



National Research and Development Centre
for adult literacy and numeracy

Time and Money

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Maths4Life

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Approaches to learning about time and money

This booklet is aimed at tutors working with learners from Entry Level 1 to Level 2. It is not a text book, or a list of recipes to teach particular aspects of time and money. Instead, it suggests some approaches that we have found effective in enabling learners to use time and money effectively and to relate them to other mathematical concepts.

Note: we do not mean to imply that time and money must be taught together. In many cases, they do go very well together and are closely interlinked. However, it may be a good idea to introduce them separately. Additionally, some of the activities are specific for time or money.

It is important that learners understand that time does not fit into the metric scheme of measures and that its units are built up on several different bases.

An introduction to time and money should include a strong emphasis on developing practical skills such as reading timetables, working out journey times, calculating discounts and interest payments, and budgeting.

Many learners have a basic understanding of how to tell the time but cannot use this knowledge to calculate real life needs such as journey times. Similarly, most learners recognise the coins and notes in daily use but may not have the skills to handle their own finances.

Many learners may feel that listening to the tutor and completing their own individual worksheets is the main way of learning. However, we believe that learners learn more if they actually enjoy the activity, have a chance to discuss what they do, explain their work and reach a shared understanding. There is now widespread recognition for the value of collaborative work in developing conceptual understanding (see Collaborative Learning in Mathematics: A Challenge to Our Beliefs and Practices, Malcolm Swan, NRDC and NIACE, 2006)

Although the activities outlined in this booklet can be done individually, most of them will work better as collaborative tasks. This approach may be unfamiliar to many learners, particularly those whose previous mathematics was learned in a traditional, formal class.

Learning is generally most effective when learners are working collaboratively. The task can be pitched a bit higher, just outside an individual learner's comfort zone, so that it needs a second opinion; it may also involve practical equipment that needs a second pair of hands. An explanation of the benefits and ground rules is important for all learners before starting collaborative tasks, so that each group member gets a chance to express an opinion and challenge what others say.

In this context the tutor is not so much an instructor as someone asking the right kind of questions to move discussions on, and does not immediately confirm correct answers. The tutor will want to spend time listening to the discussion in small groups, and may join in, but should not try to replace whole class lectures with small group ones.

As with all learning situations, the tutor will have to make some snap decisions about how to react to situations that develop, particularly those where a group agrees about something which is in fact incorrect. Comparison with the work of other groups where learners have to justify their conclusions can be a more powerful checking strategy than simple validation from the tutor.

Collaborative learning situations tend to have a shared goal of producing an end product, such as a poster, a presentation to the group, or a set of questions for other learners. Discussion of the similarities and differences between posters from different groups can be a very effective way of addressing errors.

Why teach time and money?

Time and money are among the most useful elements in the numeracy curriculum. Many learners do not identify time or money as part of mathematics, despite using them more often than many other areas of mathematics. Many learners have strategies for dealing with time and money even if they are not mathematically adept. However, to make the most of their finances and to manage their time effectively, they need to extend their skills and knowledge.

Time may be confusing because learners do not know how the units within it inter-relate. What's more they have difficulties calculating with it because the units are not in base 10.

Learners need the mathematics of time in many aspects of their lives: dealing with schedules; using timetables to plan journeys or calculating their wages from hourly rates. If they do sport, they need to be able to work out for example, how much time is left before the whistle blows or how fast they have run.

Money confuses some learners when they start to write it down, because of the decimal point. They also find it hard to calculate best buys or interest rates, or to plan financially. As with time, they need to be able to calculate with money to ensure correct payment for hours worked.

Introducing Time and Money

One of the first places to start is to collect learners' ideas on the topics by asking them to think of situations where they use time or money in their lives.

Ask them to think of where they use time in calculations, that is, beyond just finding out what the time is. For example, 'What time do I have to leave if I need to be there at 7.20pm' or 'I have another 140 miles to drive. Roughly what speed do I need to go if I am to be there in time? Is this possible within the speed limit?'. These will generate some supplementary questions and an initial vocabulary of time. Often it will elicit a surprising depth of knowledge and maybe spring a few surprises.

