that refer to Mrs Jones having more debt if she takes on the new loan offer:

- She will owe more money.
- She will be unable to control her spending.
- She is going deeper into debt.

(ii) Answers that refer to Mrs Jones having to pay more interest:

- 13% of 10 000 is greater than 15% of 8 000.

(iii) Answers that refer to the increased length of time over which Mrs Jones will have the debt:

- It might take longer to repay because the loan is bigger and the payments are the same.

(iv) Answers that refer to the possibility that Mrs Jones will have to pay a cancellation fee if she cancels her initial loan agreement with FirstZed Finance:

- She may have a penalty fee for paying the FirstZed loan early.

The second broad type of item, with regard to format and coding, is selected response. This kind of item requires students to choose one or more alternatives from a given set of options. The most common type in this category is the simple multiple-choice item, which requires the selection of one from a set of (usually) four options: see item 5, in *PAY SLIP*, and item 10, in *NEW BANK CARD*. A second type of selected-response item is complex multiple choice, in which students respond to a series of "Yes/No"-type questions. Item 2, in *SPENDING CHOICES*, illustrates a "Yes/No" set of selections. For this task students need to make three independent correct selections to gain credit. Item 3, in *MOTORBIKE INSURANCE*, has a similar format, in that three independent correct selections must be made to gain credit; but in this case each selection is from three options: "Increases cost", "Reduces cost" and "Has no effect on cost". Selected-response items are typically regarded as most suitable for assessing items associated with identifying and recognising information, but they are also a useful way of measuring students' understanding of higher-order concepts that they themselves may not easily be able to express.

Although particular item formats lend themselves to specific types of questions, care needs to be taken that the format of the item does not affect the interpretation of the results. Research suggests that different groups (for example, boys and girls, and students in different countries) respond differentially to the various item formats. Several research studies on response format effects based on PISA data suggest that there are strong arguments for retaining a mixture of multiple-choice and constructed-response items. In their study of PISA reading literacy compared with the IEA Reading Literacy Study (IEARLS), Lafontaine and Monseur (2006) found that response format had a significant impact on gender performance. In another study, countries were found to show differential equivalence of item difficulties in PISA reading on items in different formats (Grisay and Monseur, 2007). This finding may relate to the fact that students in different countries are more or less familiar with the particular formats. In summary, the PISA financial literacy option includes items in a variety of formats to minimise the possibility that the item format influences student performance. Such an influence would be extrinsic to the intended object of measurement: in this case, financial literacy.

When considering the distribution of item formats, the question of resources must be weighed as well as the equity issues discussed in the preceding paragraphs. All except the most simple of constructed-response items are coded by expert



judges who must be trained and monitored. Selected response and very short “closed” constructed response items do not require expert coding and therefore demand fewer resources.

The proportions of constructed- and selected-response items are determined taking account of all these considerations. The majority of the items selected for the PISA 2012 main survey do not require expert judgement.

Most items are coded dichotomously (full credit or no credit), but where appropriate an item’s coding scheme allows for partial credit. Partial credit makes possible more nuanced scoring of items. Some answers, even though incomplete, are better than others. If incomplete answers for a particular question indicate a higher level of financial literacy than inaccurate or incorrect answers, a scoring scheme has been devised that allows partial credit for that question. Such “partial credit” items yield more than one score point.

Distribution of score points

In this section we outline the distribution of score points across the categories of the three main framework characteristics discussed previously. The term “score points” is used in preference to “items”, as some partial credit items are included. The distributions are expressed in terms of ranges, indicating the approximate weighting of the various categories.

While each PISA financial literacy item is categorised according to a single content, a single process and a single context category it is recognised that, since PISA aims to reflect real-life situations and problems, often elements of more than one category are present in a task. In such cases, the item is identified with the category judged most integral to responding successfully to the task.

The target distribution of score points according to financial literacy content areas is shown in Table 5.1.

Table 5.1
Approximate distribution of score points in financial literacy, by content

Money and transactions	Planning and managing finances	Risk and reward	Financial landscape	Total
30% - 40%	25% - 35%	15% - 25%	10% - 20%	100%

The distribution reflects that *money and transactions* is considered to be to the most immediately relevant content area for 15-year-olds.

