

# RAFT IDEAS

**Topics:** Geometry, Pi,  
Irrational numbers, circles

## Materials List

- ✓ 120 cm (4 feet) of cord, string, or yarn
- ✓ 140 or 147 mini pony beads (see instructions for details on colors)
- ✓ Optional: a special, larger bead, or small triangle to represent the first digit, “3”

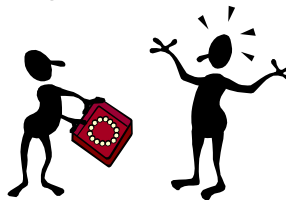
This Activity can be used to teach:

- Area & Circumference of Circle (Common Core Math Standards: Grade 6, Geometry, 6; Grade 7, Geometry, 4)
- Irrational numbers (Common Core Math Standards: Grade 7, Number System, 4, 5; Grade 8, Number System, 1, 2)



# Wearable Pi

Encoding  $\pi$  Into Jewelry Fun!



The concept of irrational numbers like Pi ( $\pi$ ) can be a bit daunting for students at first. In this activity, students encode the first few digits of Pi ( $\pi$ ) into a necklace as a fun way to present or reinforce the circle ratio, especially on March 14<sup>th</sup> (Pi day)!

**To Do and Notice** (This Idea Sheet presents 2 ways of making a Pi ( $\pi$ ) Necklace)

**Method 1:** Represent the digits of Pi ( $\pi$ ) by the numbers of beads of a color. This method requires 147 beads to represent the first 31 digits. If using 2 alternating colors, students will need 64 beads of the first color and 83 beads of the second color.

**Method 2:** Represent Pi ( $\pi$ ) by assigning a different color for each digit: 0-9. This method requires 140 beads to make a necklace representing the first 141 digits:

13 for “0”	18 for “2”	14 for “4”	13 for “6”	18 for “8”
11 for “1”	15 for “3”	12 for “5”	10 for “7”	16 for “9”

1. Decide which method to use. For each method, the first digit (“3”) is not represented by a pony bead, but rather by a special bead or large knot.
2. Measure out cord and count out the required number of beads. You may wish to have students figure out how many beads of each color they will need on their own.
3. If using Method 2, assign a different color for each digit.
4. Temporarily knot one end of the cord and string on beads to represent the digits. Begin with the first digit after the decimal (“1”).
5. When finished stringing the beads, undo the temporary knot and represent the first digit of Pi (“3”) by attaching a special bead, a triangle, or by tying off the two ends with a large, decorative knot.

## The Math Behind the Activity

Any perfect circle’s circumference divided by its diameter is a constant ratio represented by the Greek letter Pi ( $\pi$ ). As an irrational number, Pi ( $\pi$ ) continues ad infinitum. Many ancient civilizations (Greeks, Egyptians, Babylonians, Chinese) knew of Pi ( $\pi$ ), but had only derived the first few digits; we now know billions.

The first 141 digits of Pi are: **3**.1415926535 8979323846 2643383279 5028841971 6939937510 5820974944 5923078164 0628620899 8628034825 3421170679 8214808651 3282306647 0938446095 5058223172

**Web Resources** (Visit [www.raft.net/raft-idea?isid=455](http://www.raft.net/raft-idea?isid=455) for more resources!)

For more on the history of Pi ( $\pi$ ), the first 10,000 digits, and more information visit <http://www.joyofpi.com/> or <http://oldweb.cecm.sfu.ca/pi/pi.html>