**Lesson 19 Notes: Rational Numbers**

**What is a rational number?**

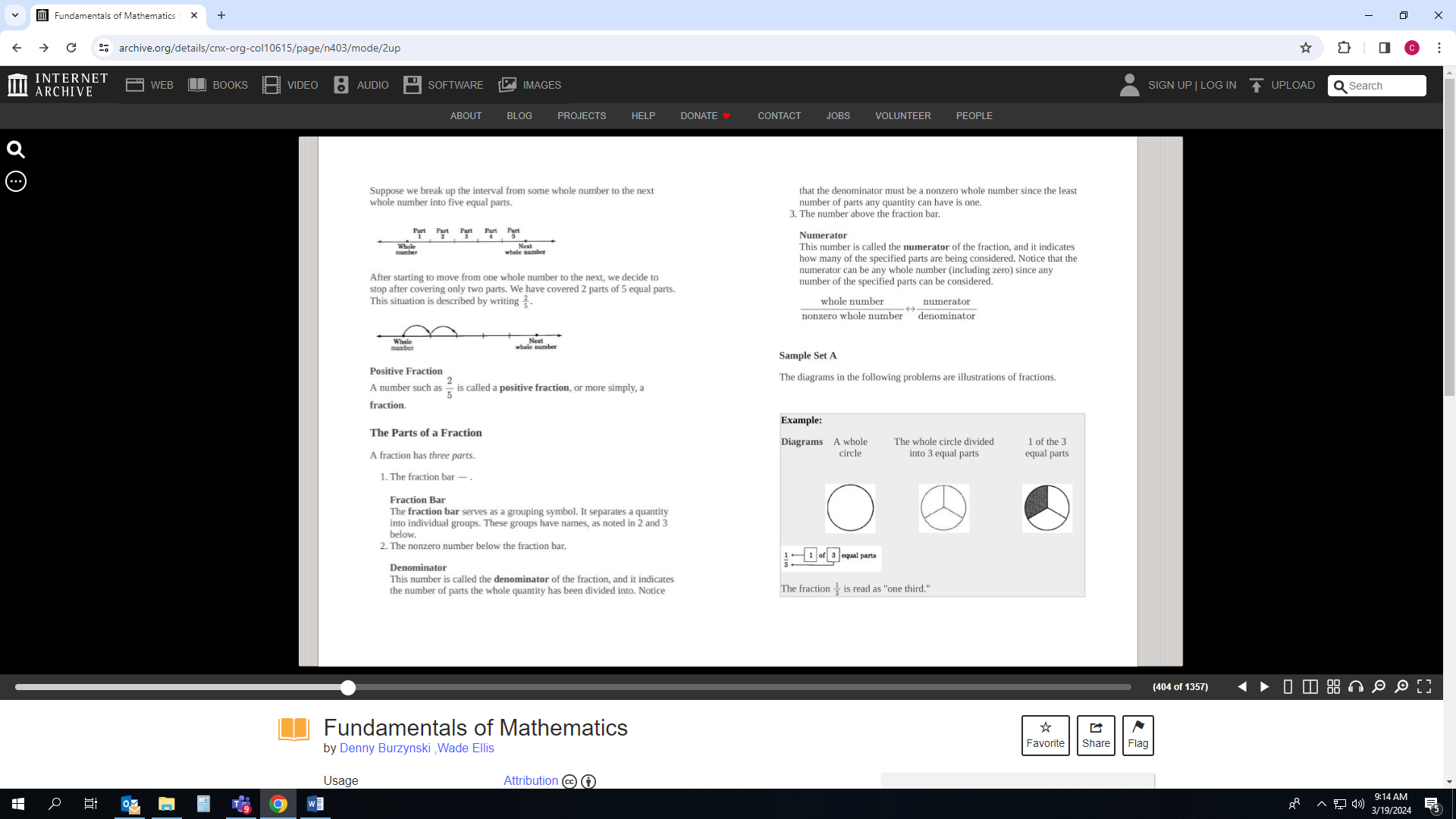
The idea of breaking up a whole quantity gives us the word *fraction* which comes from the latin word “*fractio*” which means a breaking or fracture.

