1-100 Number Grid

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Division Strategy: Partial Quotients

Materials: Division Equations Board (3 digit dividend, one digit divisor)

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1. Work with a partner. Choose a line of four problems from the board (vertically, horizontally or diagonally) that you will both solve. Solve each problem using the partial quotients strategy.

   Step 1: Write a list of easy facts for the divisor.
   Step 2: Subtract from the dividend an easy multiple of the divisor (e.g. 100x, 10x, 5x, 2x). Record the partial quotient in a column to the right of the problem.
   Step 3: Repeat until the dividend has been reduced to zero or the remainder is less than the divisor.
   Step 4: Add the partial quotients to find the quotient.

Example: 826 ÷ 6

Easy Facts for 6	
2 x 6 = 12	20 x 6 = 120
3 x 6 = 18	30 x 6 = 180
5 x 6 = 30	50 x 6 = 300
10 x 6 = 60	100x6 = 600

```
   137 r4
6) 826
  -600      100 x 6
   226
  -180       30 x 6
    46
  - 42        7 x 6
     4
```

2. Check your work with your partner. Repeat with another line of four problems.

192 ÷ 6	724 ÷ 7	155 ÷ 5	129 ÷ 4
157 ÷ 7	373 ÷ 3	336 ÷ 6	209 ÷ 9
191 ÷ 5	242 ÷ 6	288 ÷ 9	180 ÷ 5
684 ÷ 6	163 ÷ 7	208 ÷ 6	428 ÷ 8

Division Strategy: Partial Quotients

Materials: Division equations boards

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1. Work with a partner. Choose a line of four problems from the board (horizontally, vertically or diagonally) that you will both solve using the partial quotients algorithm.

Step 1: Write a list of easy facts for the divisor.

Step 2: Subtract from the dividend an easy multiple of the divisor (e.g. x 10, x 100, x 200 etc.) Record the partial quotient in a column to the right of the problem.

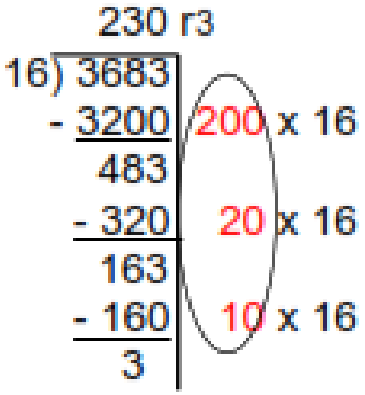
Step 3: Repeat until the dividend has been reduced to zero, or the remainder is less than the divisor.

Step 4: Add the partial quotients to find the final quotient.

Example: 3,863 ÷ 16

Easy Facts for 16

10 x 16 = 160
20 x 16 = 320
30 x 16 = 480
100 x 16 = 1,600
200 x 16 = 3,200



3. Check your work with your partner.

4. Repeat with another line of four problems.

3,292 ÷ 16 =	3,624 ÷ 17 =	3,155 ÷ 15 =	2,929 ÷ 14 =
6,835 ÷ 17 =	3,973 ÷ 13 =	4,836 ÷ 16 =	3,919 ÷ 19 =
4,591 ÷ 15 =	4,834 ÷ 16 =	3,828 ÷ 19 =	4,580 ÷ 15 =
4,984 ÷ 16 =	3,463 ÷ 34 =	1,831 ÷ 16 =	3,768 ÷ 18 =

Division Strategy: Partition the Dividend

Materials: Division Equations Board

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1. Work with a partner. Choose a line of four problems from the board (vertically, horizontally or diagonally) that you will both solve.

2. Solve each problem by breaking the dividend into parts that are easy to divide. Solve the easier problems and then add the partial quotients.

