SD Common Core State Standards Disaggregated Math Template

Domain:	Number Sense	**Cluster:**	Know that there are numbers that are not rational, and approximate them by rational numbers	**Grade level:**	8

Correlating Standard in Previous Year	Number Sequence & Standard	Correlating Standard in Following Year
7.NS.2d Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	8.NS.1. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	9-12.N-RN.3 Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

Student Friendly Language:
I can look at the decimal form of any real number and identify it as rational or irrational. I can understand that every real number can be written as a decimal. I can convert a repeating decimal into a fraction.

Know (Factual)	Understand (Conceptual) The students will understand that:	Do (Procedural, Application, Extended Thinking)
• Rational numbers • Irrational numbers • Real Numbers • Decimal expansion • Terminating decimals • Repeating decimals	All real numbers can be written in decimal form. There are rational and irrational numbers. Rational numbers in decimal form repeat or terminate. Irrational numbers in decimal form do not repeat or terminate.	Write any real number in decimal form. Convert terminating or repeating decimals to fractions. Classify any real number as rational or irrational.

Key Vocabulary:				
Rational numbers	rrational numbers	Real numbers	Decimal expansion	fractions
Terminating decimals	Repeating decimals	Non-terminating	Non-repeating decimals	Square roots
Relevance and Applications: How might the grade level expectation be applied at home, on the job or in a real-world, relevant context? Include at least one example stem for the conversation with students to answer the question “why do I have to learn this”?				
Mary has a batting average of .54545454..... What is this as a fraction?				

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Domain:	Number System	**Cluster:**	Know that there are numbers that are not rational, and approximate them by rational numbers	**Grade level:**	**8**

Correlating Standard in Previous Year	Number Sequence & Standard	Correlating Standard in Following Year
7.NS 2.d Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in zeros or eventually repeats.	8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). For example, by truncating the decimal expansion of √2 (square root of 2), show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.	9-12.N-RN 3 Explain why the sum or product of rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

Student Friendly Language:

I can approximate the size of an irrational number by changing it to its decimal form.
I can use the approximated decimal form of an irrational number to place it on a number line.
I can estimate the value of an expression that has an irrational number.

Know **(Factual)**	**Understand** **(Conceptual)** **The students will understand that:**	**Do** **(Procedural, Application, Extended Thinking)**
• Approximating irrational numbers • Truncating	Irrational numbers fall between two rational numbers. Irrational numbers can be placed on a number line. Irrational numbers and expressions have a never-ending value that can be truncated. Irrational numbers can represent real quantities such as π and non-perfect square roots.	Approximate irrational numbers to compare and order them. Graph approximated irrational numbers on a number line. Estimate the value of an expression that has an irrational number.

Key Vocabulary:

Rational numbers	Irrational numbers	Truncate	Approximate	Square root
Perfect squares	Expression	Number line	π	

Relevance and Applications: How might the grade level expectation be applied at home, on the job or n a real-world, relevant context? Include at least one example stem for the conversation with students to answer the question "why do I have to learn this"?

In real life, we encounter situations in which our calculations result in irrational numbers. In order to deal with these situations, we round to an appropriate number of decimal places for the situation. Common applications are in the fields of carpentry, engineering, and surveying. It is important to take into account round-off error when calculating very large or very precise measurements. An example of the possibility of substantial round-off error is in calculating the circumference of the earth.

For example, by truncating the decimal expansion of √2 (square root of 2), show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.

It is Christmas time and I want to decorate my farm yard with Christmas lights. I will be putting lights on all the buildings and grain bins in the yard. I need to figure out how long the string of lights needs to be to go all the way around my grain bin. (You will be finding the circumference of a circle which uses π.)

If your doorway is 7 feet by 3 feet, will a table that is 8 feet in diameter fit through it? (Pythagorean Theorem)

If you have a circular garden and you need to calculate how much fertilizer you need, you would need to use π to calculate the area.

Calculate the volume of a snow cone cup.

How much wrapping paper would you need to wrap a gift in the shape of a cylinder?

Sue has a square garden in her backyard with an area of 210 square feet. Estimate a side of the garden to the nearest tenth of a foot.