Similarly, ask learners to think of how they would like to be able to use money to manage their finances or perhaps to budget. You will need to address this sensitively; you do not want to know details of your learners' finances.

Now ask learners to list units of time and money, and specify how they can be measured. This will be a useful indicator of their current level of knowledge.

Many learners instinctively estimate both time and money and compare their results using non-specific comparative vocabulary such as late, early, cheap, expensive etc.

We can raise some questions about time and money and encourage learners to think of their own questions, for example:

How accurately do we need to tell the time?

Why is time not decimal?

Why does time go faster when you're interested and slower when you're bored?

Why do people use money?

Does it matter if we have pounds or euros?

What does 0% interest mean?

Why do you spend money more quickly when you have broken into a £20 note?

Can we get away with an estimate?

Language of time and money

Much of the language involved in working with time and money needs to be taught explicitly in context.

Learners should be encouraged to use the vocabulary that describes the concepts they are exploring.

However, some of the vocabulary can be applied across more than one context, or may have other accepted meanings outside of time and money. For example, the word 'second' has several meanings, three of which relate to time, and several representations:

Second place/prize – also written as 2nd

The date 2/3/06 - 2nd of March

Second - 60 in 1 minute - accurately measured length of time

"I'll be there in a sec!" - short unmeasured length of time

"I'll second that!" - add support to someone speaking

This can cause confusion for learners.

Time

Words associated with time include:

Second, minute, hour, day, night, week, fortnight, month, year, decade, century, millennium

Short forms of the above

Lunar month, quarter, season, term

Names of; days of the week, months, seasons

12-hour and 24-hour clock, am, pm

Analogue, digital

Clock, watch, stopwatch, egg timer, cooker timer, sundial

Time zone, GMT, BST, summer time

Diary, schedule (eg TV programming), timetable

To, from, past, half, quarter, o'clock, midday, midnight

Half time, extra time, injury time, full time

Money

Words associated with money include:

Expensive, dear, pricey, costly, cheap, priceless, fortune

Slang (some related to old money i.e. £ s d, but still in use today) –
quid, bob, nicker, pony, monkey, grand, a K, penny, damage

Pound, pence, p, £

Foreign currencies especially Euros, €, dollars, \$, exchange rates,
commission

Interest, deposit, discount, credit, debit, budget, balance sheet, finance,
interest rates, MLR (minimum lending rate), APR (annual percentage
rate), base rate, bank statement, bill

Half price, 1/3 off, BOGOF (buy one get one free)
two for the price of one, 50% off

Leasing charges, hire charges, hire purchase, service charge (tip)

Change, price, cost

Making connections

If learners don't consider time and money to be part of mathematics, they cannot make connections between them and any other part of mathematics. This is compounded by the fact that, while sometimes money is taught as part of decimals, time is often taught as a discrete unit. As tutors, we can use time and money in many of our examples and practice exercises instead of just using number.

We can use the knowledge and experience that all adult learners already have of time and money to make meaningful connections; these help to make sense of mathematics and to make it easier to learn.

Learners are expected to use time and money at all levels of the Adult Numeracy Core Curriculum. The curriculum includes the following specific skills for time and money in common measures (MSS1):

E1	E2	E3	L1	L2
Relate real life events to times of day, days of the week, seasons	Use common date formats. Tell the time using analogue & 12-hr digital clocks to nearest $\frac{1}{4}$ hr	Write time & date correctly & tell the time to nearest 5 mins	Calculate using time, timetables & 24-hr clock	Measure time accurately using instruments. Understand relationship between units of time
Choose correct coins to use	Find change in pence or whole pounds & calculate cost of more than one item	Use decimal notation to add & subtract money. Round to nearest whole pound or 10p	Write calculations correctly using decimals. Add, subtract, multiply & divide money.	Calculate with sums of money & convert between currencies.