Example: 72÷5

72

50+22 (÷5)

10 + 4R2 = 14 R2

or

10 + 4 R2 =14 R2

5)50+22

256÷7

256

210+46 (÷7)

30 + 6R4 = 36 R4

or

30 + 6 R4 = 36 R4

7) 210 + 46

3. Check your work with your partner. Then repeat with another line of four problems.

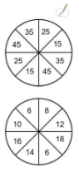
101 ÷ 9	91 ÷ 7	104 ÷ 8	125 ÷ 5
64 ÷ 4	58 ÷ 4	48 ÷ 3	79 ÷ 6
73 ÷ 6	97 ÷ 8	67 ÷ 5	41 ÷ 3
49 ÷ 3	120 ÷ 9	72 ÷ 5	84 ÷ 6

Double and Halve

Materials: 10 counters per player, 2 paper clips, 2 pencils, Double and Halve board

Double and Halve

30 x 3	50 x 3	70 x 3	90 x 3
30 x 4	50 x 4	70 x 4	90 x 4
30 x 5	50 x 5	70 x 5	90 x 5
30 x 6	50 x 6	70 x 6	90 x 6
30 x 7	50 x 7	70 x 7	90 x 7
30 x 8	50 x 8	70 x 8	90 x 8
30 x 9	50 x 9	70 x 9	90 x 9



1. Work with a partner. Collect 10 counters each.

2. Take turns to spin a paper clip on each spinner. Use the two numbers the paper clips land on to create a multiplication problem.

3. Double one factor and halve the other to change the problem to one with an equivalent product that is easy to solve mentally. Explain your strategy.

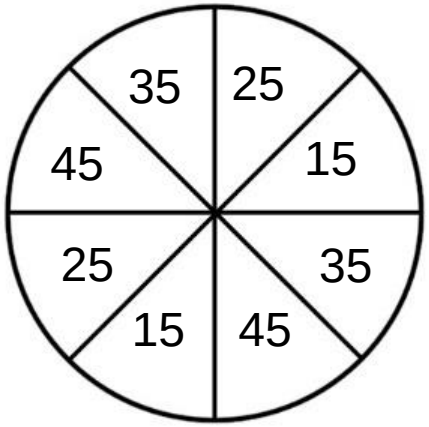
4. Place a counter on the multiplication fact on the board. If the multiplication fact is already covered play passes to the next player.

5. Continue playing until one player has placed all ten counters on the board.

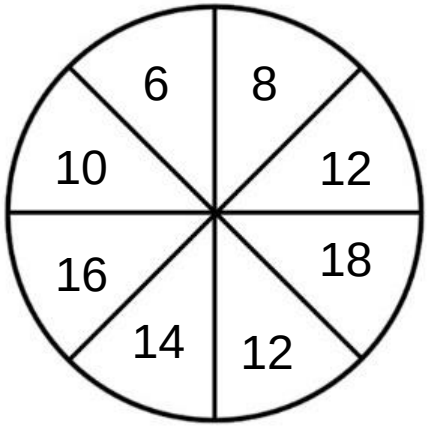
Double and Halve

30 x 3	50 x 3	70 x 3	90 x 3
30 x 4	50 x 4	70 x 4	90 x 4
30 x 5	50 x 5	70 x 5	90 x 5
30 x 6	50 x 6	70 x 6	90 x 6
30 x 7	50 x 7	70 x 7	90 x 7
30 x 8	50 x 8	70 x 8	90 x 8
30 x 9	50 x 9	70 x 9	90 x 9

