**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 questions  Check-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, Fluency  Form. 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 |