Although the core curriculum identifies these skills as elements at each level, this should not be seen as a set of hard and fast rules. If learners are encouraged to understand and explore concepts, their work on time and money may well spread across more than one 'level'. For example, the 24 hour clock

does not appear until level 1, but many E1 and E2 learners are aware of it because they have digital watches or use train timetables.

These skills only brush the surface of learners' real life needs in managing their time and money.

Work on time and money can be integrated into most mathematics topics; number, decimals, fractions, percentages, ratio, shape and data handling.

For example, when teaching any of the four rules of number, why not use time or money problems?

- Add up the cost of a snack and a drink in a café and calculate how much change from £10. This uses addition and subtraction. This example also uses decimals, data handling i.e. reading prices from a menu and estimating – have I got enough money?
- Plan the journey to an appointment or job interview. This uses addition and subtraction of time at a more complex level than the previous example. It also uses reading timetables and checking days and dates, and might include the cost of the journey.

Time can be used to introduce fractions. For example, using an analogue clock to show $\frac{1}{2}$ and $\frac{1}{4}$ hours illustrates both fractional shapes and the idea of splitting numbers (60 minutes) into fractional parts.

Money can be used to help learners to make sense of why we sometimes round to two decimal places when learning about decimals and rounding.

There are many other areas of mathematics, such as ratio or percentages, where using money or time in the examples will help learners both to understand the concepts and to apply their life experience.

Learners should be encouraged to develop their skills in multiplication and division by 100; these skills are integral to understanding and using money as we use them every time we convert between pounds and pence. Multiplying and dividing by other decimals will come into play when converting pounds to other currencies using exchange rates.

Their knowledge of place value will be extended when they use the base 60 and base 24 of time.

Teaching points

The main teaching point to which all the others are related is to use practical approaches and realia wherever possible.

- When working with money on shopping exercises, we should ask our learners to decide what they would choose to buy rather than imposing our own ideas on them.
- Similarly, when working with time on journey planning, we should ask our learners to decide where they would choose to go and how they would like to travel rather than using our choice of journey.
- Not all activities need to be within learners' own experiences. For example, to deal with large amounts of money or complex journeys, set up fantasy scenarios like winning the lottery, or travelling around the world in 80 days.
- Particularly with Entry level 1 and Entry level 2 learners, use coins and notes wherever possible. Ideally, these should be real, otherwise use plastic coins. However, make sure that any replica coins you use do look like the real thing; children's playsets are not suitable for use with adults.
- For learners who travel abroad, it may be worthwhile asking them to bring in foreign coins. You can then work on conversion rates.
- Vary the ways you represent time and date in class. Learners need to be comfortable with all the different ways of representing these.
- Be aware that learners may have experience of elements of the curriculum across levels. At Entry 1 and Entry 2, the curriculum asks for calculations in pence or in whole pounds; this is not what learners experience in the real world. Anyone who uses public transport will have experienced the 24 hour clock although this does not appear in the curriculum until Level 1. Similarly, everyone knows about the clocks changing in Spring and Autumn (BST and GMT). Anyone who travels abroad will have experienced time zones. These do not appear in the curriculum at all.
- We can introduce other areas of the curriculum through the topics of time and money, for example, percentages through discounts and interest rates, fractions through the clock face.

Activity examples

Here are some example activities for developing learners' understanding of personal finance and day to day time management.

These can be differentiated by giving more information to lower ability levels, and asking higher ability groups to do their own research. You can ask higher level learners to think of extensions to the activities.

With all the activities, the method of working and the discussion is as important as the "right" answer.

How much?

Compare the cost of buying goods using a credit agreement or loan using monthly or weekly payments as opposed to saving and then paying as a lump sum.

Examine the cost of repayments on loans over different time periods. For example, how much more does it cost to borrow £3000 over 36 months than over 12 months?

Examine the benefits of bulk buying and BOGOF (buy one get one free) offers.

Calculate the saving on sales goods with percentage discounts or the extra cost on items surcharged because they were bought with a credit card.

Choices, choices

Compare phone and internet pricing packages. Calculate the best deal for learners' own requirements.

