

Primary Years
Noarlunga Cluster

***Numeracy Planner***

**Big Idea: Partitioning** **Focus/Goal of unit: To develop the halving, thirding, quartering and fifthing strategies by partitioning continuous quantities.**

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| **Lesson Sequence** | **Stage 1(Building the field)** | **Stage 2**  | **Stage 3**  | **Stage 4**  | **Stage 5** |
| Recap last lessonLow Order / Intro Activity (5-10mins) | Number line activity 0-100numbers 22,49,70,99, 11,Listen for fraction language e.g. I know that 49 is almost half way to 100 etc | Continue number line activity using different numbers. | Number line counting on from 0 in halves.(word)  | Number line using quarters only (word) | Number line using thirds only |
| Goal / Purpose of lessonMake explicit to the students the purpose of the lesson, what they will know by the end and why. | .To develop an understanding of the term fraction | To develop an understanding that one half is one of two equal parts and to recognise and create halves of objects and collections  | To understand one quarter (fourths) as one of four equal parts. Recognise and create quarters of collections and models. | To understand one third as one of three equal parts.Recognise and create thirds of collections and models. | to understand one fifth as one of five equal parts. Recognise and create fifths of collections and models. |
| High Order / Modelling (10-15mins) | Brainstorm fraction language they know in the’ real world’ and practise naming and recording using oral and written language only. Discuss the difference between how many and how much. Point out the use of ordinal numbers to describe the fraction part.Use examples to ensure that students understand equal **parts** are required.Demonstrate fair/unfair shares using oranges cut up/counters.  | Discuss previous activity of making two equal parts from one whole collection/ plasticine model. Introduce the word denominator as being the amount of parts.Remodel the activity using groups of objects and paper shapes. Indicate that this is called partitioning. Discuss meaning. | Demonstrate cutting paper or plasticine pizza into half and then quarters. Notice the difference in size of the parts. Repeat with a collection of items. | Recap on halves and quarters.Demonstrate thirding as in previous stage. Emphasise importance of equal parts. | Use activities from previous stages to recap on halves, quarters and thirds and to model creating fifths. |

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| Application (20 mins)Children set to task as teacher observes, assesses & scaffolds as needed. | Students repeat sharing activity with a partner using plasticine (Plasticine pizza),hand full of counters, length of streamer ect. | Students work in pairs to show how many different ways they can show half using paper shapes. | Students work in pairs to partition a collection of counters and shapes into halves then quarters recording what they notice with each different collection or shape |  Using paper shapes and lengths of streamer and collection of counters and partition into thirds. | Working in pairs using five identical paper shapeskeep one whole and partition others by folding into halves, quarters, thirds and fifths.Notice what happens to the part.  |
| Joint conceptualising / meaning making (10 mins) | Discuss strategies used for making two equal parts. Discuss halves .Difficulties encountered (odd no, of counters) Pizza not even sized. | Discuss halves as opposed to a whole. Makes more pieces but each piece is smaller. Language denominatorindicates how many equal parts. | What is the same /different between halves and quarters of shapes /collections.the more pieces the smaller the amounts | Discuss how students made thirds/ are the parts equal? How do you know?Would these parts be larger or smaller than a half, a quarter? How could you find out? | Discuss what happens to the parts. As the parts get more they get smaller. The denominator tells us the size of the parts (How much). |
| Equipment/Resources needed in lesson | Various equipment to divide up, plasticine, plastic knivesseveral oranges.Number line and cards | eggbox,junk mail pictures of food items i.e. 10 rolls, counters, paper shapes, scissors. Number line and cards | counters/unifix cubes etc. Variety of paper shapesNumber line and number cards | counters/unifix cubes etc.streamer paper, paper shapesNumber line and cards | Paper shapesNumber line and cards |
| New Language introduced | divide, share ,equal parts, whole, half, how much ,how many parts, fraction | halves, denominator, partitioning | quarters, same , differentdifference, smaller/larger fraction | thirds | fifths |

