Grade 7 Summer Learning

For students who have just completed Grade 7

Because work with rate, ratios, and percents, including graphing rate relationships, is so important in Grades 7 and 8 and even beyond, it is logical to focus on those topics in this review. As well, the addition and subtraction of integers is an important aspect of the Grade 7 math curriculum and worth revisiting. Almost all learning about volume and circle measurement is begun in Grade 7, so these are also important topics to review. And because algebra becomes increasingly important in going up the grades, it makes sense, as well, to focus some summer learning on algebraic ideas.

Therefore, the Grade 7 topics I decided to focus on to ready students for Grade 8 are the following:

- Percent calculations
- Solving rate/ratio problems
- Addition and subtraction of integers
- Evaluating algebraic expressions and solving equations
- Graphing linear relationships
- Circle measurement
- Volume relationships

Essential Understandings that are the focus of the support:

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–5 There are relationships among the four operations. Addition and subtraction are inverse operations.

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–13 Subtracting an integer can be thought of as adding its opposite.

PR–1 Sometimes it is useful to compare two numbers in terms of how far apart they are, but other times it is useful to compare them in terms of how many units of one number it would take to fit into the other.

PR–2 Any comparison involving a ratio can be thought of as a fraction and vice versa.

PR–5 Any rate or ratio relationship can be represented in different ways. Different representations might be useful in different situations.

A–1 Many of the properties that underlie operations are useful in certain circumstances to simplify calculations or to predict how specific values of expressions will change with a change in the value of a variable.

A–2 Equality is an expression of balance. The two sides of an equation describe the same quantity.

A–6 Solving an equation uses relationships between numbers and relationships between operations to determine an equivalent, simpler form of the equation.

A–7 Knowing a relationship between two variables allows you to predict information about one based on what you know about the other.

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.

M–5 Estimating is a useful part of the measuring process. Estimating is facilitated by using familiar benchmarks.

M–6 Some measurements of an object are independent of other measurements of that object, but some are related.

M–7 Sometimes known measurements can be used to calculate unknown measurements.

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M–8 Measurement formulas allow us to use measurements that are simpler to determine in order to calculate measurements that are more difficult to determine.

SO–5 Geometric constructions are based on properties of various geometric shapes.

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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 7: 7, 28, 29, 30, 31, 33, 34, 36, 37, 38, 41, 45, 49, 50, 59, 66, 75
Grade 8: 5, 7, 10

Grade 8 Diagnostic Tasks to check on prerequisites from Grade 7 come from these topics:

- Percent
- Integer Operations
- Using Algebra
- Solving Equations and Inequalities
- Linear Patterns and Relationships
- Measurement

On a day that a Diagnostic Task is used (based on the seven 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 7 Diagnostic Tasks and treat them as additional activities. These tasks come from the following topics:

- Adding and Subtracting Integers
- Rates and Ratios
- Percent
- Algebra
- Representing Linear Relationships
- Circle Measurement
- Volume

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:

- Powers and Roots
- Adding and Subtracting Integers
- Decimal Operations
- Fractions
- Rates and Ratios
- Algebra
- Representing Linear Relationships
- Probability

- Circle Measurement
- Volume

The suggested MathUP lessons that follow assume that students are working at the Grade 7 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.

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Strand	Topic	Lesson	* Prerequisite Topics
N	Adding and Subtracting Integers	**Lesson 2** Adding Integers **Lesson 3** Subtracting Integers by Adding On	None
N	Rates and Ratios	**Lesson 2** Solving Ratio Problems **Lesson 3** Solving Rate Problems	None
N	Percent *	**Lesson 1** Determining the Whole From a Percent **Lesson 2** Percent Increases and Decreases	Rates and Ratios
A	Algebra	**Lesson 1** Evaluating Expressions **Lesson 2** Solving Equations	None
A	Representing Linear Relationships *	**Lesson 1** Graphing Linear Relationships	Rates and Ratios Algebra
SS	Circle Measurement *	**Lesson 1** Circumference of a Circle **Lesson 2** Area of a Circle	Powers and Roots
SS	Volume *	**Lesson 2** Volume of Rectangular Prisms **Lesson 3** Volume of Triangular Prisms **Lesson 6** Volume of Cylinders	Circle Measurement