M2C3 MATH MODELING LESSON OVERVIEW

LESSON TITLE: Swim Team Selection Task

STANDARDS ALIGNMENT:

GRADE 3	GRADE 4	GRADE 5
3.NBT Use place value understanding and properties of operations to perform multi-digit arithmetic. **3.NBT 2.** Fluently add and subtract within 1000 using strategies and algorithms based on place value properties of operations and/or the relationship between addition and subtraction.	**4.NF.** Understand decimal notation for fractions and compare decimal fractions. **4.NF: 7.** Compare two decimals to hundredths by reasoning about their size. **4.MD.** Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. **4.MD: 2** Use the four operations to solve word problems involving … intervals of time… including problems involving simple fractions or decimals…	**5.NBT.** Understand the place value system **5.NBT:5.** Read, Write, and compare decimals to thousandths. Compare decimals based on meanings of digits in each place.
MP: 1 Make sense of problems and persevere in solving them. **MP: 2** Reason abstractly and quantitatively. **MP: 3** Construct a viable argument and critique the reasoning of others. **MP: 4** Model with mathematics.	**MP: 1** Make sense of problems and persevere in solving them. **MP: 2** Reason abstractly and quantitatively. **MP: 3** Construct a viable argument and critique the reasoning of others. **MP: 4** Model with mathematics.	**MP: 1** Make sense of problems and persevere in solving them. **MP: 2** Reason abstractly and quantitatively. **MP: 3** Construct a viable argument and critique the reasoning of others. **MP: 4** Model with mathematics.

CONNECTIONS (Consider while planning):

• Previous Math Knowledge: *What prior math knowledge and experiences does this lesson consider and/or build on?*

- Time in seconds
- Ordering whole numbers (grade 3) and decimal numbers (grades 4 & 5)
- Organizing data
- Reading tables/charts

• Cultural/Community/Family Connections: *How does the lesson connect to, or build on the knowledge, practices, or experiences of children and families? On community contexts??*

The school or community may have a swim team. Students may know of the Olympic swimmers or local college swimmers. They may have raced each other in a local pool or lake. They may need to understand that time is kept for each swimmer. Thus, even though we can see who wins and who comes in second, we record the time it took for each swimmer to finish the race.

- Vocabulary:
    - Students may need to review
        - swim meet,
        - event,
        - freestyle

TASK VARIATIONS:

Opening Routines: What do you notice? Wonder?

- Use initial slides to connect students' knowledge and experiences with swimming and swim meets. Local swim teams could provide relevant video and data if available. Some students may be on a swim team. Others may not know how to swim.
- Discuss the characteristics a coach would consider when choosing a swimmer for the championship event. These might include:
    - fastest overall time,
    - fastest in the most races.
    - swimmers who did not miss a race (no DNC),
    - fastest times in recent races,

- Discuss the "Who is the fastest table?" Fastest means lowest number of seconds.

Swimming Task

SWIMMING TASK: ANTICIPATED STUDENT STRATEGIES:

Relevant considerations that should come out during the initial discussion of this task (some information might be available, some will need to be assumed):

Student may:

- Select the swimmers with the fastest times in the table.
- After the discussion in the opening routines, disqualify students who missed events as indicated by "DNC."
- Order each swimmers' times from slowest to fastest, then pick the two that have the fastest times.
- Consider only the last two or three events and select the swimmers with the fastest times.
- Add up the swimmers' times and pick the minimum (omitting the swimmers with

DNC times)
- Add the most recent two or three times and choose the two minimum times.
- Determine the average times and pick the fastest two among them. Note: Average (mean) is not a Grade 3-5 topic in the CCSS. However, as a common application of summation and division, students may understand the concept of average.

Materials

Swim Team Selection_Student Task
Swim Team Selection_Lesson Slides