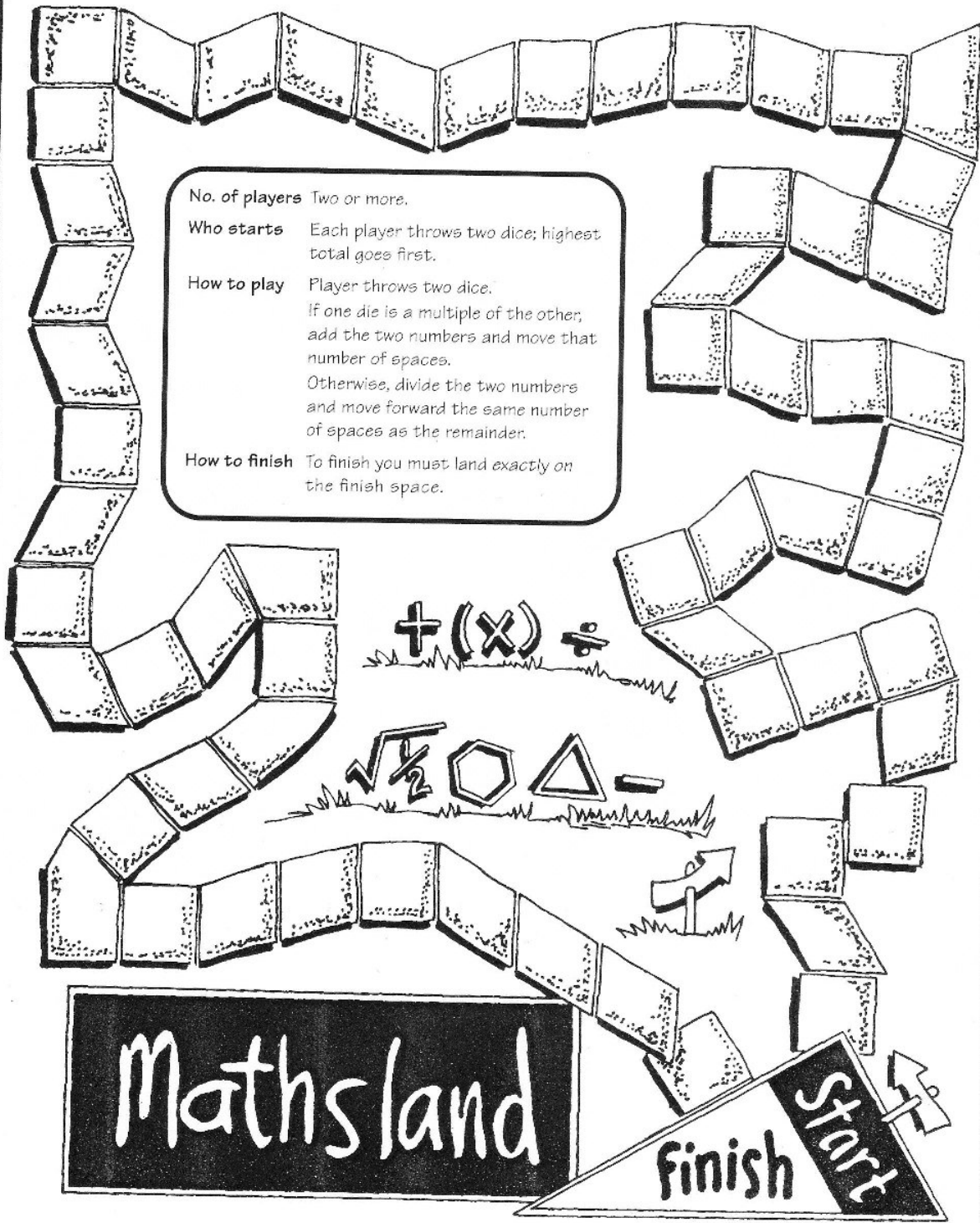


4.3

Multiples and divisors game



No. of players Two or more.

Who starts Each player throws two dice; highest total goes first.

How to play Player throws two dice.
If one die is a multiple of the other, add the two numbers and move that number of spaces.
Otherwise, divide the two numbers and move forward the same number of spaces as the remainder.

How to finish To finish you must land exactly on the finish space.

Tests for divisibility.

It is often useful to know if a number is divisible by another number. Here are some simple divisibility tests to help you.

A number is divisible by 2 if it ends in 0, 2, 4, 6 or 8.

82 768
100 000 000
39 504
4136

A number is divisible by 3 if the sum of its digits is divisible by 3.

79 is NOT divisible by 3 since $7 + 9 = 16$, and 3 does not go evenly into 16.



A number is divisible by 4 if its last two digits are divisible by 4.

679 320 is divisible by 4.

679 320
 $\begin{array}{r} 5 \\ 4 \overline{)20} \end{array}$

A number is divisible by 5 if it ends in 0 or 5.

50 005
840
26 040
279 364 805

A number is divisible by 6 if it is divisible by both 2 and 3.

