UNIVERSITY OF TECHNOLOGY SYDNEY

# ASSIGNMENT COVER SHEET

## FASS: EDUCATION

| | |
|---|---|
| **SUBJECT NUMBER & NAME** | 013402 Professional Experience and Classroom Management 2 |
| **NAME OF STUDENT** (PRINT CLEARLY - SURNAME, FIRST NAME) | CHIPMAN, Michael |
| **STUDENT ID NUMBER** | 95093744 |
| **STUDENT EMAIL** | Michael.W.Chipman@student.uts.edu.au |
| **STUDENT CONTACT NUMBER** | 0415 312 759 |
| **NAME OF TUTOR** | Mark Sinclair |
| **DUE DATE** | 29 June 2018 |
| **ASSESSMENT ITEM NUMBER/TITLE** | TPA |

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. If this assignment is submitted after the due date I understand that it will incur a penalty for lateness unless I have previously had an extension of time approved and have attached the written confirmation of this extension. Please provide details of extensions granted here if applicable _____

_____

**Signature of Student:** _____

If submitted electronically tick here to indicate you agree with the above ☑

**Date:** __22_/_06_ /_18_

## Element 1: Planning for teaching and learning

| | | | |
|---|---|---|---|
| **Name:** | Michael Warwick CHIPMAN | | **Student ID:** 95093744 |
| **Name of University** | University of Technology, Sydney | | |
| **Name of course/program** | Master of Teaching in Secondary Education (Mathematics / Science) | | |
| **Specialisation/s being taught** | Mathematics | | |
| **Dates of professional experience** | **07/05/18 - 18/06/18** | | **Total number of days:** 30 |
| **Description of school context:** | | | |
| **School name & address** | Epping Boys' High School, 213 Vimiera Rd Eastwood, NSW 2122 | | |
| **Location (Education Region)** | Northern Sydney | | |
| **School sector** | Government | | |
| **Enrolment Number** | 1156 | | |
| **Index of Community Socio-Educational Advantage (ICSEA)** (https://www.myschool.edu.au/ ) | ▪ High socio-economic profile<br>▪ School ICSEA value: 1121<br>▪ Distribution of students: 55% in top quartile, 82% in upper two quartiles | | |
| **Student Diversity** (https://www.myschool.edu.au/ ) | ▪ 0% Indigenous students<br>▪ 59% Language background other than English | | |
| **Priority Areas** (https://www.myschool.edu.au/ ) | ▪ To provide a positive learning environment for boys<br>▪ To encourage student participation in activities that foster gifts / talents<br>▪ To develop a sense of civic responsibility in students | | |
| **Year level being taught for the TPA** | Year 7 | | |
| **Number of students in the class** | 25 | **Gender Ratio** | 100% boys |
| **Description of the physical space** | ▪ A classroom dating from the school's establishment (1957), carpeted and recently airconditioned, with pairs of single desks arranged grid-wise.<br>▪ A whiteboard – not smartboard – is fixed to the front wall. A classroom computer with projector is available for teacher/student use. | | |
| **Name of Mentor Teacher, Work Email Address** | Ramya Jayamanne (Liyanage) | | ramya.jayamanne@det.nsw.edu.au |

**Diversity in the class based on linguistic, cultural, religious, socioeconomic and/or other characteristics**

The cultural backgrounds of the 25 Year 7 students reflects that of the overall school population, except that no students have an Indian/Sri-Lankan or other South Asian family background. Students in the class comprise the following broad groupings:

- Anglo-Celtic – 9 students
- Continental European – 8 students
- East Asian – 5 students
- Middle Eastern – 2 students
- African – 1 student

All students in the class have good English skills, and none are overseas fee-paying students.

**Description of the physical, social and intellectual characteristics of students**

This non-streamed Year 7 mathematics class includes students with a broad range of intellectual abilities. Whilst no students in the class are diagnosed with learning or behavioural disabilities, some students (~5) show a very poor grasp of elementary primary-school mathematics, and one student has difficulty concentrating for even relatively short periods. In general, and typical of boys of this age, students show:

- A wide range of heights and weights, with one student substantially shorter than his classmates
- Varying degrees of sociability, though most appear to be on friendly terms with one another
- Substantial variation in writing skills and clarity of written work
- A largely enthusiastic, even exuberant temperament, though perhaps a quarter of the class is relatively quieter

One of the more able boys in the class had severe eczema and, apparently, has fewer friends because of this.

**Explanation of the range of learning strengths and the needs of students**

- Three students are substantially more advanced than others in the class and often require additional work to maintain their interest and keep them engaged
- Around four students have very weak elementary skills, and are slow to understand the relevant operational mathematics, and quick to apparently forget what they seem to master in previous lessons
- Several students are resistant to copying lesson material to their books. As mentioned above, some show very poor bookwork and need to be repeatedly reminded to stick worksheets in their books etc
- In common with sizeable numbers of students in later years, some students in the class show a resistance or inability to complete unanswered questions at home, or to do other assigned homework. For these students, their only mathematics practice is the work they do in class
- During lessons, most students are attentive as concepts and techniques are explained. Students are largely compliant when silence is required – as teacher explanations are given, or student ideas expressed.

**Theory and/or research informing teaching strategies to engage and challenge diverse learners**

Helping to develop student awareness of the connections between new and prior knowledge is vital for engaging and challenging learners. Indeed, constructivist theories of learning hold that teachers should situate new learning within each student's "zone of proximal development" before students can hope to build, or "construct", new knowledge. Student prior-knowledge, however, often comes with student misconceptions. In mathematics, misconceptions can be a strong barrier to developing new understanding. Identification of misconceptions through small, diagnostic tests and quizzes can help to highlight these and suggest a path to overcoming them.

Information-processing models of learning are especially useful for the many practical teaching techniques

they suggest. Think-alouds, for example, are particularly effective for communicating to students the connection between thinking about a given mathematical task and/or problem, and the application of methods of solution. Talking through example mathematical problems and solutions is a powerful way to reinforce learning in students, combining students' auditory and visual input channels simultaneously. Think-alouds paired with teacher modelling of mathematical working also functions as an effective metacognitive tool for students.

