Sample Mathematics Learning Plan

Big Idea/ Topic

- Build Fluency with Addition and Subtraction

Standard(s) Alignment

MGSE3.NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100.

MGSE3.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.

MGSE3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

Diagnostic Assessment

In this diagnostic assessment task, students are presented with a number square puzzle that has been partially completed. They are then asked to estimate what the inner-most number may be and identify any patterns they find in the number square puzzle.

Diagnostic Mathematics Exemplar Tasks

This assessment task can be used to diagnose students' level of understanding of the big idea and standards addressed in this learning plan.

Instructional Design

Engage

Addition Number Talks Display the addition problem on the board and allow students time to think of how to solve it in more than one way. Step by step instructions for completing a Number Talk can be found at the link.

- **Synchronous** Complete during a classroom discussion or virtual classroom meeting.
- **Asynchronous** Introduce the problem to students in a virtual platform; this can be done via e-document or video. Allow students to share responses and provide feedback to their peers within the virtual platform/classroom. Provide feedback to individual student responses and highlight multiple strategies used by students.
- **Unplugged/ Offline** Encourage students to provide a written explanation of their thinking and how they reached their solution when solving problems. Provide feedback that demonstrates different strategies to solve problems. Alternatively, share a problem along with a strategy and solution; ask students to explain a different way to solve the problem.

Explore

"Piggy Bank" **3-Act Task- Early addition and subtraction with part-part-whole models.**

- **Synchronous** Complete during a classroom discussion or virtual classroom meeting.
- **Asynchronous** Pre Record each act or create an e-document for each act. Allow students to share their thinking within the virtual platform/classroom. When students are asked to share their solutions and strategies in act 3, ask them to illustrate with drawings or write an equation to match. Showcase different strategies students used and allow them to respond/give feedback within the virtual platform.
- **Unplugged/ Offline** Provide students with information from Act 2 and provide them with the main question "how much money is in the piggy bank?" Ask students to answer the question and provide an equation and/or drawing that demonstrates how they solved the problem.

Apply

Scenario: As many as 80% of the pollutants that end up in our ocean start out as debris on land that is not properly thrown away. Many of those pollutants include single use plastic bags and other plastic items. In this investigation, you will raise awareness about the amount of plastic individuals use each day, collect a class data list of plastic use, and consider ways you might reduce, reuse, and recycle plastics.

- Begin this investigation by keeping a record of your personal plastic use for seven days. Here are some examples of personal plastic items. This list is not all inclusive.
    - ziplock plastic bags
    - plastic grocery bags

    - bag holding crackers inside the box
    - water bottles
    - plastic bottle tops
- Students will keep their individual record of plastics per day and for the entire week.
- The class will create a class data set, which adds each students' individual totals for the week.
- Use the data to create a bar graph showing the amount of plastic used. Graphs could include different types of plastic items and/or different days of the week. Graphs could also compare amounts of plastic used from individual student sets of data. Students will use the "how many more" and "how many less" phrases to compare bar graph data.
- Utilize the Engineering Design Process or Design Thinking to engage students in student-centered problem solving to brainstorm ways to reduce, reuse, or recycle plastics and ultimately, reduce the presence of pollutants in the ocean.

Synchronous: Using student created data sets, students will analyze their own and classmates' plastic use, and suggest ways to reduce, reuse, and recycle based on their information.

Asynchronous: Students can, over a period of 7 days, log data at different times and asynchronously analyze classmates' data.

Unplugged / Offline: Students will record information on paper and share with teacher via 1:1 phone call. Teacher will provide new data set based on class compiled data.

Reflect

Would You Rather? **In this task, students must use mathematical reasoning to decide how many jellybeans they would rather give to a friend.**

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Evidence of Student Success

- Piggy Bank - 3- Act Task Formative Assessment Questions

- What models did you create?
- What organizational strategies did you use?

Mathematics Exemplar Assessment Tasks

Students are presented with a number square puzzle that has been partially completed. They are then asked to estimate what the inner-most number may be and identify any patterns they find in the number square puzzle.

Student Learning Supports

At all grades, the mathematics big ideas encourage students to reason mathematically, to evaluate mathematical arguments both formally and informally, to use the language of mathematics to communicate ideas and information precisely, and to make connections among mathematical topics and to other disciplines. The following strategies are intended to support students who are struggling to progress towards this goal:

- ***Conceptual Processing:*** Utilize the Concrete-Representational-Abstract instructional sequence to support students in making connections among mathematical ideas, facts and skills, and reflecting upon and refining one's own understanding of relationships, generalizations and connections.
- ***Language:*** Strategically select language routines to support students

  in describing strategies, explaining their reasoning, justifying solutions

  and making persuasive arguments.
- ***Visual-Spatial Processing:*** Provide opportunities for students to engage with visual representations and manipulatives (virtual or concrete) as they solve problems, explore concepts and communicate ideas.
- ***Organization:*** Teach problem-solving strategies and problem types such as CGI Problem Types in order to support students in figuring out how to get started, carrying out a meaningful sequence of steps while solving problems, keeping track of the information from prior steps, monitoring their own progress and adjusting strategies accordingly.
- ***Memory:*** Focus on conceptual strategies and patterns for computation, providing a scaffold for students who struggle with basic facts and carrying out written algorithms.

Here is an additional game that can be used to support students via intervention support or acceleration.

- **Race to One Hundred This game provides students an opportunity to practice addition, subtraction, multiplication, and division as they try to reach 100 on a number chart. This is a great way to have students practice addition and subtraction, and it's fun too!**
    - **Intervention** - Students who need additional support/practice with addition and subtraction can play this game using one operation at a time to strengthen their knowledge.
    - **Acceleration**- Students who have mastered addition and subtraction can be challenged by adding multiplication and division.

Engaging Families

Dice Addition and subtraction games

This resource contains four different games that can be played with dice to review addition and subtraction at home.

RoboGarden STEAM (Online)

Student practices counting, addition and subtraction while solving some coding challenges

Zearn

Independent digital addition and subtraction lessons. Zearn is a self-paced, virtual program that students can use to review mathematical concepts. Student accounts are free.

Khan Academy

Addition, subtraction, and estimation. Video tutorials and virtual guided practice using numbers and base ten. Student accounts are free, but not necessary to access practice questions and tutorials.

Connect Four

Review addition and subtraction with a Connect 4 Like Game