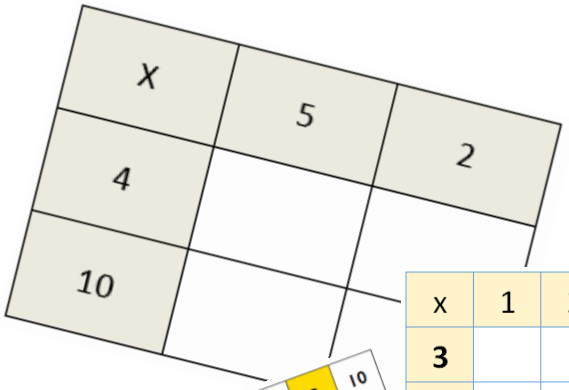
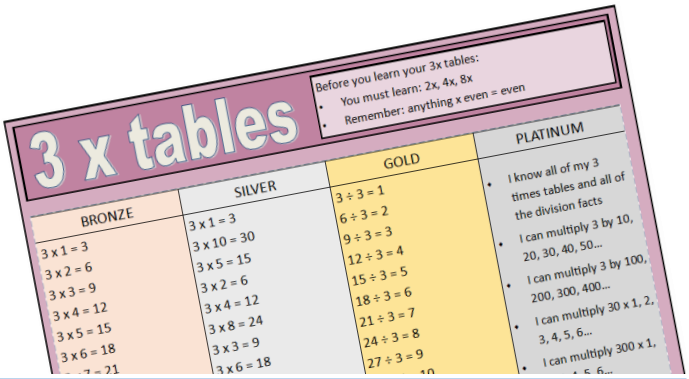
Cambridgeshire Maths Team

Cambridgeshire County Council

Teaching Multiplication Tables





x	1	2	3	4	5	6	7	8	9	10	11	12
3												
6												
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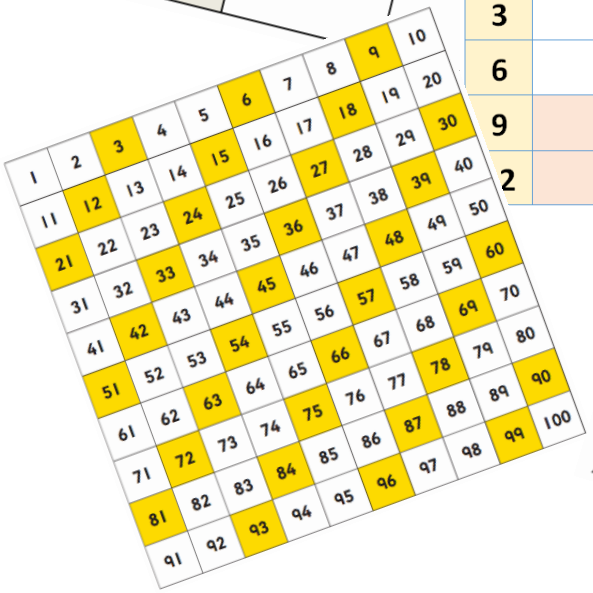
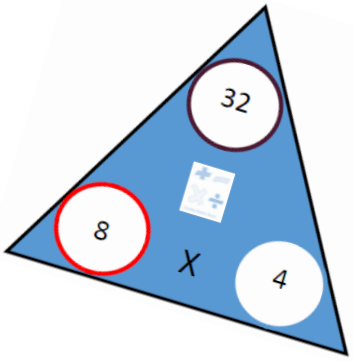
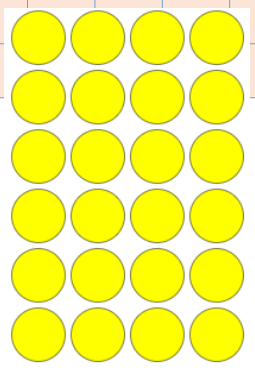
2												







Teaching Multiplication Tables

This booklet is designed to support the teaching of multiplication tables facts. Although it may be particularly helpful for teachers in Years 3 and 4, the key messages and ideas apply to all years from 1 to 6. This guide is supplemented by several free-to-download resources, available on the Cambridgeshire Maths Team's group library on Knowledge Hub. The online resources include posters, matching cards, chanting grids, challenge tasks and more.