The parts of a fraction:

1. Fraction bar -
2. Denominator -
3. Numerator-
4. Fractions =

**Fraction Concepts:**

1. *Part-to-Whole*



1. *Fraction-quotient –*
2. *Ratio –*

Unit Fraction:

**Example 1**: Write the fraction fifty three-hundredths with whole numbers.

**Converting an Improper Fraction to a Mixed Number**

**Example 5:** Convert to a mixed number.

**Example 6:** Convert to a mixed number.

**Types of Fractions**

**Proper Fractions:**

**Example 2:**

A proper fraction always lies between \_\_\_\_\_ and \_\_\_\_\_.

**Improper Fractions:**

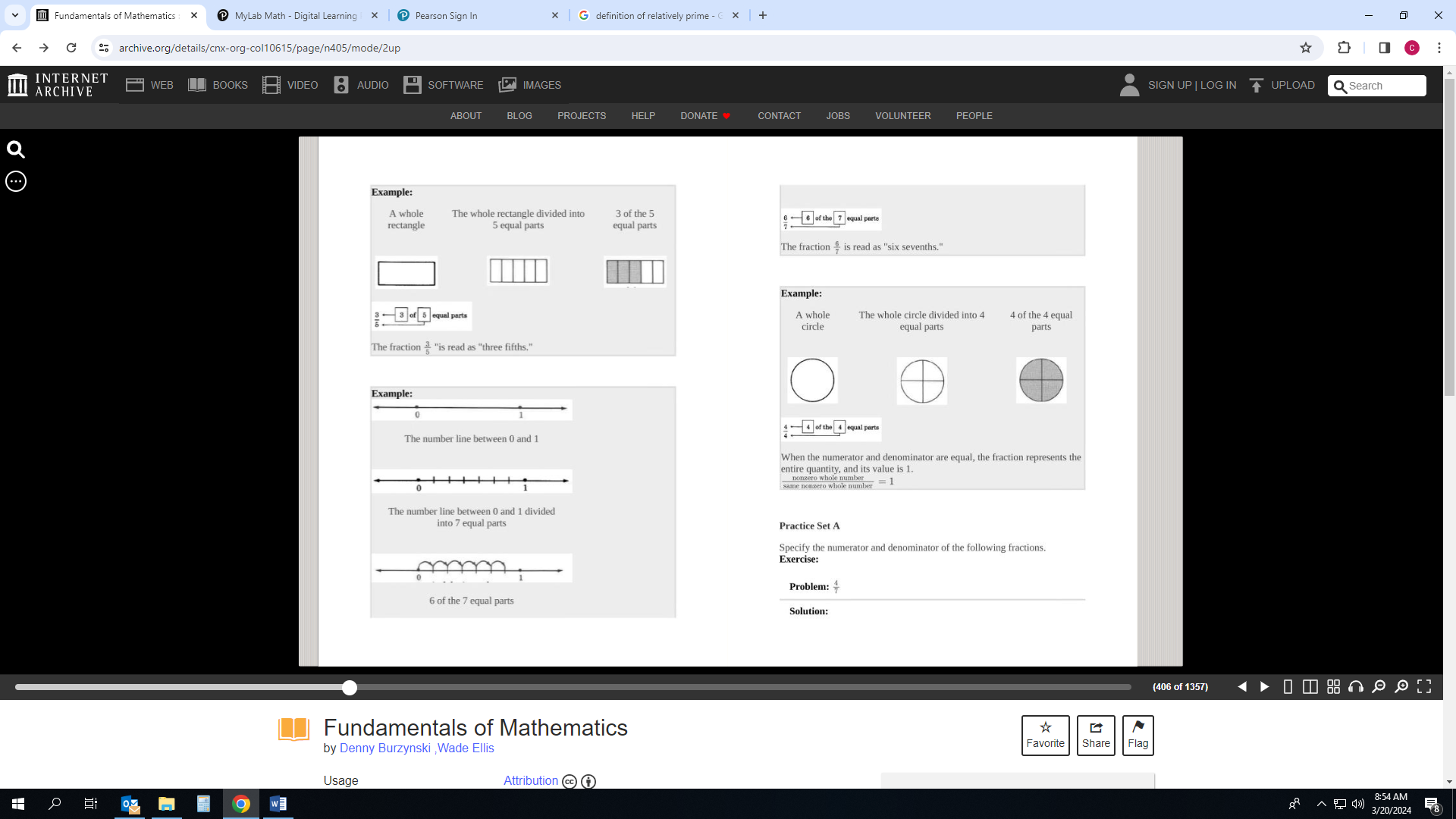
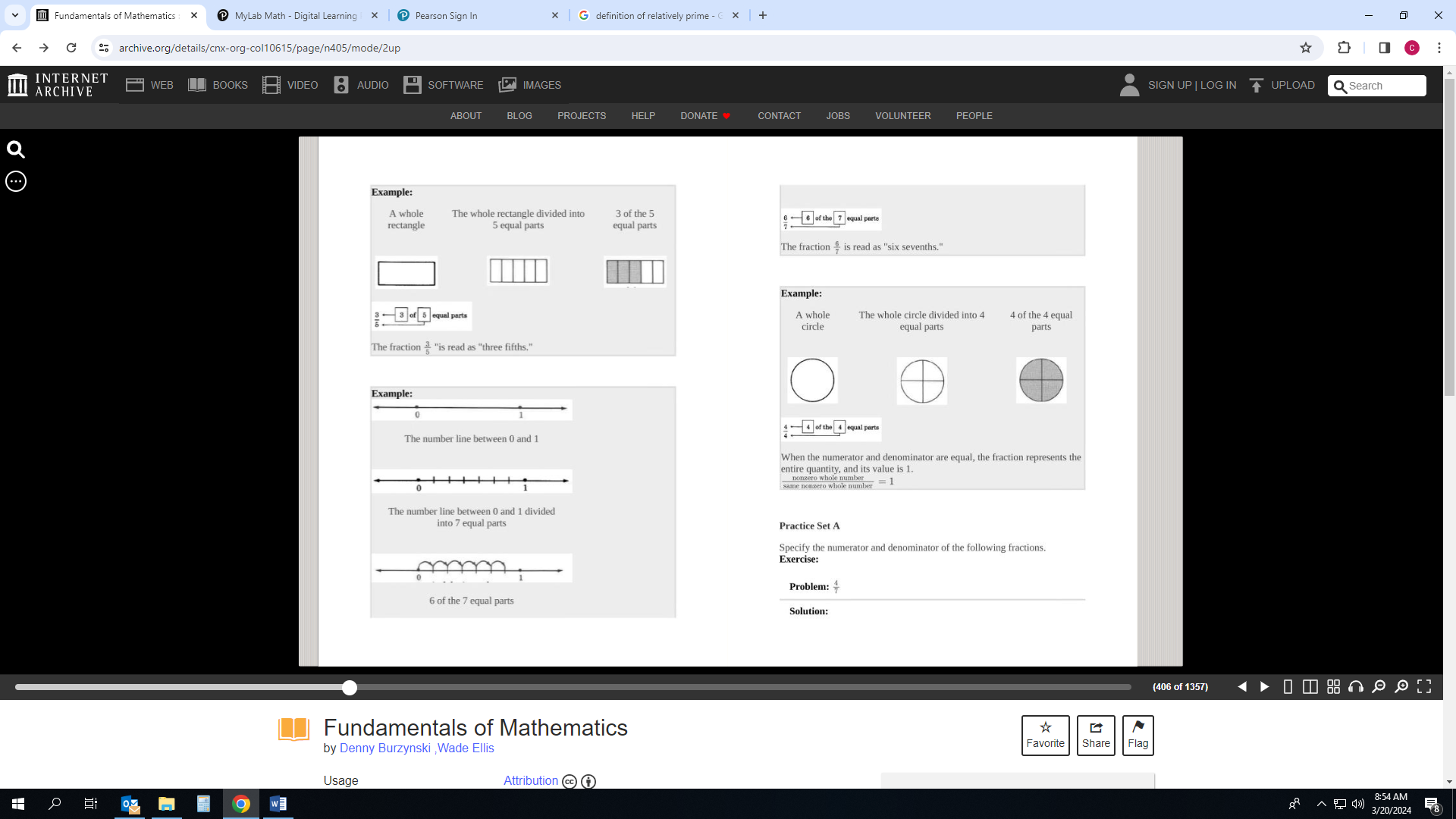
**Example 3:**