Compare the cost of gas or electricity from different suppliers (use internet comparison sites). Should you switch supplier?

It's all about food

Examine the various formats of sell-by and use-by dates on food packaging. Calculate how long you can keep an item before you must consume it.

Plan meals using cooking times – either microwaveable ready meals (use packaging) or recipes depending on learners' choices.

Time is money!

Using the minimum wage calculate how much a worker could earn in a normal (37 hour) working week. Now suppose the worker gets overtime at “time and a quarter”. How much more can they earn if they do 5 hours overtime? What about 7 hours overtime? What if they work a Sunday at “time and a half” or a bank holiday at “double time”? Use different hourly rates or different base hours to extend this activity. Also, set up a spreadsheet to explore these “what if” questions with interested learners.

Metric time

For higher level learners:


“The government has decided to impose metrication on time”. How would this work? Ask the groups to collect ideas and calculations. Mini whiteboards would be ideal for this activity. Groups can present their findings and their methods to the class.

Interpreting time and money

Interpreting dates and times

A way of helping learners to interpret the many different representations of dates and times is to get them to do a matching exercise. Present a group of learners with a set of cards showing the same dates and times in different formats. Ask them which cards match. This can be very effective in encouraging learners to reflect on and discuss their reasoning. Later, learners can be encouraged to create more examples following the patterns on the cards they already have.

For example:




3.30 pm	15.30	Half past three	
Sept 8th 06	08.09.06	8th September 2006	09/08/06 US format

Entry level 1 and 2 learners should start with only a few cards and build up to a larger mixed set as they gain confidence. Other learners can be extended with the use of the US date format.

While learners are matching the different time formats, they could discuss “half past” and “quarter past”. Can your learners make the link between time and fractions or do they see them as separate topics? A clock face can help them to see these and other more complex fractions.

Interpreting money

Similarly, learners can match the different formats for money, including amounts written in words. For example:

Two pounds & nine pence	Two pounds & ninety pence	Two pounds & nineteen pence
£2.90	£2.19	£2.09
219p	209p	290p
		

We also need to ensure that Entry 1 and 2 learners can interpret the coins and notes of the currency. In a mixed level class, differentiate by using foreign currency for learners who are confident with UK currency.

Dealing with remainders

Learners can often be confused about what to do with remainders after calculating with time or money. They may not be sure when to ignore remainders, to round them up, or to show what is left over as a fraction or a decimal. They need to decide how to interpret the remainder and decide what makes sense depending on the context.

For example:

You want to buy snacks costing £3 each. How many can you buy with £10? (ignore remainder)

You need to tape 10 one hour programmes. Each tape lasts 3 hours. How many tapes do you need? (round up)

A job will take 10 hours evenly spread over 3 days. How much time is spent each day? (include remainder – show as minutes)

Another area of confusion can arise when you introduce calculations using a calculator. Interpreting both time and money remainders on a calculator can be tricky. For example:

In money, 26.9 is £26.90 not £26.09

With time, 2.35 hours is often not 2 hours 35 minutes, though sometimes it is.

Evaluating statements about time and money

We can find out a lot about how our learners think and what they already know about time and money by listening to their discussions. Unfortunately, getting learners to discuss mathematics is never easy because often at school they were taught that mathematics is an individual activity. Also, because sometimes a question in mathematics has a single right answer, learners feel there is nothing to be discussed.

One way to encourage discussion is to prepare a set of statements about time and money, each on an individual card. Ask learners to decide, in their groups, whether each statement is true always, sometimes or never and to sort the statements accordingly. Most importantly, they have to have group consensus. Once they have consensus, they have to be able to justify their decisions. They need to be able to give examples and convincing explanations when they present their findings to the rest of the class.

The statements may include common misconceptions as well as straightforward facts that they should (but may not) know. As part of the activity, learners should be encouraged to think of other statements for others to classify.

