Set-Up	Before Class	During Class	After Class	Mix It Up!
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# Sort The Sequences

Mathfest - Denver, CO Encouraging Effective Teaching Innovation

Sarah Wright - Fitchburg State University

August 2, 2018

Set-Up ●00	Before Class 00	During Class 0000	After Class 00	Mix It Up! 00

### THE PLAN:

In this talk we'll discuss the outline of a lesson plan for a class covering the introduction to Infinite Sequences in a second semester Calculus course. This plan fits into one 75 minute class and my own flipped classroom structure, but could be easily adjusted for other situations. Additionally, I hope to discuss ideas of other topics where similar ideas may also be successful.

Set-Up

Before Class

During Class

After Class

Mix It Up!

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THE BASIC	CS			

#### Course: Calculus II

#### Chapter: Sequences and Series

#### Time Frame: one 75-minute class

#### Students: 5-35

C10\*: I can determine if a sequence converges or diverges.

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### GOOOOOOALS!

- Practice with definitions
- Looking at lots examples is a good idea!
- Are there pattens in the examples?
- ► Is that a coincidence or a theorem?

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- ► To complete the assigned work before class
- Participating in class is more than being in the seat

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- To complete the assigned work before class
- Participating in class is more than being in the seat
- Giving an incorrect answer and making mistakes are part of learning

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RF	EPARATION WC	ORK		
	MATH 2400 8.1 PREP ASSIGN	NMENT DUE: TUES 3/20		
	We now start the portion of Calc II that many peop It is a tough bit of material and it feels like it co either of those things. You can probably gain a pay I think to get to the deep level of understanding that almost break you first. There are going to be ideas wird. There will be stuff you don't believe. You'll ahead. You'll be better for it in the end. Sequences are the beginning of this chapter. These Many of the techniques used to determine limits at Review these if you think you need to.	ble struggle with, and probably even dread. mes out of nowhere. There is no denying sigu understanding of this material by just few rules, and theorems, and testsbut and concepts that seem crazy. Infinity is be confused. This is to be expected. Forge are simply lists of numbers that we study. infinity in Cale I will come in handy here.		
	Read: The Introduction to Chapter 8 and Section 3 Respond: These questions and problems are part o - Sequences. After doing the above reading and we answers.	8.1 of the "test" on Blackboard called, 8.1 Prep atching, open that "test" and submit your		
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	(2) While this chapter will involve very little de What does the text claim is the core concept this material? So far in your own study of cale	erivatives and integrals, it is still calculus. t of calculus that appears often in studying culus, would you agree with that sentiment?		
	(3) Just as with improper integrals, we will be converges or diverges. Think about these mathematics. What do these words mean ou their meaning in this section? If you have in other than English, please share.	studying if a sequence (and soon a series) terms in the English language outside of tside of calculus? How does that align with sights regarding these words in a language		
	(4) Give an example of a convergent sequence.			
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	(6) Describe in your own words what it means for	or a sequence to be monotonic.		

During Class

After Class

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Before Class

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PREPARATION WORK	
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During Class

After Class

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"everyday" definitions vs. mathematical definitions

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"everyday" definitions vs. mathematical definitions

representations of sequences

Set-Up	Before Class	During Class	After Class	Mix It Up!
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"everyday" definitions vs. mathematical definitions

representations of sequences

techniques for determining convergence

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"everyday" definitions vs. mathematical definitions

representations of sequences

techniques for determining convergence

monotonic & bounded definitions

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### THE ACTIVITY

Choose a few sequence cards from the front of the room for your group to work with. For each sequence, determine if the sequence

- (a) Is bounded,
- (b) Is monotonic,
- (c) Converges or diverges, and
- (d) If it is convergent, find the limit.

Once your group agrees, write the sequence in the appropriate space on the board (include the limit if it exists), return the card, and choose another. You do not need to write the sequence on the board again if it is already there, but do make sure you agree with where it is placed. You can use the space below for your own scratch work or to keep track of the final decisions of the class.

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Set-Up	Before Class	During Class	After Class	Mix It Up!
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Set-Up	Before Class	During Class	After Class	Mix It Up!
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Set-Up	Before Class	During Class	After Class	Mix It Up!
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Set-Up	Before Class	During Class	After Class	Mix It Up!
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Set-Up	Before Class	During Class	After Class	Mix It Up!
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End of C	LASS			
	Math 2400	Exit Ticket	Tues 3/20	
	Name:			
	Circle the face th	at describes best how you feel about this new material:		
	:-D	>) :-  :-/	:-(	
	For each descript why no such sequ	ion below, give an example of a sequence that satisfies t ience exists.	hat criteria or explain	
	Convergent	Divergent		
	Bounded	Unbounded		
	Monotonic	NOT Monotonic		
	Unbounded & Convergent	NOT Monotonic & Convergent		
	Bounded & Divergent	Monotonic & Divergent		
	Bounded & Mone	otonic & Divergent		

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SHORT TERM

WeBWorK Homework

Series Convergence Tests

C10\*: I can determine if a sequence converges or diverges.

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## LONGER TERM

#### Series Convergence Tests

#### C10\*: I can determine if a sequence converges or diverges.

**Optional Project on Recursive Sequences** 

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# OTHER IDEAS ....

Set-Up 000	Before Class 00	During Class 0000	After Class 00	Mix It Up! ●0

### OTHER IDEAS ....

#### ► Linear Algebra - TFAE

Set-Up 000	Before Class 00	During Class 0000	After Class 00	Mix It Up! ●0

### OTHER IDEAS ...

#### ► Linear Algebra - TFAE

#### Functions - Injective, Surjective, Inverse?

Set-Up 000	Before Class 00	During Class 0000	After Class 00	Mix It Up! ●0

# OTHER IDEAS ....

- ► Linear Algebra TFAE
- ► Functions Injective, Surjective, Inverse?
- Geometry Symmetry

Set-Up 000	Before Class 00	During Class 0000	After Class 00	Mix It Up! ●0

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# OTHER IDEAS ....

- ► Linear Algebra TFAE
- ► Functions Injective, Surjective, Inverse?
- Geometry Symmetry

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### YOU'RE THE BEST!!!!!

# THANKS!!!!!

#### I love chatting crazy math teaching ideas. Feel free to strike up a conversation: swright8@fitchburgstate.edu