

General Pattern for Divisibility.

Divisibility by 2:

Using a large number 6,826.

Is 1- 10 divisible by 2? We look at the units to determine if a number is divisible by 2. We do not need to look at anything greater than units. Since 6 is divisible by 2 then 6,826 is divisible by 2.

Start off by using units.	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Does 1 fit into 2 equal? No	☉									
Does 2 fit into 2 equal? Yes	☉☉									
Does 3 fit into 2 equal? No	☉☉☉									
Does 4 fit into 2 equal? Yes	☉☉☉☉									
Does 5 fit into 2 equal? No	☉☉☉☉☉									
Does 6 fit into 2 equal? Yes	☉☉☉☉☉☉									
Does 7 fit into 2 equal? No	☉☉☉☉☉☉☉									
Does 8 fit into 2 equal? Yes	☉☉☉☉☉☉☉☉									
Does 9 fit into 2 equal? No	☉☉☉☉☉☉☉☉☉									
Does 10 fit into 2 equal? Yes	☉☉☉☉☉☉☉☉☉☉									

Figure 1

Divisibility by 5:

Using the number 9,865

Is 1- 10 divisible by 5? We look at the units to determine if a number is divisible by 5. We do not need to look at anything greater than units. Since 5 is divisible by 5 we know that 9,865 is divisible by 5.

Start off by using units.	No	No	No	No	Yes	No	No	No	No	Yes
Does 1 fit into 5 equal? No	☉									
Does 2 fit into 5 equal? Yes	☉☉									
Does 3 fit into 5 equal? No	☉☉☉									
Does 4 fit into 5 equal? Yes	☉☉☉☉									
Does 5 fit into 5 equal? No	☉☉☉☉☉									
Does 6 fit into 5 equal? Yes	☉☉☉☉☉☉									
Does 7 fit into 5 equal? No	☉☉☉☉☉☉☉									
Does 8 fit into 5 equal? Yes	☉☉☉☉☉☉☉☉									
Does 9 fit into 5 equal? No	☉☉☉☉☉☉☉☉☉									
Does 10 fit into 5 equal? Yes	☉☉☉☉☉☉☉☉☉☉									

Figure 2

**Divisibility by 25**

If a number is divisible by 25 the unit and tens place has to end in a 25, 50, 75 or 00. To work with number higher than 100s place, you divide the number by 10 and use rule above.

$$1000 / 10 = 100 \quad \text{and } 100 \text{ ends in } 00 \quad \text{Therefore } 1000 / 25 = 40$$

$$1250 / 10 = 125 \quad \text{and } 125 \text{ ends in } 25 \quad \text{Therefore } 1250 / 25 = 50$$

$$17500 / 100 = 175 \quad \text{and } 175 \text{ ends in } 75 \quad \text{Therefore } 17500 / 25 = 700$$

$$150 / 25 = 6 \quad \text{Since } 150 \text{ ends in } 50 \text{ we know it is divisible by } 25$$

Figure 3

**Divisibility by 4:**

If the unit is an even 10s place and is a multiple of 4 than the number is divisible by 4.

Using the multiples up to 20 (4, 8, 12, 16) we can subtract the multiple from the actual number and if the remainder is divisible of 4 than the number is divisible by 4.

$$96 - 16 = 80 \quad 80 / 4 = 20 \quad \text{Therefore } 96 / 4 = 24$$

$$56 - 16 = 40 \quad 40 / 4 = 10 \quad \text{Therefore } 56 / 4 = 14$$

$$28 - 8 = 20 \quad 20 / 4 = 5 \quad \text{Therefore } 28 / 4 = 7$$

Figure 4

**Divisibility by 8:**

To determine if a number is divisible by 8 you have to look at the hundreds, tens and ones. If the last three digits of the number are divisible by 8 or are a multiple of 8, then the number is divisible by 8.

$$96 - 16 = 80 \quad 80 / 8 = 10 \quad \text{Therefore } 96 / 8 = 12$$

$$56 - 16 = 40 \quad 40 / 8 = 5 \quad \text{Therefore } 56 / 8 = 7$$










$$248 - 8 = 240 \quad 240 / 8 = 30 \quad \text{Therefore } 248 / 8 = 31$$

Figure 5

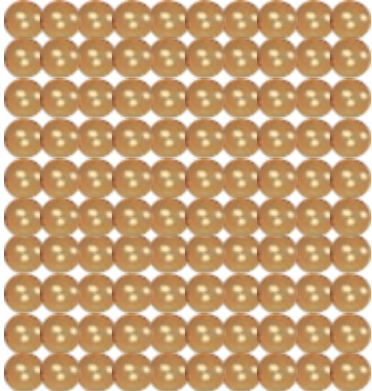
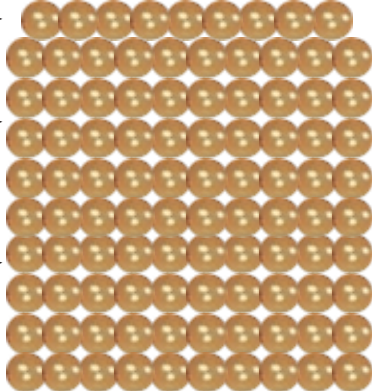

Divisible by 3:

Units: if the number ends in multiples of 3 (3, 6, 9) the number is divisible by 3.

Tens: Change 10 into units and take away 1 unit for every ten.

Tens	Units (in Golden Beads)	Multiple of 3(in Golden Beads)	Remainder (In golden beads)	Multiple of 3	Remainder
10				9	1
20				18	2
30				27	3

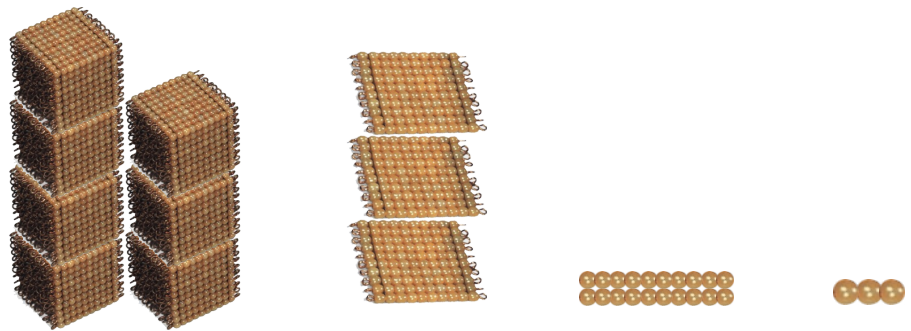
Hundreds: Change to 9 tens and 10 units and take away 1 unit for every ten.

Hundreds	Units (in Golden Beads)	Multiple of 3(in Golden Beads)	Remainder (In golden beads)	Multiple of 3	Remainder
100				99	1

Thousands: Same Technique as the hundreds.

Example: Using the number 7323 we set out the beads. Put out the units that you would substitute for if you used all the general rules from above.

Number value in Golden Beads.



Number of beads substituted (in golden beads)



If we add all the golden beads that would be substituted and it is divisible by 3 then the entire number is divisible by 3.

$$7 + 3 + 2 + 3 = 15$$

And we know that 15 is divisible by 3 therefore the entire number (7323) is divisible by 3. You can check by dividing by long division if child knows how.

$$\begin{array}{r}
 2441 \\
 3 \overline{) 7323} \\
 \underline{6} \phantom{0} \phantom{0} \phantom{0} \\
 13 \phantom{0} \phantom{0} \\
 \underline{12} \phantom{0} \\
 12 \phantom{0} \\
 \underline{12} \\
 03 \\
 \underline{03} \\
 0
 \end{array}$$