**Unit Title: Benchmarks**

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**Context: Election**

**Anticipated Time in Hours and # of Classes: 18 hours total, 3 hrs/week x 6 weeks)**

**Level A GLE 1-4**

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| **Stage 1 – Desired Results** |
| **Unit Purpose**The purpose of this unit is to build and deepen students’ understanding of common benchmark fractions, decimals and percents. First, students explore the fraction ½, its connections to decimals and percents, and its use as a benchmark. When they show mastery and conceptual understanding of ½, they are ready to extend their knowledge to one quarter and three quarters. Benchmark fractions are useful in many adult contexts, such as interpreting sale prices, measurements, and data.**Unit Goals and Outcomes**By the end of this unit, students will be able to use quarters as benchmarks in order to interpret data about the 2016 election. |
| **Unit Objectives** Students will be able to:* Identify the part and whole in various cases, and write this information in word and fraction form.
* Use sense making strategies to find ½ of a whole.
* Determine whether a fractional amount is more than, less than, or equal to ½.
* State the fraction that represents the whole for any case.
* Find one-fourth of a quantity using multiple strategies, including finding half of half or dividing by four.
* Determine the whole and three-fourths of a quantity when one fourth of the quantity is known.
* Solve problems by finding three-fourths of a quantity using at least two methods.
* Relate finding three-fourths to division and multiplication.
* [Compare fractions involving numbers up to 1,000 to determine where they are located in relation to the benchmarks ¼, ½, ¾.]

Other Integrated Math Content* Pie charts, data
* Measurement by quarters of an inch

Other Academic Content* Polling, campaigns, infographics
 | **Priority CCRSAE Math Content Standards**Understand a fraction 1/b as the quantity formed by 1 part when the whole is partitioned into b equal parts [Note: this will be done with ½ and ¼] (3.NF.1a)Understand a fraction a/b as the quantity formed by a parts of size 1/b. [Note: this will be done with ¾] (3.NF.1b)Understand a fraction as a number on the number line; represent fractions on a number line diagram. [Note: this will be done with quarter increments] (3.NF.2)Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. (3.NF.3a)Recognize and generate simple equivalent fractions. Explain why the fractions are equivalent. (3.NF.3b)Partition shapes into equal areas. Express each part as a unit fraction of the whole. (3.G.2)Compare two fractions using a benchmark. [Halves and quarters only] (4.NF.2) |
| **CCR Standards for Mathematical Practice**MP 3: Construct viable arguments and critique the reasoning of others.MP 4: Model with mathematics. | **Essential Questions** What are benchmark fractions and why are they useful?How are fractions, decimals, and percents related?How are parts and wholes related?How can knowing one benchmark help you find other? |
| **Stage 2 – Assessment Evidence** |
| **Performance Task(s)**Students will describe and sketch a pie chart for a set of data, using quarters as benchmarks. | **Other Evidence**HiSET type questionsCheck-ins Informal Assessments |
| **Stage 3 – Learning Plan** |

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| **Learning Activities** | **Purpose** | **Standard** |
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| (2 weeks) [Note: Students who need a longer time to demonstrate competency with ½ can continue to use only ½ as a benchmark with various activities until they are ready to move on to ¼. Most of the application activities in the second part of the unit on ¼ work just as well with ½ for students who need more practice.] |
| *EMPower Plus Using Benchmarks* Lesson 1: More Than, Less Than, or Equal to One-Half? |
| * Review ½ - Practice: Find Half of It; Why Is 50% a Half?
 | Form. Assess., Conceptual,Fluency | 3.NF.1a  |
| * Stations: Comparing Fractions to 1/2
 | Conceptual | 4.NF.2 |
| * Comparing to ½ - Is It Half? problems
 | Conceptual, Fluency | 4.NF.2 |
| Infographic: “Social Media and the Popular Vote” from <http://www.trendhunter.com/trends/predict-the-presidential-election>Students use the benchmark of 50% to make statements about the data, then use data to support their answer: If you were running for president, would you campaign on social media? | Application | 4.NF.2 |
| * Measuring to the Nearest ½-Inch
 | Application | 3.NF.2 |
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| (2 weeks) |
| *EMPower Plus Using Benchmarks* Lesson 2: Half of a Half |
| Finding ¼ with manipulatives and shapes | Form. Assess. Conceptual |  |
| * Practice: Show Me ¼!
 | Conceptual | 3.NF.1a, 3.NF.2, 3.G.2 |
| * Practice: ¼ Measurements
 | Application | 3.NF.2 |
| * Practice: What Makes It a Quarter?
 | Conceptual | 3.NF.3a , 3.NF.3b |
| * Activity 1: ¼ Wasted
 | Conceptual, Fluency | 3.NF.1a, 3.NF.1b |
| Recipe for No Bakes Cookies. Cut down recipe to make ¼ of original recipe. Then make! (Teacher generated) | Application | 3.NF.1a |
| * Activity 2: Is It Really a Quarter?
 | Application | 3.NF.1a |
| * Practice: How Many, How Far?
 | Conceptual, Application | MP 4 |
| Looking at shopping deals activity (teacher generated)Students create a shopping list from a catalog, list the prices, then find the sale prices at 25% off. They compare their new total with the original total - 25%. | Application | 3.NF.1a |
| * Practice: Comparing Fractions to ¼
 | Conceptual, FluencyForm. Ass. | 4.NF.2 |
| * Test Practice
 | Application | All |
| Pie charts: Reading and creating (teacher generated) | Application | 4.NF.2 |
| Paper Folding Activity (from https://www.youcubed.org/task/paper-folding-fun/) | Form. Ass. | MP 3 |
| **Vocabulary and notes: visual models for fourths, one quarter, one fourth, 25%, three quarters, 75%** |
| **Assessment: No Bakes Cookie Activity (see above) and Shopping Deals (informal), Comparing Fractions to ¼ (formative) and Check-in (formative)** |
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| (2 weeks) |
| *EMPower Plus Using Benchmarks* Lesson 3: Three Out of Four |
| * Practice: Show Me ¾!
 | Conceptual | 3.NF.1b |
| * Practice: ¾ Measurements
 | Conceptual | 3.NF.1b, 3.NF.2 |
| * Activity 1: Seats for ¾
 | Conceptual | 3.NF.1b |
| * Activity 2: Where Are You From?
 | Application | 4.NF.2 |
| * Practice: Measuring to the Nearest ¼ Inch
 | Application | 3.NF.2 |
| Cut matting for photos – Measure to nearest ¼ inch, use exacto knife and T-square. | Application | 3.NF.2 |
| Outdoors: rope number line with white boards, find benchmarks, then move to place in line. | Conceptual | 4.NF.2 |
| * Practice: Where to Place It?
 | Conceptual | 4.NF.2 |
| * Practice: Missing Quantities – Parts and Wholes
 | Conceptual, Fluency | 3.NF.1a, 3.NF.1b |
| * Practice: More “How Many, How Far?” problems
 | Conceptual, Application | All |
| * Test Practice
 | Application | All |
| Data project: Use benchmarks to describe a data set and make a pie chart. | Application | 4.NF.2 |
| **Vocabulary and notes: visual models for fourths** |
| **Assessment: Matting Activity and Outdoor Number Lines (informal), Check-in (formative), Data Project (summative)** |

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| **Resources*** *EMPower Plus Using Benchmarks: Fractions and Operations* Student and Teacher Books
* <https://www.youcubed.org/task/paper-folding-fun/>
* Websites for fluency practice
* Teacher-generated materials
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