

Math Literacy & Climate Change: Workbook, Online Homework, Computer Labs

Class work every day in the workbook.

We build a toolkit of skills.

Mindset modules address math anxiety and growth mindset.

Finding the rate of increase of the atmospheric CO2 concentration.

Math 098 - Math Literacy in a Global Context
By Carrie Keiser and Kelly Mercer
2nd edition by Paula Thonney
Table of Contents - Fall 2018

Unit 1: Comparing with Numbers: Ratios, Rates, and Percents

1-01	Big Idea 1 - The Three Numbers	1
1-02	Toolkit - Millions and Billions	3
1-03	Mindset - Syllabus and Resource Assignment	4
1-04	Toolkit - Rounding	6
1-05	Mindset - Disequilibrium	8
1-06	Toolkit - Ratios, Rates, and Scaling	9
1-07	Mindset - Collaboration Norms	13
1-08	Toolkit - Proportions and Cross Multiplying	14
1-09	Toolkit - Percent Basics	15
1-10	Computer Lab - Orientation	16
1-11	Toolkit - Solving Percent Problems	18
1-12	Mindset - How This Class is the Same	23
1-13	Mindset - What You Can Expect	26
1-14	Toolkit - Vocabulary for Graphs and Rate of Change	27
1-15	Big Idea 1 - Three Graphs	32
1-16	Computer Lab - Making Graphs and Rate of Change	36
1-17	Google Sheets Template - Making Graphs and Rate of Change	38

1-06 Toolkit: Ratios, Rates, and Scaling

- According to Michael Ruhlman's book, "Ratio," bread is made up of 5 parts flour to 3 parts water. (Smaller amounts of salt and yeast are also included.) Write three ratios that would be equivalent to a 5:3 ratio of flour to water. Make one of them a relatively small batch of bread, and another one a large batch of bread, such as a bakery might mix up. Include units.
- I read that standard bread that uses plain flour has a 60% hydration. If hydration is defined as the ratio of water to flour weight, how does this compare to the information in Ruhlman's book?