**Useful websites for this whole unit:Coolmath4kids, whiteboard interactive fraction games** [**http://au.ixl.com**](http://au.ixl.com)

**Guruangadeducational, [www.education.vic.gov.au/studentlearning/teaching](http://www.education.vic.gov.au/studentlearning/teaching) resources/maths http://pbskids.org/cyberchase/games/fractions**

**RESOURCES:Fraction Series RIC Publications**

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**Big Idea: Partitioning**  **Focus/Goal of unit. To develop an understanding of how to name and record fractions**

 **in the oral and written (formal) way.**

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| **Lesson Sequence** | **Stage 6** | **Stage 7** | **Stage8** | **Stage9** | **Stage10** |
| Recap last lessonLow Order / Intro Activity (5-10mins) |  Matching fractions game.Bingo- fraction of shape coloured to word on bingo card.(Only to fifths) |  Ordering fractions halves to fifths only using cards pinned onto students, timing how long to get in order from largest to smallest? Smallest to largest? |  Ordering fractions as before but using cards showing formal recording. (Can go beyond 1/5 now. | Continue with ordering game | Bingo fraction game matching written word to formal notation. |
| Goal / Purpose of lessonMake explicit to the students the purpose of the lesson, what they will know by the end and why. | To demonstrate an understanding of halves quarters thirds and fifths as fractions of a whole. | To consolidate the understanding that as the number of parts increases the size of the parts decreases. | To further consolidate the understanding that as the number of parts increases the size of the parts decreases through visual representation and using formal recording. | To consolidate an understanding of the numerator and how it indicates how many parts. |  To determine whether the students are able to demonstrate their knowledge of partitioning using numerator, denominator and record formally and in words. |
| High Order / Modelling (10-15mins) | Recap on halves quarters thirds and fifths by demonstrating on an object in the class using masking tape. E.g. metre rule. | Prepared chart on whiteboard. Three columns with headings: No. Of parts,Name, Formal recordingFill in with students helping.Begin with one whole2-----halves.........1/23----thirds------1/34-----fourths----1/4Continue until students see a pattern. Point out that the number of parts names the part (Ordinals). | Paper folding activity.Using coloured brenex paper square or rectangle teacher demonstrates folding paper in a series of different ways. First fold in half. Notice how many pieces and the size, name and record the fraction. Then quarters, continue noticing size of pieces to number of pieces. | Using the folded brenex square from the previous stage teacher cuts the square into half and leaves it intact. How many parts are in this part of my square? Eg. If the square had been partitioned into 16 parts in the previous stage there would be 8 parts. 8 out of 16 8 is the amount of parts and 16ths is the size of the parts so its 8/16. Cut the other half into quarters. Go through the same process ending with 4/16. |  Students take a 9 sided dice and roll it twice to determine what their fraction will be. The lowest number will be the numerator and the highest number will be the denominator.eg roll a 6 and 5 the fraction will be 5/6.On the think board they write it in words and formally, They draw it, using any shape, and then make it using paper shapes or streamer that can be stuck onto the board. |
| Application (20 mins)Children set to task as teacher observes, assesses & scaffolds as needed. | Students in pairs choose an object around room or close by in school yard to partition into fractions (e.g. Paving slab, brick, table. Ruler. Students can choose which fraction from halves to fifths. Use chalk or masking tape. Photograph results. | Students work in pairs and continue the chart. Encourage more able students to skip and go to twentieths/one hundred and tenths etc  | Students each have a brenex square and decide how they will fold their square to partition it into equal fractions. They unfold the square to see how many pieces. They then record the name of the fraction formally and in words. | Students use their own brenex square from previous stage and cut in half and then quarters. Can cut the quarter in half too. Cut paste and record their fractions remember to emphasise that the numerator indicates the amount of parts | Students can complete task individually or with a partner. |
| Joint conceptualising / meaning making (10 mins) | Each pair to show and explain their partitioning. Share strategies use to determine equal parts. Discuss difficulties. | Discuss findings. Does the pattern continue for every fraction? Discuss number of parts names the part this is the denominator. Discuss numerator, The amount of parts e.g. ½ is one of two equal parts. | Discuss how students decided on their partitioning. (By accident or did they think it through) EG. If I fold it in half and half again I will get quarters. Discuss the formal recording in relation to how many parts. |  Discuss students’ results and strategies. Listen for use of correct language-partition, denominator, numerator | students have turns at presenting their think board and sharing strategies used in completing the task |
| Equipment/Resources needed in lesson | chalk, masking tape, cameraFraction bingo game | Fraction cards | coloured brenexsquaresfraction cards | coloured brenex squares | fraction bingo game |
| New Language introduced |  | numerator, formal |  |  |  |

