HOW I TEACH FRACTIONS IN THE INTERMEDIATE PHASE WHEN THE LANGUAGE OF LEARNING AND TEACHING (LOLT) IS ENGLISH AND THE LEARNERS' HOME LANGUAGE IS NOT ENGLISH

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INTRODUCTION

In 2004, Myburgh *et al.* reported that where learners do not speak the language of instruction, authentic teaching and learning cannot take place. The Department of Basic Education agrees and states that such a situation largely accounts for the school ineffectiveness and low academic achievement experienced by students in Africa (DBE, 2010).

We feel that since the LOLT in Intermediate Phase Mathematics is English in many schools in South Africa – 80% of Intermediate Phase Mathematics classes were taught in English in 2007 (DBE, 2010) – it is important that teachers have the necessary tools to support and assist their learners in this crucial phase.

Therefore, we believe that introducing English terminology about fractions in Grade 4 should be done slowly, with plenty of repetition and with the use as many interesting visual resources as possible.

SIX THINGS TO CONSIDER BEFORE YOU START A LESSON

1. Make sure you explain to learners why it is important to learn about fractions. Use pictures or props wherever possible. For example:

    - Fractions are important because we encounter them in our everyday lives:
        o Fractions are used in time, such as quarter past, half past, half a day, quarter of a year. Show them a clock face to illustrate some of these times.
        o When cooking and baking we measure ingredients using words like: half a dozen eggs, half of a tablespoon, a quarter of a cup.
        o In shops we often see signs that say 'Half price sale!'

2. Reinforce vocabulary in order to boost their language development. For example, go through these words one at a time explaining each one and illustrating each word using pictures or drawings wherever possible:

    > whole number, half, double, quarter, third, tenth, divide, share, equal parts, denominator, numerator, common fraction, proper fraction, mixed fraction, equivalent fraction

3. Use visual resources that will make it easier for the learners to understand the concepts you are trying to explain. For example:

- laminated fraction strips
- different coloured shapes cut into fractions and labelled
- fraction walls and number lines
- flash cards with fraction notation and words
- pictures of everyday objects that can be divided into fractions.

4. Explicitly teach thinking skills rather than have learners rote learn the subject. Remember that learners should be exposed to different types of questions that will make them think creatively, even if they haven't yet mastered the language. For example:

- '54 ÷ 6 = 9' **or** '54 sweets shared between 6 children'.
- '54 ÷ 2 = 27' **or** 'Halve 54' **or** 'What is half of 54?'
- Ask learners: 'Why are $\frac{1}{2}$ and $\frac{5}{10}$ the same?' Instead of asking them 'Which fraction is equivalent to $\frac{5}{10}$?'

5. Construct a multiple meaning bank that will help learners know a question whichever way it is been posed. For example:

- 'What is one fourth of twelve?' **or** 'What is a quarter of twelve?'

6. Use collaborative learning strategies to help learners to learn from each other. For example:

- The way your learners sit in class should be determined by the kind of activity you will be doing. If you have been teaching a lesson that is difficult for some learners to grasp, mix those who struggle with those who have understood the lesson well and let them help each other.

THE LESSON

Lesson objectives

Note that you may not get through all of these objectives in one lesson. Be aware of whether learners are keeping up and teach at the correct pace for your learners.

At the end of the lesson learners will be able to:

- understand prerequisite knowledge using new terminology in English, i.e. sharing and fractions
- define fraction, numerator and denominator (in English)
- identify the number of shaded parts and the number of equal parts in a shape

- recognise and write a fraction using mathematical notation and using words
- determine if two fractions are equivalent using shapes
- add fractions with the same denominators.

Starting off

Show learners a bar of chocolate (or any other physical resource that can be divided in different ways) and ask them: 'If I have one bar of chocolate and I want to give it to two children, what should I do to make sure that each child gets an equal share?' Illustrate this using two learners in the class, or using pictures or drawings.

Then discuss: 'If I want to give the same bar of chocolate to three children, how will I make sure that each child gets an equal share?'

And lastly: 'If I want to give the same bar of chocolate to four children, how will I make sure that each one gets an equal share?'

Write down answers as they give them to you.