Here are some examples:

You can't calculate time on a calculator

5.2 hours is 5 hours 20 minutes

Midday is 12.00 so midnight must be 24.00

A year is really $365\frac{1}{4}$ days long

There are 4 weeks in lunar months and 5 weeks in calendar months so February must be a lunar month

A century is 100 years long

0% interest means you don't have to pay any money back

An offer of buy one get one free for soap powder is cheaper than the same soap powder sold at 50% off

It is always more expensive to buy something with a credit agreement (paying so much a month) than to pay cash

It is better value to buy a multipack than a single pack

Links outside the classroom

Learners have experience of time and money outside the classroom. They bring some of that experience to the classroom but cannot always apply it to mathematics problems. They may be limited in their knowledge of time and money, knowing enough to get by but not to deal with more complex or out of the ordinary situations.

It is important that we relate activities in the classroom to situations where learners encounter time and money outside the classroom.

For example, we can use internet shopping, advertisements in local newspapers and supermarket offer leaflets to tie any shopping work to real life offers and prices. It would not be as useful to use prices that are out of date or to use catalogues for things that a learner would never want to buy.

Similarly, work with journey times should use real timetables (and maps to calculate actual distances if speed is being calculated). Longer journeys across time zones should also be included even with learners at Entry level 1 or Entry level 2, because many of these learners visit relatives abroad.

This requires us to be more prepared as tutors; we need to ask learners to bring in the realia we want them to use (but to have some in reserve in case learners forget).

We can put together activities that relate to learners' experiences outside the classroom that encompass much of time and money. For example, a learner about to take a caravan on a European touring holiday would need to be able to work out journey times and costs, read timetables, calculate fuel costs and understand prices in Euros and pounds. Although this scenario (taken from an Entry 1 learner) may not apply to all learners, the learners themselves will tell you what they are interested in doing.

Assessing understanding of time and money

Modes of assessment

Traditionally, mathematics has been assessed summatively by the end of term test, or by the successful completion of examples or worksheets. Although we still need to use summative assessment to allow learners the chance to gain national accreditation, assessing them formatively by the use of appropriate questioning and observation may be more useful in assessing learners' skills and achievements throughout the year.

We need to use questioning and observation (our formative assessment tools) to enable us to:

build on learners' existing knowledge

identify misconceptions

identify rote learning without understanding.

Class questions, which everyone has a chance to think about and answer, can provide a useful starting point for discussion. This means that we need to provide a way for all learners to take part without the quieter members of the class being overwhelmed by the more confident.

Allowing silence is surprisingly effective. It gives learners the time they need to think their answers through before expressing them. Also, listening to their explanations and to learners' discussions between themselves can be a more powerful assessment tool than any number of written diagnostic tests.

We need not abandon summative tests; we can make them work for us. Learners can use existing questions as models to write their own questions for each other. They must be able to calculate the answers before they can pose the questions. This can lead them to writing their own questions without a model, using their own interests and life experience to make them real. This process also builds up learners' confidence for when they are faced with the National summative tests towards the end of their course.

Assessment by questioning

Tutors can use questions to find out whether a learner knows the answer to a specific closed question such as how many minutes there are in an hour. However, we can use questions much more imaginatively for formative assessment and to encourage mathematical thinking.

When we introduce a new topic, questions can help us to identify what learners already know, and some of the misconceptions already deeply embedded in their learning. For example, asking "How could you work out how long it takes you to get to college?" might tell you if learners can use watches, clocks or timetables, or if they can estimate time.

We need to plan our questions. Asking questions without having considered possible responses is a dangerous business. Even so, learners inevitably spring surprises.

Having asked questions, tutors need to consider how to react to the responses. You may need to ask supplementary questions to try to explore what has led to an incorrect response. Equally, it is often worthwhile to question a correct response. Sometimes learners have the right answer with totally the wrong reasoning. We need to be flexible when deciding how far to follow a line of enquiry which was not planned for the lesson.

Questioning learners about why they are doing something is a good way of uncovering their thinking processes. Devil's advocate questions (for example, "Isn't 2 hours 20 minutes the same as 2.20 hours?") or What if...? questions can help to see if learners have developed a good understanding of a concept.

