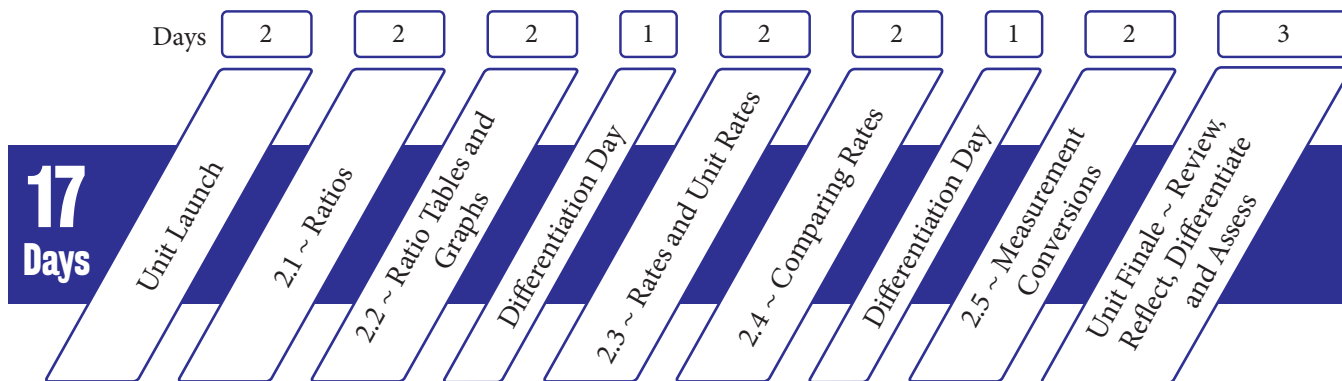


Unit Pacing



Standards Correlation

Focus Content Standards

The following Focus Content Standards comprise one of the major clusters for the year. While all three of the Grade 6 standards within the Ratios and Proportional Relationships domain are targeted in this unit, standard 6.R.P.A.3 will be revisited as a Focus Content Standard in Unit 3 *Percents* and Unit 6 *Equations*. All standards in this unit are formatively assessed throughout the unit and summatively assessed in the unit's Test Prep, Performance Assessment and Unit Assessments.

		Lesson	2.1	2.2	2.3	2.4	2.5
6.R.P.A.1 MAJOR	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.		✓				
6.R.P.A.2 MAJOR	Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship.				✓	✓	
6.R.P.A.3 MAJOR	Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. <ul style="list-style-type: none"> a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. b. Solve unit rate problems including those involving unit pricing and constant speed. c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. 		✓ 3a	✓ 3a	✓ 3b	✓ 3b	✓ 3a,d

In this unit, students are able to connect to multiple standards with thoughtful interactions. Students use previously learned whole number and decimal operations (6.NS.B.2, 6.NS.B.3) when solving problems involving ratios, rates and measurement conversions. They will represent ratio relationships on pairs of number lines (6.NS.C.6) and as ordered pairs on the coordinate plane (6.NS.C.8), helping them to develop an understanding for how two quantities change in relationship to one another (6.EE.C.9). While working with measurement conversions, students will have opportunities to solve problems involving dimensions, areas and volumes of figures (6.G.A.1-2).

Focus Mathematical Practice Standards

The Standards for Mathematical Practice (SMPs) are integrated throughout EdGems Math. Each lesson specifically provides implementation guidance for the SMPs in the Teacher Guide. Students also have the opportunity to identify moments in which they apply the SMPs throughout the unit using the Mathematical Practices Tracker. The SMPs can be formatively assessed during the unit Storyboards (SMP2) and Performance Task (SMP6) and summatively assessed during the Performance Assessment (SMP3).

