

## Lesson Title: Discovering Pi

Age Group: About Grade 5, ideally children who are not familiar with the concept of pi yet but familiar with using natural units of measurement and with the concept of deriving mathematical “rules”.

Materials: Circular objects of various sizes (ie. coins, cans, plates, wheels, analogue clocks, etc.), string, scissors, paper, pencils.

Introduction: Lead a class discussion on circles and why the circumference is harder to measure than the perimeters of other objects. Ask students how they would suggest going about measuring the diameter and circumference of a circle.

Procedure: Give each student, or group of students (depending on the amount of materials available) various circular objects and string to measure, plus scissors to cut the string if needed, and paper and pencils to record information if needed. Ask them to imagine it is ancient times and nobody knows how the diameter of a circle can be used to predict the circumference. Tell them the emperor needs them to figure it out. Go around to the different groups to help guide the ones in need.

There are two ways they will probably go about this. Either use the string to measure the diameter, then see how many times that measurement fits into the circumference, or use the string to measure the circumference and use markings or cuts to see how many diameters it divides into. Encourage students to use multiple sizes of circles. Remind them it takes more than one circle to see whether the rules apply universally, try smaller or bigger ones.

Eventually, it will become clear to students that all circles, regardless of size, follow the same rule. The rule for predicting the circumference of a circle is it will be the length of the diameter multiplied by three and a little bit. Once they reach this conclusion, congratulate them on discovering Pi. Since they found it themselves, they should have a deeper understanding and remember it more easily.

Lecture: After the activity, talk about Pi. Explain that it was derived using methods similar to the activity students just did and that it is the exact number used to calculate measurements of a circle. It is the exact number of times the diameter fits into the circumference. It is an irrational number, the exact value of which cannot be known, but is approximately 3.14.