

## Maths Problem Solving Week 4

This week's problems come from the Australian Maths Trust Publishing.

The Senior Question is from *Problems to Solve in Middle School Mathematics* by B Henry, L Mottershead, A Edwards, J McIntosh, A Nakos, K Sims, A Thomas and G Vardard.

The Junior and Middle Questions are from *Problems to solve in Primary School Mathematics* by B Henry.

Good Luck

### Multiples of 3

- a Multiply several different numbers by 3. Add the digits of the answer in each case. What do you notice about the sums of the digits?
- b Make up five 4-digit numbers each of which has a digit sum which is *not* a multiple of 3. Will 3 divide exactly into each number (that is, is each number a multiple of 3)? What do you find?
- c Write down a rule for finding out if a number is a multiple of 3 or not (without doing the division).
- d List all the whole numbers between 1 and 1 000 000 which are even multiples of 3 and are made up using only the digits 0 and/or 1.

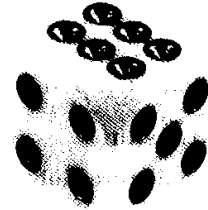
## Middle – Threedub

### Threedub

Threedub is a game played with numbers.

To *threedub* a number you

EITHER double it  
OR add 3 to it.



Each player rolls one die to get a number.

They threedub it, then threedub the result.

Their final score is this number divided by the number they started with.

The player with the highest final score is the winner.

Lee rolled a 4. He doubled it to make 8; then doubled it again to make 16.  
 $16 \div 4 = 4$ , so his final score was 4.

- a Aaron rolled a 3. He doubled it, then added 3. What was his final score?
- b Beau rolled a 6. What is the highest final score he can get?
- c Cathy rolled a 2. How can she can beat Beau and Aaron?
- d David played threedub and got a final score of 8. What number did he roll?  
How did he get 8?

## Junior – Adding Even and Odd Numbers

### Adding Even and Odd Numbers

An even number is a multiple of 2. For example, 16 is an even number, because  $2 \times 8 = 16$ .

The first five even counting numbers are 2, 4, 6, 8 and 10.

- a Write down the next 10 even numbers.
- b If a number is even, its units digit can only be one of five digits. What are the five digits?
- c If a number is not even, it is *odd*. Write down the first 10 odd numbers.
- d If a number is odd, its units digit can only be one of five digits. What are the five digits?
- e Julie added two even numbers together. Was her answer even or odd?
- f She added two odd numbers together. Was her answer even or odd?
- g Here is an addition table to complete. Fill the empty squares with either 'even' or 'odd'. Your answers to e and f go in the first and last squares.

+	Even	Odd
Even		
Odd		