Grade 5 Math Enrichment - Unit 3 - Beyond Base Ten

Unit Focus

In this unit we start with the history of base ten number system. Then students explore other, non-base ten, number systems that have been used in the past. These explorations allow the students to develop a deeper conceptual understanding of place value. Finally, they create a new number system of their own.

Stage 1: Desired Results - Key Understandings

Standard(s)

Common Core
Mathematics: 5

- Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. (CCSS.MATH.CONTENT.5.NBT.A.1)
- Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. (CCSS.MATH.CONTENT.5.NBT.A.2)
- Look for and express regularity in repeated reasoning. (CCSS.MATH.MP.8)

Madison Public Schools Profile of a Graduate

- Product Creation: Effectively use a medium to communicate important information. (POG.3.2)

Transfer

Students will be able to independently use their learning to...
T1 Apply an understanding of known patterns to new problems and make connections between concepts.

Meaning

Understanding(s)	Essential Question(s)
Students will understand that... **U1** Mathematicians attend to the underlying meaning of quantities and symbols. **U2** Mathematicians see patterns to make generalizations about structures and relationships.	*Students will keep considering...* **Q1** How does counting help us in our everyday lives? **Q2** What do the quantities mean? **Q3** What are the strengths and weaknesses of the tools at hand?

Acquisition of Knowledge and Skill

Knowledge	Skill(s)
Students will know... **K1** decimal place values represent powers of ten **K2** number systems can be based on any value **K3** expanded form can be used to represent values in any place value system	*Students will be skilled at...* **S1** using a non-based 10 (ex. base 5,8 or binary) system to represent quantities **S2** representing quantities in number systems without place value **S3** converting between decimal numbers and other bases **S4** using expanded form to convert numbers from one base to another.