Note: This unit contains many significant **multiplication and division concepts**. You may wish to **spread it across a Semester,** or **repeat some lessons across the year**. Of course, you may wish to use it as a base on which to add your own ideas, according to your student's needs.

Topic: Multiplication and Division **Level: 5 & 6**

KEY CONCEPTS: (please insert your relevant curriculum outcomes here)

*Identify and describe **factors and multiples** of whole numbers.
*Solve problems involving **multiplication of large numbers by one- or two-digit numbers using efficient mental, written strategies** and appropriate digital technologies.
*Solve problems involving **division by a one digit number,** including those that result in a remainder.
*Use **efficient mental and written strategies** and apply appropriate digital technologies to **solve problems**.
*Identify and describe properties of **prime, composite, square and triangular numbers.**

Equipment/Resources: Arrays, games printed (links provided below), printed pre-assessment task sheets (link below), Mfacts121 Practise Cards printed (link below), 10 sided dice, counters, individual whiteboards and markers, growth mindset activities	**Vocabulary:** 'rows of', array, strategy language-(double, double-double, distributive property, grid method), product, multiple, factor, multiplier, quotient, divisible, remainder

SESSION & LEARNING INTENTION (L.I.)	**TOOLS/ WARM UP**	**WHOLE GROUP LEARNING**	**INDEPENDENT LEARNING**	**REFLECTION/ SUMMARY**	**ASSESSMENT and FEEDBACK**
Session 1 L.I: We are reflecting on **what we know about multiplication** and what we don't know **yet.**	**Whole class-** each student will be given one minute to **write down the multiples of 7** (skip count by 7s) (**or could be multiples of 8 or 9-** teacher chooses based on class needs). How far can each student get in **one minute**? Students write in their books/whiteboards. After the one minute concludes, the class calls out the list of multiples and students correct their own work. Teacher briefly draws attention to **patterns/ strategies.** Asks students to look at their own work- what was challenging for	**Teacher explains:** 'We will be finding out what we already know about multiplication and what we don't know **yet,** with our **pre-assessment task.** Let's do that now'.	Pre-Assessment Task Assessment Task Teacher Talk Teacher explains- students are to **answer** the questions and **explain** their thinking. **Teacher to rove and question** the students on their thinking- record any observations on the student work. ***Try to get more information than 'I just know it'.*** Students will be reluctant to record their thinking- it's very useful to rove and get better insights.	**Teacher summarises-** 'Today we were thinking about what we know about multiplication. In the next few sessions, we will be working on strategies for learning our multiplication facts (times tables) up to 10x 10.'	**Collect pre-assessment task** and **sort** completed tasks into groups, according to level of understanding. Identify trends and foci for your class.

	you? What strategies can help you when counting by 7s (or 8s/9s)? **Then, repeat**- can students go further and improve on their **personal best**? Provide **one more minute** for students to count as far as they can by 7s (or 8s/9s). *Becoming proficient at anything takes effort and practise.* Teacher Talk Video: 'Skip Counting and Multiples'				
Session 2 L.I: We are investigating **efficient strategies for the multiplication facts** (up to 10 x 10).	Mfacts121 Practise Cards- These cards should be photocopied *back-to-back* so that you have questions on the front and *questions with answers* on the back. Best to do it on *coloured card* and keep sets in the classroom for regular use. Students can choose whichever colour level they are working on, or wish to revise, and use that Practise Card. Students will be given **two minutes** to see how many questions they can answer. *They must write each question and the answer in their book.* When time is up, students turn their Practise Card over and **self correct** (answers will be on the	Teacher **chooses a relevant 'nines fact'** and asks students to share their strategies. Such as 9 x 7 = ? *What strategy would you use to solve this?* **Begin recording on a class chart**- **'Multiplication Facts – Our Strategy List'** *(It's a good idea to start with the **class building up their own list**, rather than giving them the pre-determined list of strategies.* *The Mfacts121 Strategy List can be brought in later and linked to what students have developed themselves).*	**View** '9 x _ Strategy' Video to revise this concept. **Game-** '9 x _ Game' in pairs. **Teacher group- - '9 x _ Game'** as above with teacher input **Extend**- play an adjusted version of the '**9 x _ Game',** increasing the number range, so that high attainers are to multiply 9 X 2-digit by numbers (refer to instructions on game). *See 'Teacher Talk' for ideas and tips on teaching the **9 x _ strategy**. You will also find ideas about **student prerequisite skills** required for learning this strategy.	What helps you learn your multiplication facts? What goals could you set for yourself?	

