CONFLICT MINERALS
FRACTION & DECIMAL EDITION

Ideal Unit: Fractions & Decimals	**Time Range**: 3-5 Days	**Supplies**: Pencil & Paper

Topics of Focus:

- Adding, Subtracting and Multiplying with Fractions and Decimals
- Reducing Fractions to Lowest Terms
- Equivalent Fractions

Driving Question	*"How can you use fractions and decimals to understand the impact a cell phone has on conflict minerals and human rights?"*
Culminating Experience	A conflict mineral infographic

Common Core Alignment:

4.NF.B.3d	Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
4.NF.B.4	Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
4.NF.C.6	Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
4.NF.C.7	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.
5.NF.B.6	Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
5.NBT.A.3	Read, write, and compare decimals to thousandths.
5.NBT.B.7	Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Procedures:

A.) In "Mineral Usage", students will use basic operations with decimals to investigate authentic mineral data to determine lifetime costs.

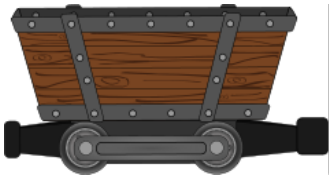
B.) In "Cell Phone Materials", students are given the composition of a cell phone's materials in fractions. Students add, subtract and multiply with these fractions to determine the weight of the material in a phone.

C.) In "Importing Minerals", students are given the fraction or decimal that the US is self sufficient or relies on imports and will use this information to determine the overall spending on these minerals.

D.) In "Conflict Minerals", students look at the value of the four main conflict minerals of the Democratic Republic of Congo and the fraction of the world's supply. Students will determine the amount of revenue that funds criminal enterprises.

E.) In "Conflict Minerals Take Action Infographic", students will use evidence from the mathematics work to build an infographic.

* Aspects of the project can be completed independently. The entire project does not need to be completed to have a great learning experience, though it is suggested because it will best scaffold the skills and context.



MINERAL USAGE

Name _____ Date _____

Every step you take is on top of a mineral. A mineral is any natural inorganic solid. Some minerals have been mined, processed and used to create a product. Everything from cans to laptops is the product of minerals. There are many concerns with mining these non-renewable resources. When will we run out? Should we try to save? Other issues exist with how miners are paid and treated. This issue is even bigger when you think about how mining is outside of North America. In parts of Asia, Africa and South America there are human rights problems with minimum wages, child labor and slavery.

In the United States, we can't live without these minerals. We use, use, use. How much do we use? Below is an estimation of how much of certain minerals will be needed for someone's life. Also in the table are the average costs of these items for two recent years. You will see that the prices of these commodities fluctuate from year to year. **Determine the total costs of the minerals using the two different prices and calculate the difference in Lifetime Cost from 2015 to 2016.**

Mineral	Amount Required over a Lifetime	Average 2015 Cost / Unit	Average 2016 Cost / Unit	Did the Cost Increase or Decrease?	Total Lifetime Cost in 2015 Dollars	Total Lifetime Cost in 2016 Dollars	Difference in Lifetime Cost (Larger – Smaller)
Aluminum	5,677 lbs	1.16	0.98	Decrease	5677*1.16= 6585.32	5677*0.98= 5563.46	6585.32-5563.46= $1021.86
Cement	29.71 mtu	89.50	95.00				
Clays	8.73 mtu	68	69				
Copper	1,309 lbs	4.06	3.70				
Gold	1,576 oz	1572	1700				
Iron ore	13.43 mtu	99.45	101				
Lead	928 lbs	1.22	1.14				
Phosphate rock	8.99 mtu	96.64	96.9				
Stone, Sand & Gravel	730.5 mtu	8.68	8.78				
Zinc	671 lbs	1.06	0.93				

Source: U.S. Geological Survey and U.S. Energy Information Administration; statistical analysis by National Mining Association

FOLLOW-UP: Order the total lifetime costs in 2016 from greatest to least. Are there any surprises?