This Year 7 lesson sequence and corresponding assessment plan concerns elementary operations on fractions and decimals, and conversions between these different representations. Foundational skills here are extremely important for correct manipulation of algebraic expressions, as well as developing greater numerical facility and understanding in students generally. Rates and ratios, as well as decimal quantities, are also fundamental to junior high school topics in science, geography and commerce.

The significance of this topic necessitates frequent and repeated student practice of the different mathematical operations to be learnt. With practice, students experience success, and consequently develop a greater sense of self-efficacy, crucial to all students' ongoing motivation to learn. Regular practice also helps students to appreciate that "acquiring long-term knowledge and skill is largely dependent on practice" (American Psychological Association, Coalition for Psychology in Schools and Education,2015, p. 11).

Short topic summaries, highlighted key ideas, and the use of mnemonics are additional teaching strategies suggested by information processing models of learning (McInerney & Putwain, 2017). According to information processing models, the effective organisation of content to be taught is very important for meaningful student learning. Concept maps are ideal for a topic like this since they concisely illustrate the connections between the different sub-topics, and between the mathematics and "real-world" examples.

Engaging and challenging diverse learners in mathematics can never be about the application of arbitrary rules. This is guaranteed to leave many students confused and others wondering why and how the rules 'work'. To engage and challenge students, and to develop deep knowledge (DET NSW, 2003), students need to understand not just the connections between the various parts of their mathematical learning, but also the reasons for applying the algorithms and rules that they are asked to use.

Thus, for fractional division, an explanation of how the “invert and multiply rule” functions is very helpful for students. Likewise, the importance of equivalent fractions and the method of transforming one fraction to another by multiplication of a number a/a = 1 is an especially important skill to master (Troutman & Lichtenberg, 2003). These techniques and related mathematical operations are very effectively presented in concept-maps.

A final strategy for engaging and challenging students is to start each lesson with a short, informal 10-minute quiz. These quizzes function to immediately engage students in productive work and help students focus on the topic at hand. Permitting students to work together on quizzes also encourages co-operative learning. Finally, quizzes of this sort provide a ready connection with material learnt in previous lessons, and are a ready source of 'feedback' for students.

**Design of sequence of lessons**

- **Overarching goal for the sequence of lessons**

  Students develop a facility for confidently performing addition, subtraction, multiplication and division of fractions and decimals, and can convert between decimal and fractional representations.

- **Curriculum links**

  MA4-5NA: A student operates with fractions, decimals and percentages (Mathematics K-10 Syllabus, 2012).
  In particular, students:

  - Multiply and divide fractions and decimals using … written strategies and digital technologies (ACMNA154)
  - Express one quantity as a fraction of another, with and without the use of digital technologies (ACMNA155)
  - Round decimals to a specified number of places (ACMNA156)
  - Connect fractions, decimals and percentages and carry out simple conversions (ACMNA155)
  - Investigate terminating and recurring decimals (ACMNA184)

- **Learning goals for each of the individual lessons**

  - Lesson 1:

  Students can calculate:

  a) fractions of quantities, and
  b) a dimensionless fraction from two quantities (e.g. what fraction is 8 min of 1 h?)

  Following the previous lesson, students have been exposed to a justification of the "invert and multiply" rule for division of fractions. This justification uses a non-algebraic, *concrete* example only.

  - Lesson 2:

  Students understand the place-value interpretation of decimals and can express decimals in expanded form. Consequently, students can order sets of decimals and can position decimals on the number line. Students have also gained practice rounding decimals. Advanced students have answered extension questions.

  - Lesson 3:

  Students have revised the place-value interpretation of decimals, ordering of decimals and decimal rounding. Students can convert from decimals to fractions, and from simple fractions (with denominator a power of 10) to decimals. Advanced students have answered extension questions/problems.

  Students have completed their first formative assessment for this lesson sequence.

  - Lesson 4:

  Students can add or subtract decimal numbers. Students have reviewed their results from the first formative assessment.

  - Lesson 5:

  Students have learnt how to multiply decimals, specifically:

  a) multiplication of a decimal by a whole number,
  b) multiplication of a decimal by a power of 10, and
  c) multiplication of a decimal by another decimal

  Advanced students have answered extension questions/problems.

  - Lesson 6:

  Students have gained further practice with decimal multiplication. Students have additionally learnt how to divide decimals, specifically:

  a) division of a decimal by a whole number,
  b) division of a decimal by a power of 10, and
  c) division of a decimal by another decimal

  Students have completed their second formative assessment for this lesson sequence.

- Lesson 7:

Students can convert a fraction to a decimal using one of two methods:

a) multiplying the numerator and denominator by a number which converts the fraction to a fraction with denominator being a power of 10, and which directly admits a decimal representation using place value
b) simple (long) division of the numerator by the denominator

Advanced students have answered extension questions/problems.

- Lesson 8:

Students can convert fractions to decimals and understand why calculators may give an approximation to recurring decimals. The correct notation for recurring decimals is understood by students.

Students have completed their summative assessment for this lesson sequence.

- **List of resources, including ICT, that will be intellectually challenging for students**

Pre-prepared worksheets
Questions from assigned textbook (Signpost 7)
Additional exercises taken from Mathscape 7 (2004) and Freefall 7 textbooks
Miscellaneous material based on the following websites:

NCETM (National Centre for Excellence in the Teaching of Mathematics)
https://www.ncetm.org.uk/resources/13232)
NRICH (University of Cambridge Millenium Maths Project)
https://nrich.maths.org/9325)
Shodor (Computational science education)
http://www.shodor.org/interactivate/activities/FractionFour/)

Casio calculator simulator, pre-loaded to classroom PC

- **List of organizational aspects that ensures students are learning in a safe environment:**

The class seating plan established by my mentor teacher is to be used throughout the lesson sequence. Basic classroom rules around courteous and respectful behavior are expected to be observed by students. These follow EBHS goals of "respect, responsibility and engagement", and include:

- quiet listening when being addressed by the teacher, or as peers ask or answer questions
- electronic devices away, in accordance with school policy
- respect for classroom property
- courteous behavior in general, including "hats off"

- **Assessment plan – formative and summative – for the sequence of lessons**

Formative assessment 1: Mini-test (Fractions, ordering decimals – 8 questions) at end of lesson 3
Formative assessment 2: Mini-test (Fractions, decimals – 10 questions) at end of lesson 6
Summative assessment: Mini-test (Fractions, decimals – 13 questions) at end of lesson 8

**Adjustments or differentiations to ensure that all students in the class are supported and challenged**.

A list of adjustments for struggling learners of mathematics is suggested by Misquitta (2011):

"using explicit and systematic instruction including step-by-step explanations …, providing specific feedback and multiple opportunities for guided and independent practice; … using concrete and visual representations; implementing collaborative learning practices; ... ; setting high but reasonable expectations; and providing frequent practice ..." (p. 110). For students with such different skills and prior mathematical learning, each of these adjustments is appropriate for the content in this sequence of lessons.