Lesson	2.1	2.2	2.3	2.4	2.5
Focus Math Practice	SMP5	SMP8	SMP2	SMP3	SMP7

Content Analysis

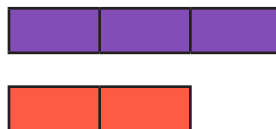
In this unit, students will build upon their previous understandings of fractions, multiplication and division to explore the concepts of ratios and rates. A ratio is a comparison between two or more quantities that may have the same units (four tennis balls to two golf balls) or different units (14 miles every two hours). Ratios involving different units are often referred to as rates. Students will use ratio language, such as “to,” “per” and “for every,” to describe the relationship between quantities and they will represent ratio relationships in many forms to explore equivalence (or proportionality). These representations, which will be introduced early in the unit, include the following:

Words & Numbers

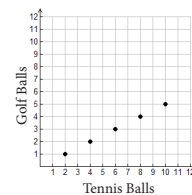
Cylinders to Prisms

As a fraction: $\frac{3}{2}$
 Using a colon: 3 : 2
 Using the word “to”: 3 to 2

Tape Diagrams



Graphs

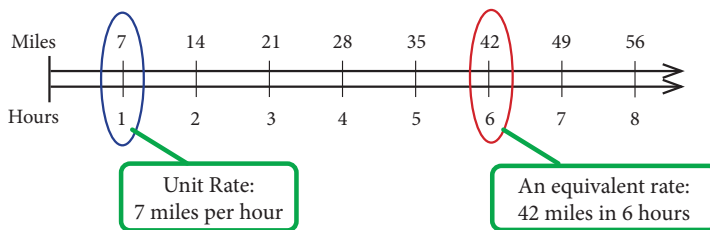


Tables

Birch Trees	16	2	22
Oak Trees	40	5	55

Arrows indicate operations: +8 and ×11 from 2 to 22; ÷8 and ×11 from 5 to 55.

Double Number Lines



Toward the end of the unit, students will use ratio and rate concepts and representations to solve problems in authentic contexts, such as to make comparisons of speed, duration or price and to convert measurements within or between systems. For example, to convert from centimeters to meters, students could create a table of equivalent ratios or multiply the number of centimeters by the conversion factor $\frac{1 m}{100 cm}$. Later in the year, students will revisit ratios to develop an understanding of percentages (as a rate per 100). In future courses, students will expand their understanding of equivalent ratios to compute with ratios of rational numbers and to explore the algebraic nature of proportionality. For example, the ratio of two birch trees to five oak trees can be represented by an equation in the form $y = rx$, where r represents the unit rate. In this case, the equation $y = \frac{2}{5}x$ can be used to show $\frac{2}{5}$ birch tree, x , for every one oak tree, y . Explorations of proportionality will eventually connect to students’ work with geometry and statistics in Grades 7 and 8, and evolve into the study of linear and nonlinear functions in Grade 8 and beyond.

Readiness Check & Learning Progression

Readiness Check Skills

Skill 1: I can identify equivalent fractions and write fractions in simplest form. **3.NF.A.3b**

Skill 2: I can graph ordered pairs in Quadrant 1. **5.G.A.1**

Skill 3: I can interpret a fraction as a division problem. **5.NF.B.3**

Skill 4: I can convert measurements within the same system of measurement. **5.MD.A.1**

Previously, students have...

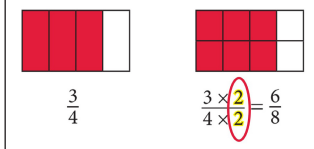
Interpreted a fraction as a division problem.

5.NF.B.3

$$\frac{4}{3} \rightarrow 4 \div 3 \rightarrow 1\frac{1}{3}$$

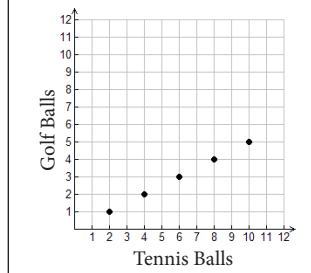
Used multiplication and division to find equivalent fractions.

4.NF.A.1, 5.NF.B.4



Graphed ordered pairs in the first quadrant.

5.G.A.2



Converted measurements within a system.

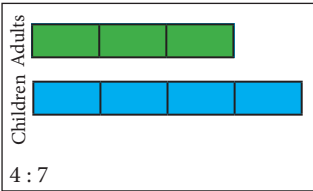
5.MD.A.1

12,000 meters = _____ kilometers
 7 yards = _____ feet
 430 millimeters = _____ centimeters
 9,000 pounds = _____ tons

In this unit, students will...

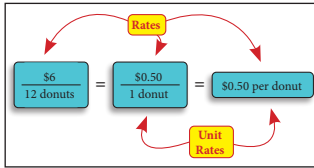
Use ratios to represent situations.

