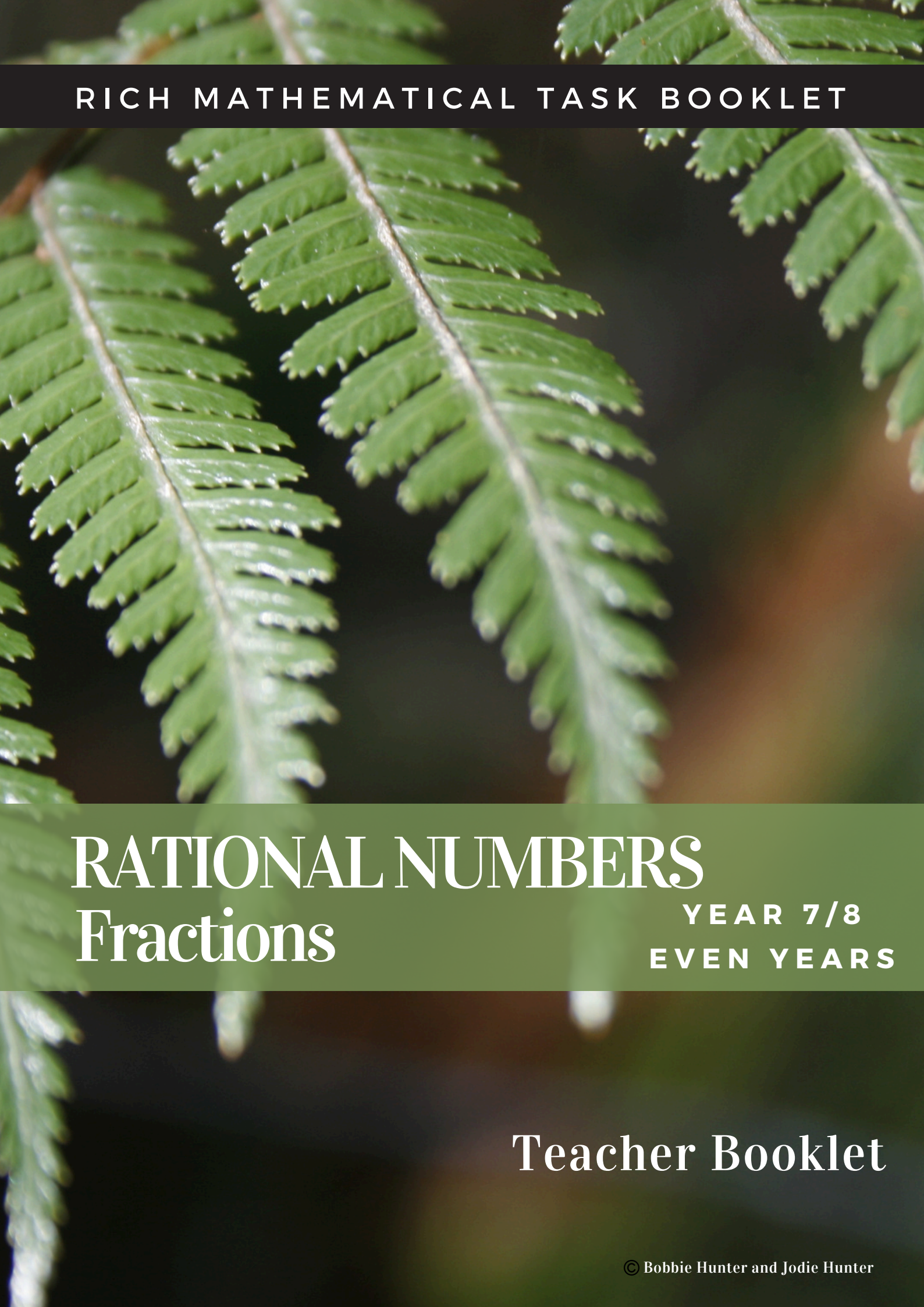

RICH MATHEMATICAL TASK BOOKLET

RATIONAL NUMBERS
Fractions

YEAR 7/8
EVEN YEARS

Teacher Booklet

Task 1

What are all the different ways you can use the fraction tiles to make more than one quarter but less than seven ninths?

