MATH UP Grade 3 Summer Learning

For students who have just completed Grade 3

Because much of the addition and subtraction work with numbers we commonly use stops in Grade 3, it makes sense to review both number representation and the addition and subtraction of wholes. Because multiplication becomes increasingly prominent in Grade 4, reviewing the basics is valuable. Work on increasing patterns and bar graphs is also useful and provides a nice reprieve from work only on numbers.

Therefore, the Grade 3 topics I decided to focus on to ready students for Grade 4 are the following:

- Representing numbers/ decomposition
- Adding and subtracting whole numbers
- Multiplication and division facts
- Increasing patterns
- Bar graphs

Essential Understandings that are the focus of the support:

WN–1 Every whole number can be represented in many ways. Each way highlights something different about that whole number.

WN–2 A place-value system standardizes how whole numbers are decomposed and how that decomposition is recorded. A place-value system makes it easier to describe and compare numbers.

O–1 Any addition situation involves parts and a whole. The parts are known, but the whole is not known.

O–2 Any subtraction situation involves parts and a whole. One or more parts and the whole are known, but not all of the parts are known.

O–3 Multiplication is about a change from a unit of a given size to a unit of 1. You know the size and the number of units (the size and the number of groups) and you multiply to figure out the number of units of 1 (the product).

O–4 Division is about a change from a unit of 1 to a unit of a given size. You know the number of units of 1 and the size of the unit (the dividend and the size of the group) and you divide to figure out the number of units (the number of groups). Or you know the number of units of 1 and the number of units (the dividend and the number of groups) and you divide to figure out the size of the unit (the size of the group).

O–5 There are relationships among the four operations. Addition and subtraction are inverse operations. Multiplication and division are inverse operations. Any multiplication situation can be thought of as repeated addition and vice versa. Any division situation can be thought of as repeated subtraction and vice versa.

O–6 A place-value system standardizes how numbers are decomposed (i.e., in tenths, ones, tens, hundreds, and so on) and how that decomposition is recorded. Decomposing by place value makes it easier to perform operations with numbers.

O–7 Performing operations with numbers is often made easier by decomposing and recomposing numbers and/or by thinking of numbers in other units.

O–9 Estimating is an essential part of any computation to catch errors or to give a feel for how to proceed with a calculation.

O–10 There are always multiple strategies for determining the result of a computation, whether it is an estimated or an exact result.

PA–1 Every pattern involves some kind of repetition.

PA–2 A pattern can be represented in many ways. Each way highlights something different about the pattern.

Grade 3 Summer Learning

For students who have just completed Grade 3

PA–3 There is no way to be certain how a pattern continues without a pattern rule.

PA–5 Many ideas about number, geometry, measurement, and data can be revealed by exploring underlying patterns.

DA–1 The way a set of data is to be organized should be affected by what information is wanted from the set of data and can affect what we conclude from it.

DA–3 Often a visual data display makes it easier to show data. The type of graph used depends on what we want viewers to see, including frequency (how often something occurs), comparisons between categories, changes over time, and so on.

Grade 3 Summer Learning

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This has been set up for 20 sessions of about 1.5 to 2 hours each:

- Each day includes at least one Number Talk.
- Each day also includes either a Diagnostic Task, which may be followed up with an additional Number Talk or some practice activities, or a MathUP lesson, which is followed up with practice activities.

Number Talks that are particularly recommended are the following:

Grade 3: 2, 6, 7, 9, 10, 12, 13, 14, 18, 22, 25, 40, 42, 52
Grade 4: 4, 12, 14, 64, 71, 72

Grade 4 Diagnostic Tasks to check on prerequisites from Grade 3 come from these topics:

- Representing Whole Numbers
- Adding and Subtracting Whole Numbers
- Adding and Subtracting Decimal Numbers
- Patterns
- Displaying and Interpreting Data

On a day that a Diagnostic Task is used (based on the five focus topics), there is a Number Talk followed by the Diagnostic Task. The task should be described as an activity, not a test, to reduce any anxiety students might feel.

It might be appropriate to review some of the vocabulary in the Diagnostic Task before administering it.

If students struggle with the Diagnostic Task, it might be a good idea to go back to the related Grade 3 Diagnostic Tasks and treat them as additional activities. These tasks come from the following topics:

- Representing Whole Numbers
- Adding and Subtracting Greater Numbers
- Representing Multiplication and Division
- Multiplying and Dividing
- Patterns
- Displaying and Interpreting Data

If there are no problems with the Diagnostic Task and you have more time to work with students, you might choose to work on additional Number Talks, or you might choose to use one or more of these Minds On activities from the following topics:

- Estimating and Comparing Whole Numbers
- Adding and Subtracting Numbers Less Than 100
- Fractions
- Coding
- Perimeter

The suggested MathUP lessons that follow assume that students are working at the Grade 3 level and that it is not necessary to return to lessons from an earlier grade.

Before beginning a lesson, it would be valuable for the teacher to read the Sum It UP section to review the content being covered and then move on to the three parts of the lesson — Minds On, Action, and Consolidate — followed by the Your Turn Questions and additional suggested practice activities.

Grade 3 Summer Learning

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Strand	Topic	Lesson	* Prerequisite Topics
N	Representing Whole Numbers *	**Lesson 2** Representing Three-Digit Numbers **Lesson 3** Comparing Representations of Three-Digit Numbers	Skip Counting
N	Adding and Subtracting Greater Numbers*	**Lesson 1** Adding Three-Digit Numbers **Lesson 2** Subtracting Three-Digit Numbers	Adding and Subtracting Numbers Less Than 100
N	Representing Multiplication and Division	**Lesson 1** Representing Multiplication Using Sets and Arrays **Lesson 2** Representing Multiplication on a Number Line **Lesson 3** Representing Division as Sharing **Lesson 4** Creating Groups of a Given Size	None
N	Multiplying and Dividing *	**Lesson 1** Multiplying in Parts **Lesson 3** Multiplication Patterns **Lesson 4** Dividing in Parts	Representing Multiplication and Division
A	Patterns	**Lesson 1** Patterns in Charts and on Number Lines **Lesson 2** Relating a Number Pattern to a Rule or a Picture	None
D	Displaying and Interpreting Data *	**Lesson 1** Pictographs With Scale **Lesson 2** Bar Graphs With Scale	Representing Multiplication and Division Multiplying and Dividing Collecting, Organizing, and Describing Data