Learning and recalling facts.

It is important to recognise that when we talk about learning facts, there is more than one process involved. In this booklet we refer to these processes as: a) the 'input' of information, when we learn facts; b) the 'storage' of information in our short term and long-term memory; and c) the 'output', when we remember and recall the facts. Whilst these processes are linked, children aren't always equally adept at each.

You will probably be able to think of some pupils who seem to pick up information quickly in one lesson, but when you asked them about it later they struggled to remember that same information. Whereas, other children seemingly have no problem accessing and recalling their prior learning at all. For these children, recall of facts seems effortless – as if the information they are looking for is neatly filed away in their memory. Wouldn't it be great if all of us could retrieve and recall key information so easily?

With this in mind, we believe that it's important to consider not just how we teach the children to 'input' the facts but also how they learn to 'store' the facts and retrieve them.

In this booklet we suggest several routines and timetables for learning multiplication facts. Please be aware that this is not a scheme to be followed, but a guide to instruct your teaching and learning. The suggested activities should be adapted to meet the needs of your learners based on their starting points.

Jump to:

How can we help children to learn multiplication tables facts?

Like other key facts and concepts that we learn in maths, we can learn multiplication facts by connecting new learning to existing knowledge. We try to build up the amount of facts we know and we aim to develop what we know about those facts as we go. The better we understand these facts, the more we can do with them.

There are also some ideas or concepts that help children to learn the multiplication tables.

When talking about a multiplication, such as 4 x 3 we refer to the number 4 as the *multiplicand* and the number 3 is the multiplier. This means that we are multiplying 4, three times. The number we create is the *product* of these two *factors*.

Linking **multiplication and division** is crucial and it's important to 'do and undo' when learning facts and procedures. Using factor-product triangles, showing related facts, supports this and helps children to make links to derived facts.

An understanding of **commutativity** is also key. If children agree that 3 x 4 and 4 x 3 both have the same product, then we don't have to learn 144 separate facts. Instead we only have to learn 78 facts. Immediately, the task of learning the multiplication tables seems much more manageable!

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1 x 1	1 x 2	1 x 3	1 x 4	1 x 5	1 x 6	1 x 7	1 x 8	1 x 9	1 x 10	1 x 11	1 x 12
2		2 x 2	2 x 3	2 x 4	2 x 5	2 x 6	2 x 7	2 x 8	2 x 9	2 x 10	2 x 11	2 x 12
3			3 x 3	3 x 4	3 x 5	3 x 6	3 x 7	3 x 8	3 x 9	3 x 10	3 x 11	3 x 12
4				4 x 4	4 x 5	4 x 6	4 x 7	4 x 8	4 x 9	4 x 10	4 x 11	4 x 12
5					5 x 5	5 x 6	5 x 7	5 x 8	5 x 9	5 x 10	5 x 11	5 x 12
6						6 x 6	6 x 7	6 x 8	6 x 9	6 x 10	6 x 11	6 x 12
7							7 x 7	7 x 8	7 x 9	7 x 10	7 x 11	7 x 12
8								8 x 8	8 x 9	8 x 10	8 x 11	8 x 12
9									9 x 9	9 x 10	9 x 11	9 x 12
10										10 x 10	10 x 11	10 x 12
11											11 x 11	11 x 12
12												12 x 12

In this model (above) commutative facts have been omitted to show that as we learn each new multiplication table, there are fewer new facts to be learnt each time.