As you make these record them and be ready to explain and justify why they are less than one whole.

What are all the different ways you can use the fraction tiles to make a fraction number that is less than four eighths but more than one seventh?

As you make these record them and be ready to explain and justify why they are less than one half.

What are all the different ways you can use the fraction tiles to make a fraction number that is more than one whole but less than one whole and two thirds?

As you make these record them and be ready to explain and justify why they are more than one whole.

What are all the different ways you can use the fraction tiles to make a fraction number that is the same as four fifths?

As you make these record them and be ready to explain and justify why they are equivalent.

What are all the different ways you can use the fraction tiles to make a fraction number that is the same as two sevenths?

As you make these record them and be ready to explain and justify why they are equivalent.

Task 1 (independent)

1. $\frac{1}{6}$ of 36 =

2. $\frac{5}{6}$ of 36 =

3. $\frac{1}{2}$ of 200 =

4. $\frac{2}{5}$ of 100 =

5. $\frac{3}{5}$ of 200 =

6. $\frac{1}{4}$ of 280 =

7. $\frac{2}{9}$ of 540 =

8. $\frac{3}{4}$ of 1 000 =

9. $\frac{1}{3}$ of ? = 24

10. $\frac{3}{9}$ of ? = 27

Task 2

This question is asked on a quiz show:

Are there numbers between numbers?

What would you answer be and why? Prove your answer by recording the following:

5 numbers that might come before 1

15 numbers that might come between 5 and 6

For the doubters in the room be ready to use a representation and a number line to prove that there are the numbers you have recorded and a whole lot more.

Task 2 (independent)

Write a set of 10 quiz questions using all the fraction knowledge you have. Make sure that you record the answer on the back of each quiz question.

Task 3

John and Henry are having an argument over their homework. They were asked to order a set of fractions from smallest to largest.

John has ordered the fractions in this order:

$\frac{3}{4}, \frac{4}{5}, \frac{7}{10}, \frac{10}{12}, \frac{12}{15}$

Henry disagrees with John. To prove his claim, Henry explains to John a different way to order the fractions. Use representations including a number line to show how you would order the fractions from smallest to largest.

Task 3 (independent)

Place these fractions on a number line in order of size

1. $\frac{5}{6}, \frac{2}{3}, \frac{7}{9}$

2. $\frac{3}{4}, \frac{5}{8}, \frac{7}{12}$

3. $\frac{7}{8}, \frac{11}{12}, \frac{10}{11}$

4. $\frac{3}{8}, \frac{5}{7}, \frac{1}{2}$

5. $\frac{5}{6}, \frac{8}{12}, \frac{7}{9}$

6. $\frac{11}{16}, \frac{5}{8}, \frac{7}{12}$

7. $\frac{7}{8}, \frac{2}{3}, \frac{3}{4}$

8. $\frac{1}{4}, \frac{3}{8}, \frac{1}{3}$

For each set of fractions what rule or pattern did you use to help you?

Task 4

Amataga's family have been making an Ie tōga to present at the opening of their new church.

By last month they had completed three eighths of it.

Last week was busy so they only completed another third of it. This week they have completed another quarter.

How much have they completed and how much more do they have to do to complete it?

Task 4 (independent)

Add these fractions:

1. $\frac{1}{10} + \frac{1}{2} + \frac{1}{6} =$
2. $\frac{1}{15} + \frac{1}{3} + \frac{1}{5} =$
3. $\frac{2}{12} + \frac{1}{2} + \frac{3}{4} =$
4. $\frac{2}{3} + \frac{5}{6} + \frac{6}{8} =$
5. $\frac{2}{5} + \frac{3}{8} + \frac{1}{10} =$
6. $\frac{3}{4} + \frac{1}{3} + \frac{4}{5} =$
7. $\frac{1}{8} + \frac{1}{7} + \frac{1}{3} =$

What patterns do you notice?

Record the rule you could use to find the common denominator.

Task 5

How good are your estimating skills? Which is the answer closest to?