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**Big Idea: Partitioning**  **Focus/Goal of unit. To develop an understanding of, and have the ability to, add and subtract fractions with common denominators.**

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| **Lesson Sequence** | **Stage 11** | **Stage 12** | **Stage13** | **Stage14** | **Stage15** |
| Recap last lessonLow Order / Intro Activity (5-10mins) | Short fraction quiz.what is half of 18what is a third of 36 etc |  Sort improper /proper fraction cards. | Number line with proper fractions and mixed numbers. | Show a fraction card. Tell me another with a common denominator. | Mentally add common fractions with like denominators. |
| Goal / Purpose of lessonMake explicit to the students the purpose of the lesson, what they will know by the end and why. | To learn the difference between proper and improper fractions. | To be able to convert improper fractions to a mixed number | To develop an understanding of the term “common denominator” | To be able to add fractions and mixed numbers that have a common denominator. | To be able to subtract fractions and mixed numbers that have a common denominator. |
| High Order / Modelling (10-15mins) |  Discuss with students the difference between a proper and improper fraction. Demonstrate using two paper rectangles. Cut both into quarters. Show ¼ and record fraction. Repeat adding ¼ each time and recording. When you get to 5 quarters explain that now this is an improper fraction and why.Use a 10 sided dice. Roll first number-denominatorRoll second number-numerator. Is it an improper or proper fraction?  | Begin demonstrating dice rolling lesson as stage 11 to reinforce understanding.Introduce the term “mixed number”Demonstrate how to convert an improper fraction into mixed number. Use the paper cutting activity as stage 11.Show 7/4 physically rearrange so there is one whole and ¾. How do we know there is one whole? (The numerator and denominator will be the same.) | Review denominator to ensure full understanding.Discuss when two or more fractions have the same denominator we say they have a common denominator. Use a 6 sided dice to roll and make 10 fractions. Group them into fractions with common denominators. | Use enlarged fraction mat to demonstrate adding fractions with common denominators.Use fraction kit pieces to reinforce.It is important that the students understand that we only add the numerator **never** the denominator. Some students find this difficult to understand.When the 2 fractions are added try 3. Is the answer an improper fraction? How do we convert it to a mixed number? | Repeat stage 14 but this time use subtraction.Make the two fractions first by rolling the dice to get the common denominator. Roll twice more to get the 2 numerators. Remind the students that we subtract the lower numerator from the higher numerator as in normal whole number subtraction. |

