

Sample: provided for guidance only.

LESSON PLAN SET

Context

This set of 2.5 hour lesson plans was developed following upon a GED math test preparation given to a class of fairly advanced learners. Some of the learners were born in the U.S., some are non-native speakers, and some are English-speakers born in other countries. The assessment revealed specific skills to be addressed, strategies to be explored, and several issues based on cultural and class differences (e.g. unfamiliarity with plot plans and use of calculators, respectively) which needed additional attention.

Common Learning Goals

All lessons were designed with the following learning goals in mind:

- Be able to identify individual areas needing improvement in order to obtain good score on GED math test.
- Develop ability to analyze own strengths and weaknesses in standardized test taking, including habits and attitudes that are successful and those that are not.
- Develop ability to monitor own progress.
- Develop strategies for taking control of math test challenges by thinking critically.

Common Instructional Approaches

The following approaches were used in most classes but not always noted in the lesson plans as specific activities:

- Learners collect their best strategies and approaches in an analysis log.
- Learners adopt best strategies of other learners.
- Learners explain successful strategies and approaches aloud.
- Learners demonstrate successful strategies to other learners, as peer instructors.

Analysis Log

Learners were asked to analyze their work on each assessment problem, whether they got the correct answer or not. The first version of the log proved too unwieldy for them. In response to their feedback, the log was revised and proved more successful in its new form. Both versions are attached.

LESSON PLAN #1

Class: GED Prep		Materials, etc.
Learning Objectives	<ol style="list-style-type: none"> 1. Be able to determine patterns among correct and incorrect answers on practice test. 2. Use analysis log or similar instrument to help achieve overall learning goals. 	
Activities	<ul style="list-style-type: none"> ▪ Administer assessment practice test (45 minutes). ▪ Distribute assessment analysis log and explain its use. 	Princeton GED, p. 433, 440, 442. Answer key Blank analysis log sheets
Wrap-up/Reflect	<ul style="list-style-type: none"> ▪ "What group patterns do we notice among correct and incorrect answers?" ▪ "What individual strengths and weaknesses do you notice from correct and incorrect answers?" 	
Assessment	N/A	
Homework, Notes & Checks	<ul style="list-style-type: none"> ▪ Do at least five entries of assessment analysis log. ▪ Determine at least one strength and one weakness and be ready to describe to class. ▪ <i>(Consider peer tutoring idea for next class.)</i> 	

LESSON PLAN #2

Class: GED Prep		Materials, etc.
Learning Objectives	<ol style="list-style-type: none"> 1. Learn to use bubble grids on GED answer sheets. 2. Develop ability to facilitate others' learning. 	
Activities	<ul style="list-style-type: none"> ▪ Discuss discovered strengths and weaknesses ▪ Discuss assessment analysis log entries ▪ Ask learner(s) with good entries to explain how to do a good entry for a learner who had trouble with log. ▪ Explain discovered common problem from practice test with use of bubble grids; go over those problems (60) ▪ Begin problems with new practice packet. 	Bubble grid practice packets
Wrap-up/Reflect	<ul style="list-style-type: none"> ▪ "Is the assessment log helpful? If so, why? If so, why not?" ▪ "Would someone summarize how to use the bubble grid correctly?" 	
Assessment	Assess ability to make bubble grid answer entries, next class.	Bubble grid assessment sheet
Homework, Notes & Checks	<ul style="list-style-type: none"> ▪ Begin work on next common problem--geometric formulas--next class. Ask learners to look at problems 17, 20, 23, & 27 because formulas are needed in all cases. ▪ <i>Remind to bring calculators!</i> 	

LESSON PLAN #3

Class: GED Prep		Materials, etc.
Learning Objectives	<ol style="list-style-type: none"> 1. Learn to use bubble grids on GED answer sheets. 2. Be able to understand when geometric formulas are needed and how to apply them. 3. Learn to use square/square root key on calculator. 	
Activities	<ul style="list-style-type: none"> ▪ Go over bubble grid assignment; ask learners with correct answers to explain answer to others (30) ▪ Share analysis log entries. Isolate model entries OR group-write an entry to model a good one. ▪ Review formula applications in 17, 20, 23, 27. ▪ Solve problem 10 using square/square root key 	Bubble grid packets Calculators
Wrap-up/Reflect	<ul style="list-style-type: none"> ▪ After assessment, "Do you think that understanding how to use the bubble grid will improve your GED math test score? If so, by how much?" ▪ Before formula work, "What is a 'formula'?" 	Pocket dictionary
Assessment	Bubble grid assessment: eight entries for page of blank grids.	
Homework, Notes & Checks	<ul style="list-style-type: none"> ▪ Review problems 13 & 16 + SPECIAL PRIZE PROBLEM ▪ Do five additional entries in log, or revise based on today's formula work. ▪ <i>Develop hands-on "helicopter" activity to illustrate plot plans, next class.</i> ▪ <i>Revise analysis log.</i> 	Ratio/proportion practice packet [Buy special prize from Pier One] Cuisenaire rods, rulers