1. $\frac{1}{12} + \frac{7}{8} =$

   Is it 20, 8, $\frac{1}{2}$, 1?

2. $\frac{8}{9} + \frac{11}{12} =$

   Is it 19, $1\frac{1}{2}$, 2, $1\frac{3}{4}$?

3. $\frac{6}{7} - \frac{1}{2} =$

   Is it $\frac{1}{2}$, 1, 5,

4. $9\frac{3}{4} - 5\frac{5}{6} =$

   Is it 4, $3\frac{1}{2}$, 3?

Be ready to justify your reasoning using at least two different ways.

Task 5 (independent)

Solve these equations using estimation as your thinking tool. Provide justification for each answer without working out the exact answer.

Record whether they are more or less than a $\frac{1}{2}$?

1. $\frac{2}{5} + \frac{1}{10}$
2. $\frac{1}{4} + \frac{3}{8}$
3. $\frac{1}{3} + \frac{1}{6}$
4. $\frac{3}{7} + \frac{1}{4}$

Record whether they are more or less than 2?

5. $\frac{3}{4} + \frac{9}{12} + \frac{1}{2}$
6. $\frac{17}{20} + \frac{7}{8} + \frac{9}{10}$
7. $3\frac{1}{6} - 1$
8. $3\frac{3}{4} - 1\frac{1}{2}$

Now your turn to write a set of ten questions for your classmates to answer similar to the ones above.

Task 6

A car travels $\frac{5}{6}$ of a kilometre in one minute. How many kilometres will the car have travelled after 11 minutes?

A recipe to make 12 cookies needs $\frac{2}{3}$ of a cup of sugar. Litea wants to make enough cookies for her hub at school which has 84 students. How much sugar does Litea need?

Timo is preparing bags of mandarins to sell at the local market. Each bag has $\frac{3}{4}$ of a kilogram of mandarins. Timo needs to prepare 15 bags to sell, how many kilograms of mandarins does he need to fill the bags?

Task 6 (independent)

Dion is preparing bags of apples to sell at the local market. Each bag has $1\frac{1}{2}$ of a kilogram of mandarins. Dion needs to prepare 20 bags to sell, how many kilograms of apples does he need to fill the bags?

A bike travels $\frac{2}{5}$ of a kilometre in one minute. How many kilometres will the bike have travelled after 23 minutes?

A recipe to make 20 pieces of fudge needs $\frac{7}{8}$ of a cup of sugar. Stella wants to make enough fudge for her hub at school which has 120 students. How much sugar does Stella need?

Task 7

Ilapesi and Sela are preparing ‘otai for the students in their class for Tongan language week. To make enough ‘otai for four people, they need:

$1\frac{3}{4}$ cups of pineapple

$3\ \frac{1}{2}$ cups of watermelon

$\frac{5}{6}$ cup of coconut

$\frac{4}{5}$ cup of coconut milk

1 Lemon

$\frac{7}{8}$ cup of coconut water

$\frac{2}{3}$ cup of lime

$2\ \frac{2}{5}$ cups of ice cubes

They want to make enough ‘otai for 32 people. Write a list of the total amount of each ingredient that they will need.

Task 7 (independent)

Gabriella filled 5 glasses with $\frac{2}{3}$ of a litre of sprite in each glass. How much sprite did Gabriella use?

You have $\frac{3}{4}$ of a pizza left. If you give $\frac{1}{3}$ of the pizza to your cousin, how much of a whole pizza will your brother get?

Louise used $2\frac{1}{2}$ tubes of paint. Each tube holds $\frac{4}{5}$ gram of paint. How many grams of paint did Louise use?

Task 8

You are helping to make ula lole for a celebration. There are bags of fruit bursts to use to make each ula lole.

Your Mum gives you 4 and $\frac{3}{4}$ bags of fruit bursts.

You find that on average you use $\frac{2}{3}$ of a bag of fruit bursts to make each ula lole.

You use up all the fruit bursts you have. How many ule lole have you made altogether?

Task 8 (independent)

You are helping to make ula lole for a celebration. There are bags of fruit bursts to use to make each ula lole.