	back of their card). Next, teacher picks out a multiplication question from any card, to discuss- E.g. 9 x 6, ask: *what strategy would you use to solve this?* or '*How did you know the answer?*' Discuss ideas. Now repeat the Practise Card activity. Provide **two minutes again.** Can the students improve on their score? Aim is to continue to improve on personal best, Teacher Talk Video: 'Practise Cards'.				
Session 3 L.I: We are investigating **efficient strategies for the multiplication facts** (up to 10 x 10).	**Play 'Multiples Game'** (Teacher chooses which multiple they would like to focus on).	Teacher **chooses a relevant 'fives fact'** and asks students to share their strategies. Such as **5 x** 8 = ? *What strategy would you use to solve this?* Does any student suggest thinking 10 x 8 and then halving the result? If so, hone in on this efficient strategy. **View** '5 x _ Strategy' Video (May view 10 x _ Strategy also if desired)	**Game-** 'Tens Facts and Five Facts Game' in pairs. ***Extend / Early Finishers**: students log on to their Mfacts121 account and complete 'Online Practise' or 'Online Assessment' or 'Self-Directed Tasks' *See 'Teacher Talk' for ideas and tips on teaching the **5 x _ strategy**. You will also find ideas about **student prerequisite skills** required for learning this strategy.	Growth Mindset Reflection: How have you grown your maths brain? What are you doing/going to do to keep improving on your multiplication facts? Growing Your Maths Brain, reflection sheet Keep this sheet and add to it later.	
Session 4 L.I: We are investigating **the 'distributive**	Mfacts121 Practise Cards- Choose a card. How many can you answer in 2 mins? Can you improve your	Teacher chooses a relevant fact and asks students to **share their strategies**. Continue recording on a **class chart-**	**Play** 'Paddocks' game Teacher to reiterate the concept that this game links to the **'distributive property'.**	Students to give an example of how they use the 'distributive	**Assessment-** Teacher logs onto mfacts121.com

property' as a multiplication strategy.	personal best? (see **Session 2** Tools/Warm Up for details) **Growth Mindset Clip** (2.5 mins) Growth Mindset Video *You can grow your brain through effort and persistence!*	**'Multiplication Facts – Our Strategy List'** E.g. 7 x 5 = ? Does anyone suggest a strategy that is in fact the distributive property? (Such as think 5 x 5 = 25 and then 2 x 5 = 10 and add together?) Introduce the strategy **'Distributive Property- separate the question into easier parts'** **View** 'Distributive Property Strategy' Video	If you can't fit your array onto the paddock, **you can separate it into smaller parts,** but you must make sure it still equates to the same equation- e.g. **6 x 5** can be thought of as **6 rows of 5** so this could be separated into **3 rows of 5** and **3 rows of 5**, which is still **6 rows of 5** altogether**.** *See 'Teacher Talk' for ideas and tips on teaching the **Distributive property strategy**.	property'. *Is there a multiplication fact which you use the distributive property to help you solve quickly?*	to check **'Results'** and monitor where each student is up to, on their fact levels.
Session 5 L.I: We are investigating **efficient strategies to multiply** up to 10 x 10.	**Count aloud as a class OR on individual whiteboards**, by 7s, 8s or 9s. Note patterns or strategies. Reiterate that these are the *multiples of 7/8/9.*	**View** 'Making Connections Strategy' Video **:** Think 'use what you know, to help with what you don't know'. On **individual whiteboards**, ask students to do the activity at the end of the Making Connections video (above), showing examples of how they could use one X fact, to help solve another X fact, **e.g. I know 6x4=24, so 7x4 must be one more group of four, that's 28**	**Game-** 'Strategy Game' in pairs. **Extend** - play the 'Strategy Game' but increase number range, to multiplying 2-digit by 1-digit numbers (refer to instructions on game) Students log on to their Mfacts121 account and complete 'Online Practise' or 'Online Assessment' or 'Self-Directed Tasks'. *See 'Teacher Talk' for ideas and tips on teaching the **Making Connections strategy**.	What is a **square number?** Which multiplication facts are square numbers? Model on an array to illustrate the square shape produced. These square number facts are handy to remember and can help us derive the answers for other X facts.	
Session 6 L.I: We are investigating **efficient strategies to multiply** up to 10 x 10 and beyond.	**Play 'Multiples Game'** (Teacher chooses which multiple they would like to focus on).	**Review** 'Making Connections Strategy' Video **:**Think 'use what you know, to help with what you don't know'. **Or** Reflect on class list:	**Rotations:** **1)(Repeat) Game-** 'Strategy Game' in pairs. **Extend** - play the 'Strategy Game' but increase number range, to multiplying 2-digit by 1-digit numbers (refer to instructions on game) **2)Students log on to their Mfacts121**	**Students complete 'Making Connections' chart** to show how knowing one X fact, can help us with	