LESSON PLAN #4

Class		Materials, etc.
Learning Objectives	<ol style="list-style-type: none"> 1. Be able to understand when geometric formulas are needed and how to apply them. 2. To understand the concepts of ratio and proportion and solve problems that depend on that knowledge. 3. Develop ability to strategize to solve problems. 	
Activities	<ul style="list-style-type: none"> ▪ Share newest log entries; discuss revised analysis log and model one-two entries together. ▪ Go over formulas worksheet again. ▪ Go over ratio/proportions packet (homework) and supplement with practice questions. ▪ Aware "Special Prize" to learners who tried SP problem. ▪ Hands-on "helicopter views" of models made from manipulatives; render as plot plans. 	<p>Revised analysis log packets</p> <p>Ratio/proportions practice packets</p> <p>Special Prize: Wooden fish.</p> <p>Rods, rulers</p>
Wrap-up/Reflect	<ul style="list-style-type: none"> ▪ "How can you recognize a ratios & proportions problem?" ▪ "Are there repeatable ways to set up these problems for solving?" ▪ After assessment, "What mental rules could you use to conclude that you need to apply a formula?" and "How can you be sure you're using the correct formula?" 	
Assessment	<p>Formulas assessment (eight problems) [Quick check on square/square root key]</p>	
Homework, Notes & Checks	<ul style="list-style-type: none"> ▪ Review packet, notes for R&P assessment. ▪ Make five entries in new analysis log. ▪ <i>Prepare hands-on table cloth & hem activity.</i> 	<p><i>Tape measure</i></p>

LESSON PLAN #5

Class: GED Math		Materials, etc.
Learning Objectives	<ol style="list-style-type: none"> 1. To understand the concepts of ratio and proportion and solve problems that depend on that knowledge. 2. Develop ability to strategize to solve problems. 3. Make connection between math skills and real-life activities. 	
Activities	<ul style="list-style-type: none"> ▪ Share new log entries. ▪ Go over ratio and proportion assessments. ▪ Hands-on activity: <ul style="list-style-type: none"> ▪ Measure tabletop for fringe (perimeter) ▪ Measure tabletop for tablecloth with overhang and hem (area & two-part task) ▪ Discussion: Can we set up some standard rules for attacking math test problems?¹ ▪ Model algebra problem #11. 	Tape measure
Wrap-up/Reflect	<ul style="list-style-type: none"> ▪ "Is the new log working better?" ▪ "Is using a log helpful for thinking about problems more critically?" ▪ "Are there other real-life applications for the math skills we're learning?" 	
Assessment	Ratio and proportion assessment (six problems)	
Homework, Notes & Checks	<ul style="list-style-type: none"> ▪ Go over problems 11, 14, 26 & 28 (algebra) for homework. Make log entry for each. 	

¹ Based on this activity, class came up with the following rules. The ones in brackets were added in later classes. Some weeks later, all of the rules were collected onto a common strategy set called "Righteous Rules" and printed up.

- Determine exactly what the problem is asking for.
- [Determine if the problem is a one, two, or even three-part problem.]
- Consider whether a formula is needed; if one is, then consult the formulas page.
- [Check to see if you chose the right formula from the page.]
- [Write the problem down where you will be doing the math.]
- [Come up with a sketch plan for solving the problem.]
- Solve the problem [with calculator, or check pencil math with calculator.]

LESSON PLAN #6

Class; GED Math		Materials, etc.
Learning Objectives	<ol style="list-style-type: none"> 1. To make connection between ratio/proportion and algebra. 2. To understand that algebra is a method for discovering unknown values based on relationships among other values. 3. To set up and solve algebra problems. 	
Activities	<ul style="list-style-type: none"> ▪ Discuss the word "algebra" ("bone setting" in Arabic/Latin) ▪ Discuss the word "variable" ▪ Discuss the word "equation" ▪ Go over algebra problems: 11, 14, 26,28 ▪ Discuss connections between R/P and algebra (solving for unknowns, etc.) 	dictionary
Wrap-up/Reflect	<ul style="list-style-type: none"> ▪ "What is the connection between R/P and algebra?" ▪ "What does knowing algebra allow us to do in math?" 	
Assessment	N/A	FF answer key. Picture, portrait
Homework, Notes & Checks	<ul style="list-style-type: none"> ▪ For homework, go over notes and prepare for algebra assessment. ▪ <i>Cover "scientific notation", problem #27, next class.</i> ▪ <i>Need to review use of calculators.</i> 	Prepare calculator practice packet & algebra assessment. Bring calculators!