In addition, interspersing chunks of theory and teacher-modelled solutions with opportunities for student practice helps to keep engaged students at both ends of the ability spectrum. Weaker students are presented with smaller blocks of theory to digest and then use in their own work, and more able students are offered frequent opportunities to extend themselves by attempting more difficult questions.

Clearly, as students are working on set exercises, weaker students require additional monitoring to check understanding and provide extra assistance as required. Willing students can be called upon to demonstrate their solutions to the class, and all students encouraged to participate in this way. To build self-efficacy, weaker students should be given frequent opportunities to show what they know.

For many of the students in this class, explicit instruction includes providing clear directions about what to copy down in student books. By establishing a consistent pattern of whiteboard work, with short explanations or definitions followed by numbered examples, students can be conditioned to always copy down relevant material. In addition, care should be taken when indicating student errors on the whiteboard, lest some students unknowingly copy the error as correct working.

Following formative tests, worksheets addressing particular topic areas are given to students as needed, to then complete as additional homework. For students with especially poor bookwork, these sheets include worked examples of the sort given previously. This allows students, with minimal effort, to reference relevant indicative solutions.

**References:**


American Psychological Association, Coalition for Psychology in Schools and Education. (2015). *Top 20 principles from psychology for preK–12 teaching and learning*. Retrieved from http://www.apa.org/ed/schools/teaching-learning/top-twenty-principles.pdf

DET, NSW. (2003). *Quality teaching in NSW public schools: a classroom practice guide*. Sydney, NSW: Department of Education and Training, Professional Support and Curriculum Directorate.

*Mathematics K-10 Syllabus*. (2012). Board of Studies NSW. Retrieved from http://syllabus.nesa.nsw.edu.au/download/

McInerney, D., & Putwain, D. (2017). *Developmental and Educational Psychology for Teachers: An Applied Approach* (2nd ed.). Taylor & Francis

Misquitta, R. (2011). A review of the literature: Fraction instruction for struggling learners in mathematics. *Learning Disabilities Research & Practice*, 26(2), 109-119

Troutman, A. P., & Lichtenberg, B. K. (2003). *Mathematics: A good beginning. Strategies for Teaching Children* (6th Ed.). Wadsworth/Thomson Learning

## Element 2: Assessing for impact on student learning

**Data display for student responses to assessment tasks**

Spreadsheet data for class responses to the two formative tests (Test1 and Test2) and final summative test (Test 3) are appended below. Note that a '1' in spreadsheet cells records a perfect (or close to perfect) response for the indicated student/topic pair. Conversely, a '0' indicates at least one incorrect response, or component error, for the student/topic pair. Note also that results for some topic categories aggregate responses to multiple test questions.

**Data analysis for the extent of all students' attainment of the overarching learning goal**

The overarching learning goal for this sequence of lessons is for students to demonstrate an ability to add, subtract, multiply and divide fractions and decimals, and be able to convert between decimal and fractional representations. Each of these foundational skills is tested in the summative test (Test 3), with columns in the spreadsheet for Test 3 showing aggregate results for the different skills. Overall, the data provides the following snapshot of class achievement against the overarching goal:

- Addition and subtraction of fractions and decimals saw the highest number of perfect responses, with average scores of 0.90 and 0.89 respectively. Most errors here arose because of transcription problems, or simple numerical mistakes. Pleasingly, mixed fractions were added and subtracted successfully by almost all students.
- Unsurprisingly, converting decimals to fractions was easier for the class a whole compared to the reverse operation, with average class scores of 0.65 and 0.25 respectively. Most errors in converting fractions to decimals arose from misrepresenting recurring decimals, possibly reflecting students' lack of practice with this skill.
- Multiplication and division of fractions saw perfect scores from 67% and 60% of students respectively. Errors related to handling mixed fractions and fractional simplification persist in some students.
- Disappointingly, questions related to multiplication of decimals were correctly answered by only 45% of students. The class result for decimal division was even worse, with wholly correct responses from only 25% of the class. The relatively poorer results here reflects the increased difficulty of these operations for students and shows a clear need for additional practice of these skills.

**The moderation process used**

Pre-assessment moderation to check the appropriateness, fairness, clarity and standard of the assessment tasks included:

- Checks to ensure that questions were comparable to teacher-modelled questions, and textbook questions students had previously attempted
- Mentor teacher review of questions

No teacher post-assessment moderation was considered necessary, although students had the opportunity to question their results when tests were returned to them.

**Efficacy of the moderation process used**

The standard of question in each of three mini-tests was appropriate to early Stage 4 (Year 7) mathematics. Set questions were checked by my mentor teacher and were clearly of a kind demanded by the syllabus. Questions were also comparable to those in current Year 7 texts. The spread of results reflects not so much the appropriateness of the set questions, but rather the difference in mathematical backgrounds and skills of students in the class.

No post-assessment moderation was required since:

- Questions were relatively simple, mainly involving a single operation
- All assessments, including the summative test, were low-stakes, with student performance on the tests not contributing to student grades
- A single teacher marked all tests

**Student pseudonyms and assessment responses**

Student 1: Jose Student 2: Paul Student 3: Bob

Student responses to assessment tasks are appended below and labelled Jose – Test 1, Jose – Test 2 etc. Note that the final summative assessment is labelled Test 3.

