RICH MATHEMATICAL TASK BOOKLET

NUMBER & ALGEBRA

YEAR 7-8 EVEN YEARS

Copy Masters

Task 1

In the shopping mall carpark, there are 138 rows for car parks. Each row has spaces for 87 cars. How many cars can fit in the carpark? Can you show your solution using two different representations?

In the shopping mall carpark, there are 172 rows for car parks. Each row has spaces for 376 cars. How many cars can fit in the carpark? Can you show your solution using two different representations?

Task 1 (independent)

Solve the following equations:

147 x 78 =

153 x 36 =

546 x 49 =

209 x 67 =

Explain what patterns you used to help solve the equations.

Would the patterns always work?

Practise your timetables with a buddy and make flash cards with the equation on one side and answer on the other side for any that you do not know automatically. Use your flash cards to practice the multiplication facts that you do not know.

Task 2

The Salvation Army has donated $3213 to help families get essential furniture to set up their homes. They have 56 families that need help to do this. How much money will each family receive?

What numbers (above a thousand) could you start with, that would mean that each family only receives dollars and no cents?

Task 2 (independent)

Solve the following equations:

836 x 261 =

319 x 672 =

467 x 789 =

876 x 208 =

Represent your solution strategies using equations and the area model.

Use your flash cards with a buddy and for any multiplication facts that you do not know automatically, write them out and say out loud quietly to yourself at least 4 times.

Task 3

Griffin biscuit factory use a machine to put 203 biscuit packets in a large container to be sent for packaging. Every ten minutes the machine sorts 4519 packets of biscuits. How many containers would be used every ten minutes and how many packets of biscuits would be left over?

For what numbers would there be no packets of biscuits left over but almost the same number of containers used?

Task 3 (independent)

Solve the following equations:

5556 ÷ 25 =

8666 ÷ 422 =

7255 ÷ 35 =

9333 ÷ 322 =

$\frac{1}{4} \div \frac{1}{8} =$

$\frac{1}{2} \div \frac{1}{5} =$

Use your flash cards for 3 x 3, 6 x 6, 4 x 4, 8 x 8. Make new flash cards for 6 x 3 and 4 x 8 and practice these while also noting the relationship between the square numbers and the new facts.

Task 4

Work in your group to see whether you can work out the last digits of the following numbers without doing the full multiplication:

5^4

6^4

7^4

Discuss the patterns that you could use to help you with the task. Develop a range of conjectures and see whether you can prove them.

Task 4 (independent)

Work to see whether you can work out the last digits of the following numbers without doing the full multiplication:

2^8

8^4

9^6

10^5

What patterns can you use that will help you with this task?

Predict the results and write these down with a justification.

Now use a calculator to check whether you were correct.

What conjectures can you make from this?

Task 5

Can you work together in your group to work out whether these number sentences are true or false?

Make sure that you develop an explanation that everyone can share.

$398 + 467 = 396 + 469$

$657 + 18 = 657 + 9 + 8$

$82 – 34 = 84 – 36$

$465 = 465$

$8 \times 7 = (8 \times 5) + 8$

$9 \times 7 = (10 \times 7) – 7$

$25 + 26 + 27 + 28 + 29 + 30 = 31 + 32 + 33 + 34 + 35$

Task 5 (independent)

Work out which number sentences are true or false and explain your reasoning.

$369 + 496 = 367 + 494$

$267 + 7 + 9 = 267 + 16$

$71 – 57 = 73 – 59$

$459 = 455$

$6 \times 7 = (6 \times 5) + 7 + 7$

$13 \times 8 = (13 \times 5) + (13 \times 2)$

$4 + 5 + 6 + 7 = 8 + 9 + 10$

Task 6

Can you work together in your group to solve these number sentences? Make sure that you develop an explanation and justification.