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| Application (20 mins)Children set to task as teacher observes, assesses & scaffolds as needed. | Students repeat dice rolling activity in pairs. Record results on a chart. Proper/improperCan use 12, 20 sided dice | Repeat dice rolling activity. This time use the least sided dice for the denominator and the most sided dice as the numerator and convert the improper fraction into a mixed number. | Students repeat the demonstrated activity in pairs recording results. Can use variety of dice according to their ability. | **Students work in pairs and repeat the demonstrated activity using their own fraction mats and whiteboard markers completing one problem at a time and then recording in books. More able students can add multiple fractions not just 2; if successful they can make their own mixed numbers and add these.** | **Repeat teacher demonstrated activity in pairs. Extension using mixed numbers.** |
| Joint conceptualising / meaning making (10 mins) | Share results. Let them explain what a proper fraction is and an improper fraction,  | Discuss strategies used to convert the improper fractions. How do you know how many wholes there are?etc. | Discuss results ensuring students fully understand the term common denominator | Share with other students what they have done/ what they know. | Share strategies and findings/ Discuss |
| Equipment/Resources needed in lesson | paper for demonstrating quarters6,10,12 and 20 sided diceWhiteboards and markers or student books | Variety of dicefraction kits for checking/or paper to cut into fractionsFraction cards | Numberline with fraction cards | Fraction mats, variety of dice, fraction kits, whiteboards/markers, students booksFraction cards | Equipment as in stage 14 |
| New Language introduced | proper fractionimproper fraction | mixed number | common denominator |  |  |

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**Big Idea: Partitioning**  **Focus/Goal of unit. To develop an understanding of equivalent fractions, how to**

 **simplify fractions and how to find the lowest common denominator.**

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| **Lesson Sequence** | **Stage 16** | **Stage 17** | **Stage18** | **Stage 19** | **Stage20** |
| Recap last lessonLow Order / Intro Activity (5-10mins) | Fraction game (Make a whole fraction Loopy) | Choose a fraction. How many ways can we represent it in 1 minute/ Share | Fraction cards. Can we simplify this one? | Fraction dominoes class game | Fraction dominoes class game |
| Goal / Purpose of lessonMake explicit to the students the purpose of the lesson, what they will know by the end and why. | To know that two equal fractions are known as equivalent fractions | To understand how to reduce(simplify ) a fraction  | To be able to find the lowest common denominator of two different fractions. | To be able to add fractions with different denominators. | To be able to subtract fractions with different denominators |
| High Order / Modelling (10-15mins) | Equivalent means equal in value. Fractions can look different but be equivalent.Demonstrate with simple fractions ½ same as 2/4. Use the fraction wall kit to reinforce. What else equals ½? 3/6, 4/8, 5/10 ect.What do you notice?The numerator is exactly half the denominator. What about 1/3? What do you think will happen? Demonstrate, 2/6, 3/9, 4/12. The denominator is now 3 times the numerator. | When we see a fraction in its simplest form the numerator and the denominator have only 1 as their common factor. E.g. 3/5 one is the only common factor of 3 and 5.To simplify a fraction we need to divide the numerator and the denominator by their greatest common factor.18/24 to simplify this fraction we need to look at the factors of each number. 18-1,2,3,**6**,9,1824-1,2,3,4,**6**,8,12,24The greatest common factor is 6We need to divide the numerator and the denominator by 618 divided by 6 = 3 24 divided by 6 = 4The simplest form is ¾ Demonstrate a few more with students helping. | We can only add fractions when they have a common denominator. To add fractions with different denominators we need to find the lowest common denominator for those fractions. That is the lowest number that can be divided equally by the denominators.Demonstrate 1/3 + 1/5 What is the lowest number that 3 and 5 can be divided into equally?15. We need to make the common denominator 15We have to multiply the denominator and the numerator of 1/3 by 5 to make 15ths1 x 5 = 53 x 5 = 15We have to multiply the denominator and the numerator of1/5 by 3 to make 15ths1 x 3 = 35 x 3 = 15Practise together.  | Review stage 18 to ensure students understand how to find the lowest common denominator of different fractions in order to add or subtract them.Use the same model1/3 + 1/5Now both fractions have a common denominator we can add them together5+ 3= 815 + 15 = 15Model several more before setting students to task | To subtract fractions with different denominators we go through the same process and find the lowest common denominator. E.g.1/3 – 1/55 – 3 = 215 – 15 = 15Model several more.Introduce some simple word problems to solve involving subtraction. |
| Application (20 mins)Children set to task as teacher observes, assesses & scaffolds as needed. | Students play the fraction wall game, “How many wholes can you make” in pairs noticing the equivalent fractions | Students use 6 sided dice to roll numerator and 12 sided dice for denominator and show fractions in their simplest form.More able students use 12 sided and 20 sided dice. | Working in pairs each has a turn to make a fraction using 2 packs of cards pictures removed. Take one card from each pile. The lowest number becomes the numerator and highest denominator. Find the lowest common denominator for the pair.  | Same activity as Stage 18 but now add them together. | Same activity as stage 18 but using subtraction.Make up some word problems of their own for another pair to solve. |
| Joint conceptualising / meaning making (10 mins) | What did you notice? What equivalent fractions did you find? Share and discuss- how do you know this? | Share findings and discuss. Can all fractions be simplified e.g. 11/19? Discuss, (factor knowledge is important)Is there a connection between finding equivalent fractions and simplifying fractions/? Discuss | Discuss what they did and how they did it. How did they know what the lowest common denominator was? | Discuss and review what the students have done.Check for understandingThis concept relies on students having a firm understanding of factors.  | Discuss process of subtraction/ easier/ harder than addition. Anyone try more than two fractions? Anyone try mixed numbers? Share problem solving |
| Equipment/Resources needed in lesson | Fraction kit“How many wholes” gameFraction game (Make a whole Loopy Fraction) | Variety of dice | packs of cardsx Tables chartsFraction cards | packs of cardsx tables chartsFraction dominoes | Packs of cardsxtables chartswhiteboards, markersfraction dominoes |
| New Language introduced | equivalent | simplify, common factorsgreatest common factor equally |  |  |  |