**Mixed Number:**

**Example 4:**

**Locating Fractions on the Number Line**

Fractions are located on a number line by using the part-to-whole concept. First, select a UNIT. Then, divide this interval into equal parts.



**Converting Mixed Numbers to Improper Fractions**

**Example 7:** Convert the mixed number to an improper fraction.

**Equality of Fractions Activity**

By using an area model in which part of a region is shaded, students can see how fractions are related to a whole unit, compare fractional parts of a whole, and find equivalent fractions.

**Equivalent Fractions**



**A Test for Equivalent Fractions Using the Cross Product**

**Example 8:** Determine if are equal.

**Example 9:** Use the test for equality of fractions to determine which pairs of fractions are equal.

1. 2.3.

|  |  |  |  |
| --- | --- | --- | --- |
| **1** | | | |
|  | |  | |
|  |  | |  |

**Reducing Fractions to Lowest Terms**

* When a fraction is converted to the fraction that has the smallest numerator and denominator in its collection of equivalent fractions it is said to be reduced to lowest terms.
* The only whole number that divides the numerator and denominator without a remainder of a reduced fraction is \_\_\_\_\_\_\_\_\_\_.

If the numerator and denominator of a fraction are divided by their \_\_\_\_\_\_\_, the resulting fraction is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the fraction is said to be in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* Two numbers are considered \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_if there are no common factors other than 1.

Two Methods of Reducing Fractions:

* Divide Out Common Primes
* Divide Out Common Factors

**Helpful Hint:** Share a catchy video with songs to help students remember the rules. Check out a video on reducing fractions by [NUMBEROCK](https://youtu.be/U-1KjlJAA6M?si=mC2A-YpI_d5j0hRk).2

**Inequality of Fractions**

[Click to watch a video of how a tower of bars illustrates many different equalities of fractions.](https://youtu.be/LZT-v8xoi6o?si=rAVyf_AtMBPSv8qA)1

Test for Inequality of Fractions:

**Example 10:** Determine the inequality for each pair of fractions using

1. b. c. d.

**Methods of Reducing Fractions to Lowest Terms**

**Divide Out Common Primes**



**Example 11:** Reduce the fraction to lowest terms.

**Divide Out Common Factors**



**Example 12:** Reduce the fraction to lowest terms.

**Example 13:** Write each fraction in simplest form using either method for reducing fractions.

1. 2. 3. 4.

**References**

# 1YouTube. (2012). *Inequality Step 2 - Decreasing and Increasing Fractions.*

YouTube. <https://youtu.be/LZT-v8xoi6o?si=lDFZgrRLeapFNDiT>

# 2YouTube. (2016, June 30). *Simplest Form Song: Simplifying Fractions by NUMBEROCK. YouTube.* <https://youtu.be/U-1KjlJAA6M?si=mcKcDPLfGOi8bnkF>