**Next steps for teaching the three students**

**Jose (Student 1):**

Jose's results rose noticeably between the second formative and final summative assessment tasks. Jose is clearly an able student who was sufficiently motivated to complete additional assigned revision following his poor result in Test 2. His results from the summative test suggest that next steps for teaching Jose should include:

- Revisiting simplification of fractions, and a reminder to simplify fractions where possible by dividing numerator and denominator by the GCD
- Review of notation for recurring decimals
- A comprehensive review of approaches to solving 'word' problems like the final questions in each test.

While Jose attempted the final questions from the two formative tests, he made no attempt on the final question from the summative test, in common with many of his classmates. A concentration on this area should hopefully see Jose better appreciate the utility of the foundational mathematical skills he's developed, and is likely to increase his enthusiasm for mathematics generally. Specific elements to stress here for Jose include:

- setting out given data mathematically
- drawing a diagram (and the DAD mnemonic)
- highlighting key information in the problem text and identification of the question to be answered
- problem attack via simplification, and writing a mathematical expression to help (MEH)

**Paul (Student 2):**

Paul's results have improved to the point where, at the time of the summative assessment task, he was achieving at a level just below the average for the class, with Paul's summative test 'score' 4, compared to a class average of 4.38. The improvement Paul has shown still leaves him unable to demonstrate competency with decimal multiplication and division, in particular. Paul also often fails to express fractions in fully simplified terms, and, like Jose and many others in the class, shies from attempting longer 'word' problems. In Paul's case, this may reflect underlying literacy difficulties.

Paul belongs to the subgroup of students in the class with very poor bookwork, and an evidently low capacity to work productively on set homework. Nevertheless, he's a polite student, and does make a reasonable effort in class. Paul needs substantial encouragement to continue to improve, and needs to develop sufficient self-regulation and motivation to complete all set work, including additional revision.

Paul is likely to benefit substantially from a programmed set of remedial online mathematics exercises, such as offered by MathsOnline (https://www.mathsonline.com.au). The benefits of repeated, regular practice of all skills, including those he appears to have mastered, should help to see Paul work faster and with greater accuracy. The immediate feedback offered by online practice should also be a help to Paul. With this, Paul also needs to be encouraged to set out his written work more neatly. Finally, and like most of the class, Paul would also benefit from a lesson devoted to solving 'word' problems.

**Bob (Student 3)**:

Bob's results are consistently good. He makes occasional careless errors but overall demonstrates a very sound facility with the mathematics here. In the summative test, Bob had a particular issue rounding recurring decimals, like most students in the class, and would benefit from additional practice with decimals (including decimal division) generally. Bob achieved a perfect result on each of the 'word' problems from the three tests, but could still benefit from instruction around improved setting out of answers to questions of this type.

**Next steps for teaching the class as a whole**

Mean class results from the summary test indicate that priority areas for class revision are decimal division (0.25), decimal multiplication (0.45), conversion of fractions to decimals (0.25), and word problems ('Fractions Applications', 0.36).

Although operations on decimals were presented later in the sequence of lessons, and might therefore have been readily recalled, the variety of approaches here possibly served to confound students and add to the difficulty of this sub-topic. As a group, the class is therefore likely to benefit from one or more lessons reviewing all three categories of decimal multiplication and division:

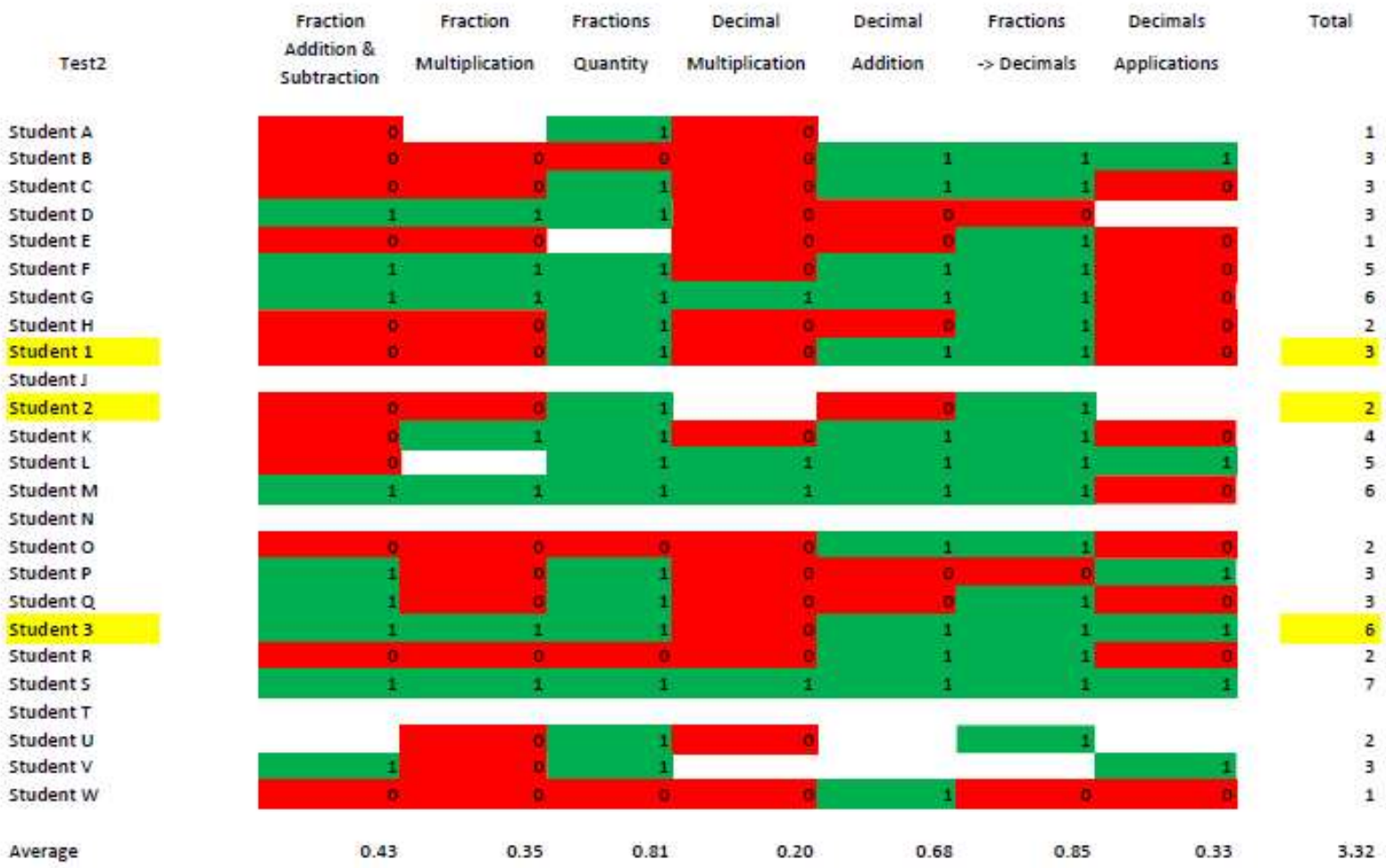
a) multiplication/division of a decimal by a whole number,
b) multiplication/division of a decimal by a power of 10, and
c) multiplication/division of a decimal by another decimal

