

LEVEL: Upper Primary	CONTENT: Number & Algebra	FOCUS: Factors and Multiples
In the Classroom		
PURPOSE	<ul style="list-style-type: none"> Identify the qualities of a good mathematician Demonstrate the qualities of a good mathematician Explain and record thinking using a systematic approach Identify and explain multiples of different numbers Identify and explain factors of different numbers Recognise and develop a definition for Prime numbers Recognise and develop a definition for composite numbers 	
INTRODUCTION	<p>Good Mathematician Brief discussion about the qualities of good mathematicians - remind students that everyone is a good mathematician and encourage students to use the strategies that they have suggested</p>	
WARM UP	<p>Identifying Factors & Multiples Give pairs of students a hundred chart; ask students to identify a number say 6, now tell me a multiple of 6; another multiple of 6; what is a multiple? Record on board. Tell me a factor of 6, what is another factor of 6? What is a factor? Factors are numbers we can multiply together to get another number</p>	
EXPLICIT TEACHING & LEARNING	<p>Factors & Multiples</p> <ul style="list-style-type: none"> Give pairs of students a 100 grid and some counters Aim is to block your partner from choosing a number First student chooses a number and covers it with a counter Next student must choose either a multiple or factor of this number, justifying their thinking First student now chooses a factor or multiple of this new number Game continues until there is no new numbers to choose Encourage students to devise a method to record the number sequence For example: $50 \rightarrow 25 \rightarrow 5 \rightarrow 1 \rightarrow 13 \rightarrow STOP$ Once students have played the game a number of times stop and discuss strategies <p>Challenge – New aim of the game is to work collaboratively to cover as many numbers on the grid as possible before being forced to stop – which pair can work together to get the most numbers covered?</p>	
DISCUSSION/KEY QUESTIONS	<ul style="list-style-type: none"> What is a multiple? What is a factor? Can you use your multiplication facts to help you identify the factors or multiples? Do all numbers have the same number of factors? Do odd numbers have more factors? Or even number? What do we call numbers that have only one factor? Why are prime numbers special? If a number is not a prime, what is it called? How are composite number created? How can you record your number sequence? What numbers should you avoid if you want to get a high total? 	
DELIBERATIVE PRACTICE	<p>The focus of this activity is for students to justify how they know the new number chosen is a factor or multiple of the previous number. Overtime the use (or avoidance) of prime numbers becomes a strategy in this game.</p>	
REFLECTION	<p>Discussion with students about the ways they demonstrated that they were a Good Mathematician</p>	
RESOURCES	<p>Factors and Multiples https://nrich.maths.org/5468 Hundreds chart; small counters; multiplication facts grid</p>	

Curriculum Connections	
CONTENT	<p>VICTORIAN CURRICULUM F-10 YEAR 5 – NUMBER & ALGEBRA Identify and describe factors and multiples of whole numbers and use them to solve problems(VCMNA181) Elaborations: explore factors and multiples using number sequences; use simple divisibility tests Use efficient mental and written strategies and apply appropriate digital technologies to solve problems(VCMNA185) Elaborations: choose between mental, written and a technology-based computation depending on the nature of the problems and the purpose for computation; use technology to solve problems and check the reasonableness of answers YEAR 6 – NUMBER & ALGEBRA Identify and describe properties of prime, composite, square and triangular numbers (VCMNA208) Elaborations: understand that some numbers have special properties and that these properties can be used to solve problems; represent composite numbers as a product of their prime factors and using this form to simplify calculations by cancelling common primes; understand that if a number is divisible by a composite number then it is also divisible by the prime factors of that number.</p>
WHAT CAME BEFORE	Students need to know (or be familiar with strategies to work out) the multiplication facts up to 10x10 An understanding of the terms factors and multiple will also be useful
WHAT COMES NEXT	The way the “win” the game is to avoid the primes higher than 50 as they have no multiple on the board and their only factor is 1. Lessons that investigate prime numbers and prime factorisation. Also lessons on highest or lowest common factor, HCF or LCF or lowest common multiple (LCM)
VOCABULARY	Addition, multiplication, skip counting, multiplication facts, times tables, multiples, factors, primes, composite numbers
WHAT PROFICIENCIES ARE TO BE UTILISED? Understanding Fluency Problem Solving Reasoning Communicating (NSW) Justifying (NSW)	<p>Year 5 (Australian Curriculum) Understanding includes making connections between representations of numbers, using fractions to represent probabilities, comparing and ordering fractions and decimals and representing them in various ways, describing transformations and identifying line and rotational symmetry Fluency includes choosing appropriate units of measurement for calculation of perimeter and area, using estimation to check the reasonableness of answers to calculations and using instruments to measure angles Problem-solving includes formulating and solving authentic problems using whole numbers and measurements and creating financial plans Reasoning includes investigating strategies to perform calculations efficiently, continuing patterns involving fractions and decimals, interpreting results of chance experiments, posing appropriate questions for data investigations and interpreting data sets.</p>
ASSESSMENT	Exit Pass – Can you show an example of a number that has one factor, three factors, more than five factors? list the multiples of your chosen numbers up to 100