Learner questions are also important. Some learners may be comfortable asking questions of the tutor and of each other, but many are not. We should set up situations where they need to question each other. In all situations, make sure everyone has time to think before they respond.

Questions about time and money


Checking understanding

In the following examples, encourage learners to calculate accurately and to remember whether they are working in £, pence or a combination, or hours and minutes.

How many minutes does this lesson last?

Work out the best buy. You could compare the price of a carton of juice as a single pack and from a multipack. You could also compare the cost of the juice itself from different size cartons. Is a value pack always good value? What about "lunch box packs"?

Which is the odd one out?

3.30 pm, 15.30, half past three in the afternoon,  .
Show how each one could be the odd one out.

If £3.60 is the answer, what is the question? Now make another question with the same answer.

Checking reasoning

Encourage learners to explain their thought processes as fully as possible. You may need to pose supplementary questions.

How could we tell the time if we only had the hour hand on a clock?

**How did you work out that 16:00 was 4 pm? Can you show me?
Can you teach Trevor?**

How did you calculate the sale price of that dress/shirt?

What if the discount was 15% instead of 10%? How would you calculate that? Can you teach Samina?

Questions learners may ask

Learners may come to class with some burning questions that they need to have answered. For higher level learners this is a useful opportunity to turn the question back on them and ask them to do some of their own research and to bring back the answers to class. Other questions may arise spontaneously during the class. Sometimes you will need to answer these!

Why do we move the clocks forward in Spring?

Why do we have a leap year?

Why is Europe on different time to us?

How can you have 0% interest?

What does 200% mean?

Analysing errors and misconceptions

Some misconceptions about time and money may be immediately apparent. Asking questions to uncover learners' thinking processes may allow us to see less apparent problems and to identify lucky guesses.

We should encourage learners to voice their ideas, even if these ideas are based on misconceptions. This will give us a better understanding of how our learners think about time and money; then we can develop tasks and activities to help learners to resolve their misconceptions.

The following shows examples of common mistakes.

Mistakes interpreting calculator results

"I put 1.25×5 into the calculator to get 5 hours at (the overtime rate of) time and a quarter. I got 6.25. That's 6 hours 25 mins."

The learner has converted easily between fractions and decimals before the calculation. However, he has forgotten that time is not calculated in base 10 when it comes to interpreting his answer.

"The question was $\pounds 13.50 - \pounds 7.60$. I did it on the calculator and the answer was five pounds and nine pence."

The calculator would have shown 5.9. The learner has misread this because she does not understand that the calculator omits trailing zeros.

Mistakes while estimating

"I estimated the bill would be $\pounds 15$. It actually came to $\pounds 12.23$. So I'll change the estimate to $\pounds 12$." (in a class problem)

The learner is more interested in getting an accurate estimate - to "get the problem right". However, in real life his first estimate would be a good estimate because it would ensure that he had enough money to pay for his purchases.

Mistakes using language of time and money

“You told me that milli means thousandth. So why does millennium mean 1000 years?”

“And why is a million pounds £1,000,000, not £1,000?”

The language of time and money is not always consistent. Sometimes it can be confusing. We do need to teach language carefully.

Mistakes in representing time or money

“It’s three pounds and 2 pence. That’s £3. 2p”

The learner is not confident with decimal notation. Also he does not know that you omit the “p” when writing digits in £.

“The question is £37.28 shared between five people. The answer is £7.456 each”

The learner has divided correctly but she cannot relate the decimal notation to real money and so does not realise that only 2 decimal places make sense.

Mistakes when calculating with time or money

“I needed to calculate £7.26 plus 6p. I got £13.26 which is too much.”

The learner has done this as a written calculation and has lined up the pence with the pounds because there is no decimal point in the 6p.

“The journey takes 1 hour 35 minutes on the bus and then 2 hours 45 minutes on the train. So altogether, the journey will take 3 hours 75 minutes.”

The learner has forgotten he is working in hours and minutes and needs to change 75 minutes into 1 hour and 15 minutes.