6.RP.A.1



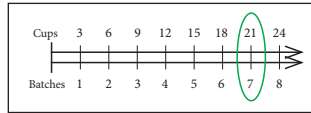
Understand and calculate unit rates.

6.RP.A.2



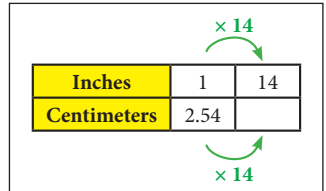
Use ratios to solve real-world problems.

6.RP.A.3



Use ratios to convert measurements within and between systems.

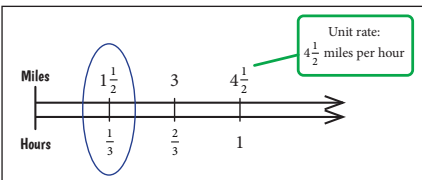
6.RP.A.3



In the future, students will...

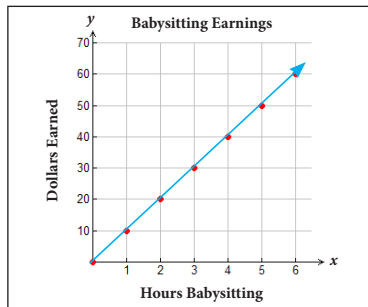
Compute unit rates with ratios of fractions.

7.RP.A.1



Recognize and represent proportional relationships.

7.RP.A.2

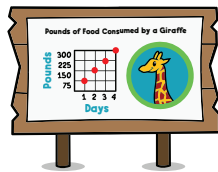


Explore proportional and nonproportional relationships.

7.RP.A.2, 8.AEE.B.5, 8.AEE.B.6

Proportional				Not Proportional			
x	y	$\frac{y}{x}$	$\frac{y}{x}$ is the unit rate.	x	y	$\frac{y}{x}$	
0	0	--		0	0	--	
1	4	$\frac{4}{1}$		1	2	$\frac{2}{1}$	
2	8	$\frac{8}{2} = \frac{4}{1}$		2	4	$\frac{4}{2} = \frac{2}{1}$	
3	12	$\frac{12}{3} = \frac{4}{1}$		3	8	$\frac{8}{3}$	
4	16	$\frac{16}{4} = \frac{4}{1}$		4	16	$\frac{16}{4} = \frac{4}{1}$	

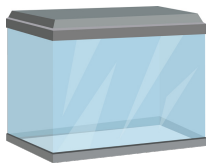
Storyboards



In this series of Storyboards, students will explore ratio and rate concepts in the context of a school field trip to the zoo. Students will reason abstractly and quantitatively (**SMP2**) as they explore changing quantities in ratios and rates (**6.RP.A.1-3**), while considering how zoos impact the animals they care for.

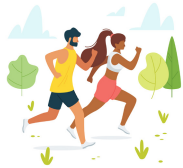
Storyboard	Learning Outcome
Storyboard Launch	Consider how quantities can be compared
Lesson 2.1 Storyboard	Use ratio language to understand a relationship
Lesson 2.2 Storyboard	Use a tape diagram to solve a ratio problem
Lesson 2.3 Storyboard	Use the unit rate to solve a problem
Lesson 2.4 Storyboard	Use ratio language to write an equivalent rate
Lesson 2.5 Storyboard	Compare rates
Storyboard Finale	Use ratios, rates and measurement conversions to compare unit rates

Performance Task



In “Aquariums,” students will apply rates, measurement conversions, and volume of rectangular prisms to determine how long it will take to fill an aquarium tank. Students will attend to precision (**SMP6**) as they discover shape and space using volume, measurement conversions and unit rates (**6.RP.A.1-3**, **6.G.A.2**), to predict if there will be enough time to fill the aquarium.

Performance Assessment



In this Performance Assessment, students will compare the rates of runners using various representations. Students will construct viable arguments (**SMP3**) as they explore changing quantities using rates, unit rates, and measurement conversions (**6.RP.A.1-3**), to predict who will win the race.

Fluency Boards

Target Skill	Standard(s)
Unit 2 Target Skill 1: Add and subtract decimals	5.NBT.B.7, 6.NS.B.3
Unit 2 Target Skill 2: Add and subtract fractions	4.NF.B.3, 5.NF.A.1