In the table below, this model has been adapted to reflect the national curriculum expectations. This shows that we learn 42 new facts in KS1, 21 new facts in Year 3 and 15 new facts in Year 4.

	x	1	2	3	4	5	6	7	8	9	10	11	12
Year 2	1	1 x 1	1 x 2	1 x 3	1 x 4	1 x 5	1 x 6	1 x 7	1 x 8	1 x 9	1 x 10	1 x 11	1 x 12
	2		2 x 2	2 x 3	2 x 4	2 x 5	2 x 6	2 x 7	2 x 8	2 x 9	2 x 10	2 x 11	2 x 12
	10			10 x 3	10 x 4	10 x 5	10 x 6	10 x 7	10 x 8	10 x 9	10 x 10	10 x 11	10 x 12
	5			5 x 3	5 x 4	5 x 5	5 x 6	5 x 7	5 x 8	5 x 9		5 x 11	5 x 12
Year 3	4			4 x 3	4 x 4		4 x 6	4 x 7	4 x 8	4 x 9		4 x 11	4 x 12
	8			8 x 3			8 x 6	8 x 7	8 x 8	8 x 9		8 x 11	8 x 12
	3			3 x 3			3 x 6	3 x 7		3 x 9		3 x 11	3 x 12
Year 4	6						6 x 6	6 x 7		6 x 9		6 x 11	6 x 12
	9							9 x 7		9 x 9		8 x 11	9 x 12
	11							11 x 7				11 x 11	11 x 12
	12							12 x 7					12 x 12
	7							7 x 7					

As well as making the most of commutativity, it is also important to build on the relationships that exist between multiplication tables. Using chanting grids, where you record and compare similar times tables, can help teachers to explain and model the links between known facts and new multiplication facts.

This chanting grid can be used to recap the 1x and 2x table, and to teach the 4x and 8x table.

x	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
4												
8												

In the table above, the white boxes represent spaces where children can record the facts they know. The pink spaces are used to record the new facts. Using this grid, the teacher can explain and model how doubling and halving can be used to help us.

For example, because I know that double 2 equals 4, I can use this information to calculate my four times table by doubling any 2x table fact to calculate a 4x table fact.

Relationships like this can be described as **multiplicative relationships** and they don't just work for doubling. See if your pupils can find links between other times tables with common factors.

Additive relationships can also be helpful and build on learning about multiplication as *repeated addition* from Key Stage 1. The chanting grid below can be used to help children with learning their 6x tables. Although we could double our 3x table facts to calculate our 6x table facts, we could also calculate our 6x table facts by adding our known 1x table facts and 5x table facts together. For example, 6 x 1 = (1 x 1) + (5 x 1). This works because of the **distributive law** of multiplication and it is this approach that makes the 'grid method' of multiplication work. For example, 16 x 2 = (10 x 2) + (6 x 2).

The chanting grid, below, can be used to recap the 1x, 5x and 3x table, and to teach the 6x table.

x	1	2	3	4	5	6	7	8	9	10	11	12
1												
5												
3												
6												

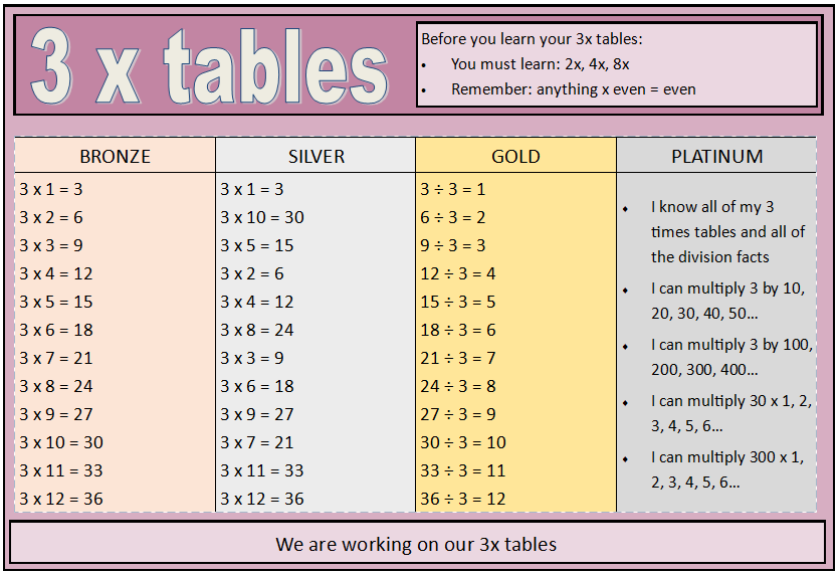
You can learn more about the laws of multiplication here: https://www.mathsisfun.com/associative-commutative-distributive.html

Effective use of chanting grids helps children to make links between known facts and the new facts they are learning. The ATM has published a resource, called Tables Together, which follows this approach and places a key emphasis on regular chanting. To find out more about this publication, visit the ATM website here: https://www.atm.org.uk/shop/act114pk .

