

Sample Mathematics Learning Plan

Big Idea/ Topic

- Extend understanding of base-ten notation

Standard Alignment

MGSE2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: a. 100 can be thought of as a bundle of ten tens — called a “hundred.” b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

MGSE2.NBT.2 Count within 1000; skip count by 5s, 10s, and 100s.

MGSE2.NBT.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

MGSE2.NBT.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons. Represent and interpret data.

MGSE2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

Diagnostic Assessment

In this diagnostic assessment task, students will be asked to determine the value of base-ten blocks that have spilled onto the floor on three separate days. Each of the tasks require students to use their base-ten reasoning in different ways to determine possible solutions.

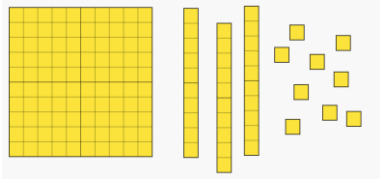
[Diagnostic Task Big Idea: Extend Understanding of Base-Ten Notation](#)

Instructional Design

Engage

Place Value [Number Talks](#)

Use base ten blocks to model a 3 digit number and ask students what number you are representing and how they know? Step by step instructions for completing a Number Talks are in the Link.



For example,

[Virtual Base Ten Blocks](#)

- **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. A great e-document to use for this activity is Padlet. It allows all students to share their own thoughts and after they post their peers can view each other's mathematical thinking. Check out an example here:
<https://video.search.yahoo.com/yhs/search?fr=yhs-Lkry-SF01&hsimp=yhs-SF01&hspart=Lkry&p=how+to+use+padlet+for+math+discussions#id=1&vid=e7ca786f7a02c63553f51141cec0c76f&action=click>
- **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

[“Straws, Straws, Straws”](#) 3 Act Task: Use base-10 knowledge to develop strategies to count large quantities more efficiently.

- **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. Showcase different strategies students used and allow them to respond/give feedback within the virtual platform.
 - Suggested Virtual Tools

- Showme App - Here is a video tutorial on how to use the ShowMe app:
https://youtu.be/ALfENx4O_6M
- Flip Grid -Here is a user's guide for Flipgrid:
<https://drive.google.com/file/d/0BzZGEfOtEWqPcGUzcFd2RzRjYTQ/view>
- **Unplugged/ Offline:** Provide students with information from Act 2 and provide them with the main question “how many straws are there?” Ask students to answer the question and provide a drawing that demonstrates how they solved the problem.

Base Ten Pictures *In this task, students create pictures using base ten blocks. They then record base ten information about their creations.*

- **Synchronous:** Complete during a classroom discussion
- **Asynchronous:** Provide students with the materials to complete part one on their own. Allow students time to virtually share the types of animal they created and how that animal travels. Create a table with the information students shared and encourage them to complete the graphing task in part two. Students can complete this task in any word processor or presentation tool (Google Docs, Microsoft Word, Google Slides, Microsoft PowerPoint). The Showme App is also a great application to use with students for this activity. Additionally, Flipgrid can be used in the virtual environment.
 - Showme App - Here is a video tutorial on how to use the ShowMe app:
https://youtu.be/ALfENx4O_6M
 - Flip Grid -Here is a user's guide for Flipgrid:
<https://drive.google.com/file/d/0BzZGEfOtEWqPcGUzcFd2RzRjYTQ/view>
- **Unplugged/ Offline:** Provide students with the materials to complete part one on their own. For part two, provide students with a pre-populated table showing the different ways animals travel.

Name	Tally	Value
Walk	  	12
Fly	 	6
Slither		2

- For example:

Apply

Great Georgia Pollinator Census

Pollinators help provide around 35 percent of the food we eat. One in four bee species are suspected of approaching extinction. Engage learners in an investigative scenario that explores the importance of pollinators. Work with students to determine steps that can be taken to increase the number of pollinators in their communities. Though the Great Georgia Pollinator Census takes place in the Fall, the resources used to conduct the census can be used year-round to collect and examine data.

- Begin this investigation by facilitating individual or group research about pollinators. Explore what pollinators are, why they are important, and the importance of local action to increase the number of pollinators. Use the [Insect Identification PowerPoint](#) to familiarize students with various types of pollinators.
- Use the [Pollinator Counting Sheet with Visuals](#) to have students count pollinators in school or at home.
- Compile the quantities from individual counting sheets and have students analyze the values presented using base ten understanding.
- Have students collectively or individually analyze the data and create bar graphs.
- Repeat the pollinator count on a regular basis throughout the year. Encourage students to count pollinators in the same location as the initial investigation. Compare data from each count.
- As an extension, utilize the Engineering Design Process or Design Thinking to engage students in student-centered problem solving to brainstorm ways to increase the pollinator population in the local community.
- **Synchronous:** Utilize resources from the Great Georgia Pollinator Census to conduct a pollinator count in school or at home. Combine student data to create a classroom data set. Use classroom data to create bar graphs of the data sets. Have students indicate which pollinators are most common at the school or in the local community.
- **Asynchronous:** Provide students with a link to the Pollinator Counting Sheet to complete at home with an adult present. Provide the combined data set for the classroom in your learning management system. Have students use the classroom data to create bar graphs of the data sets using an online tool such as [NCES KidsZone](#). Have students submit a paragraph indicating which pollinators are most common at the school or in the local community.
- **Unplugged/ Offline:** Provide students with printed copies of the Pollinator Counting Sheet to complete a count at home with an adult present. Have students use the classroom data to create bar graphs of the data sets using [centimeter grid paper](#). Have students submit a paragraph in a math journal or on paper indicating which pollinators are most common at the school or in the local community.

Reflect

Would you rather problem: Would you rather have 23 hundreds, 48 tens, and 9 ones OR 26 hundreds, 17 tens, and 22 ones. Encourage students to explain their reasoning.

- **Synchronous:** Complete the problem as an exit/out the door ticket.
- **Asynchronous:** Have students share their answers in a shared documents or online comment forum.
- **Unplugged/ Offline:** Have students respond to the prompt in a math journal or on paper.

For virtual learning environments, students can use any word processor (Google Docs or Microsoft Word) and/or Presentation tool (Google Slides or Microsoft PowerPoint) to create digital tables and share/collaborate in real time using the virtual share features.

Evidence of Student Success

The tasks below include formative and summative assessment options (during learning or at the conclusion):

“Straws, Straws, Straws” 3-Act Task Formative Questions:

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

“Base Ten Pictures” Formative Assessment Questions:

- How many blocks did you use to create your animal?
- How did you count the number of blocks?
- How many blocks did your partner use?
- Who used the most blocks?
- How could you create an animal to make it easiest to count?
- How did you count the total number used?
- Can you show me this number in standard form?
- What is the number in expanded form?

[Assessment Task Big Idea: Extend Understanding of Base-Ten Notation](#)

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.

Straws, Straws, Straws

- **Acceleration:** Give students a large amount of straws to bundle into groups of 10 and count. Have students record answers in groups of 10 as well as in numeric form.
- **Intervention:** Give students Base 10 blocks to help visualize and count the 83 bundles of ten by being able to “see” that 10 groups of 10 are 100.

Base Ten Pictures

- **Acceleration:** Have the students determine the money amounts of each of the pieces and then determine how much their picture costs.
- **Intervention:** Provide sample pictures that the student can recreate with real base ten blocks. The picture can then be labeled with the correct values and then created with centimeter paper.

Engaging Families

- [Khan Academy: Number and Operations in Base Ten](#)

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