Table 5.2 shows the target distribution of score points by the four processes.

Table 5.2
Approximate distribution of score points in financial literacy, by processes

Identify financial information	Analyse information in a financial context	Evaluate financial issues	Apply financial knowledge and understanding	Total
15% - 25%	15% - 25%	25% - 35%	25% - 35%	100%

The weighting shows that greater importance was attributed to evaluating financial issues and applying financial knowledge and understanding.

Table 5.3 shows the target distribution of score points by the four contexts.

Table 5.3
Approximate distribution of score points in financial literacy, by contexts

Education and work	Home and family	Individual	Societal	Total
10% - 20%	30% - 40%	35% - 45%	5% - 15%	100%

Consistent with an assessment of personal financial literacy of 15-year-olds, there is a clear emphasis on *individual*, but also a weighting towards the financial interests of the household or family unit. *Education and work* and *societal* contexts are given less emphasis, but included in the scheme as they are important elements of financial experience.



The impact of other domain knowledge and skills on financial literacy

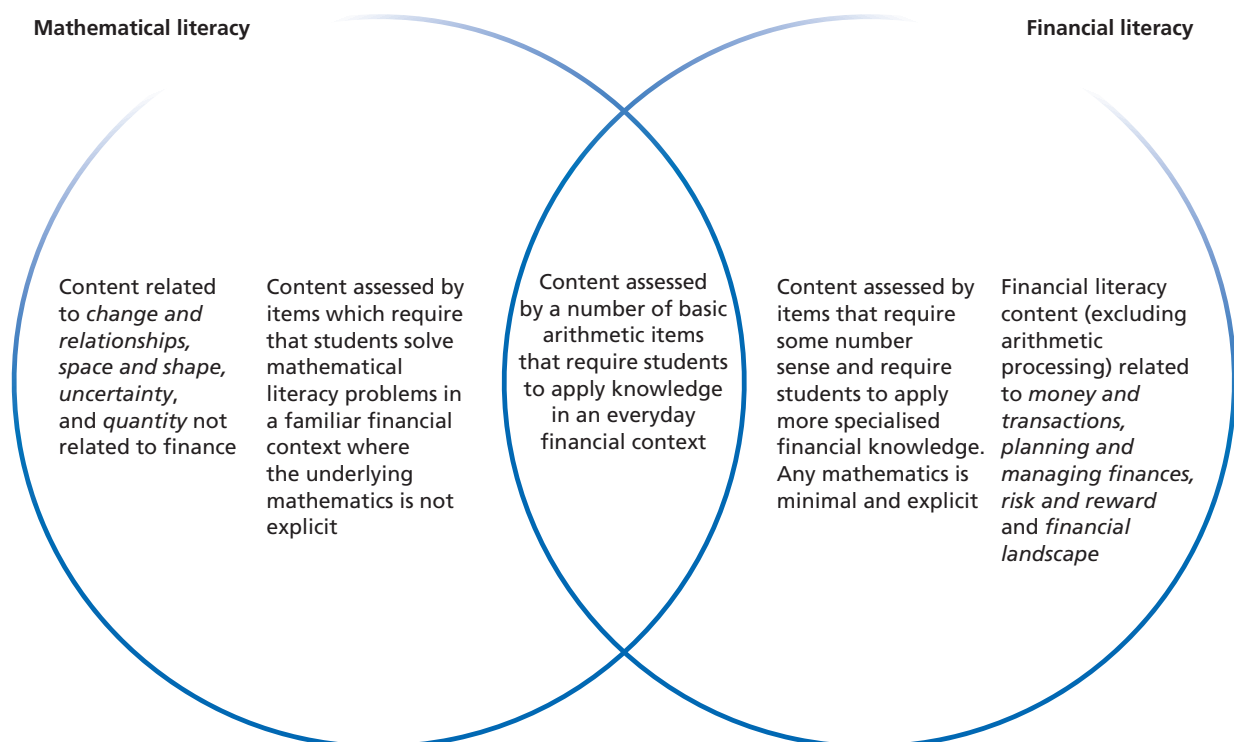
Numeracy skills

A certain level of numeracy (or mathematical literacy) is regarded as a necessary condition of financial literacy. Huston (2010) argues that “if an individual struggles with arithmetic skills, this will certainly impact his/her financial literacy. However, available tools (e.g. calculators) can compensate for these deficiencies; thus, information directly related to successfully navigating personal finances is a more appropriate focus than numeracy skills for a financial literacy measure”. It is therefore common for financial literacy assessments to include items with a mathematical literacy aspect, even though that aspect is not the primary focus of the whole measure. Lusardi et al. (2010) reported that, in the 1997 National Longitudinal Survey of Youth conducted in the United States, three financial literacy questions “differentiated well between naive and sophisticated respondents.” Two of the three questions, on interest rates and inflation, required some basic competence in mathematical literacy. Mathematically-related proficiencies such as number sense, familiarity with multiple representations of numbers, and skills in mental calculation, estimation, and the assessment of reasonableness of results are intrinsic to some aspects of financial literacy.

On the other hand there are large areas where the content of mathematical literacy and financial literacy do not intersect. As defined in the PISA 2012 mathematics literacy framework, mathematical literacy defines four content areas: *change and relationships*, *space and shape*, *quantity* and *uncertainty*. Of these, only *quantity* directly intersects with the content of the PISA financial literacy assessment. Unlike the mathematical literacy content area *uncertainty*, which requires students to apply probability measures and statistics, in the PISA assessment the financial literacy content area *risk and reward* requires an understanding of the features of a particular situation or product that indicate risk/reward. This is a non-numeric appreciation of