Counting and chanting are tools that teachers can use at each stage of the learning process. When helping children at the **'input'** stage, it is essential to recap related facts before introducing new facts. For example, before learning the 4 x table, children ought to recap the facts for the 2 x table. Other activities, such as matching tasks or those involving concrete and pictorial representations are incredibly useful at this stage of the learning journey.

Chanting also plays its part at the '**storage**' stage, when it is useful to recap known facts in an unfamiliar and unpredictable order. Once children are familiar with this, we can also help them to make deeper connections in their understanding when they study inverse operations and other derived facts.

This process can be represented as different standards or degrees of understanding. We've used the standards 'Bronze', 'Silver', 'Gold' and 'Platinum' to show this deepening of understanding.



This image, above, is one of a series of posters that you can download and use to help you to track the children's progress when they learn a multiplication table over a period of time.

Timetable for times tables

In the same way that we teach units of work in maths lessons over a sustained period of time, in aiming to achieve *mastery*, it is desirable to teach one multiplication table as a block and to plan in a *spacing effect*. This involves focused periods of study followed by spaced practice in the weeks that follow.

When timetabling when you will teach all of the multiplication facts it is important to consider how much available time you have (depending on your school term dates and key events).

Here are some example timetables for learning multiplication facts. Note the spacing effect, where facts are revisited after the initial period of study.

Example A: A two-year plan for Year 3 and Year 4 (2 practice sessions per week).

Year 3	Monthly Focus	Year 4	Monthly Focus
Y3 Autumn 1	Sept: Recap 1x and 10x tables	**Y4 Autumn 1**	Sept: Recap all known tables
	Oct: Recap 2x and 5x tables		Oct: Recap 2x, 3x and 5x tables
Y3 Autumn 2	Nov: Recap known tables	**Y4 Autumn 2**	**Nov: Learn new 6x tables facts**
	Dec: **Learn new 4 x tables**		Dec: Recap 3x, 6x and 10x tables
Y3 Spring 1	Jan: Recap known tables	**Y4 Spring 1**	**Jan: Learn new 9 x tables facts**
	Feb: **Learn new 8 x tables**		Feb: Recap all known tables
Y3 Spring 2	Feb: Recap 2x, 4x and 8x tables	**Y4 Spring 2**	**Mar: Learn new 12x tables facts**
	Mar: Recap 1x, 5x, 10x tables		**Apr: Learn new 11 x tables facts**
Y3 Summer 1	Apr: Recap 2x and 4x tables	**Y4 Summer 1**	Apr: Recap all known tables
	May: **Learn new 3 x tables**		**May: Learn new 7x tables facts**
Y3 Summer 2	Jun: Recap 1x, 2x, 5x, 10x tables	**Y4 Summer 2**	Jun: Recap all known tables
	Jul: Recap 4x, 8x and 3x tables		Jul: Recap all known tables

Example B: A one-year plan for Year 4 (3 practice sessions per week). See Appendix A.

