



Everyone's favourite math symbol, Pi ( $\pi$ ), is the symbol used to represent the ratio of the circumference of a circle to its diameter - which is a constant with the approximate value of 3.14159. Pi has been calculated to over one trillion digits beyond its decimal point. This activity is a tactile and enjoyable investigation of Pi. Eating the licorice is an added bonus!

# Circumference Search with Licorice Laces

## What you need:

Shoestring licorice laces | Scissors | Food items with a circular or cylindrical shape: marshmallows, donuts, cookies, two bite-brownies

## What to do:



1. Give each student several pieces of shoestring licorice and a series of circular or cylindrical items of different sizes. Items can include: marshmallows, cookies, donuts, two-bite brownies.
2. Students will use their licorice as a measuring tool. Starting at one end of the licorice, have them wrap their licorice around the outside of the marshmallow.
3. They should then cut it carefully so that they have a piece of licorice that is the same size as the circumference of the circle. (Image 1)
4. Have them lay this "circumference-sized" piece across the top of the marshmallow and carefully cut a piece of licorice the same size as the diameter of the circle.
5. Repeat Step 4 until they have cut as many diameters from their "circumference-sized" piece as they can. Then have them lay the diameter-sized pieces of licorice side by side along with the small leftover piece. (Image 2)
6. Students should then repeat this process with their other cylindrical shapes (donut, cookie etc.) and lay their cut pieces of licorice in groups beside each cylindrical object. What do they notice? (Image 3)
7. Using the small leftover piece, have older students estimate the fraction of the diameter that this piece represents.
8. Extend the learning by finding other circular or cylindrical shapes around the school/classroom and repeating the experiment. Do you always get the same number of pieces of licorice?

## Note for Teachers:

Students will discover that regardless of the object chosen, they will be able to cut each circumference-sized piece into three diameter-sized pieces with a small piece left over. If they estimate the size of the small remaining piece, they should find that it is approximately one-seventh (0.14) of the diameter-sized pieces. Therefore, each circumference can be cut into 3.14 ( $\pi$ ) diameter size pieces. This gives them an approximation of Pi, since the circumference of a circle ( $c$ ) is related to its diameter ( $d$ ) as follows:  $c = \pi \times d$ .