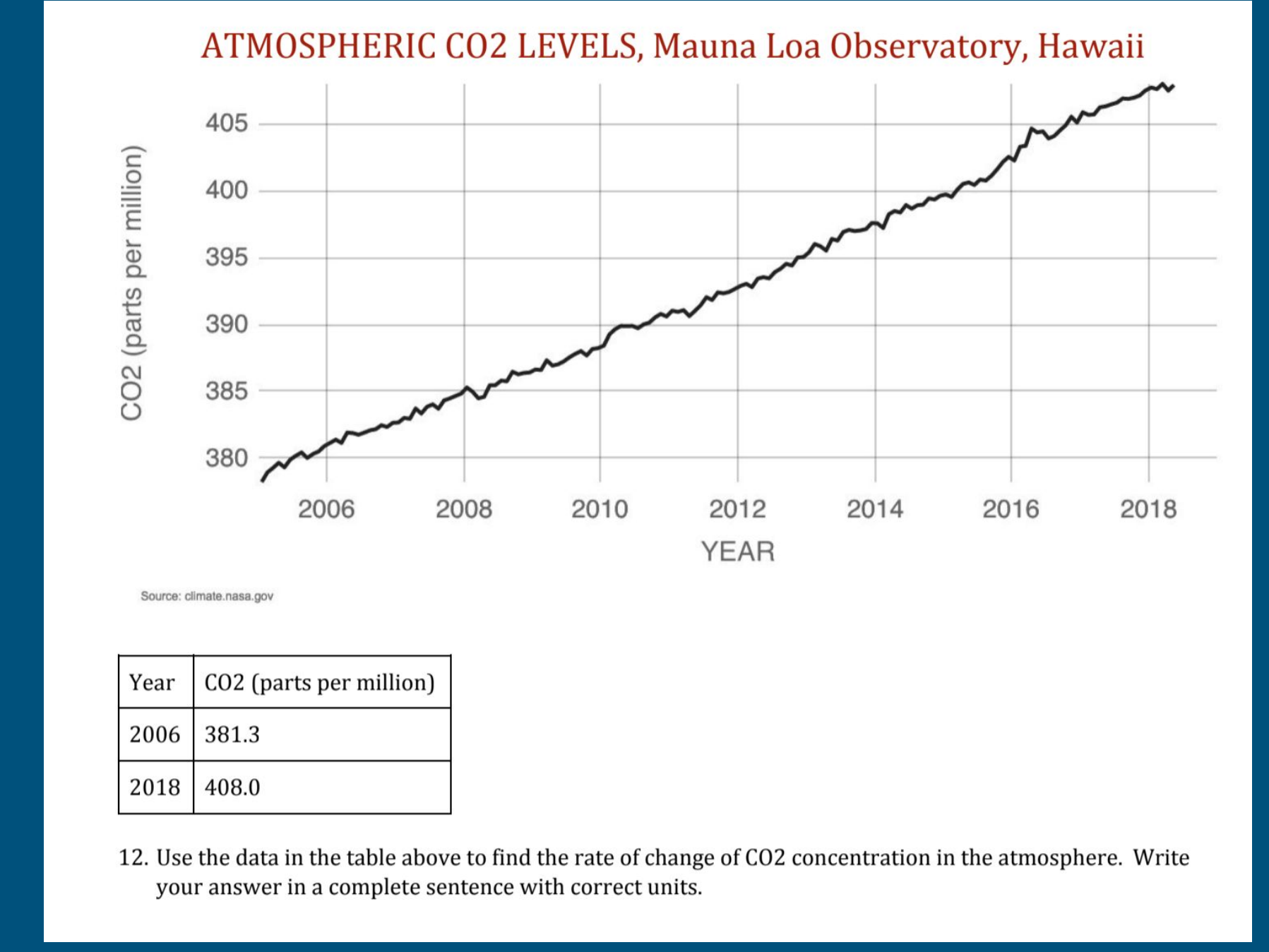
Lenders look at an individual's **debt-to-income ratio** to measure their ability to repay loans. The amount of debt you have is not as important as the ratio of your monthly loan payments to your monthly income.

- A student has a mortgage payment of \$700, a car payment of \$125, and \$175 in other loan payments. If the student's gross income (income before taxes and deductions) is \$2500/month, what is their debt-to-income ratio?

1-20 Mindset: Math Anxiety

These questions¹ refer to a video found here: <https://youtu.be/7snnRaC4t5c>²

- How does math anxiety affect working memory, and how does working memory affect math performance?
- Do you think you have (or have had at one time) math anxiety? In what ways has it manifested itself?



Online homework for each activity - real applications.

Question 3
Not complete
Scored out of 100

The falls that make up Niagara Falls are eroding backwards, thus migrating upstream. From 1842 to 1902 they eroded by about 69 meters. What was the rate of erosion along the falls? Give an answer accurate to the nearest hundredth.

_____ meters per year

Then water was diverted for hydro-electric generation. The rate of erosion slowed. From 1907 to 1927 the falls eroded by about 14 meters. What was the rate of erosion along the falls? Give an answer accurate to the nearest hundredth.

_____ meters per year

Check

Question 4
Correct
Score 1.00 out of 1.00

A hurricane is about to hit Wilmington, North Carolina, so I looked up their weather forecast. This looks scary! Round to the nearest whole number.

Wed 9/12	Thu 9/13	Fri 9/14	Sat 9/15	Sun 9/16	Mon 9/17
88° 17° F	82° 12° F	81° 12° F	81° 12° F	81° 12° F	81° 12° F
Thunderstorms	Thunderstorms	Thunderstorms	Thunderstorms	Thunderstorms	Thunderstorms
@ 5.8 in	@ 6.4 in	@ 3.2 in	@ 1.4 in	@ 0.8 in	@ 0.8 in

The daily high is decreasing by (on average) degrees per day between Wednesday and Friday.

The rainfall amount is increasing by (on average) inches per day between Wednesday and Friday.

