

Helping Kids Learn – Post #26 3/12/24 In honor of Pi (π , Pie) Day How to Remember π (Pi)

The ratio of the circumference of a circle to its diameter is so useful and special it gets its own symbol: the Greek letter π (Pi). When we write the ratio as a decimal number, the digits after the decimal point apparently never form a repeating pattern. At least, nobody has found one for thousands of years. Mathematicians call any non-repeating number *irrational*, possibly because its non-repetition isn't well-behaved (rational).

Some clever person noticed that March 14^{th} could be written using the first three digits of π as a decimal number: 3.14. Because we say π like the English word "pie," March 14^{th} has been named Pi Day to celebrate π . Not much in math gets its own day – and a delicious one at that!

Because it is used a lot, it is handy to know the decimal *approximation* of π instead of having to calculate it each time. Some people just have fun remembering as many digits of π as they can.

Investigation 1 – Pilish

Before, the 20th century only about 200 digits of π were *known* – and people could memorize that many. Modern computers calculated π to many decimal places, exploding the memorization task. One way people remember the digits is by creating Pilish: English phrases and sentences whose words have as many letters as the digits in π . Pilish

The first 10 digits of π 3.141592653

is a portmanteau word – made of parts of two words stuck together pi- and -lish. (say π -*lish*).

For example, *How*, *I said* could represent 3.14.

Create a Pilish phrase or sentence that makes some sense and represents the first 5 digits of π .

3.1416 (rounded) or 3.1415 (not rounded)

Next, try the first 10 digits.

3.141592653 (two ways to round – the 11th digit is 5)

Investigation 2 – Piems

Piem is another portmanteau, this time of "pi" and "poem," pronounced *pi*-em. You guessed it – a piem is a poem in which the words have the number of letters corresponding to the digits in π .

Write a piem that has a theme (one subject) but doesn't necessarily rhyme. You decide how many words (digits of π).

Now try one that rhymes!

Try writing a piku – a piem in which the *syllables* match the digits in π . (Think about a haiku.)

Or break new ground: try a rap or spoken word piem!

Keep Learning

For more information, check some of these Online resources (up-to-date as of 3/24):

Pi https://en.wikipedia.org/wiki/Pi

Piphilology <u>https://en.wikipedia.org/wiki/Piphilology</u>

Pilish <u>https://www.bbc.com/future/article/20160311-how-the-number-pi-inspired-a-writing-</u> <u>style</u> (requires free registration on the BBC website); <u>https://www.npr.org/sections/bryantpark/2008/03/a challenge for pi day write y.html;</u> <u>http://www.cadaeic.net/pilish.htm;</u> <u>https://www.valhallaconsulting.com.au/PilishChecker.html</u>

Transcendent Number π is also a transcendent number – it is <u>not</u> the solution of any nonconstant rational polynomial https://en.wikipedia.org/wiki/Lindemann%E2%80%93Weierstrass theorem

NJ Student Learning Standards

ELA: RL.5.4, RL.5.9, NJSLSA.W10. NJSLSA.L1, NJSLSA.L4; NJSLSA.W.5, W.8.2; W.9-10.4.D; W.11-12.3.D

Mathematics: 8.NS.A.1, 8.NS.A.2, 8.G.C; HS.G.C.A., HS.G.GPE, HS.G.MG.A.1