“The journey takes 1 hour 55 minutes on the bus and two hours 50 minutes on the train. So altogether, the journey will take 4 hours 5 minutes.”

Like the previous learner, this learner has forgotten she is working in hours and minutes. She has calculated the minutes as if they were in base 10 and carried 100 minutes over as an hour.

Ways to help your learners

General approach:

Do

Do

Find out what your learners know and start from there.

Use group work and make sure that activities are enjoyable and stimulating.

Encourage discussion.

Think about how groups are composed. This can encourage quiet learners to blossom and accomplished leaders to take a back seat.

Give lots of thinking time when you ask questions.

Support learners in checking their own and each other's work.

Encourage learners to make up questions for each other.

Don't

Don't:

Give endless drills and practice tests.

Allow "death by worksheet".

Give out proformas or writing frames for lower level learners; they learn by making up their own format for recording data and become more independent.

Tell learners all the answers.

Let learners become too comfortable in their groups.

Specifically time and money

Do
Don't

Do:

Talk about how to use time and money in everyday life.

Encourage learners to estimate and to see the value of estimation.

Use lots of practical activities with a real purpose.

Show time and money in a variety of representations especially in realia.

Encourage learners to use their skills at home.

Make connections with other mathematics topics especially decimals and percentages (for money) and fractions (for time).

Don't

Allow learners to compartmentalise time and money or to see them as separate from all other areas of mathematics.

Give learners oversimplified timetables when they have to use real ones; rather help them to create their own simplified timetable.

Allow learners to divulge their personal financial information

Give learners advice about their personal finance

Suggestions for resources

- **Readers are advised to read the background to these approaches. See the Thinking Through Mathematics ring binder for details (order it at www.maths4life.org)**
- **Realia can include price lists, catalogues, till receipts, bills, loan and interest rate leaflets, timetables, take away menus, recipes, packaging from ready meals, TV pages, diaries, calendars.**
- **Mini whiteboards and whiteboard pens and wipers. Use these to enable learners to jot down responses and work out ideas, freeing them from the worry of crossing out mistakes. They also enable tutors to assess everyone's understanding and progress rather than just the few who are prepared to speak out.**
- **Equipment for time and money:**

Money: coins, notes, replica cheques and paying in slips, credit and debit cards, store cards, vouchers, stamps, scales (to weigh coins).

Time: real clocks and watches (digital and analogue including raised markings or speaking clocks for partially-sighted learners), clock faces, stopwatches, kitchen timers, egg timers.
- **Time and Money dominoes**

You can make these using the Jigsaw template in the *Thinking Through Mathematics* ring binder (see maths4life.org). Use them to match time or money in different formats.
- **www.bbc.co.uk/skillwise/**

Use the quizzes and games. Although aimed mainly at E3 upwards, there are some that can be used with E1 and E2 learners.
- **http://www.rkl.org.uk/llu/user_standard_ex.asp**

Use the demo programs or register to adapt for your own classes.

Appendix: Examples of activities

How long?

Ask learners which is their favourite TV programme (cartoon, soap, sitcom). Ask them to note down how long each episode is (excluding advertisements) and how many times it runs per week and how long they have been regularly watching it (weeks, months, years).

Using this information, ask them to calculate the total running time of their programme. If they spend 8 hours a day watching, how long would it take to watch the whole series? If the series was recorded onto DVD or video, how many volumes would they need? For extension, what other statistics could they calculate using this data?

You can prompt them with questions if necessary. Groups can present their results to the class and explain their reasoning.

Domino Games

This example (opposite) of a domino game was made using the activity template software from Thinking Through Mathematics (see maths4life.org to order).

The game encourages learners to concentrate on how to enter sums of money into a calculator. Learners will have a better appreciation of place value as a result of this game. The game uses only 6 different sets of digits in 12 dominoes, so learners need to understand place value rather than being able to guess by matching the digits.

