**MATHEMATICS STAGE 1**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK: 11  | STRAND: NUMBER & ALGEBRA | **SUB-STRAND:** FRACTIONS AND DECIMALS 2 | **WORKING MATHEMATICALLY:** MA1-3WM; MA1-1WM |
| OUTCOMES: MA1-7NA | **Represents and models halves, quarters and eighths.**  |
| **CONTENT:**  | **RECOGNISE AND INTERPRET COMMON USES OF HALVES, QUARTERS AND EIGHTHS OF SHAPES AND COLLECTIONS (ACMNA033)*** Use fraction language in a variety of everyday contexts, e.g. the half-hour, one-quarter of the class.
* Use concrete materials to model a half, a quarter or an eighth of a collection.
* Describe equal parts of a collection of objects, eg. “I have quarters because the four parts have the same number of counters”.
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | * Do students know how to share a collection of items fairly? Share counters out to each student and ask them to share them evenly in a small group
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| **WARM UP / DRILL** | * Play “Fractions Flags” – interactive whiteboard game. [www.maths-games.org/fraction-games.html](http://www.maths-games.org/fraction-games.html)
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| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | * Half of the children in the family are boys. Draw what the family could look like.
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| QUALITY TEACHING ELEMENTS | **INTELLECTUAL QUALITY** | **QUALITY LEARNING ENVIRONMENT** | **SIGNIFICANCE** |
| * Deep knowledge
* Deep understanding
* Problematic knowledge
* Higher-order thinking
* Metalanguage
* Substantive communication
 | * Explicit quality criteria
* Engagement
* High expectations
* Social support
* Students’ self-regulation
* Student direction
 | * Background knowledge
* Cultural knowledge
* Knowledge integration
* Inclusivity
* Connectedness
* Narrative
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| RESOURCES | Collections of items (for discrete fractions), such as beads, cubes, counters, small toys, seeds, pencils, paper clips, lollies, popsticks, etc.Paper circles or squares to be used as denominators, or sub-units.Paper, whiteboards, pencils, markers, etc. for recording.Paper plates, paper circles or counters to represent pikelets in investigative activity.Interactive Games and Resources at:[www.resources.woodlands-junior.kent.sch.uk/maths](http://www.resources.woodlands-junior.kent.sch.uk/maths)[www.rainforestmaths.com](http://www.rainforestmaths.com)[www.harcourtschool.com/activity/cross\_the\_river/](http://www.harcourtschool.com/activity/cross_the_river/) |

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| TEACHING AND LEARNING EXPERIENCES |
| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| * **Students learn to:**
* Question if parts of a collection of objects are equal.
* Explain why the parts are equal.
* Use fraction language in a variety of everyday contexts.
* Visualise fractions that are equal parts of a whole collection.

**Language**: group, divide, quarters, part, part of, other part, equal, equal parts, about a half, more than a half, less than a half, one part out of two, two/four/eight equal parts, one half, one part out of four/eight, four equal parts, one quarter, one eighth.**Teaching:*** Fractions refer to the relationship of the equal parts to the whole unit. When using collections to model fractions it is important that students appreciate the collection as being a ‘whole’ and the resulting groups as ‘parts of that whole’.
* Working in small groups:
* Have diagrams or pictures of children, or simply use paper circles or squares (eight in all).
* Show students a handful of sultanas (or counters, beads, cubes). Question them: Do you think I have enough sultanas so that Mary and Bill (two of the diagrams/pictures) will get the same amount (a fair share). Students to reason (without counting, i.e. estimating) and give answers.
* How can we share these sultanas to check?
* Carry out students suggestions, using “sharing” language, each student to count their sultanas at the end and compare. Does each person have the same? Are there any left over?
* It is not necessary for students to distinguish between the roles of the numerator and denominator at this Stage. They may use the symbol ½ as an entity to mean ‘one-half’ or ‘a half’ and similarly for ¼.
* Be careful of introducing traditional fraction symbols too early as many students have not developed a meaning for the symbols before they are asked to operate with them.
* Use sharing diagrams to represent and calculate with fractions. Use sharing diagrams as representational tools.
 | LEARNING SEQUENCERemediationES1  | * Practice sharing items between 2, 4 and eight people.
* Explicitly teach that when sharing between two people, each person receives half of the total objects. Repeat with four and eight people.
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| LEARNING SEQUENCES1 | **Activity 1:****Sharing Collections:** * **Halves**

The teacher displays eight cubes and says ‘I am going to share these eight cubes between two people.’ Two students are selected to hold out their hands for the teacher to share the cubes, one at a time. Possible questions include:* Did each student get an equal amount?
* How many cubes did each student get?

The teacher says ‘We have shared the eight cubes into two equal amounts. Each is one-half of eight.’* **Quarters**

The activity is repeated using the scenario ‘I am going to share the eight cubes among four people.’ Students predict how many each student will receive and four students are selected to hold out their hands for the teacher to share the cubes. The teacher says ‘We have shared the eight cubes into four equal amounts. Each is one-quarter of eight.’ Possible questions include:* Why did each student get less this time?
* How could you check if the two/four parts are equal?
* **ASSESSMENT**

Were students able to make reasonable predictions before sharing took place?Were students able to discuss why parts of the whole became smaller when shared amongst more people?**Activity 2:** * **Investigation**: **Estimating Halves**

In pairs or small groups, students are provided with a collection of small similar objects in containers, e.g. centicubes, counters, beads. They empty the contents and create two groups of objects that they estimate will be about half of the collection. Possible questions include:* What strategies did you use to help with your estimation?
* What could you do to improve your estimation?
* How did you check your results?

 * Extension: Students estimate and create four groups and eight groups that are about equal.
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| LEARNING SEQUENCEExtension Early S2 | * **Find Half of a Collection**

Students are given a dice with faces numbered 2,4, 6, 8, 10, 12. In small groups or pairs, student take turns to roll the die. They collect counters to match half the amount rolled and record their roll and the counters taken, e.g. 10 is rolled and the student collects 5 counters. Students have a predetermined number of rolls, e.g. 20. The winner is the student who has the most counters. |
| **EVALUATION & REFLECTION** | * Can students readily discuss their visual images of fractions?
* Can students describe how the ‘whole’ collection was divided into halves, quarters and eighths.
* Can students see the link between sharing and fractions?

**Student Engagement: Resources:****Achievement of Outcomes: Follow-up:** |

* All assessment tasks should be written in **red** and planning should be based around developing the skills to complete that task.
* Assessment rubrics or marking scale should be considered.