Factor 1



Factor 2



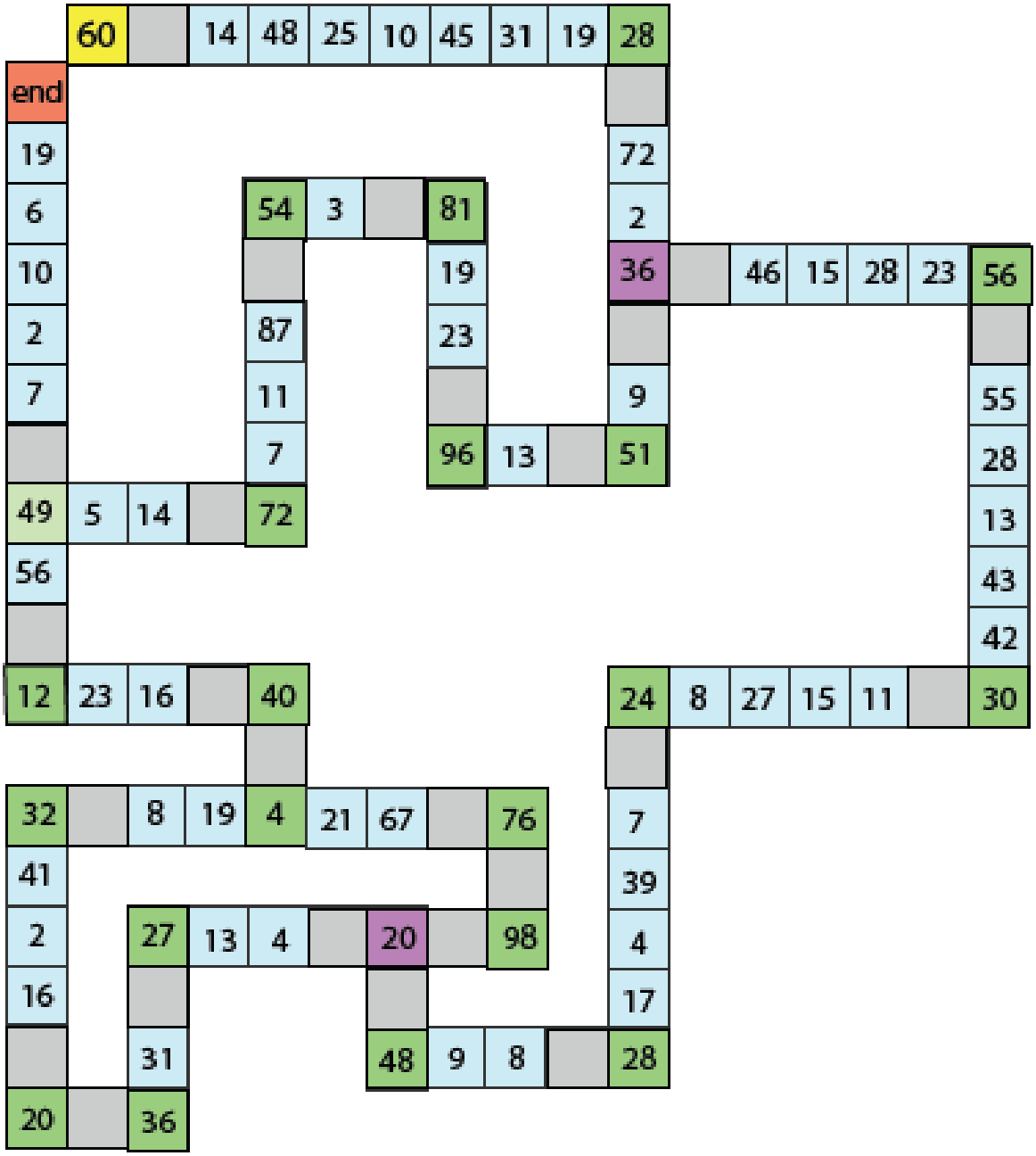
I know that the product of ___ multiplied by ___ is equivalent to the product of ___ multiplied by ___. The answer to both problems is ___.

I know that the product of ___ multiplied by ___ is equivalent to the product of ___ multiplied by ___. The answer to both problems is ___.

To solve ___ times ___ I doubled __ and halved __ to change the problem to ___ times ___. The product is ___.

To solve ___ times ___ I doubled __ and halved __ to change the problem to ___ times ___. The product is ___.

Factor Track



Rules:

You can move any factor, except 1, of the number you are on.

You start on the [yellow] 60 and make your way round to the [red] 'end' square.

You may not go round corners so you must get exactly to a green square.