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**Big Idea: Partitioning** **(Decimals)**  **Focus/Goal of unit. To develop an understanding of, and the ability to use the decimal system and understand the connection between decimals and common fractions.**

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| **Lesson Sequence** | **Stage 21** | **Stage 22** | **Stage23** | **Stage24** | **Stage25** |
| Recap last lessonLow Order / Intro Activity (5-10mins) | Whole class problem solving involving addition/subtraction of fractions | Number line with tenths | Number line with decimal tenths and whole numbers | Ordering money amounts | Ordering decimals, human number line |
| Goal / Purpose of lessonMake explicit to the students the purpose of the lesson, what they will know by the end and why. | To be able to identify tenths and hundredths as fractions and convert these to decimalfractions  | To develop an understanding that each number in the decimal system has a **face**, **place** and **total** value.Decimal fractions have the same face value but different place values to whole numbers. | To be able to add decimals, whole numbers and decimals and relate this to real life situations. (money and measurement) | To be able to subtract decimals, whole numbers and decimals and relate this to real life situations | to be able to round decimal numbers, and order decimal numbers |
| High Order / Modelling (10-15mins) | Intro- What is the decimal system/Who invented it?Using ten frames roll 10 sided dice. Colour the squares. How many tenths?Write the fraction.Write the decimal fractionReadDo several togetherLook at 100 square. Roll 2, 10 sided dice.eg 7 and 3 , 73Colour 73 out of 100 squares; Fraction 73/100. Write the decimal fraction.0.73Do several together | Discuss face, place and value of digits in a number. Decimal fractions have the same face values to whole numbers. Their value is measured in tenths, hundredths and thousandths.demonstrate TH H T O . T H TH Discuss where students may have seen decimal fractions used.(money, measurement)Practise writing whole and decimal numbers. Using number cards. | Demonstrate adding amounts of money.$6.35Discuss 35 is 35 cents out of 100 = thirty five one hundredths = .35 a decimal fraction of one whole dollar.Demonstrate adding two, three amounts of money. Where do we put the decimal point? Discuss | Same activity as stage 23 but this time subtracting money amounts.Make some algorithms without using moneyMake some using measurement e.g.12.50 metres take 8.35metres | Reteach the high 5 rule for roundingUse decimal tenths first0.5 or above (High 5) goes to next whole numbertry hundredths0.05 (High 5) or above goes up to next tens place 0.1Discuss athletic events where precise measurements are used and how competitors are placed , tenths and hundredths of a metre are important |
| Application (20 mins)Children set to task as teacher observes, assesses & scaffolds as needed. | Students do above activity in pairs. Start with tenths only. If able to do this successfully go on to hundredths. | In pairs students use number cards to make whole number and decimal fractions. Turn up card one (Whole number)decimal point, card two (Tenths)Read the numberGo to hundredths  Read the number | Using a 10 sided dice for dollars and a double dice for cents make amounts and add together. | Students make up their own subtraction problems for their partner to solve | Students use dice to show 6 measurements using wholes and hundredths. With a partner round the measurements off and order them. Make up a story to go with the measurements. |
| Joint conceptualising / meaning making (10 mins) | Have turns at reading out the fraction and decimal fraction. What does the 0 before the decimal point represent? | Look at the numbers students have made. Discuss face , place and total value | Discuss any difficulties. Is it any different from conventional addition?If we leave the dollar sign off does it change anything? | .Discuss strategies used.Were there any difficultiesIs it the same as conventional subtraction? | Share stories. How did you work out the order? |
| Equipment/Resources needed in lesson | 10 sided dice. Whiteboards and markers10 frames100squares | Number cards 0—9whiteboards and markers | 10 sided dice. Double dice | assortment of dice/whole number and decimal fraction cards | assortment of dice , whiteboards and markers |
| New Language introduced | tenths, hundredthsdecimal, decimal point | face valueplace valuetotal value |  |  | round up, round down |