As well as this, and perhaps more importantly, students should be presented with sets of questions which mix the three categories together, in order that students can gain practice selecting for themselves the appropriate method of solution to apply. A similar situation likely exists for the sub-topic 'conversion of fractions to decimals'. Here, the two approaches presented in Lesson 7 may also have confused some students, making a similar program of revision and mixed questions important.

Operations on percentages and converting between fractions, decimals and percentages is the next new topic to introduce for this Year 7 class. This provides a good opportunity to draw a connection between equivalent fraction representations and the method of converting from fractions and decimals to percentages by multiplying by 100% (100 x 1/100 = 1). The manipulation of percentages and the additional conversion between representations that this topic affords also enables additional, rich word problems to be given to students. The clear real-world connections with percentage representations (e.g. consumer sales) should also provide a good opportunity to systematically review techniques for solving word problems, as discussed for Jose (Student 1) above.

| Test 1 | | Fraction Addition & Subtraction | Fraction Multiplication | Fraction Simplification | Fraction Division | Fractions Applications | Decimals -> Fractions | Decimals Ordering | Total |
|---|---|---|---|---|---|---|---|---|---|
| Student A | 0 | 0 | 0 | | | | | | 0 |
| Student B | 1.5 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 |
| Student C | 3 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 4 |
| Student D | 2.5 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
| Student E | 4.5 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 3 |
| Student F | 4 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 4 |
| Student G | 4.5 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 4 |
| Student H | 4 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 3 |
| Student 1 | 4.5 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 5 |
| Student J | | | | | | | | | |
| Student 2 | 3 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| Student K | | | | | | | | | |
| Student L | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| Student M | 7 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 6 |
| Student N | 1 | 0 | | | | | | | 0 |
| Student O | 5.5 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 5 |
| Student P | 4.5 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 4 |
| Student Q | | | | | | | | | |
| Student 3 | 7 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 6 |
| Student R | 2.5 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
| Student S | 7 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 6 |
| Student T | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| Student U | 1.5 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
| Student V | 4 | 1 | 1 | 1 | | | | | 3 |
| Student W | 3 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 3 |
| Average | | 0.50 | 0.33 | 0.55 | 0.47 | 0.32 | 1.00 | 0.89 | 3.64 |

Formative assessment 1 results (Test 1)



| Test2 | Fraction Addition & Subtraction | Fraction Multiplication | Fractions Quantity | Decimal Multiplication | Decimal Addition | Fractions -> Decimals | Decimals Applications | Total |
|---|---|---|---|---|---|---|---|---|
| Student A | 0 | | 1 | 0 | | | | 1 |
| Student B | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 3 |
| Student C | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 3 |
| Student D | 1 | 1 | 1 | 0 | 0 | 0 | | 3 |
| Student E | 0 | 0 | | 0 | 0 | 1 | 0 | 1 |
| Student F | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 5 |
| Student G | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 6 |
| Student H | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 |
| Student 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 3 |
| Student J | | | | | | | | |
| Student 2 | 0 | 0 | 1 | | 0 | 1 | | 2 |
| Student K | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 4 |
| Student L | 0 | | 1 | 1 | 1 | 1 | 1 | 5 |
| Student M | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 6 |
| Student N | | | | | | | | |
| Student O | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 2 |
| Student P | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 3 |
| Student Q | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 3 |
| Student 3 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 6 |
| Student R | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 2 |
| Student S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 |
| Student T | | | | | | | | |
| Student U | | 0 | 1 | 0 | | 1 | | 2 |
| Student V | 1 | 0 | 1 | | | | 1 | 3 |
| Student W | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| Average | 0.43 | 0.35 | 0.81 | 0.20 | 0.68 | 0.85 | 0.33 | 3.32 |

Formative assessment 2 results (Test 2)

| Test3 | Decimal Division | Decimal Multiplication | Decimal Addition & Subtraction | Fraction Division | Fraction Multiplication | Fraction Addition & Subtraction | Fractions -> Decimals | Decimals -> Fractions | Fractions Applications | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Student A | 0 | 0 | 0 | 0 | 0 | 1 | 0 | | | 1 |
| Student B | 0 | 0 | 1 | 0 | 0 | 1 | 0 | | 0 | 2 |
| Student C | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | | 5 |
| Student D | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 4 |
| Student E | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 3 |
| Student F | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 4 |
| Student G | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | | 6 |
| Student H | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 3 |
| Student 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 7 |
| Student J | | | | | | | | | | |
| Student 2 | 0 | 0 | | 1 | 1 | 1 | 0 | 1 | | 4 |
| Student K | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | | 5 |
| Student L | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 8 |
| Student M | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| Student N | 0 | 0 | | | | | | | | 0 |
| Student O | | | | 0 | | 1 | 1 | | | 2 |
| Student P | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 2 |
| Student Q | | | | | | | | | | |
| Student 3 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 7 |
| Student R | | | | | | | | | | |
| Student S | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 8 |
| Student T | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | | 7 |
| Student U | | | | | | | | | | |
| Student V | 0 | 0 | 1 | 0 | | 1 | 0 | 0 | 1 | 3 |
| Student W | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | | 3 |
| Average | 0.25 | 0.45 | 0.89 | 0.60 | 0.67 | 0.90 | 0.25 | 0.65 | 0.36 | 4.38 |

Summative assessment results (Test 3)

Jose - Test 1

Q1. Simplify

$\frac{3}{11} + \frac{5}{12} = \frac{5}{23} = \frac{2}{5}$

can't do this. Remember need a common denominator.