Domino Games

$54.62 + 0.49$	From £54.62 take £49	From £54.62 take £4.90	$54.62 + 4.9$
$£5.46 + £4.90$	$5.46 - 0.49$	£5.46 less £4.90	Sum of £54.62 and £49
$54.62 + 49$	$54.6 + 4.09$	£54.60 and 49p	$5.46 + 4.9$
Take £4.90 from £54.62	$54.6 - 4.9$	Subtract 49p from £5.46	$54.62 - 4.9$
$54.62 - 49$	$54.6 + 0.49$	Find the difference between £54.62 and 49p	$5.46 - 4.9$
Add £54.62 and £4.90	$54.62 - 0.49$	Add together £54.60 and £4.09	Total of £54.62 and 49p

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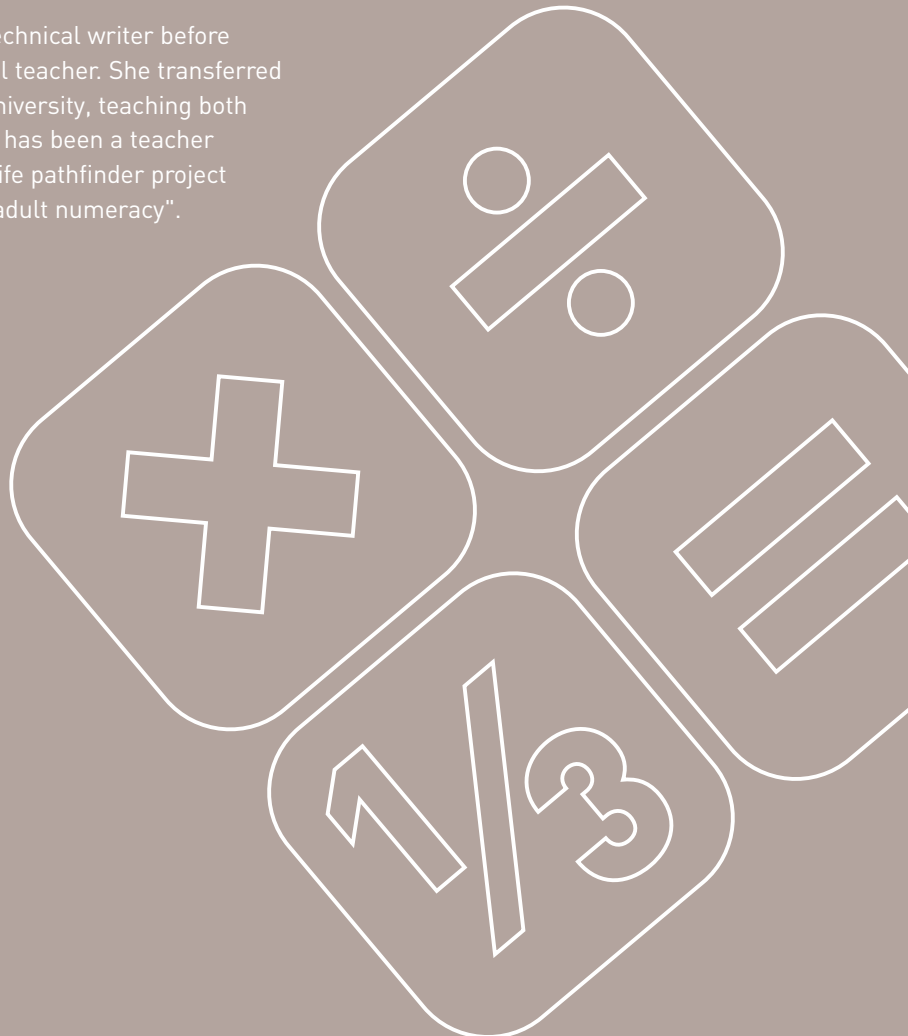
About the authors

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Debb spent 20 years as a technical writer before training as a primary school teacher. She transferred into FE at Thames Valley University, teaching both numeracy and literacy. She has been a teacher researcher on the Maths4Life pathfinder project "Formative assessment in adult numeracy".



This booklet is produced by Maths4Life to provide teachers of adult numeracy with some ideas on how to teach the topics of Time and Money. It should be useful to those teaching adults up to about Level 2