Instructional Design Proposal

Grade 7 Math Unit on Fractions, Decimals and Percent's

Assignment #2 – Task / Content Analysis, Objectives &

Criterion Referenced Evaluation

Chris Bennington

University of Saskatchewan

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Part A: Task/Content Analysis

Instructional Goal:

Students will be able to change a fraction to a decimal and then a percent.

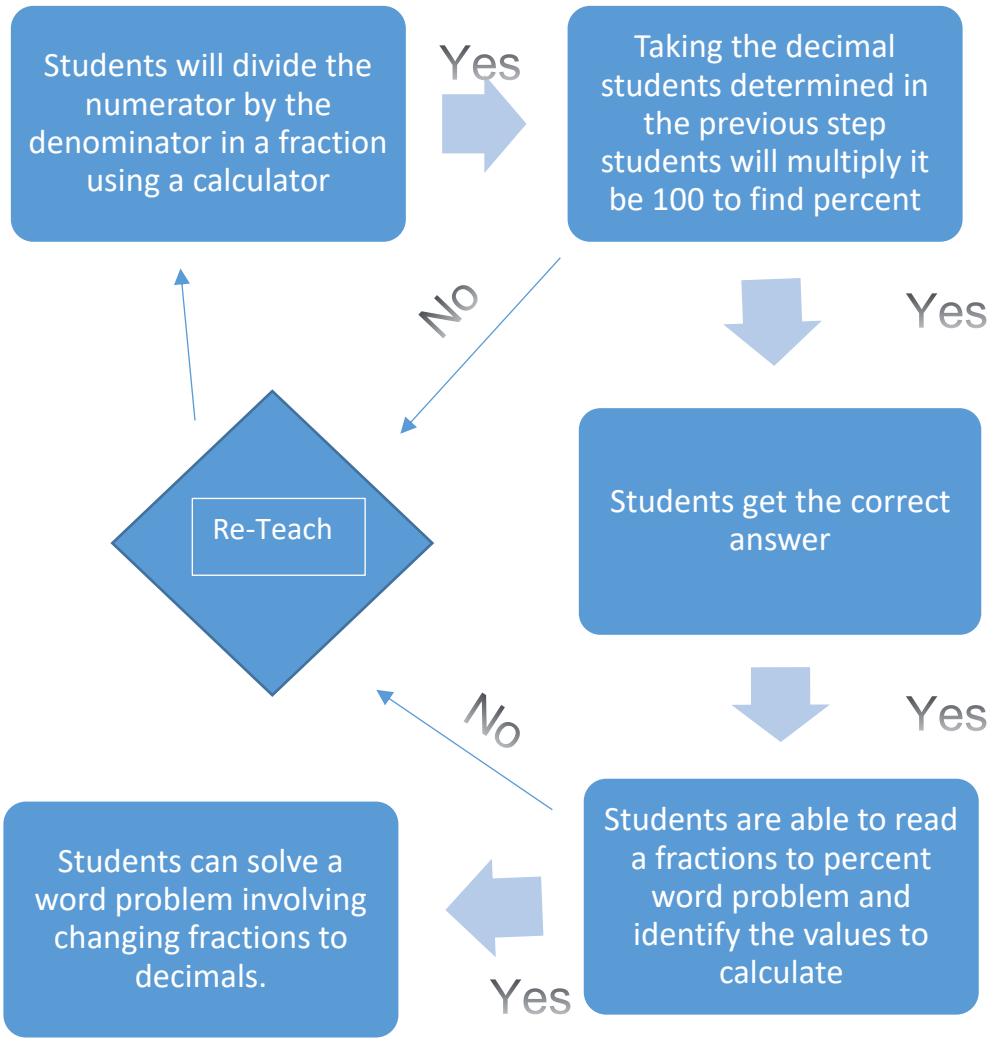
Learning Goal	Type of Learning outcome
1.Students will know how the steps to change a fraction to a decimal	**Declarative:** Students will list the steps involved in changing a fraction to a percent.
2. Students will know how to change a fraction to a decimal.	**Procedures:** Students will demonstrate how to change a fraction to a decimal by dividing the numerator by the denominator.
3. Students will know how to change a decimal to a percent.	**Procedures:** Students will demonstrate how to change a decimal to a percent by multiplying the decimal by 100.
4. Students will know how to use a calculator to help them determine the percentage.	**Procedures:** Students have learned the procedure to determine percentages on a calculator.
5. Students will be able to solve word problems involving changing a fraction to a percent.	**Problem Solving:** Learners will determine which steps are necessary to determine a percent.

Information Processing Analysis (Procedural):

Steps	Advice
Write a sample assessment question for the goal.	The student will be able to solve questions in which they must take a fraction and turn it into a percent. The students will be able to show their work. i.e. Bill and Tim have 4 apples. Bill has 3 of the total apples. What fraction of apples does Bill have? What percentage of apples does Bill have?