$\begin{array}{r} 38 \overline{) 152} \\ \underline{114} \\ 38 \end{array}$ ends in 8
 $1 + 8 = 9$

$\begin{array}{r} 4306 \\ \underline{13} \\ 4306 \end{array}$ ends in 6
 $1 + 3 + 0 + 6 = 10$

There is no simple test for divisibility by 7.



A number is divisible by 8 if the last three digits are divisible by 8.

13 592 is divisible by 8.

13 592
 $\begin{array}{r} 74 \\ 8 \overline{)592} \\ \underline{56} \\ 32 \\ \underline{32} \\ 0 \end{array}$

A number is divisible by 9 if the sum of its digits is divisible by 9.

171
 $1 + 7 + 1 = 9$

812 754
 $8 + 1 + 2 + 7 + 5 + 4 = 27$

A number is divisible by 10 if it ends in 0.

27 690
1020 304 000
300

1 Copy this table and work out which of the numbers from 2 to 10 divide exactly into the given numbers (88 has been done for you).

Number	2	3	4	5	6	7	8	9	10
252									
600									
88	✓		✓				✓		
121									
6215									
3720									
747									
4753									
110 001									
40 436									
840									
75									
2 000 646									
20 106									
7434									
601 295									

2 Write a number less than 100 which is divisible by:

- a 3 and 5 b 4 and 5 c 6 and 7 d 2 and 6

3 Write a number bigger than 100 which is divisible by:

- a 6 b 5 c 7 d 2 and 3 e 8 and 9

Find The Message

TO FIND THE HIDDEN MESSAGE, FOLLOW THESE DIRECTIONS:

Each row going across has 7 rectangles. Only 3 of them contain a number that is divisible by the given number. Circle these 3 numbers in each row.

Over each number you have circled, notice the small number and letter. The small number tells you which box at the bottom of the page to put the letter in. You will spell out a six-word message.

		2	S	14	H	11	A	7	S	20	R	9	B	18	O
I	DIVISIBLE BY 2	1731	6432	7067	7118	9175	4623	6400							

		9	U	5	A	2	P	10	E	15	P	11	O	16	V
II	DIVISIBLE BY 3	1347	4051	2091	7628	8092	3456	3712							

		6	O	8	P	16	S	13	W	20	L	12	K	10	T
III	DIVISIBLE BY 4	4311	7906	2916	3019	3724	7555	7136							

		21	M	5	E	19	I	12	F	15	I	1	L	3	E
IV	DIVISIBLE BY 5	3771	2395	5067	4810	6615	9832	1011							

		3	A	6	I	14	P	4	E	18	I	13	T	17	T
V	DIVISIBLE BY 6	4752	3810	3811	4078	6111	7926	2912							

		7	P	4	D	21	D	8	O	11	F	17	J	19	R
VI	DIVISIBLE BY 9	7856	3900	4311	5436	4018	3712	2079							

		1	T	4	C	2	R	1	S	6	A	17	W	4	Y
VII	DIVISIBLE BY 10	6105	3460	7335	7300	2061	8000	3787							

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----

Multiples

List the first ten multiples of:

1. 2 _____
2. 3 _____
3. 5 _____
4. 7 _____
5. 9 _____
6. 4 _____
7. 8 _____
8. 10 _____
9. 6 _____
10. 11 _____
11. 12 _____

Use the above to find the Lowest Common Multiple (LCM) of:

- | | | |
|------------|-------------|------------|
| 1. 2 and 3 | 2. 2 and 5 | 3. 5 and 7 |
| 4. 3 and 9 | 5. 4 and 7 | 6. 8 and 9 |
| 7. 4 and 5 | 8. 7 and 10 | 9. 6 and 4 |

Secret Code

Find the LEAST COMMON MULTIPLE of any pair of numbers below in the code at the bottom of the page. Each time the LCM appears in the code, you must write the letter of that problem above it.

KEEP DOING PROBLEMS UNTIL YOU HAVE DECODED THE POEM, A LIMERICK THAT IS HARD TO BEAR!

- A = LCM of 5 and 4 = D = LCM of 1 and 7 = W = LCM of 3 and 6 =
Y = LCM of 6 and 8 = I = LCM of 3 and 9 = F = LCM of 9 and 6 =
G = LCM of 7 and 5 = Z = LCM of 4 and 9 = H = LCM of 10 and 12 =
U = LCM of 8 and 10 = M = LCM of 5 and 2 = R = LCM of 27 and 9 =
K = LCM of 5 and 6 = N = LCM of 4 and 6 = T = LCM of 2 and 8 =
C = LCM of 7 and 21 = S = LCM of 24 and 16 = O = LCM of 4 and 2 =
L = LCM of 3 and 5 = B = LCM of 6 and 7 = E = LCM of 1 and 3 =

20 21-60-3-3-27-18-40-15 4-15-7 42-3-20-27 20-8 8-60-3 36-4-4
21-4-40-15-7 20-15-6-20-24-48 18-9-12-7 48-4-10-3-8-60-9-12-35 8-4 7-4
6-60-3-12 9-8 42-4-27-3-7 60-9-10 8-4 35-4
4-12 20 6-20-15-30 8-4 20-12-7 18-27-4
60-3 48-6-9-8-21-60-3-7 9-8 20-12-7 6-20-15-30-3-7 18-27-4 20-12-7 8-4

Find The Message

TO FIND THE HIDDEN MESSAGE, FOLLOW THESE DIRECTIONS:

Each row going across has 7 rectangles. Only 3 of them contain a COMMON MULTIPLE of the given numbers. Circle these 3 common multiples in each row.