		'Multiplication Facts – Our Strategy List'- keep adding to this.	**account** and complete 'Online Practise' or 'Online Assessment' or 'Self-Directed Tasks'. **Teacher pull-out group-** 'Strategy Game' as above with teacher input.	many more facts.	
Session 7 **L.I.:** We are identifying **factors, multiples, prime and composite numbers.**	Ask students to write a list of **multiples of 8.** Do they understand what a multiple is? Then ask students to list all the **factors of 8**. Do they remember what a factor is? *A whole number that divides exactly into another whole number.*	Look at some **key vocab definitions** online. Search '*kids maths dictionaries'* online: Factor Multiple Prime Number Composite Number Referring back to **TOOLS/ WARM UP- ask,** is 8 a composite or prime number?	**Make 'foldables' to show definitions and examples of key words:** Factor Multiple Prime Number Composite Number Example of 'Foldable' about Factors and Multiples. **Early finishers:** Who knows their 11s and 12s facts? Get onto this **practise section!** 11s and 12s facts	Share some of the foldables with the group.	
Session 8 L.I: We are using **efficient strategies for multiplication facts** (up to 10 x 10) **and beyond**.	**Whole class-** each student is to **write the multiples of 7** (skip count). Starting at 0. Can they get further than they did in Session 1? (do on individual whiteboards or in workbooks) **Then, repeat-** can students go further than the first round and improve on their **personal best**?	**Pose Problems** 63 x 4 48 x 30 **All students to attempt on individual whiteboards. Provide 'think time' for all.** Share strategies- (teacher is looking for any efficient strategies: use of distributive law - e.g. 60 x 4 plus 3 x 4, formal written algorithm, grid method, or 'double double'). View this demonstration video link: Grid Method Notice that grid method is a way to set out and use the distributive property for larger numbers.	Choose a 2 digit number card (or two playing cards to make a 2 digit number) and roll a 10-sided die to **create a 2 digit by 1 digit equation.** Students solve the equation with **their chosen strategy** (either by using distributive property, grid method or formal written algorithm). Then check and correct with calculator. **Extend**: do 2 x 2 digit numbers 3 digit x 2 digit numbers	What strategy/ies did you like today for multiplication with large numbers?	
Session 9 L.I: We are using	**Whole class-** each student is to **record the multiples of**	Pose Problems 25 x 6	Students work on a variety of problems and focus on 1 strategy at a time.	What strategy/ies did	

efficient strategies for multiplying large numbers.	**8** (skip count). Start at 0. How far can they get in **1 minute**? Students then correct their own work as the class says the multiples together. Teacher draws attention to **patterns/strategies.** **Then, repeat-** can students go further than the first round and improve on their **personal best**?	Challenge- (and Year 6) 53 x 25 All students to attempt on whiteboards. Share strategies (teacher is looking for: use of distributive property- 20 x 6 plus 5 x 6, formal algorithm or grid method) **Demonstration video link**: Grid Method	e.g. 3 groups. Students rotate through the 3 activities. Continue over two sessions. <u>3 activities:</u> 1)*Students log into their **Mfacts121 account** and go to this **Self Directed Task** involving the Grid Method (Multi-Colour Master Task) **2)*Formal Algorithm-** Choose a 2 digit number card (or two playing cards to make a 2 digit number) and roll a 10-sided die to **create a 2 digit by 1 digit equation.** Solve using formal written algorithm (vertical recording in books). 3)***Worksheet**: Grid Method task Grid Method Worksheet 2 dig x 1 dig Grid Method Worksheet 2 dig x 2 dig Grid Method Worksheet 3 dig x 2 dig	you like today for multiplication with large numbers?	
Session 10 L.I: We are learning **efficient strategies for multiplying large numbers**.	**Whole class-** each student is to **record the multiples of 8** (skip count). Start at 0. How far can they get in **1 minute**? Students then correct their own work as the class says the multiples together. Teacher draws attention to **patterns/strategies.** **Then, repeat-** can students go further than the first round and improve on their **personal best**?	Pose Problems 46 x 5 Challenge- (and Year 6) 53 x 24 All students to attempt on whiteboards. Share strategies (teacher is looking for: use of distributive property, formal algorithm or grid method) **Demonstration video link**: Grid Method	Continue to rotate through the 3 activities. <u>3 activities:</u> 1)*Students log into their **Mfacts121 account** and go to this **Self Directed Task** involving the Grid Method (Multi-Colour Master Task) **2)*Formal Algorithm-** Choose a 2 digit number card (or two playing cards to make a 2 digit number) and roll a 10-sided die to **create a 2 digit by 1 digit equation.** Solve using formal written algorithm (vertical recording in books). 3)***Worksheet**: Grid Method task Grid Method Worksheet 2 dig x 1 dig Grid Method Worksheet 2 dig x 2 dig Grid Method Worksheet 3 dig x 2 dig	What strategy/ies did you like today for multiplication with large numbers?	
Session 11 L.I. We are **reflecting on**	Practise **multiplication facts- speed and recall**, using link below:	Teacher explains: we have learnt about and practised efficient strategies for multiplying, up to	Pre-Assessment Task Assessment Task Teacher Talk	Students look at their results and reflect on what	**Correct the Post Assessment as a class**. Collect

