Part of the Lesson	Stem	Teachers Script
Introduction *10-20 sec*	In this lesson you are going to learn…by doing/using…	Hello Mathematicians. After this lesson, you will be able to differentiate between rational and irrational numbers.
Connection **(**Define Terms/ Building on Prior Knowledge) *30-60 sec*	You know that…	You remember that a rational number is any number that can be expressed in the form a/b where a and b are integers and b does not equal zero. This includes all integers, all fractions and mixed numbers formed from integers and any decimal that terminates or repeats. An irrational number is a number that cannot be expressed in the form a/b where a and b are integers and b does not equal zero. This includes all decimals that never terminate and never repeat and since they never terminate or repeat, they must be written with a symbol. The most common irrational numbers we see are numbers that end in a "...", square roots of numbers that are not perfect squares and any number or term that includes pi.
Demonstration *1-3 minc*	I'm going to explain this idea by showing you¦	So let's look at a set of numbers and determine which numbers are rational and which numbers are irrational. 0.01324..., radical 20, -2/3, 9.7 repeating, radical 81, pi/4, 0 0.01324... - the ... indicates this decimal continues forever and it does not seem to be repeating, so it is irrational, there is no way we could write this in the form a/b with a

		and b as integers. 20 is not a perfect square, so radical 20 would be irrational -2/3 is already written in the form a/b, and both -2 and 3 are integers, so this is rational 9.7 repeating is rational. You can write any repeating decimal as a fraction. 9.7 repeating could be written as 9 and 7/9. Radical 81 is 9, which is rational because it can be written as 9/1. Pi/4 is in the form a/b, but in this case a is pi, which is not an integer, so pi/4 is irrational...any number with pi in it is irrational 0 is rational. We can write it as 0/1, and since both 0 and 1 are integers, we have a rational number.

		Here is another question we could see. Which of the following squares would have an irrational side-length? Area of 25 - Area of 64 - Area of 121 - Area of 50 The square with an area of 50 would have an irrational side length, because one way to find the side length of a square it to take the square root of the area. Each of the first three are perfect squares and so when you take the square root, you would get an integer side-length. But 50 is not a perfect square, so its square root would be irrational. Which of these approximations of pi are irrational? 22/7 3.14 3.14159 All of These None of these None of these approximations of pi are irrational. The first is clearly rational as it is in the form a/b where both a and b are integers. The other two are terminating decimals, and as long as a decimal terminates, we can write it in the form a/b, and therefore it is rational. They are all very close approximations of pi, but they are all

		rational approximations of pi.
Application *1-2 min*	Let's see how this works in a problem¦	Ok, let's see how you are doing on differentiating between rational and irrational numbers. One last practice problem. Which of the following represents a rational number? - The exact circumference of a circle with a radius of 10 - The quotient of 4521 and 82 - The side length of a square that has an area of 12 - 1.121314.... - The quotient of radical 7 and 4 Did you get B? B is the only choice that can be written in the form a/b where a and b are both integers. A is not because you find circumference by multiplying diameter times pi. You would get 20 pi, which is an irrational number.

		C is not, because to find the side length, you would take the square root of 12. 12 is not a perfect square, so its square root is irrational. 1.121314... has the ...that indicates it continues on forever without repeating and is therefore irrational. The quotient or radical 7 and 4 can be written as a/b, but a would not be an integer, and therefore it is not rational. B is rational because you can write it as 4521/82. I do not know the exact decimal value of that, but it is already written in the form a/b and both numbers are integers, so this is a rational number.
Conclusion *10-20 sec*	So, now you know how to…by…	So now you can differentiate between rational and irrational numbers.