Month	Weekly Focus	Month	Weekly Focus
September Recap 1x, 2x, 5x, 10x table	Investigate the effect of x1 and x0	**February** Learn 9x table Recap 8x, 10x	Recap known ☐ x 9 facts
	Recap known 1x and 10x tables		February half term
	Recap known 2x and 5x tables		Learn 9 x 7, 9 x 11, 9 x 9 and 9 x 12
	Recap all 2x, 5x and 10x facts		Recap 3x, 4x, 6x and 12x facts
October Learn 4x table Recap 2x, 5x	Recap known ☐x4 facts	**March** Learn 12x table Recap 3x, 4x, 6x	Recap known ☐ x 12 facts
	Learn 4 x 4, 4 x 8, 4 x 12, 4 x 11		Learn 12 x 7, 12 x 11, 12 x 12
	Learn 4 x 3, 4 x 6, 4 x 9, 4 x 7		Recap all 12 x facts
	October half term		Recap 4x, 6x, 12x and ☐ x11 facts
November Learn 8x table Recap 2x, 4x	Recap known ☐ x8 facts	**April** Learn 11x table Recap 12x, 9x	Learn 11 x 7, 11 x 11
	Learn 8 x 8, 8 x 3, 8 x 6		Easter holiday
	Learn 8 x 12, x 9, x 11, x 7		Easter holiday
	Recap 2x, 4x and 8x facts		Recap 12x, 9x and 11x facts
December Learn 3x table Recap 4x, 8x	Recap known ☐ x3 facts	**May** Learn 7x table Recap 6x, 8x, 9x	Recap known ☐ x 7 facts
	Learn new 3x tables facts		Learn 7 x 7
	Recap 3x, 4x and 8x facts		Recap 6x, 7x, 8x and 9x facts
	Christmas holiday		May half term
January Learn 6x table Recap 8x, 5x, 3x	Christmas holiday	**June/July** Recap times tables families	Recap 1x, 10x, 5x
	Recap known ☐ x6 facts		Recap 2x, 4x, 8x
	Learn new 6x tables facts		Recap 3x, 6x, 12x
	Recap 3x, 6x, 5x and 8x facts		Recap 9x, 11x, 7x

'Input' activities for understanding new facts

When learning new facts, we aim to 'input' facts into our memory by building on the facts that we already know. Here are some activities and routines that you can use to help children to understand and link new facts to facts that they already know:

- "Build It, Draw It, Say It, Write It" – represent a fact or sequence in practical and pictorial ways.
- Continue the sequence – explore patterns in the 100 square to find out what will come next.
- What do you notice when…? – Describe what you notice happens when you make a change.
- Matching tasks – this could include matching pictorial representations to multiplication facts, or memory games with cards (see Appendix C – Matching Cards).
- Chanting tasks, filling in the blanks - this could involve using a counting stick, labelled with facts as in this video: https://www.youtube.com/watch?v=yXdHGBfoqfw ; and using chanting grids (see Appendix B – Chanting Grids) where there is space to recap prior learning and opportunities to make links to and record new facts.

Activities to support 'storage' of information

The process of storing information in our long term memory isn't as simple and straightforward as we might think. We need to revisit and use facts that we have learnt recently if we want to remember them, and we also need to revisit them after some time has passed. This is where *spaced practice* comes in.

Here are some routines and activities that you can use to help children to store the information they have been learning:

- Odd one out – compare and reason about different facts and make links between them.
- Non-examples – analyse examples against definitions or agreed criteria.
- Cloze exercises – fill in missing blanks from partially given information.
- Investigating inverses – using resources, like Factor-Product Triangles, showing fact families can help children to derive associated facts.
- Chanting tasks, forwards and backwards – this could involve using counting sticks, or games such as 'Tables Tennis' https://www.ictgames.com/tablesTennis/mobile/index.html
- 'Low stakes' testing – asking questions about facts in an unpredictable order.
- Matching tasks and memory games with related times tables – such as a mixture of 2x, 4x and 8x tables; helps children to recap 'what's the same and what's different'? (See Appendix C).

'Output' activities for developing retrieval and recall of facts

As we make progress through learning our multiplication tables, there are fewer new facts to learn and more facts to remember and recall. This involves recognising which facts we need, retrieving them from our memory and then recalling and applying them.

Here are some routines and activities that you can use to help children to recognise, retrieve and recall facts from their memory:

- Retrieval and recall games – such as those produced by *TT Rockstars* or '*Hit the Button'* or paper exercises such as 'Speed Tables' grids.
- Using inverses – using Factor-Product Triangles to derive associated facts.
- Chanting tasks, forwards and backwards or in a random order, using a counting stick or chanting grids (see Appendix B).
- Memory games – including covering squares on a multiplication tables grid and asking children to visualise and recall the values of the hidden numbers.
- 'Low stakes' testing – using facts from a mixture of times tables. By using a mixture of times tables, the children have to recognise, retrieve and recall their facts in an unpredictable order.
- Solving problems and investigating patterns and relationships – the NRICH website contains many varied and interesting activities you can try to support children with using, developing and applying their understanding of multiplication tables facts.