Check

Question 1
Complete
Score 5.00 out of 5.00

- Think of something in your life, or in the world, that is changing quickly. What is it?
Example: Rent in Eugene seems to be increasing pretty quickly.
- How could you go about finding the rate of change, to quantify how that thing is changing?
I would need to find two different rent amounts at different times (for the same or similar apartments). For example, in 2003 I rented a 1 bedroom apartment for \$600 per month. Right now (2018) many 1 bedroom apartments cost about \$1000.
- What units would your rate of change be measured with? (Hint: This many things per this many things.)
The rent increased by \$400 over 15 years, which means rent is increasing by about \$27 per year.

The units would be dollars per year.

- The world's Gross Domestic Product has increased significantly since 1990 to 2017.
- I found the data from The World Bank's website. In 1990 GDP was measured at 22.607 trillion dollars. By 2017 GDP was as high as 80.738 trillion dollars. I will find the rate of change by finding the difference of years and increase in US dollars. Then dividing GDP by the number of years.
GDP increased 58.131 trillion dollars in 27 years.
- Increasing 2.153 trillion dollars per year between the years 1990 and 2017.

1-16 Computer Lab: Making Graphs & Rate of Change

This activity is designed to give you an introduction to spreadsheets. We will look at data on the numbers of people incarcerated in the United States¹. As you complete each step you may place a check mark by that number.

- Log into Google and Moodle.
- Find item "1-17 Google Sheets Template - Making Graphs and Rate of Change" in Moodle and open it. Then go to File> Make a Copy. (If you can't make a copy, make sure you've logged into Google.) In the box under Name, modify the given title, so that your first and last name replace the words "Copy of." The title should look like "Your Name - 1-17 Google Sheets Template - Making Graphs and Rate of Change". Then click ok. Now that the file is yours, you can edit it.
- What data is presented in this spreadsheet? Write a complete sentence.
- Scroll down the table. What is happening to the number of incarcerated people between 1980 and 2016? Write one or two complete sentences, and be specific.
- Which year had the highest number of incarcerated people?

3-10 Big Idea 3 - Answer Key - Google Sheets Template - Carbon Footprint

3-10 Big Idea 3: Carbon Footprint Calculator

All carbon footprint values provided in the tables are measured in metric tons per year (t/yr)

Transportation

Enter the number of miles you drive per week:	80
So the number of miles you drive in a year is:	4160
Enter the fuel economy of your car (in MPG):	27
So the number of gallons you use in a year is:	154.0740741
My grams of CO2 per year is: (see page 145).	1340444.444

Your Carbon Footprint (t/yr)	1340444.444
Average Carbon Footprint (t/yr)	4.35

Home utilities

Enter your average monthly electricity bill:

Graph comparing your Transportation Carbon Footprint to the average:

Project Overview

<p>Clackamas gave us</p> <ul style="list-style-type: none"> Online homework Reflections workbook Projects Everything was in My Open Math & Word & Google Sheets (?I think) 	<p>We now have:</p> <p>In google drive:</p> <ul style="list-style-type: none"> Workbook docs Google sheets templates <p>On Moodle</p> <ul style="list-style-type: none"> Online homework Reflections <p>Students purchase the workbook for about \$15 (cost of printing) and bring it to class every day</p> <p>We meet in the computer lab 1 hour/week.</p>
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LCC (internal) OER grant- Summer 2017

- Moved documents from MOM (My Open Math) to Google Drive
- Made edits
- Brought online homework from MOM to Moodle

Open Oregon Grant - Summer 2018

- Reorganized workbook (by units, not weeks)
- Added & subtracted topics
- Created weekly computer lab activities
- Wrote more homework problems.

I can share folders with you!
thonneyp@lanecc.edu

My Drive > math 98 fall 2018 and forward

Name	Owner
answer keys	me
for instructors	me
math 98 unit 1 fall 18	me
math 98 unit 2 fall 18	me
math 98 unit 3 fall 18	me
pdf files	me
under construction	me
videos for computer labs	me