the way financial well-being can be affected by chance and an awareness of the related products and actions to protect against loss. In the financial literacy assessment, the quantity-related proficiencies listed previously can be applied to problems requiring more financial knowledge than can be expected in the mathematical literacy assessment. Similarly, knowledge about financial matters and capability in applying such knowledge and reasoning in financial contexts (in the absence of any specifically mathematical content) characterise much of all four content areas of financial literacy: *money and transactions*, *planning and managing finances*, *risk and reward* and *financial landscape*. Figure 5.12 represents the relationship between the content of mathematical literacy and financial literacy in PISA.

■ Figure 5.12 ■

Relationship between the content of financial literacy and mathematical literacy in PISA





Operationally, there are few items populating the portion of the diagram where the two circles intersect. In the financial literacy assessment, the nature of the mathematical literacy expected is basic arithmetic: the four operations (addition, subtraction, multiplication and division) with whole numbers, decimals and common percentages. Such arithmetic occurs as an intrinsic part of the financial literacy context and enables financial literacy knowledge to be applied and demonstrated. Item 1, from the unit *AT THE MARKET*, illustrates an item that requires such arithmetic skills: the mathematics involved (dividing by a factor of ten) is very basic and is of a level well within the reach of most 15-year-olds. Use of financial formulae (requiring capability with algebra) is not considered appropriate. Dependence on calculation is minimised in the assessment; tasks are framed in such a way as to avoid the need for substantial or repetitive calculation. The calculators used by students in their classrooms and on the PISA mathematics assessment will also be available in the financial literacy assessment, but success in the items will not depend on calculator use.

Reading and vocabulary

It is assumed that all students taking part in the financial literacy assessment will have some basic reading proficiency, even while it is known from previous PISA surveys that reading skill varies widely both within and across countries (OECD, 2010b). To minimise the level of reading literacy required, stimulus material and task statements are generally designed to be as clear, simple and brief as possible. In some cases, however, stimulus may deliberately present complex or somewhat technical language: the capacity to read and interpret the language of financial documents or pseudo financial documents is regarded as part of financial literacy. In item 4, in *BANK ERROR*, attentive reading of the e-mail message is required to detect the likelihood that the message is part of a scam.

Highly technical terminology relating to financial matters is avoided. The FEG has advised on terms that it judges reasonable to expect 15-year-olds to understand. Some of these terms may be the focus of assessment tasks. For example, *PAY SLIP* (item 5), assesses whether students are able to read a simple pay slip and recognise (or infer the meaning of) the terms “gross” and “net”.

