

How to Write a Contextualized Lesson Plan

What is contextualization? Contextualization is a fancy way of saying “putting math into context”. The idea here is that if math is put into a context, then memorization of math would not be as necessary. The more links that are made in the brain regarding a topic, the better the topic is said to be understood, and the less a student has to memorize. Memorization of facts are not thought to be “well connected” in the brain. They are stored into a bin that is not easily found nor transferred to situations. Contextualization allows students to make connections to things that they have experienced before (previous knowledge), so that the math is connected to something, and not just stored as a mere fact (useless knowledge if never used).

As a teacher, it can be frightening to try this type of lesson in the classroom for the first time, especially if the teacher is inexperienced with productive struggle in the math classroom. (Note: If you are afraid of this type of teaching, please know that it does get better with experience. The first step in learning is trying. Remember this is what we ask students to do in our classrooms every day.) This step-by-step guide is to help any teacher interested in writing lesson plans.

1. The first step in writing a contextualized lesson plan is picking a math concept within your course that you would like to work on. Teachers have different strategies for picking this concept; however it generally falls into one of two categories: (1) a topic that you know really well and use a lot in your personal or professional life (this is what we call the “easy win” for writing lesson plans) or (2) a topic that has never gone well in class (the general thought behind this is: “well, it can’t get any worse right?”). Note: it is harder to write a contextualized lesson plan that you don’t know very well. It’s not impossible, it’s just more work. BUT! If you choose a topic that you don’t know much about, you will learn much, much more about it from your own research and the perspectives of your students in class!!
2. Once a math concept is chosen, then
 - a. If you know your concept very well, then choose a time that you use the mathematical concept in your everyday life or your professional life. This will be your context.
 - b. If you do not know your concept well, then you can start with:
 - i. Researching the history of your topic. (For example, suppose your topic was on the number e , then you could research when e was first introduced as a number and why.) A context could be brought out here.
 - ii. Researching which professions use your topic. You may want to start with the professions that have a lot of mathematics in them (physicists, engineers, computer science, environmental science, health sciences, economics, finance, etc!). You can post in forums seeking advice from others, you can talk with other teachers and ask their opinions. You have options here.
 - iii. Connect the topic to your own learning. Which courses do you remember used this topic? What were they related to?
3. After the context with chosen, then specific learning objectives should be made explicit. (This can actually be done before the context is chosen. Steps 2 and 3 can be switched if convenient.) What about that topic do you want students to learn about or gain experience

with? The number of learning objectives is not a set number, but it should also not be a high number of objectives. The time it takes to learn something varies with each person, but there is a limit on the number of things a human can learn in a specified time. Try to choose a couple specific learning objectives.

The time it takes to write specific learning objectives varies for each teacher and depends on factors such as: experience with/understanding of the mathematical topic chosen, experience with writing learning objectives, experience teaching the course that the lesson is for (the more a teacher understands their course, especially the vertical and horizontal curriculum alignments of this course to others, the easier it is to write explicit learning objectives for topics), and experience with contextualization. The more exposure and experience with these factors, the easier it becomes to write specific learning objectives.

4. Once the learning objectives are made explicit, then how much other non-math knowledge is necessary for the context of the problem? For example, if your lesson plan talks about the lottery, sports knowledge, etc., then you will need to make sure that your students discuss this before starting the lesson. Make a list of all non-math knowledge needed for your context. This should be built in at the beginning or intermixed throughout the lesson as need be.
5. Once you have the mathematical concept, the context, the specific learning objectives, and the non-math knowledge needed, then it is time to start a rough draft of the lesson plan.
 - a. First, make an attempt at how you would like your students to interact with the context in the classroom. For me, this was easier to do on my kitchen table. I sat down as if I was a student trying to learn the problem for the first time. This helped me organize how I wanted the students to interact with the problem at-hand. It may be helpful to make notes on: (1) the time it took to do/complete things, (2) the items that could be confusing to students; or (3) the organization of ideas - items that need to come before one another (i.e. generally students cannot compute probabilities of pulling a card out a deck if they don't know how many cards are in a deck).
 - b. Once you become comfortable enough with the problem, write what you have done on a piece of paper, or type it up. This is your first rough draft at the lesson.
6. Once you have a rough draft of the lesson, share it with someone. This person can be a co-worker, a friend, or a family member. The more input sought from different people, the better the lesson plan becomes. After these discussions, create the rough draft of the student notes of the lesson plan. (These are notes for the students to have while working in groups.)
7. Once the rough draft of the student notes are in place, then write the rough draft of the teacher notes. These should include all answers to the student notes, plus the timing of each activity/problem, and the needed materials for the lesson. (If you could share these with a co-worker to get their input, it might be helpful to you before you use them.) The timing is the hardest part to get right the first time (or second time) doing a contextualized lesson plan. Knowing how long something takes to do is only gained through the experience of doing it many times.

8. This is the hardest step to do for the first time: Execute your lesson plan in class. Tell your students up front that you will be trying a contextualized lesson plan. Tell them why you feel it necessary for them to learn this topic in this manner. (Note: I told my students that I wanted to get better at teaching and I was trying something new. From my previous experience, my students were not learning the topic as well as I wanted them to, so that is why I had them try my this “new” way of learning.)
9. As soon as you have tried out your lesson, reflect on that class as soon as possible. After reflection, update the student notes and teacher notes from that class.

Contextualized lesson plans are never complete. These lessons become good after the first or second execution of the plans. Overtime, they become gold (when continuously updated each time).