our learning.	http://www.transum.org/Software/SW/Flash_Tables/ Display on Interactive WB and students all participate on paper/individual whiteboards.	10x10 and beyond. You are going to **reflect on the knowledge you have built**, by having another look at the **pre-assessment task** you did in the beginning of the unit.	Students are given back their original assessment task and now they add to/change their answers based on their new learnings (using a different colour pen/pencil). **Teacher to rove and question** the students on their thinking- record any observations on the student work. ***Try to question the students to get more information than 'I just know it'.***	they have learnt or improved on.	and look through improvements.
Session 12 L.I: We are using our **knowledge of multiplication to help with division**.	*Once multiplication facts are consolidated, division facts can be brought in. We believe that if multiplication facts are thoroughly understood and fluent, student will be more able to solve division facts. They can be encouraged to 'think multiplication' to solve division (we are aiming to move students beyond skip counting to work out division facts)* **'Fact families' -** Write a multiplication fact on the board e.g. **6 x 5 = 30** Knowing this fact also helps with **division**. Let's think about: **30 ÷ 6 = ?** Encourage students to '*think multiplication' to solve division facts-* i.e. think: *6 whats are 30*? Or 6 X ? = 30 6 **fives** are 30.	View the video relating division and multiplication. Relating division and multiplication video.	Students practise division equations. **2 Rotations:** **1) Worksheet -** Multiplication and Division Fact Families **Early finishers-** Division Apprentice Log into Mfacts121! Division Master Log into Mfacts121! **2)** Play online division games: Mathplayground- Division Derby Division Apprentice Division Master *Does everyone in your class know their 11s and 12s facts??* Get your Year 5/6s onto this **practise section!** 11s and 12s facts	Does knowing your multiplication facts help when working on division?	

	So 30 divided by 6 is 5. Then, **30 ÷ 5 = ?** Encourage students to *'think multiplication' to solve division*- i.e. think: *5 whats are 30*? Or 5 X ? = 30 5 **sixes** are 30. So 30 divided by 5 is 6. **Students write the 4 facts, in the fact family:** **6 x 5 = 30** **5 x 6 = 30** **30 ÷ 6 = 5** **30 ÷ 5 = 6**				
Session 13 L.I: We are **dividing** by 1 digit numbers	**Fact families'** up to 10x10 - give a X fact on the board e.g. 8 x 6 = 48 Students to **draw the array**, 8 rows of 6, then **write the 3 other facts in the fact family** 6 x 8 = 24 48 ÷ 6 = 8 48 ÷8 = 6 **Ask students to use the array to illustrate the facts.** **Ask students to find all factors of 48.**	Look at some **key vocab definitions** online. Search '*kids maths dictionaries'* online: divisor quotient divide remainder factor Students attempt this equation on individual whiteboards: 6 ⟌726 Model how to solve, using the formal written algorithm.	Students practise various formal division equations with larger numbers, using the long division symbol e.g. 6 ⟌726. **Enable:** work with no remainders to begin **Independent:** with remainders **Extend-** 3 digit ÷1 digit or 4 digit ÷ 1 digit 3 digit ÷ 2 digit or 4 digit ÷2 digit with remainders. Students calculate and check answers on calculator as they go.	Is your division work improving as you practise?	**Assessment-** Teacher logs onto mfacts121.com to check where each student is up to, on their fact levels.

NB- We acknowledge the external websites used and do not claim their content as our own.

<u>Other Strategy Videos suggested for this level:</u> (use across the year, in 'Tools/Warm Up time' or as they arise)

- Eights Facts: 8 x _ = Think 'double, double, double'

- Tens Facts: 10 x _ = Think ‘make it 10 times bigger with a zero’
- Commutativity: Think ‘use your turn around facts’