In addition to the key ideas we have outlined so far, here are our top tips for teaching times tables.

Top Tips for Teaching Times Tables

1. Regularly recap prior learning

Chanting is a simple and effective routine that takes very little time. This really helps to contribute to spaced practice and supports information 'storage' and 'output'. See Appendix B for chanting grids.

2. 'Build it, draw it, say it, write it'

Use concrete resources and images often, not only to explore and aid direct teaching of new facts but also to recap and revisit prior learning. You can use counters, cubes, coins, Cuisenaire, tens frames and many other resources. Using manipulatives can help pupils to make links to other areas of maths and to investigate division facts.

3. Mix it up

Make sure you use a mixture of familiar routines and strategies – such as chanting, matching tasks and quizzing; but allow yourself to experiment with different ways of teaching 'input', 'storage' and 'output' activities and use different resources too. There are so many different ways you can find success with teaching times tables; have fun trying different things. If you enjoy it, the children will too!

4. Home learning

Engage the parents and share your expectations and routines with them. You can set a variety of times tables homework challenges and games, including interactive apps or matching cards (see Appendix C: Matching Cards). If you haven't already done so, you can download and share 'Maths at Home', our guide for learning key maths facts at home, from the Cambridgeshire Maths Team's group page on Knowledge Hub.

5. Get active

Try taking the learning outdoors and search out good times tables songs and dances online. These types of activities can help to make learning times tables fun and more memorable, but shouldn't replace direct teaching.

6. Variation and variety

When learning new facts, children find *variation* of questioning helpful. When revisiting known facts, *variety* of questions can add an element of unpredictability. If you are unfamiliar with the distinction between variation and

variety of questions, you can download our 'Variation' guide from the Cambridgeshire Maths Team's group page on Knowledge Hub.

7. Share the journey and set targets with children

Share your aims and intentions clearly with your class and their parents/carers. Let them know what you're going to be learning and how you will achieve your aims. For some children it can be somewhat overwhelming to think about learning all of the tables up to 12x12, so let them know how you will break it down into manageable steps. Using posters to show what you're learning and when can help with this. You can download our times tables posters from the Cambridgeshire Maths Team's group page on Knowledge Hub.

8. Reward and celebrate effort

It's just as important to reward effort and progress as it is to celebrate achievement. Many schools have a '*TT Rockstar of the Week*' or '*Mathlete of the Week*' to reward online learning, but you can do the same in class with Class Dojo (an interactive programme) or other effort and progress certificates or prizes.

9. Have a times tables champion or advocate

Is there someone in your team who could be responsible for recognising and rewarding children's effort (see point 6) or to support children who need to 'catch up' through informal intervention activities? Sometimes nothing beats a short 1:1 activity; going over tricky facts or addressing misconceptions. At other times is can be a simple recognition of a job well done, such as a 'High 5', or sharing success with parents/carers when you see them on the playground.

10. Low stakes testing

A short times tables quiz, 'Speed Tables' grid, or daily fluency exercise such as '5-a-day' is a nice way to help the children to revisit prior learning and to help you to identify areas to develop and facts to revisit. Our advice would be to keep it informal and avoid using the results to determine which children are ready to 'move on'.

Preparing for the Statutory Multiplication Tables Check (MTC)

At the time of writing this booklet there has already been lots of information written about the MTC and how to prepare for it. Your school may have participated in the trial already. However, if you're unfamiliar with the MTC you may find the following resources and information useful.

