

# DEVELOPING MATHEMATICAL INQUIRY COMMUNITIES

Level 4 (Year 7-8)  
Copy Masters,  
Number and  
Algebra

## **Task 1 – Group Task**

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 in two different representations?

In the shopping mall carpark, there are 179 rows for car parks. Each row has spaces for 76 cars. How many cars can fit in the carpark? Can you show your solution in two different representations?

## **Task 1 – Independent Tasks**

Solve the following equations:

$$147 \times 78 =$$

$$153 \times 36 =$$

$$546 \times 49 =$$

$$209 \times 67 =$$

Explain what patterns you used to help solve the equations.

Would the patterns always work?

## **Task 2 – Group Task**

In preparation for the summer markets, Monty is planting lettuce. He plants 613 lettuce plants in each row. He can fit 391 rows on their land. How many lettuces can he grow altogether?

In preparation for the summer markets, Sia is planting lettuce. He plants 828 lettuce plants in each row. He can fit 421 rows on their land. How many lettuces can he grow altogether?

## Task 2 - Independent Tasks

Solve the following equations:

$$836 \times 261 =$$

$$319 \times 672 =$$

$$467 \times 789 =$$

$$876 \times 208 =$$

Represent your solution strategies using equations and the area model.

### **Task 3 – Group Task**

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 3 - Independent Tasks

Solve the following equations:

$$5556 \div 25 =$$

$$8666 \div 422 =$$

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

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

## **Task 4 – Group Task**

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 4 - Independent Tasks

Solve the following equations:

$$7255 \div 35 =$$

$$9333 \div 322 =$$

$$\frac{1}{6} \div \frac{1}{12} =$$

$$\frac{1}{2} \div \frac{1}{8} =$$

## Task 5 – Group Task

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 5 - Independent Tasks

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 6 – Group 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.

$$398 + 467 = 396 + 469$$

$$657 + 18 = 657 + 9 + 8$$

$$82 - 34 = 84 - 36$$

$$465 = 465$$

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

$$9 \times 7 = (10 \times 7) - 7$$

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

## Task 6 - Independent Tasks

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 7 – Group Task

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

$$189 + 25 = \underline{\quad} + 26$$

$$85 - \underline{\quad} = 75 - 28$$

$$674 + 56 - \underline{\quad} = 671$$

$$24 \times 16 = 48 \times \underline{\quad}$$

$$105 \div 15 = (45 \div 15) + (\underline{\quad} \div 15)$$

## Task 7 - Independent Tasks

Find the missing numbers:

$$37 + 26 = 35 + \underline{\hspace{2cm}}$$

$$\underline{\hspace{2cm}} + 276 = 399 + 286$$

$$376 - 159 = 276 - \underline{\hspace{1cm}} =$$

$$\underline{\hspace{1cm}} - 266 = 571 - 268$$

$$3 \times 18 = (3 \times 6) + (3 \times \underline{\hspace{1cm}})$$

$$176 \div 8 = (\underline{\hspace{1cm}} \div 8) + (16 \div 8)$$

## Task 8 – Group Task

Soane is solving divisions problem that his teacher gave him.

He is solving this:  $216 \div 12 =$

Soane solves it by writing  $216 \div 12 = 216 \div 2 \div 3 \div 2$

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 pattern?



## Task 8 - Independent Tasks

Find the missing numbers:

$$46 \times \underline{\quad} = 46 \times 3 \times 5 \times 2$$

$$1392 \div 3 \div 2 \div 2 \div \underline{\quad} = 1392 \div 24$$

$$1260 \div \underline{\quad} = 1260 \div 2 \div 5 \div 3 \div 2$$

$$27 \times 36 = 27 \times 3 \times \underline{\quad} \times 4$$

## Task 9 – Group Task

Tina works at a clothing factory making t-shirts. At the factory she gets paid a specific amount per day and \$5 for each t-shirt she makes.

Can you write an equation that you could use to work out how much she earns in a day for making any number of t-shirts?

Tina earned \$50 for one day. Can you show the different ways that Tina could have earned this using your equation?

## Task 9 - Independent Tasks

Nikki and Milo each have a sticker collection. They know that their sticker collections each contain the same number of stickers, but they don't know how many. Milo also has 12 stickers on a sheet.

How would you represent the number of stickers that Nikki has?

How would you represent the total number of stickers that Milo has?

Nikki and Milo combine all their stickers to make one collection.

How would you represent the total number of stickers they have?

Write other stories with unknowns and show how these would be represented using equations and expressions.

## **Task 10 – Group Task**

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 10 - Independent Tasks

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 11 – Group Task

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 11 - Independent Tasks

Solve the following equations:

$$x + 11 = 40$$

$$23 - h = 15$$

$$8e = 80$$

$$6h - 5 = 7$$

$$1 + 2r = 35$$

$$8q + 8 = 2q + 62$$

$$3h + 4 = h + 16$$

$$6w - 8 = 13 + 3w$$

## Task 12 – Group Task

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:

$$5 + \underline{\quad} = 21$$

$$-5 - 3 =$$

$$\underline{\quad} - -15 = -7$$



## Task 12 - Independent Tasks

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

$$4 + -5 =$$

$$- 13 - \underline{\quad} = 0$$

$$\underline{\quad} + 32 = - 31$$

$$22 - -14 =$$

## Task 13 – Group Task

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 13 - Independent Tasks

Solve these equations (use an empty line if it helps):

$$-18 + 5 =$$

$$- 23 + - 18 =$$

$$-37 - -42 =$$

$$63 - -24 =$$

$$-143 - 69 =$$

$$-145 + -251 =$$

$$274 - -128 =$$

## Task 14 – Group 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.