Collecting data about financial behaviour and experience

Information about non-cognitive factors related to financial literacy is collected in a short student questionnaire at the end of the cognitive assessment of financial literacy. Items address aspects of three of the four key areas identified for inclusion by the financial literacy expert group: *access to information and education*; *access to money and financial products*; and *spending and saving behaviour*. The questionnaire comprises a small set of questions that explore the range and types of students’ interest in and experience with financial matters.

The questions for the short questionnaire are based on questions from existing national surveys of financial literacy. Additional information that is pertinent to understanding the distribution of financial literacy can be drawn from the standard PISA student background questionnaires. Data about the students’ home situation (family socioeconomic status in particular) and school experience may be relevant to understanding their financial literacy results. In addition, the school questionnaire, which heads of all schools in the PISA sample are asked to complete, includes questions about the availability of financial education for their students, and access to professional development in financial education for their teachers.

REPORTING FINANCIAL LITERACY

The data from the financial literacy assessment is held in a database separate from the main PISA database. This database includes, for the sampled students, their financial literacy, mathematics and reading cognitive results, the behaviour data from the short questionnaire on financial literacy, and data from the general student questionnaire and school questionnaire.

It is therefore possible to report on financial literacy as an independent result, and on financial literacy in relation to mathematics performance, reading performance, financial behaviour, and in relation to some background variables such as socioeconomic status and immigrant status. The results also allow the development of further work under the aegis of the OECD Project on Financial Education.

The financial literacy cognitive data is scaled in a similar way to the other PISA data. A comprehensive description of the modelling technique used for scaling can be found in the *PISA 2006 Technical Report* (OECD, 2009c).



Each item is associated with a particular point on the PISA financial literacy scale that indicates its difficulty, and each student's performance is associated with a particular point on the same scale that indicates the student's estimated proficiency.

As with the other PISA domains, the relative difficulty of tasks in a test is estimated by considering the proportion of test takers getting each question correct. The relative proficiency of students taking a particular test is estimated by considering the proportion of test items that they answer correctly. A single continuous scale showing the relationship between the difficulty of items and the proficiency of students will be constructed.

The scale is divided into levels, according to a set of statistical principles, and then descriptions are generated based on the tasks that are located within each level, to encapsulate the kinds of skills and knowledge needed to successfully complete those tasks. The scale and set of descriptions are known as a described proficiency scale.

By calibrating the difficulty of each item, it is possible to locate the degree of financial literacy that the item represents. By showing the proficiency of each student on the same scale, it is possible to describe the degree of financial literacy that the student possesses. The described proficiency scale helps in interpreting what students' financial literacy scores mean in substantive terms.

Following PISA practice, a scale is being constructed having a mean of 500 and a standard deviation of 100 (based on the participation of 13 OECD countries). Given the number of items in the 2012 assessment (40), four levels of proficiency in financial literacy will be described, as a first step in reporting how competency in financial literacy develops, and to enable comparisons of student performance between and within participating countries and economies. The optional assessment of financial literacy in PISA 2012 will provide essential inputs and data for both PISA and the OECD Project on Financial Education.



Notes

1. The Joint Ministerial Statement from the 2012 APEC Finance Ministerial Meeting is available at http://www.apec.org/Meeting-Papers/Ministerial-Statements/Finance/2012_finance.aspx.
2. *Attitudes towards and confidence about financial matters* are not covered in the PISA 2012 financial literacy assessment.

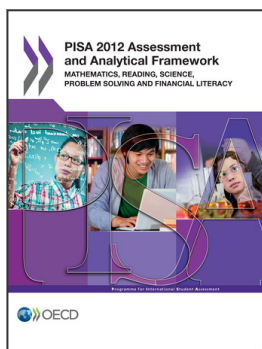


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From:
PISA 2012 Assessment and Analytical Framework
Mathematics, Reading, Science, Problem Solving and
Financial Literacy

Access the complete publication at:
<https://doi.org/10.1787/9789264190511-en>

Please cite this chapter as:

OECD (2013), "Financial Literacy Framework", in *PISA 2012 Assessment and Analytical Framework: Mathematics, Reading, Science, Problem Solving and Financial Literacy*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/9789264190511-7-en>

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