Once you've written all the answers down, ask the learners how they worked out their answers and discuss them together. If learners do not easily come up with the correct answers, make representations of the chocolate using cardboard or paper, cut the drawing up into pieces and share the pieces between the children.

Activities

1.   Divide your learners into groups and give each group one bar of chocolate (or any other physical resource that can be divided in different ways). Make sure the chocolate can be divided equally amongst the number of children in the group but try to have groups of different sizes (for example, if you have bars of chocolate that have 12 pieces, divide the learners into groups of 2, 3, 4 and 6). See how they share the chocolate you have given them. Make sure that each child in a group gets an equal share of the group's chocolate.

Then ask them to look at the pieces they have shared and talk in their groups about what fraction each member of the group has. Then ask different groups to compare how the chocolates have been divided differently. Discuss who got the biggest portion and why. (This will be determined by the number of learners in the group – if there were many learners in a group, each learner will get a smaller fraction of the chocolate.)

Ask one learner from each group to come to the front of the class with their pieces and then ask the rest of the learners to arrange them from most to least (biggest fraction of the whole to smallest fraction of the whole), according to the pieces they have in their hands. Let them discuss which fraction is bigger and which fraction is smaller.

2. Write a fraction on the board, or hold up a fraction card for everyone to see and ask them if they know what this is called. (For example: $\frac{1}{2}$)

Expected answer: Fraction

Then ask them to explain what a fraction is.

Expected answer: A fraction is a part of a whole.

Tell learners that in fraction we have two numbers. Ask them if anyone can tell you what these numbers are called.

Expected answer: The top number is called the numerator and the bottom number is called the denominator.

3. Show learners some shapes with shaded parts and ask them to tell you which fractions they represent. Make sure that learners can match the fractions in fraction notation and also in words. For example:

$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{2}{4}$	$\frac{4}{8}$	$\frac{3}{4}$
one half	one quarter	three eighths	two quarters	four eighths	three quarters

Ask your learners to look at the fractions below and say which ones they think are different but have the same value. Tell them that these fractions are called equivalent fractions. Give them a chance to choose those fractions that are equivalent to each other. For example:

$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$
$\frac{2}{4}$	$\frac{2}{8}$	$\frac{6}{8}$

4. Ask your learners if they know how to add fractions together. Go over the difference between the numerator and the denominator of a fraction again. Then explain that they can only add fractions together when the denominators are the same. Show them physical examples or drawings so that they understand why this is the case. Then show them this example:

$$\frac{5}{10} + \frac{3}{10} = ?$$

- The denominators are the same, so we can add the numerators.
- Add the top numbers and put the answer over the denominator.

$$= \frac{5 + 3}{10} = \frac{8}{10}$$

Illustrate this by counting fraction pieces, colouring in drawings as you count, or 'hopping' in eighths on a number line. Do not expect learners to grasp the notation straight away. Use many examples to show them how to do this.

ADDITIONAL NOTES AND TIPS

- Explain terms in English using simple language wherever possible.
- Use as many visual resources as you can, including physical resources that learners can manipulate using their hands.
- Use a class test to find out what learners know and what they don't know, and immediately intervene as soon as you discover problems.
- Talk to the parents of learners who are struggling. The best is to call a group of parents in and show them how to help their children at home. If they are unable to help, advise them to ask trustworthy friends, family members or even an older learner to help their child after school.
- Encourage learners to talk about how they got to their answers so that you can easily find mistakes and misunderstandings they may have.
- Be sensitive and take extra care considering those learners who find fractions difficult and frustrating. Always be patient with these learners. It is much better and easier for you if learners love the subject rather than hate it.
- Praise learners for each little improvement they show and always tell them how great they can be if they practise working with fractions everyday.
- Many learners and teachers think of fractions as the most difficult area to understand in Mathematics. Try to keep your lesson positive and make sure that learners believe that they **can** do it. Always try to make learning fractions fun and easy.
- Try to bring sweets, chocolates, pizzas or biscuits to work with in class, and let learners share them at the end of the lesson.

REFERENCES

Department of Basic Education. 2010. The status of the language of learning and teaching (LOLT) in South African public schools.

Myburgh, O., Poggenpoel, M. and Van Rensburg, W. 2004. Learners' experience of teaching and learning in a second or third language. Education, 124(3):573.