Information and guidance from the DfE:

- https://www.gov.uk/guidance/multiplication-tables-check-development-process
- https://www.gov.uk/government/publications/multiplication-tables-check-administration-guidance
- https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/755745/2018_MTC_assessment_framework_PDFA.pdf

Online simulators you can use:

- https://mathsframe.co.uk/en/resources/resource/477/Multiplication-Tables-Check

Recommended reading:

- https://www.tes.com/news/times-tables-check-what-do-i-need-know
- https://thirdspacelearning.com/blog/year-4-multiplication-times-tables-check-new-assessment-framework-2020/

Once you have read the guidance and information, you may still have questions about how to organise the MTC in your school. If so, please don't hesitate to get in touch with our team. You can contact us by emailing maths.team@cambridgeshire.gov.uk or by messaging us on Twitter @Cambs_SIS or via our Knowledge Hub group page https://khub.net/group/cambridgeshire-maths-team/

Resources to support teaching and learning

Factor-Product Triangles, Times Tables Posters, homework challenge tasks and several other resources can be found and downloaded for free from the Cambridgeshire Maths Team's *Knowledge Hub* group library https://khub.net/group/cambridgeshire-maths-team/group-library/

Digital resources, games and apps:

- MathsFrame - https://mathsframe.co.uk/en/resources/resource/477/Multiplication-Tables-Check
- Hit The Button and other games - https://www.topmarks.co.uk/maths-games/hit-the-button
- Times Tables Memory Game and other games - https://www.timestables.co.uk
- NRICH activities relating to multiplication - https://nrich.maths.org/14228
- Times Tables Rockstars - https://ttrockstars.com/home

References and Reading

In this booklet we have explored how we can learn facts in mathematics. To create these resources we have drawn on theories for learning and cognitive science, including how we construct knowledge, how we store and retain learning, as well as the behaviours of learning.

The advice in this booklet is built along the following key ideas:

- New learning is developed by making links to prior knowledge
- Learning is based on *mental processes*, such as thinking, memory and solving problems
- Learning new facts is easier when we have capacity in our *working memory*
- 'Direct' or 'Explicit' instruction, following a model of 'Explain – Model – Scaffold – Practise', helps children to learn new facts by reducing the *cognitive load* and helps teachers to overcome and address misconceptions

If you'd like to find out more about these key terms, here is a selection of reading and research that you might find useful:

- 'Why Students Don't Like School? Because the Mind is Not Designed for Thinking.' (D.T. Willingham, 2009)
- Organising Instruction and Study to Improve Student Learning (H. Pashler et al, 2007)
- The Science of Learning (Deans for Impact, 2015)

Additional reading relating to teaching multiplication tables can be found here:

- How To Teach Times Tables So Pupils Learn Instant Recall From KS1 Through To KS2 (Third Space Learning, 2019)
- https://www.ncetm.org.uk/resources/20320
- https://www.oxfordowl.co.uk/for-home/maths/times-tables-tips/

Appendix A – Example Planning

Example Times Tables Planning (3 sessions, between 5-10mins each)

Week 6, Day 1	Weekly Focus: Learn 4 x 3, 4 x 6, 4 x 9, 4 x 7				
Recap	New learning	Bronze	Silver	Gold	Platinum
Recap known 4x facts from last week, with counting stick. 4 x 1, 4 x 2 4 x 4, 4 x 5 4 x 8, 4 x 10 4 x 11, 4 x 12	Introduce 4 x 3 – show that it's the same as ((4 x 2) + 4) and 4+4+4.	Build arrays to show that 4 x 3 is four more than 4 x 2, and the same as 4 + 4 + 4	Draw factor product triangle for 4 x 3 = 12 and write related facts including ÷	Draw factor product triangle for 4 x 3 = 12 and write related facts including ÷	If I know 4 x 3 = 12, what else can I work out?

Week 6, Day 2	Weekly Focus: Learn 4 x 3, 4 x 6, 4 x 9, 4 x 7				
Recap	New learning	Bronze	Silver	Gold	Platinum
Recap known times tables facts for 4x table so far: 4 x 1, 4 x 2, 4 x 3, 4 x 5, 4 x 8, 4 x 10, 4 x 11, 4 x 12	Yesterday we learnt 4 x 3 – one more 4 than 4 x 2, and the same as 4 + 4 + 4. Use this fact to calculate 4 x 6, by doubling.	Build 4 x 6 as an array to show 4 x 6 = double 4 x 3.	Match the times tables to the product – all 4 x tables, except 4 x 7 and 4 x 9.	Factor – Product triangles game with 4 x tables, except 4 x 7 and 4 x 9. Include division questions.	Prove that 4 x 6 is 100 times smaller than 40 x 60.