Q2. Simplify

$1\frac{7}{11} - 2\frac{5}{6}$

$\frac{21}{11} \times \frac{17}{6} \times \frac{4}{3}$ 7

$\frac{21}{11} \times \frac{17}{3 \times 2} \times \frac{4}{3}$

$\frac{21}{11} - \frac{34}{33} = \frac{1}{33}$

2

Q3. Simplify

$2\frac{2}{5} \times 1\frac{7}{11}$ $4\frac{1}{2}$ ✓

$\frac{12}{5} \quad \frac{15}{5} \quad \frac{180}{40}$

Q4. Find $\frac{5}{8}$ of 3 m.

250 cm

Q5. Express 0.065 as a simplified fraction.

$\frac{65}{1000}$ ✓ $\frac{200}{5\overline{)1000}}$ $\frac{913}{200}$ $\frac{65}{1000}$ $\frac{13}{200}$

Q6. Evaluate the following. Express your answer in simplest terms.

$\frac{16}{21} \div \frac{24}{35}$ $\frac{2}{3} \frac{3}{5}$

$\frac{16}{21} \times \frac{35}{24}$ ✓ $\frac{\cancel{16}^{2}}{3} \times \frac{\cancel{35}^{7}}{\cancel{24}_{3}}$ $\frac{14}{9} = 1\frac{5}{9}$

5 = mistake here.

Q7. List the following decimal numbers in **descending** order:

32.64, 32.664, 32.56, 33.7, 33.52

33.7, 33.52, 32.664, 32.64, 32.56 ✓

Q8. A carpenter purchased a $1\frac{1}{2}$ metre length of timber. He used $\frac{1}{5}$ of this to make a chair leg and $\frac{3}{8}$ of the remainder to make a picture frame. What length of timber remains unused?

$\frac{17}{40}$ of timber.

$\frac{23}{40} \quad \frac{20}{40}$ $\frac{1 \times 2 - 3}{2 \times 20 \times 40 \times 1}$ $\frac{1}{5 \times 8} \quad \frac{3}{8} \times 5$ $\frac{5}{40} \quad \frac{15}{40}$ $\frac{20}{40}$

Unused timber = $\frac{3}{4}$ m

$2\left(\frac{3}{4} + \frac{3}{4}\right) = 1\frac{1}{2}$ m)

Chair length = $\frac{1}{5} \times \frac{3}{2}$ m = $\frac{3}{10}$ m

Picture frame = $\frac{3}{8} \times \frac{4}{5} \times \frac{3}{2}$ m = $\frac{9}{20}$ m

Total used = $\frac{3}{10} + \frac{9}{20} = \frac{6}{20} + \frac{9}{20} = \frac{15}{20} = \frac{3}{4}$ m.

$\frac{93-68}{24} = \frac{25}{24} = 1\frac{1}{24}$

$\frac{21}{8} - \frac{17}{6} = \frac{63-68}{24}$

$\frac{3}{8} \times \frac{5}{12} = \frac{9}{24} + \frac{10}{24} = \frac{19}{24}$

Jose - Test 2

**Q1.** Simplify:

$5\frac{1}{2} + 2\frac{2}{3}$

$7\frac{3}{5}$ ✗

**Q2.** Simplify:

$4\frac{1}{4} - 2\frac{5}{6}$

$4$ ✓

**Q3.** Simplify:

$1\frac{3}{7} \times 1\frac{4}{5}$

$1\frac{12}{35}$ ✓

**Q4.** Find $\frac{1}{4}$ of 3 L.

750mL ✓

4) 3000

7 50

**Q5.** Evaluate 0.452 x 0.08

0.3616 ✗

0.03616

**Q6.** Evaluate 0.452 + 0.08

0.532 ✓

0.452
0.080
5.32

**Q7.** Express the following mixed fraction as a decimal:

$3\frac{27}{1000}$

3.027 ✓

~~3.0027~~

**Q8.** Evaluate 71.892 ÷ 9

7.988 ✓

9 | 71.892

**Q7.** What fraction of 3 s of 2 min ?

$\frac{1}{40}$ ✓

**Q8.** A council plants 9 trees along the side of a street. The first and last trees are 4.8 m from each end of the street and the trees are equally spaced at intervals of 15.3 m. What is the length of the street?

147.3 ✗

9.6 ~ 415.3 / 9 = 137.7

13 7.7 / 9.6 = 147.3

Jose - Test 3

**Q1.** Simplify the following:

a) $4.72 \div 0.8$

b) $4.5 \div 0.15$

**Q2.** Simplify the following:

a) $\frac{2}{3} - \frac{3}{5}$

b) $4\frac{3}{11} + 2\frac{1}{3}$

**Q3.** Simplify:

a) $34.6 \div 1000$

b) $0.6 \times 87.2$

**Q4.** Write as a decimal:

a) $\frac{33}{50}$

b) $\frac{7}{9}$ just write: $0.\dot{7}$

**Q5.** Simplify the following:

a) $\frac{7}{10} \times \frac{15}{16}$

b) $\frac{7}{10} \times 4$

**Q6.** Evaluate:

a) $\frac{1}{2} \div \frac{3}{5}$

b) $4\frac{4}{5} \div \frac{3}{4}$

**Q7.** Simplify:

a) $\frac{180}{720}$

b) $0.04 \times 0.4$

**Q8.** A 3 m length divided into 11 equal parts gives an answer of $0.\dot{2}7$ m. Give this answer correct to:

a) 1 dec. pl

b) 2 dec. pl

c) 3 dec. pl

**Q9.** Find the value of $67.54 - 3.219$

**Q10.** Find the value of $6.11 + 3.9$

Jose - Test 3

**Q11**. What fraction is the first quantity of the second quantity?

a) 50 g of 2.5 kg $\frac{1}{50}$ ✓

$\frac{50}{2500}$

b) 75 cm of 2 m $\frac{3}{8}$ ✓

**Q12**. Express the following decimals as simplified proper fractions:

a) 0.125

$\frac{125}{1000} = \frac{25}{200} = \frac{1}{8} = \frac{1}{2}$

b) 4.36

$4\frac{36}{100} = \frac{43}{50} = \frac{9}{25}$ $4\frac{9}{25}$ ✓

c) 10.85

$10\frac{85}{100} = 10\frac{17}{20}$ ✓

**Q13**. Fred's petrol tank was half full when he started out, but her used ⅗ of this petrol travelling to work and back. What fraction of the whole tank did he use and what fraction remained afterwards?