Give problem to experts – observe and question.	The “expert” in this situation would be the math learning consultant for the school division. The school’s principal would also be considered an expert.
Identify common mental or physical steps.	Working with the expert, I would create a step by step flow chart using bullet points for the students to follow. i.e. Students will: 1. Read the word problem 2. Identify the total number of apples 3. Know that the total number of apples goes into the denominator place and write it there. 4. Identify the number of apples that Bill has. 5. Know that the number of apples Bill has is written in the numerator place. 6. Identify the fraction (3/4 or three-fourths). 7. Divide 3 (numerator) by 4 (the denominator). 8. Find the answer .75. 9. Multiple the answer by 100 to get the percent.
Identify the easiest path and what will make understanding simpler for the learner.	With students utilizing a calculator, a simple step-by-step flow chart will be designed to help students change a fraction to a percent (similar to above). Online programing will follow this step-by-step flowchart.
Note factors that complicate the simple understandings.	The possible challenge of this procedure may be forgetting to divide the numerator by the denominator or by forgetting to multiply the decimal by 100. Simple transcription errors can also make getting the correct solution complex.
Select understandings that best fit the goal and the audience.	By reviewing the expert’s notes, I will determine the best pathway that fits students’ needs and the instructional goal.
List steps and decision points.	See procedural Chart below
Confirm analysis with experts.	Consult with the Experts mentioned in Assignment #1 and the teacher in charge of implementing the unit.

Procedural Flowchart:



Prerequisite Analysis:

Step #1:

The learner must be able to*:* Multiply and divide using a calculator.

Tools and equipment needed: Calculator or smart device with a calculator.

Safety concerns: There is always a risk of finding inappropriate content when using personal devices with calculators on them.

Critical Attitudes: Willingness to attempt to solve the math question.

People Skills Required: Courage to ask question if needed.

Step #2:

The learner must be able to: To identify the numerator and the denominator in the fraction.

Tools and equipment needed: Textbook, Chromebook or iPad.

Safety concerns: Utilizing internet lessons to review understanding of numerator and denominator. Risk of inappropriate content.

Critical Attitudes: Patience and willingness to learn.

People Skills Required: Being able to read and type on a keyboard.

Step #3:

The learner must be able to: Students can read and understand how to find the important values in a word problem.

Tools and equipment needed: textbook, computer, internet access.

Safety concerns: Risk of inappropriate content.

Critical Attitudes: Patience and risk taking to learn how to read and decipher word problems.

People Skills Required: Courage to ask question if needed. Patience and perseverance.

Part B: Writing Objectives/Criterion Referenced Evaluation

Objectives:

Objectives #1: Given access to either pencil and paper questions or computer based questions, Grade 7 students can divide fractions to determine decimals with 80% accuracy.

The Audience	Grade 7 students
Terminal Behavior	Will be able to change fractions to decimals by logging in to their school account and access practice lessons and by paper and pencil.
Conditions	Given a Chrome book or iPad, internet access, website address and paper/pencil.
Performance Degree, Standard or Criterion	The performance degrees are shown in the rubric below. Minimum Standard: Students will be able to divide fractions to get decimals using both computer generated practice questions and paper and pencil questions 60% of the time.

Objective #2: Given access to either pencil and paper questions or computer based questions, Grade 7 students can change a decimal to a percent by multiplying by 100 with 80% accuracy.

The Audience	Grade 7 students
Terminal Behavior	Will be able to change a decimal to percent by logging in to their school account and access practice lessons and by paper and pencil.
Conditions	Given a Chrome book or iPad, internet access and a website, paper and pencil.
Performance Degree, Standard or Criterion	The performance degrees are shown in the rubric below. Minimum Standard: Learners consistently able to change a decimal to a percent correctly 60% of the time.

Objective #3: Given access to either pencil and paper questions or computer based questions, Grade 7 students can read and solve word problems requiring them to change a fraction to a percent 80% of the time.

The Audience	Grade 7 students
Terminal Behavior	Will be able to read and solve word problems requiring them to change a fraction to a percent in both paper and pencil and on computer generated questions.
Conditions	Given a Chrome book or iPad, internet access and a website, paper and pencil.
Performance Degree, Standard or Criterion	The performance degrees are shown in the rubric below. Minimum Standard: Students can read, interpret values and solve fractions to percent word problems 60% of the time.

Objective #1:

Given access to either pencil and paper questions or computer based questions, Grade 7 will be able to divide fractions to get decimals 80% of the time on practice questions.

Objective #2:

Given access to either pencil and paper questions or computer based questions, Grade 7 students will be able to change a decimal to percent 80% of the time on practice questions.

Objectives #3:

Given access to either pencil and paper questions or computer based questions, Grade 7 students will be able to read, interpret values and solve word problems requiring them to change a fraction to a percent 80% of the time on practice questions.