LESSON PLAN #7

Class		Materials, etc.
Learning Objectives	<ol style="list-style-type: none"> 1. To understand that algebra is a method for discovering unknown values based on relationships among other values. 2. To set up and solve algebra problems. 3. Develop facility to use calculator for basic functions: squares/square roots; cubes/cube roots; fractions-to-decimals and reverse; enter fractions; percents-to-decimals and reverse; shift equals (percent conversion) function. 	
Activities	<ul style="list-style-type: none"> ▪ Review algebra problems etc. to prepare for assessment. ▪ Go through calculator practice packet. ▪ Review percentage > decimal > fraction conversions. 	calculator practice packet
Wrap-up/Reflect	<ul style="list-style-type: none"> ▪ Before every assessment, and before test!, review "Righteous Rules" for solving math problems successfully. 	
Assessment	Algebra assessment (eight problems)	
Homework, Notes & Checks	[End of lesson plan set]	

ASSESSMENT ANALYSIS LOG

NAME: _____

The log starting on the next page will make you think about your answers and push yourself to understand math more deeply. It will also help you to understand what you do well and what you could do better. It might also help you reduce the number of wrong answers you have on tests.

Here's how to use the log. Let's look at the following sample problem:

If 20% of a shipment of 50,000 tomatoes is crushed during transport, how many tomatoes will still be intact?

Let's say your answer was 10,000. That would be incorrect. After thinking about why you did not get the right answer, you might fill in the chart in ways like the following.

Explain why your answer was right or wrong. If it was wrong, what would be the right answer?	If your answer was wrong, how could you make sure you get problems like this one right next time?
I took 20% of the total number of tomatoes, but then I forgot to subtract that number from 50,000. The answer should have been 40,000.	I should plan out solving the problem BEFORE I start doing the math, see how many steps there are first, then go through each step. E.g., First find 20% and then <u>subtract</u> from 50,000. Or, take 80% of 50,000 instead of 20%.

OR

Explain why your answer was right or wrong. If it was wrong, what would be the right answer?	If your answer was wrong, how could you make sure you get problems like this one right next time?
I guess I didn't know what "intact" meant. Now I know they were looking for how many tomatoes were not crushed.	I should try to figure out what words mean that I don't know, because they can make the difference between right and wrong answers.

If you got an answer right, you should still fill out the first box. That will help you remember good practices, and find out if you got the right answer by accident!

The log starts on the next page.

TEST ANALYSIS LOG

Explain why your answer was right or wrong. If it was wrong, what would be the right answer?	If your answer was wrong, how could you make sure you get problems like this one right next time?
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	Note: Log sheets continue to cover

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MATH ASSESSMENT ANALYSIS LOG [Revised based on learner feedback]

Name: _____

The log starting on the next page will make you think before answering math question, and think about what you did wrong if you don't get a right answer. Here's how to use the log. Let's look at the following sample problem:

If 20% of a shipment of 50,000 tomatoes is crushed during transport, how many tomatoes will still be intact?

Now, let's fill in the first two columns of the log:

WHAT IS THE QUESTION ASKING FOR?	WHAT STEPS SHOULD I TAKE TO GET THE ANSWER?	IF I GOT THIS WRONG, WHAT DID I DO WRONG? (AND WHAT SHOULD I REMEMBER FOR <i>NEXT TIME</i>)?
<u>They want to know how many tomatoes got crushed.</u>	I need to know what 20% of 50,000 is. I should change the 20% to a decimal, .20, and multiply it times 50,000.	

Let's say your answer was 10,000. That's not right. So you would fill in the third column, maybe as in the underlined section.

WHAT IS THE QUESTION ASKING FOR?	WHAT STEPS SHOULD I TAKE TO GET THE ANSWER?	IF I GOT THIS WRONG, WHAT DID I DO WRONG? (AND WHAT SHOULD I REMEMBER FOR <i>NEXT TIME</i>)?
They want to know how many tomatoes got crushed.	I need to know what 20% of 50,000 is. I should change the 20% to a decimal, .20, and multiply it times 50,000.	<u>They wanted to know how many tomatoes DIDN'T get crushed. That's what "still intact" means. I should have subtracted the 20% from 50,000. $50,000 - 10,000$ is 40,000.</u>

A blank log starts on the next page->

MATH TEST ANALYSIS LOG

WHAT IS THE QUESTION ASKING FOR?	WHAT STEPS SHOULD I TAKE TO GET THE ANSWER?	IF I GOT THIS WRONG, WHAT DID I DO WRONG? (AND WHAT SHOULD I REMEMBER FOR <i>NEXT</i> TIME)?
<div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-bottom: 10px;">#</div>		
<div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-bottom: 10px;">#</div>		
<div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-bottom: 10px;">#</div>		
<div style="border: 1px solid black; display: inline-block; padding: 2px 5px; margin-bottom: 10px;">#</div>		

[NOTE: Several more blank sheets would normally follow this one.]