Paul - Test 1

**Q1.** Simplify:

$\frac{3}{8} + \frac{5}{12}$ $= \frac{9}{24} + \frac{10}{24}$

$\frac{19}{24}$ ✓

**Q2.** Simplify:

$3\frac{7}{8} - 2\frac{5}{6} = \frac{31}{8} - \frac{17}{6}$

$= \frac{93}{24} - \frac{68}{24} = \frac{25}{24}$ ✓

$= 1\frac{1}{24}$

**Q3.** Simplify:

$2\frac{2}{5} \times 1\frac{7}{8}$

$\frac{12}{5} \times \frac{15}{8} = \frac{12}{8} \times \frac{15}{5}$

$= \frac{3}{2} \times \frac{3}{1} = \frac{3}{2} = 4\frac{1}{2}$.

**Q4.** Find $\frac{5}{6}$ of 3 m.

$\frac{5}{6} \times 300$ cm

$= 250$ cm

**Q5.** Express 0.065 as a simplified fraction.

$\frac{65}{1000} = \frac{13}{200}$

**Q6.** Evaluate the following. Express your answer in simplest terms.

$\frac{16}{21} \div \frac{24}{35}$ [redacted] $= \frac{16}{21} \times \frac{35}{24} = \frac{16}{24} \times \frac{35}{21}$

$= \frac{2}{3} \times \frac{5}{3} = \frac{10}{9} = 1\frac{1}{9}$.

**Q7.** List the following decimal numbers in **descending** order:

32.64, 32.664, 32.56, 33.7, 33.52

33.7, 33.52, 32.664, 32.64, 32.56

**Q8.** A carpenter purchased a $1\frac{1}{2}$ metre length of timber. He used $\frac{1}{3}$ of this to make a chair leg and $\frac{1}{8}$ of the remainder to make a picture frame. What length of timber remains unused?

Paul - Test 2

**Q1.** Simplify:

$5\frac{1}{2} + 2\frac{2}{3}$

$7\frac{3}{5}$ ×

**Q2.** Simplify:

$4\frac{1}{4} - 2\frac{5}{6}$

$2\frac{1}{3}$ ×

**Q3.** Simplify:

$1\frac{3}{7} \times 1\frac{4}{5}$

**Q4.** Find $\frac{1}{4}$ of 3 L

75 cm ✓

**Q5.** Evaluate 0.452 x 0.08

**Q6.** Evaluate 0.452 ÷ 0.08

0.40

0.452 × 100 = 45.2

0.08 × 100 = 8

45.2 ÷ 8 = 5.65

**Q7.** Express the following mixed fraction as a decimal:

$3\frac{27}{1000}$ 3.027 ✓

**Q8.** Evaluate 71.892 ÷ 9

**Q7.** What fraction is 3 s of 2 min ?

**Q8.** A council plants 9 trees along the side of a street. The first and last trees are 4.8 m from each end of the street and the trees are equally spaced at intervals of 15.3 m. What is the length of the street?

Paul - Test 3

**Q1.** Simplify the following:

a) $4.72 \div 0.8$

b) $4.5 \div 0.15$

**Q2.** Simplify the following:

a) $\frac{2}{3} - \frac{3}{5}$

b) $4\frac{3}{8} + 2\frac{1}{3}$

**Q3.** Simplify:

a) $34.6 \div 1800$

b) $0.6 \times 87.2$

**Q4.** Write as a decimal:

a) $\frac{33}{50}$

b) $\frac{7}{9}$

**Q5.** Simplify the following:

a) $\frac{7}{10} \times \frac{15}{16}$

b) $\frac{7}{10} \times \frac{4}{1}$

**Q6.** Evaluate:

a) $\frac{1}{2} \div \frac{3}{5}$

b) $4\frac{4}{5} \div \frac{3}{4}$

**Q7.** Simplify:

a) $\frac{180}{720}$

b) $0.04 \times 0.4$

**Q8.** A 3 m length divided into 11 equal parts gives an answer of 0.27 m. Give this answer correct to:

a) 1 dec. pl
b) 2 dec. pl
c) 3 dec. pl

**Q9.** Find the value of $67.54 - 3.219$

**Q10.** Find the value of $6.11 + 3.9$

**Q11**. What fraction is the first quantity of the second quantity?

a) 50 g of 2.5 kg

Paul - Test 3

b) 75 cm of 2 m

**Q12**. Express the following decimals as simplified proper fractions:

a) 0.125 $\frac{125}{1000}$ ✓ $= \frac{1}{8}$

b) 4.36 $4\frac{36}{100}$ ✓ $= 4\frac{9}{25}$

c) 10.85 $10\frac{85}{100}$ ✓ $= 10\frac{17}{20}$

**Q13**. Fred's petrol tank was half full when he started out, but her used ¼ of this petrol travelling to work and back. What fraction of the whole tank did he use and what fraction remained afterwards?

Bob - Test 1

Q1. Simplify

$\frac{1}{8} + \frac{5}{12} = \frac{9}{24} + \frac{10}{24} = \frac{19}{24} = \frac{19}{24}$

$\frac{19}{24}$ ✓

Q2. Simplify

$1\frac{7}{8} - 2\frac{5}{6} = \frac{21}{8} - \frac{17}{6} = \frac{63}{24} - \frac{68}{24} = \frac{25}{24}$

$= 1\frac{1}{24}$ ✓

Q3. Simplify

$2\frac{2}{5} \times 1\frac{7}{8} = \frac{12}{5} \times \frac{15}{8} = \frac{180}{45} = 4$

40

Q4. Find $\frac{1}{4}$ of 1 m.