		18
		28
12	42	8

		36
		40
32	45	1

		63
		24
21	72	6

		12
		48
24	24	12

		45
		12
18	30	9

		48
		63
42	72	3

Can you work out the numbers that need to go into the squares so that when you multiply the rows and columns you get the products shown? You can only use the numbers 1-9 and you can only use the numbers once. The numbers in red show the difference between the sums of the products in the third row and the third column. Can you make another grid that has a difference of 1? What is the biggest difference you can make? Is it possible for there to be a difference of zero? If not can you explain why not?

Multiplication Race

Materials: gameboard, number cube, one counter per player, calculator **No. of Players:** 2-3

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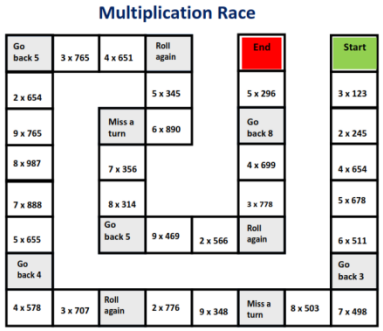
1. Each player places a counter on the box marked ‘Start’.

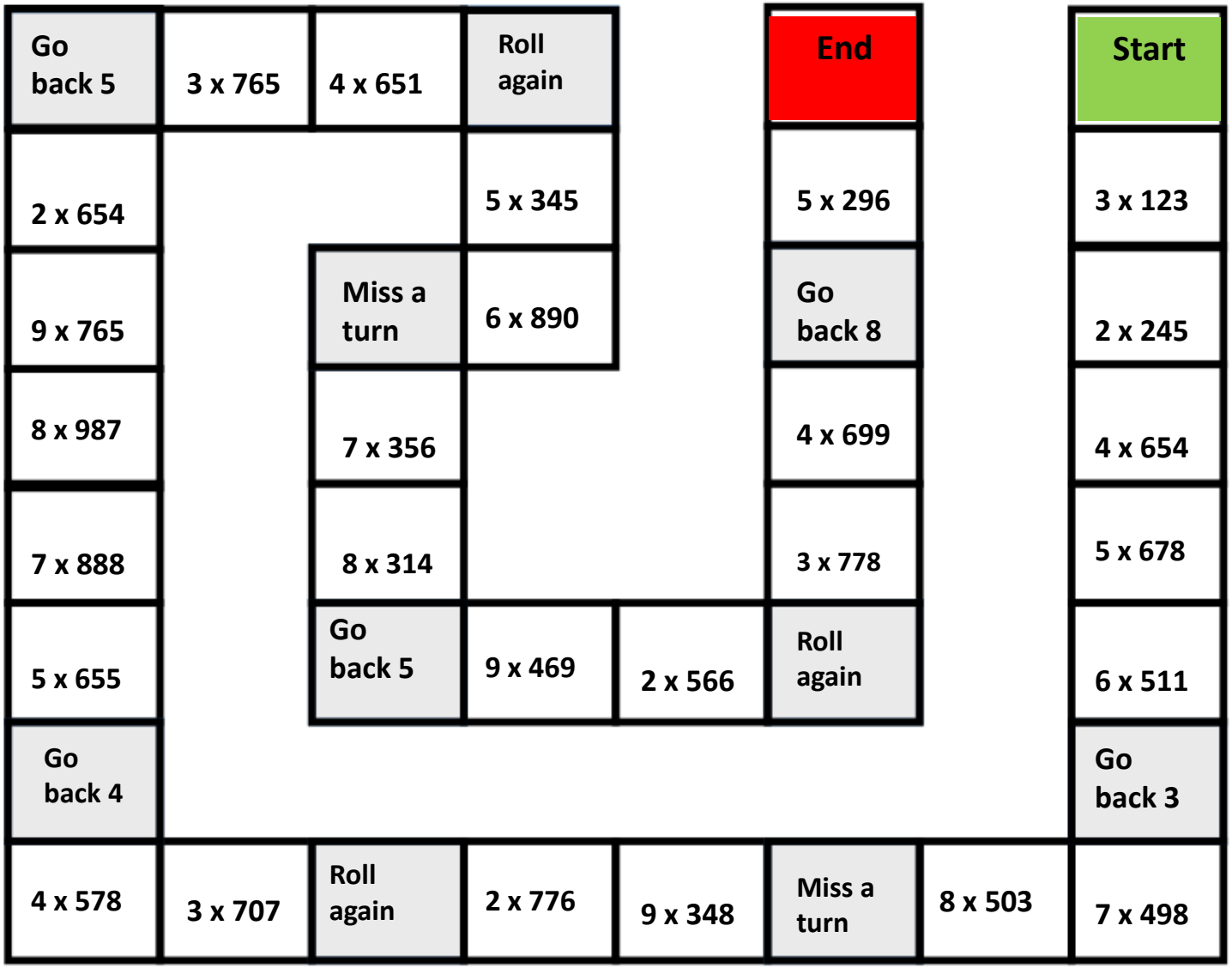
2. Take turns to roll a number cube and move forward that number of spaces along the path. Solve the multiplication problem you land on or follow the instruction given.

