

**Age 11+ Level ★
Worksheet 1****1. Product 100**

The product of four different positive integers is 100.
What is the sum of these four integers?

2. Prime Order

How many of the three-digit numbers that can be made from all of the digits 1, 3 and 5 (used only once each) are prime?

3. Producing Zeros

If the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 are all multiplied together, how many zeros are there at the end of the answer?

4. Almost a Million

Which of the following is divisible by 6?

- (a) one million minus one
- (b) one million minus two
- (c) one million minus three
- (d) one million minus four
- (e) one million minus five

5. Multiple Years

The year 2010 is one in which the sum of the digits is a factor of the year itself. What is the next year that has the same property?

6. Multiplication Table Puzzle

In the multiplication table on the right, the row and column headings are all missing, and only some of the products in the table are filled in.

All the numbers in the table are positive integers.

What is the value of $A + B + C + D + E$?

x					
	A	10		20	
	15	B	40		
	18		C	60	
		20		D	24
			56		E

These problems are adapted from UKMT (ukmt.org.uk) and WMC (competition.ac) problems.

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Worksheet 2****1. What's on the Back?**

Four cards each have a number written on one side and a phrase written on the other. The four numbers are 2, 5, 7 and 12. The four phrases are "Divisible by 7", "Odd", "Prime" and "Greater than 100".

On each card, the number written **does not** have the property written on the other side of the card. What are the four number-property pairs?

2. Divisible Digits

I wrote down a 4-digit number that was divisible by 3, 4, 5 and 6, but I spilt a cup of tea on it and can only see the first two digits.

The first two digits are 95 (in that order). What were the last two?

3. Pairing Up

The numbers 72, 8, 24, 10, 5, 45, 36, 15 are grouped in pairs so that each pair has the same product. Which number is paired with 10?

4. Tricky Customer

Charlie wants to buy a new house but he doesn't like house numbers that are divisible by 3 or by 5.

If all the houses numbered between 100 and 150 inclusive are for sale, how many houses can he choose from?

5. Calculation 2000

What is the value of $2000 + 1999 \times 2000$?

6. Reversible Primes

The integer 113 is prime, and its reverse, 311, is also prime.

How many two-digit primes are there between 10 and 99 which have the same property?

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