Your Mum gives you 4 and $\frac{5}{6}$ bags of fruit bursts.

You find that on average you use $\frac{4}{5}$ of a bag of fruit bursts to make each ula lole.

You use up all the fruit bursts you have. How many ule lole have you made altogether?

Record an explanation to tell someone else what is important about dividing fractions.

You are helping to make ula lole for a celebration. There are bags of fruit bursts to use to make each ula lole.

Your Mum gives you 8 and $\frac{3}{4}$ bags of fruit bursts.

You find that on average you use $\frac{7}{9}$ of a bag of fruit bursts to make each ula lole.

You use up almost all the fruit bursts you have. How many ule lola have you made altogether?

Record an explanation to tell someone else what is important about dividing fractions.

Task 9

Koro has $1\frac{1}{5}$ hours to do 3 things to help his family around his home.

How much time does he take to do each job?

Solve this problem using both a number line and counters.

Now test your answer against the solution in minutes.

Task 9 (independent)

Solve these equations:

$\frac{2}{3}+\frac{2}{3}+\frac{2}{3}+\frac{2}{3}+\frac{2}{3}+\frac{2}{3}+\frac{2}{3}+\frac{2}{3}=$ __ x __ = __

$4 \times$ __ $=\frac{5}{6}+\frac{5}{6}+\frac{5}{6}+\frac{5}{6}=$

$\frac{4}{7}+?=2 \times \frac{4}{7}=$

$\frac{3}{8} \times$ __ $=$ — + — + —

$3 \div \frac{1}{2} =$

Write a story problem that would match these equations and solve them:

$\frac{4}{5} \times 6 =$

$\frac{2}{3}+\frac{7}{9}=$

$6 \div \frac{2}{7}=$

$5 \div \frac{5}{6}=$

Task 10

Mum is filling up the petrol tank.

The petrol tank is $\frac{1}{3}$ full and she pumps 35 litres into the tank.

Now the tank is $\frac{4}{5}$ full.

How many litres would be needed to fill the tank completely?

Make sure you are able to justify your explanation using both representations and notation

Task 10 (independent)

Marika has been given a cake to decorate. She is given 108 lollies to decorate it. She decides to split the cake into three sections and decorate each section but with a different proportion of lollies on each section.

She puts $\frac{4}{6}$ of her lollies on the first section.

She puts $\frac{2}{9}$ of the lollies on the second section.

She puts $\frac{1}{12}$ of the lollies on the third section.

How many lollies does she put on each section?

Marika is making otai. For each bottle of otai she needs:

1 and $\frac{1}{2}$ cups of pineapple.

3 and $\frac{2}{3}$ cups of watermelon.

1 and $\frac{3}{4}$ of a cup of coconut milk.

$\frac{5}{6}$ of a cup of coconut water.

$\frac{1}{4}$ of a cup of lemon juice.

Marika wants to make 6 bottles of otai. How much of each ingredient will she need?

Task 11

If 72 felts is $2\frac{1}{4}$ sets. How much is 1 set of felts?

If you run fast, you can cover $3\frac{1}{2}$ km in $\frac{3}{4}$ of an hour.

How fast are you running in kilometres per hour?

Task 11 (independent)

Can you write 3 fraction multiplication problems and then solve them?

Can you write 3 fraction division problem and then solve them?

Task 12

Solve each equation:

1. $a \times \frac{1}{4} = 2$
2. $3 \times \frac{1}{3} + 2 \times \frac{1}{3} = b$
3. $8 \times \frac{3}{8} = c$
4. $d \times \frac{3}{4} = 15$
5. $e \times 1\frac{2}{3} = 25$
6. $\frac{1}{3} = f \times \frac{1}{6}$
7. $\frac{2}{5} = g \times \frac{1}{10}$
8. $\frac{3}{8} + h = \frac{1}{2}$
9. $\frac{7}{20} = \frac{i}{15}$
10. $\frac{1}{10} = 2 \times j$
11. $\frac{8}{5} = k \times \frac{1}{10}$
12. $2 \times \frac{1}{3} = l \times \frac{1}{6}$

Be ready to explain and justify your explanations using representations and/or notation.