4|1300
 050
 2 50

250 cm ✓

Q5. Express 0.065 as a simplified fraction.

$\frac{65}{1000} = \frac{13}{200}$ ✓

$\frac{16}{21} \cdot \frac{35}{24} \cdot \frac{15}{24} \cdot \frac{35}{21}$

$\cdot \frac{2}{3} \cdot \frac{5}{3}$

Q6. Evaluate the following. Express your answer in simplest terms.

$\frac{16}{21} \div \frac{24}{35} = \frac{16}{21} \times \frac{35}{24} = \frac{560}{1004} = \frac{280}{502} = \frac{140}{251}$

try simplifying first.

24
×21
24
1004

$= \frac{152}{9} = 1\frac{1}{9}$

3 35
×16
210
+35
560

Q7. List the following decimal numbers in **descending** order:

32.640, 32.664, 32.560, 33.700, 33.520

Q8. A carpenter purchased a $1\frac{1}{2}$ metre length of timber. He used $\frac{1}{5}$ of this to make a chair leg and $\frac{2}{8}$ of the remainder to make a picture frame. What length of timber remains unused?

5|150
 030
 120

8|120
 01.5
 5
 ×
 45 ✓

11
×210
45
75

75 cm ✓

✓ good, but reasons could be clearer!

Bob - Test 2

**Q1.** Simplify:

$5\frac{1}{2} + 2\frac{2}{3} = 5\frac{3}{6} + 2\frac{4}{6} = 8\frac{1}{6}$ ✓

**Q2.** Simplify

$4\frac{1}{4} - 2\frac{5}{6} = 4\frac{3}{12} - 2\frac{10}{12} = 1\frac{5}{12}$ ✓

**Q3.** Simplify:

$1\frac{3}{7} \times 1\frac{4}{5} = \frac{10}{7} \times \frac{9}{5} = \frac{90}{35} = 2\frac{20}{35}$

$= 2\frac{4}{7}$ ✓

**Q4.** Find $\frac{1}{4}$ of 3 L

750 ml ✓

0.03616

**Q5.** Evaluate 0.452 × 0.08 — 3.616

0.452 × 0.08 = 0.03616

4.52 × 8 = 36.16

**Q6.** Evaluate 0.452 + 0.08

0.452 + 0.080 = 0.532 ✓

**Q7.** Express the following mixed fraction as a decimal:

$3\frac{27}{1000}$ 3.027 ✓

**Q8.** Evaluate 71.892 ÷ 9

9 | 71.892 = 7.988 — 7.988

**Q7.** What fraction is 3 s of 2 min ?

$\frac{3}{120} = \frac{1}{40}$ $\frac{1}{40}$ ✓

**Q8.** A council plants 9 trees along the side of a street. The first and last trees are 4.8 m from each end of the street and the trees are equally spaced at intervals of 15.3 m. What is the length of the street?


15.3 × 8 = 122.4

122.4 + 9.6 = 132.0

132 m ✓ good!

Bob - Test 3

**Q1.** Simplify the following:

a) $4.72 \div 0.8$ $5.9$

b) $4.5 \div 0.15$ $30$

**Q2.** Simplify the following:

a) $\frac{2}{3} - \frac{3}{8} = \frac{16}{24} - \frac{9}{24} = \frac{1}{24}$

b) $4\frac{3}{8} + 2\frac{1}{3} = 4\frac{9}{24} + 2\frac{8}{24} = 6\frac{17}{24}$

**Q3.** Simplify:

a) $34.6 \div 1000 = 0.0346$

b) $0.6 \times 87.2 = 52.32$

**Q4.** Write as a decimal:

a) $\frac{33}{50}$ $0.66$

b) $\frac{7}{9}$ $0.777\ldots$

**Q5.** Simplify the following:

a) $\frac{7}{10} \times \frac{15}{16} = \frac{105}{160} = \frac{21}{32}$

b) $\frac{7}{10} \times 4 = \frac{28}{10} = 2.8 = 2\frac{8}{10} = 2\frac{4}{5}$

**Q6.** Evaluate:

a) $\frac{1}{2} \div \frac{3}{5} = \frac{1}{2} \times \frac{5}{3} = \frac{5}{6}$

b) $4\frac{4}{5} \div \frac{3}{4} = \frac{24}{5} \div \frac{3}{4} = \frac{24}{5} \times \frac{4}{3} = \frac{96}{15} = 6\frac{6}{15} = 6\frac{2}{5}$

**Q7.** Simplify:

a) $\frac{180}{720} = \frac{2}{8} = \frac{1}{4}$

b) $0.04 \times 0.4 = 0.04 \times 4 = 1.6$

**Q8.** A 3 m length divided into 11 equal parts gives an answer of 0.27 m. Give this answer correct to:

a) 1 dec. pl. 0.3

b) 2 dec. pl. 0.27

c) 3 dec. pl. 0.273

**Q9.** Find the value of $67.54 - 3.219$

$67.540 - 3.219 = 64.321$

**Q10.** Find the value of $6.11 + 3.9$

$6.11 + 3.90 = 10.01$

**Q11.** What fraction is the first quantity of the second quantity?

a) 50 g of 2.5 kg

$\frac{1}{50}$ ✓

$5\overline{)25}$ → $5\overline{)140}$ → 08

b) 75 cm of 2 m

$\frac{75}{200} = \frac{3}{8}$ ✓

**Q12.** Express the following decimals as simplified proper fractions:

a) 0.125 $\frac{1}{8}$ ✓

Bob - Test 3

b) 4.36 $4\frac{36}{100} = 4\frac{9}{25}$ ✓

c) 10.85 $10\frac{85}{100} \div \frac{8}{25} = 10\frac{17}{20}$ ✓

**Q13.** Fred's petrol tank was half full when he started out, but her used ¼ of this petrol travelling to work and back. What fraction of the whole tank did he use and what fraction remained afterwards?

$\frac{1}{8}$ used ✓

$\frac{3}{8}$ left