Week 6, Day 3	Weekly Focus: Learn 4 x 3, 4 x 6, 4 x 9, 4 x 7				
Recap	New learning	Bronze	Silver	Gold	Platinum
Recap 2x tables with chanting and 4x tables chanting the ones we know so far – include 4 x 9 and 4 x 7 but give the products for these numbers.	How can we use 4 x 6 = 24 to work out 4 x 7? How can we use 4 x 10 = 40 to calculate 4 x 9?	Complete factor product triangles for 4 x tables.	4 x tables Factor-Product triangles – practice in random order.	Non-examples. Which of these numbers are not divisible by 4?	Non-examples. Which of these numbers are not divisible by 4?
Low stakes testing		Test A – x2, x4, x10		Test B - x2, x4, x10, ÷2, ÷4, ÷10	

Appendix B – Chanting Grids

1. Chanting grids for recapping the 1x, 2x, 5x and 10x tables

x	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
5												
10												

x	10	20	30	40	50	60	70	80	90	100	200	300
1												
2												
5												
10												

2. Chanting grids for recapping the 1x and 2x tables and for learning the 4x and 8x tables

x	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
4												
8												

x	10	20	30	40	50	60	70	80	90	100	200	300
1												
2												
4												
8												

3. Chanting grids for recapping the 1x, 2x and 4x tables and for learning the 3x tables

x	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												

x	10	20	30	40	50	60	70	80	90	100	200	300
1												
2												
3												
4												

4. Chanting grids for recapping the 1x, 5x and 3x tables and for learning the 6x tables

x	1	2	3	4	5	6	7	8	9	10	11	12
1												
5												
3												
6												

x	10	20	30	40	50	60	70	80	90	100	200	300
1												
5												
3												
6												

5. Chanting grids for recapping the 3x and 6x tables and for learning the 9x and 12x tables

x	1	2	3	4	5	6	7	8	9	10	11	12
3												
6												
9												
12												

x	10	20	30	40	50	60	70	80	90	100	200	300
3												
6												
9												
12												

6. Chanting grids for recapping the 1x and 10x tables and for learning the 9x and 11x tables

x	1	2	3	4	5	6	7	8	9	10	11	12
1												
9												
10												
11												

x	10	20	30	40	50	60	70	80	90	100	200	300
1												
9												
10												
11												

7. Chanting grids for recapping the 2x, 4x and 8x tables and for learning the 12x tables

x	1	2	3	4	5	6	7	8	9	10	11	12
2												
4												
8												
12												

x	10	20	30	40	50	60	70	80	90	100	200	300
2												
4												
8												
12												

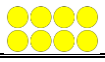
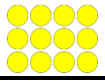
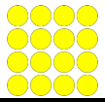
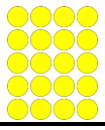
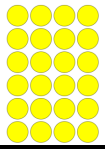
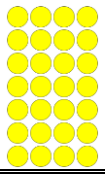
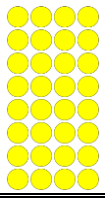
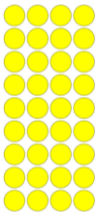
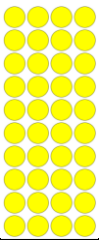
8. Chanting grids for recapping the 5x, 6x and 8x tables and for learning the 7x tables

x	1	2	3	4	5	6	7	8	9	10	11	12
5												
6												
7												
8												

x	10	20	30	40	50	60	70	80	90	100	200	300
5												
6												
7												
8												

Appendix C – Matching Cards

Example matching cards for the 4x table:

4	8	4 x 1	4 x 2		
12	16	4 x 3	4 x 4		
20	24	4 x 5	4 x 6		
28	32	4 x 7	4 x 8		
36	40	4 x 9	4 x 10		
44	48	4 x 11	4 x 12