

Divisibility Detectives

Divisible by 2, by 5, by 10 — crack the codes

Name: _____ Date: _____

Remember the rules

Divisible by 2: the last digit is 0, 2, 4, 6 or 8.

Divisible by 5: the last digit is 0 or 5.

Divisible by 10: the last digit is 0 — so the number is divisible by 2 AND by 5.

Puzzle 1 — Four baskets, three words

Sort the 20 numbers into the four baskets. Each number has a letter. Write the letters in each basket in the same order as the numbers appear (left to right, top row first). Three of the baskets spell autumn words; the fourth is just leftovers!

77	380	316	48	235	100	241	90	29	331
X	B	G	E	C	I	Q	R	Z	J

55	121	230	40	365	295	82	225	396	32
I	V	C	H	D	E	E	R	S	E

Divisible by 10	Divisible by 2 but not by 5	Divisible by 5 but not by 2	Neither

The three words: _____

Puzzle 2 — The missing-digit code

In each number one digit is missing. Find the digit that follows the instruction, then turn it into a letter with the code table. Read the six letters from top to bottom.

0	1	2	3	4	5	6	7	8	9
A	M	E	S	O	T	L	I	U	N

	Number	Must be ...	Choose ...	Digit → Letter
1	3 4 □	divisible by 10	the only digit that works	___ → ___
2	7 1 □	divisible by 2	the largest digit that works	___ → ___
3	2 9 □	divisible by 5 but NOT by 10	the only digit that works	___ → ___
4	6 3 □	divisible by 2 but NOT by 5	the largest digit that works	___ → ___
5	□ 0	divisible by 10	the smallest digit that makes a two-digit number	___ → ___
6	9 □ 5	divisible by 5	the largest digit that works	___ → ___

The word:

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Puzzle 3 — The leaf trail

A squirrel wants to cross the field from the top-left square to the bottom-right square. It may only move RIGHT or DOWN, and it may only step on numbers that are divisible by 10. Colour the trail and collect the letters on it.

210 H	108 Y	26 F	295 P
250 A	170 R	90 V	52 W
55 D	35 K	80 E	75 D
58 P	32 M	160 S	70 T

The word on the trail:

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Trap check: find one number on the field that is divisible by 2 but NOT by 10: _____.

And one divisible by 5 but NOT by 10: _____.

Answer Key (for the teacher)

Puzzle 1: by 10: 380 B, 100 I, 90 R, 230 C, 40 H → BIRCH. By 2 not 5: 316 G, 48 E, 82 E, 396 S, 32 E → GEESE. By 5 not 2: 235 C, 55 I, 365 D, 295 E, 225 R → CIDER. Neither: 77, 241, 29, 331, 121.

Puzzle 2: 1) $34\square$ by 10 → 0 → A. 2) $71\square$ even, largest → 8 → U. 3) $29\square$ by 5 but not 10 → 5 → T. 4) $63\square$ even but not by 5: 2, 4, 6 or 8, largest → 8 → U. 5) $\square 0$: smallest first digit of a two-digit number → 1 → M. 6) $9\square 5$ ends in 5, so any middle digit works; largest → 9 → N. Word: AUTUMN.

Puzzle 3: trail $210 \rightarrow 250 \rightarrow 170 \rightarrow 90 \rightarrow 80 \rightarrow 160 \rightarrow 70 \rightarrow$ HARVEST. It is the only right/down path through multiples of 10. Traps: 108, 26, 52, 58, 32 (by 2 only); 295, 55, 35, 75 (by 5 only).