$189 + 25 = \_\_ + 26$

$85 - \_\_ = 75 - 28$

$674 + 56 - \_\_ = 671$

$24 \times 16 = 48 \times \_\_$

$105 \div 15 = (45 \div 15) + (\_\_ \div 15)$

Task 6 (independent)

Find the missing numbers:

37 + 26 = 35 + ____

___ + 276 = 399 +286

376 – 159 = 276 – __ =

__ – 266 = 571 – 268

3 × 18 = (3 × 6) + (3 × __)

176 ÷ 8 = (__ ÷ 8) + (16 ÷ 8)

Look at your flash cards for or write them out if you don't have them.

3 x 4 =

3 x 8 =

6 x 4 =

6 x 8 =

Discuss with a partner the patterns that you notice between each one. Use the patterns to help remember the times-table facts.

Task 7

What are the possible values for $k + k = 12$?

What are possible values for $j + s = 10$?

Now, work together in your group to solve these equations and justify your solution. Make sure that everyone can explain and justify your responses.

$w + 14 = 30$

$2b + 5 = 23$

$6h - 7 = 29$

$d + d - 5 = 13$

$3p + p + 2 - p = 17$

Task 7 (independent)

Solve the following equations:

$5g = 35$

$d + 7 = 16$

$k - 9 = 31$

$n \div 4 = 3$

$3b + 4 = 28$

$10x - 14 = 26$

$8j + 7 = 39$

$3e - 8 = 28$

Task 8

Work together in your group to solve these equations and justify your solution. Make sure that everyone can explain and justify your responses.

$6q = 2q + 24$

$2s + 5s = 15 + 13$

$16 = 4 - t + 3t$

$15 + p = 2p - 3$

$7y - 13 = 2y + 12$

Task 8 (independent)

Solve the following equations:

$x + 11 = 40$

$23 - h = 15$

$8e = 80$

$6h - 5 = 7$

$1 + 2r = 35$

$8q + 8 = 2q + 62$

$3h + 4 = h + 16$

$6w - 8 = 13 + 3w$

Look at your flash cards for or write them out if you don't have them.

2 x 7 =

4 x 7 =

8 x 7 =

3 x 9 =

6 x 9 =

Discuss with a partner the patterns that you notice between each one. Use the patterns to help remember the times-table facts.

Task 9

In your groups look at the equations and develop a story that matches the equation. Make sure that everyone in your group can explain and justify why the story matches the equation. Have a go at solving the story problems that you have created:

5 + __ = 21

-5 – 3 =

__ – -15 = -7

Task 9 (independent)

Look at the equations and develop one or more stories that match each equation.

4 + -5 =

- 13 – __ = 0

__ + 32 = - 31

22 – -14 =

Task 10

In your groups represent your reasoning on a number line to show how you solved each of these problems:

-3 + 4 =

12 – 17 =

-4 + -4 =

2 + -5 =

3 – -5 =

-9 + -8 =

Task 10 (independent)

Solve these equations (use a blank number line if it helps):

-18 + 5 =

- 23 + - 18 =

-37 – -42 =

63 – -24 =

-143 – 69=

-145 + -251 =

274 – -128 =

Task 11 (whole class option and optional task)

Soane is solving a division problem that his teacher gave him.

He is solving this: 216 ÷ 12 =

Soane solves it by writing 216 ÷ 12 = 216 ÷ 2 ÷ 3 ÷ 2

Do you agree with Soane's solution? In your group, develop an explanation of why this works or why you think it doesn't work.

Can you develop examples with other numbers which also use this pattern?

Does this pattern work with multiplication?

Task 11 (independent)

Find the missing numbers:

46 x __ = 46 x 3 x 5 x 2

1392 ÷ 3 ÷ 2 ÷ 2 ÷ __ = 1392 ÷ 24

1260 ÷ __ = 1260 ÷ 2 ÷ 5 ÷ 3 ÷ 2

27 x 36 = 27 x 3 x __ x 4

Task 12 (optional task)

Can you work together in your group to work out whether these number sentences are true or false? Make sure that you develop an explanation that everyone can share.

8 + 3 = -8 – 3

7 + 5 = 7 + -5

-3 + 6 = 6 + -3

10 – 4 = 10 – -4

-7 + - 9 = -7 – -9

- 5 – -5 = -5 – -1

In your group, talk about the patterns that you notice and be ready to share these.