Assessment Design

1. What kind of assessment would be appropriate for the knowledge/tasks/skills that you want the learners to perform/acquire for the task you analyzed above?

   Prior to teaching the unit I would conduct pre-assessments to determine what students already knows and what needs to be worked on. In order to gather formative assessments along the way, observations, entry/exit slips and pop quizzes would give a good picture about student's progress in understanding. For a summative assessment a combination of observations, one on one unit exit

interviews that discuss what they have learned, and test results would be use for summative assessments.

One example of an assessment design would be an exit question posed to the students as followed near the end of instruction. It would look similar to this question.

"Carolyn got 36/50 on a recent math test on integers, she requires a 75% or higher in order to pass the unit. Did Carolyn achieve this on her test?"

(The answer is no, she would only achieve 72%)

2. How many objectives can you estimate will arise from the task analysis above?

I believe that there will be around 6 objectives. They are as followed:

- Can the students use a calculator to multiply and divide?
- Can the students multiply and divide using paper and pencil, without a calculator or other device for assistance?
- Does the students know the parts of a fraction?
- Can the students calculate the decimal of a fraction?
- Can the students multiply a decimal to get a percent?
- Can the student interpret and solve?

3. Knowing approximately how many objectives, how many test items can you estimate for an assessment instrument for the task you analyzed above?

I believe there can be around 12 specific test items, allowing each of the above objectives to be evaluated at least twice. The test items will include observations of class work, entry/exit slips, conversations and tests.

Rubric for determining grade 7 student understanding of changing a fraction to a percent.

Objective	Not yet met	Begin to meet	Meeting	Excelling
Students can divide fractions to get decimals on both paper and computer designed practice drills.	Student is **unable** to divide fractions to get decimals on both paper and computer designed practice drills.	Student is able to divide fractions to get decimals on both paper and computer designed practice drills **50% of the time**.	Student is able to divide fractions to get decimals on both paper and computer designed practice drills **80% of the time.**	Student is able to divide fractions to get decimals on both paper and computer designed practice drills **100% of the time.**
Students can change a decimal to a percent by multiplying by 100.	Student is **unable** to change a decimal to a percent on both paper and computer designed practice drills.	Student is sometimes able change a decimal to a percent on both paper and computer designed practice drills (**~50% of the time**).	Student is able change a decimal to a percent on both paper and computer designed practice drills (**~80% of the time**).	Student is able change a decimal to a percent on both paper and computer designed practice drills (**100% of the time**).
Students can read and solve word problems requiring them to change a fraction to a percent using both paper/pencil and computer software.	Student is **unable** to read and solve word problems on fractions to percent on both paper and computer designed practice drills	Student is sometimes able to read and solve word problems on fractions to percent on both paper and computer designed practice drills (**~50% of the time**).	Student is sometimes able to read and solve word problems on fractions to percent on both paper and computer designed practice drills (**~80% of the time**).	Student is sometimes able to read and solve word problems on fractions to percent on both paper and computer designed practice drills (**~50% of the time**).

Instrument Blueprint

Objective	Format	Number of Items	Criterion Level	Proportion
Objective #1: Given access to either pencil and paper questions or computer based questions, Grade 7 will be able to divide fractions to get decimals 80% of the time on practice questions.	Test questions and observations of work.	8 items (include entry exit slips, one on one observations (whiteboard work)	80%	.30
Objective #2: Given access to either pencil and paper questions or computer based questions, Grade 7 students will be able to change a decimal to percent 80% of the time on practice questions.	Test questions and observations of work.	10 items (include entry exit slips, one on one observations (whiteboard work)	80%	.35
Objective #3: Given access to either pencil and paper questions or computer based questions, Grade 7 students will be able to read, interpret values and solve word problems requiring them to change a fraction to a percent 80% of the time on practice questions.	Short Answer Test questions and observations of work.	8 items (include entry exit slips, one on one observations (whiteboard work)	80%	.35

Since Math involves a lot of questions and calculations the format for assessment will be test questions and observations. A combination of exit/entry slips and summative tests will be utilized to assess proficiency and mastery. I figure that the minimum of

seeing the skill 8 times with a variety of assessment means will allow a comprehensive analysis of the students understanding.

Part C: Small Group Work

- 2% towards participation mark

What advice did you receive from your group?	Drea provided good advice on clarifying objectives and provided suggestions for my procedure chart.
What advice did you incorporate into your project? Why?	Drea gave excellent advice on how to clarify my objectives and add detail to my procedure table which I incorporated.
What advice did you decline? Why?	I declined the advice on using Lucid chart to make charts. I wasn't ready to spend money on it at this time in the design of this assignment.
Briefly, what advice did you offer to your group mates?	I gave advice to Dea on her assignment and I found hers to be well constructed.
How often did you contribute to your group?	I contributed to discussions at least twice on this assignment. I commented on most group mates work at least once.