3. Partners use a calculator to check each other’s work. A player who gives an incorrect product must miss a turn.

4. Continue until one player reaches the box marked ‘End’.



Multiplication Race



Multiplication Race

Materials: game board, number cube, one counter for each player, calculator

---

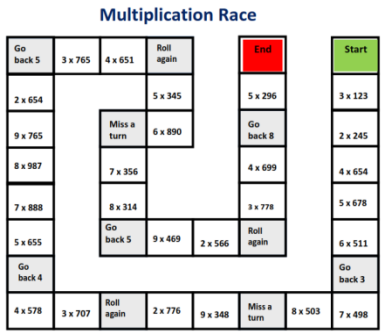
1. Each player places a counter on the box marked ‘Start’.

2. Take turns to roll a number cube and move forward that number of spaces along the path. Solve the multiplication problem you land on or follow the instruction you land on.

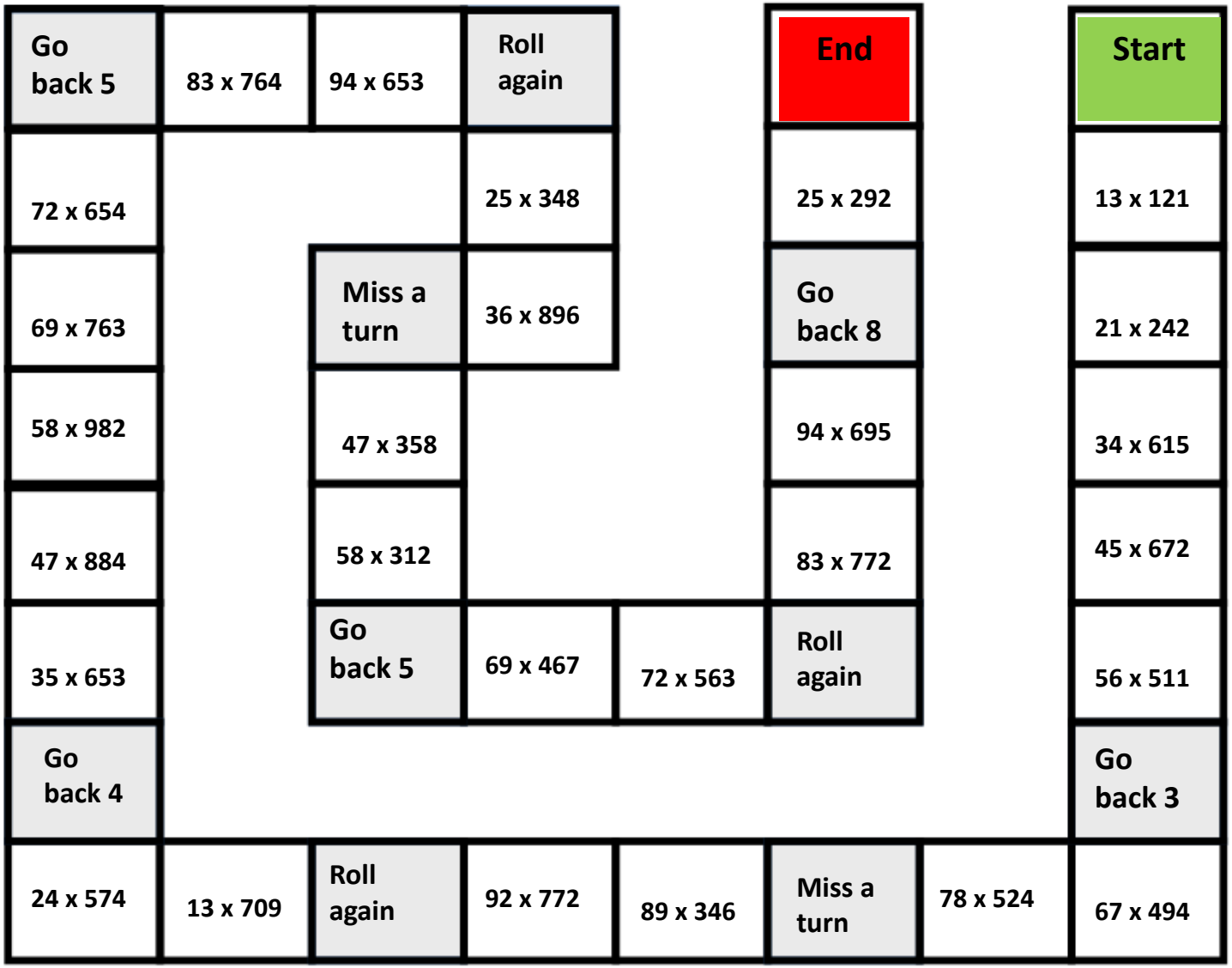
3. Partners use a calculator to check each other’s work. A player who gives an incorrect product must miss a turn.