Over each number you have circled, notice the small number and letter. The small number tells you which box at the bottom of the page to put the letter in. You will spell out a four-word message.

		21 P	13 Y	11 R	7 S	9 L	15 A	19 E
I	2 and 4	30	8	18	4	6	2	12
		2 A	4 A	21 S	18 P	6 U	9 R	5 K
II	3 and 4	12	64	36	9	32	24	16
		12 L	15 U	16 B	4 I	11 C	14 M	20 R
III	6 and 9	24	54	9	18	36	63	27
		17 I	3 H	5 C	8 V	19 A	1 C	18 N
IV	10 and 15	90	75	30	45	80	15	60
		10 B	2 I	6 I	17 U	20 E	14 B	12 K
V	6 and 8	12	60	24	36	40	72	48
		8 S	3 G	1 G	16 S	10 O	20 S	4 E
VI	7 and 14	21	28	7	14	35	42	49
		10 I	11 V	8 P	8 T	1 M	19 O	1 S
VII	8 and 12	24	36	12	48	72	80	60

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----

2.4 Divisibility and factors

A **factor** is a number that **exactly divides** into another number.

One way to find the factors of a number without doing the actual division is to use the tests for divisibility.

Some simple tests for divisibility are listed below.

A number is:

- **divisible by 2** if the last digit is 0, 2, 4, 6 or 8 (i.e. an even number)
- **divisible by 3** if the sum of its digits is divisible by 3
- **divisible by 4** if the last two digits form a number that is divisible by 4
- **divisible by 5** if the last digit is 5 or 0
- **divisible by 6** if it is divisible by both 2 and 3 (i.e. it is an even number *and* the sum of the digits is divisible by 3)
- **divisible by 8** if the last three digits form a number that is divisible by 8
- **divisible by 9** if the sum of the digits is divisible by 9
- **divisible by 10** if the last digit is 0.

** There is no simple test for divisibility by 7.*

- 1** Apply the *sum of the digits* test and circle the numbers which are **divisible by 3**.

75 89 137 249 376 438 516 754 1 625 8 229

- 2** Apply the *last two digits* test and circle the numbers which are **divisible by 4**.

116 234 348 552 747 1 082 1 496 2 002 3 116 4 614

- 3** Circle the numbers that are **divisible by 5**.

53 65 90 256 370 765 1 523 1 395 2 630 5 502

- 4** Circle the numbers that are **divisible by 6**.

84 96 124 369 636 1 266 1 323 2 351 5 610 7 398

- 5** Circle the numbers that are **divisible by 9**.

129 198 252 619 747 1 381 2 106 3 519 7 435 9 378

2.4 Divisibility and factors

CONTINUED 

6 Use the divisibility tests to answer the following questions.

- | | |
|------------------------------------|-----------------------------------|
| a Is 578 divisible by 2? _____ | b Is 1 082 divisible by 4? _____ |
| c Is 763 divisible by 3? _____ | d Is 1 615 divisible by 5? _____ |
| e Is 1 848 divisible by 8? _____ | f Is 2 754 divisible by 9? _____ |
| g Is 7 368 divisible by 3? _____ | h Is 39 047 divisible by 4? _____ |
| i Is 60 305 divisible by 10? _____ | j Is 83 070 divisible by 6? _____ |

7 Label each statement as **true** or **false**. Remember, a **factor** is a number that exactly divides into another number.

- a 4 is a factor of 64 _____
- b 3 is a factor of 52 _____
- c 5 is a factor of 980 _____
- d 2 is a factor of 125 _____
- e 9 is a factor of 218 _____
- f 6 is a factor of 288 _____
- g 3 is a factor of 1 080 _____
- h 5 is a factor of 1 375 _____
- i 10 is a factor of 5 700 _____
- j 9 is a factor of 3 545 _____



8 Answer yes or no.

- | | |
|---------------------------------|---------------------------------|
| a Is 4 a factor of 402? _____ | b Is 2 a factor of 476? _____ |
| c Is 3 a factor of 796? _____ | d Is 5 a factor of 1 870? _____ |
| e Is 6 a factor of 842? _____ | f Is 4 a factor of 1 764? _____ |
| g Is 9 a factor of 2 169? _____ | h Is 6 a factor of 1 106? _____ |
| i Is 3 a factor of 5 296? _____ | j Is 9 a factor of 2 835? _____ |