***Numeracy Planner***

**Big Idea: Partitioning** (Percentages)  **Focus/Goal of unit: To develop and understand the concept that a percentage is a fraction of hundredths represented in another form.**

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| **Lesson Sequence** | **Stage 26** | **Stage 27** |
| Recap last lessonLow Order / Intro Activity (5-10mins) | Ordering tenths written as a decimal | Matching fractions to decimal fractions. tenths, hundredths ¼ ½etc |
| Goal / Purpose of lessonMake explicit to the students the purpose of the lesson, what they will know by the end and why. | To be able to express fractions as decimals. (Converting to hundredths) | To be able to write hundredths as a percentage |
| High Order / Modelling (10-15mins) | Square of paper divided into 10 equal strips.To divide a whole number into tenths we need 10 equal parts.Each one of these tenths can be written as a fraction and a decimal. 1/10, 0.1Each tenth can be divided again into ten equal parts (100 squared paper or Mab 100 block) now we have 100 parts, Hundredths.Each one of these hundredths can be written as a fraction and a decimal. 1/100, 0.01 Practise writing a few together 8/100= 0.08 | Discuss a collection of junk mail showing %Discuss where else you might see %.Discuss meanings-percent-percentage A percentage is a fraction of 100ths represented in another form.Practise writing 50/100= 50% =0.5036/100=36% = 0.36 |
| Application (20 mins)Children set to task as teacher observes, assesses & scaffolds as needed. | Students practise making and writing tenths and hundredths in fraction form and decimal | Students work on a sheet showing 100 grids.Roll double dicewrite the fraction,show it by colouring squares on the gridWrite the percentage |
| Joint conceptualising / meaning making (10 mins) | Can we put the decimal fractions in order?Discuss the difference between 0.4 and 0,04 | Discuss % made. Can we order them? Look at junk mail again. What does it mean when it says 30% off?Discuss to find out what they know. |
| Equipment/Resources needed in lesson | Fraction and decimal cards for matchingMab blocks 100 squared paper squares for dividing into tenths | Junk mail showing %Sheets of 100 gridsdice |
| New Language introduced |  | percent, percentagepercentagesconvert |