4. Continue until one player reaches the box marked ‘End’.

Extension: Create your own Multiplication Race board and try it out with a partner.



Multiplication Race



Multiplication Strategy: Doubling and Halving

We can simplify some multiplication problems by doubling one factor and halving the other factor.

Example: 5 x 16 = 10 x 8 = 80 or 5 x 16 = 10 x 8 = 20 x 4 = 80

1. Use the strategy of doubling one factor and halving the other to simplify and solve the following problems.

   a) 5 x 68 b) 3 x 16 c) 14 x 30 d) 18 x 40

   e) 35 x 20 f) 25 x 16 g) 50 x 24 h) 500 x 28

2. Does this strategy always work? Explain when the strategy of doubling and halving is useful to simplify a multiplication problem.

3. Use square tiles to make rectangular arrays for 4 x 6 and 6 x 8. Model the doubling and halving process using the tiles. Explain why this strategy works.

Multiplication Strategy: Doubling and Halving

1. Use the strategy of doubling one factor and halving the other to change each problem below to one with an equivalent product that is easy to solve mentally.

   a) I baked 16 trays of cookies. Each tray had 35 cookies. How many cookies did I bake?

   b) Mr. Jones bought 60 boxes of pencils for his class. If each box contained 50 pencils, how many pencils were there in all?

   c) A pet store has 15 fish tanks. Each fish tank contains 18 goldfish. What is the total number of goldfish?

   d) If Tim's pet cat drinks 45ml of milk every day, how much milk will it drink in 12 days?

2. Write your own multiplication word problem that could be solved using the doubling and halving strategy.

Factors & Multiples Game

This is a game for two players.

You need:

a 100 square grid and some transparent counters.

What you have to do:

The first player chooses a positive even number that is less than 50, and covers it out on the grid with a counter.

The second player chooses a number to cover. The number must be a factor or multiple of the first number.

Players continue to take it in turns to cover numbers, at each stage choosing a number that is a factor or multiple of the number just covered by the other player.

The first person who is unable to cross out a number loses.

e.g. the following game started 12, 4, 44, 11, 77

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100