

Pancakes and Pi Lesson Plan

*First Place Winner 2006 NASCO High School Math Lesson Plan Contest
Submitted by Kimberly Muller, Huntington Beach, CA*

Instructional Objective:

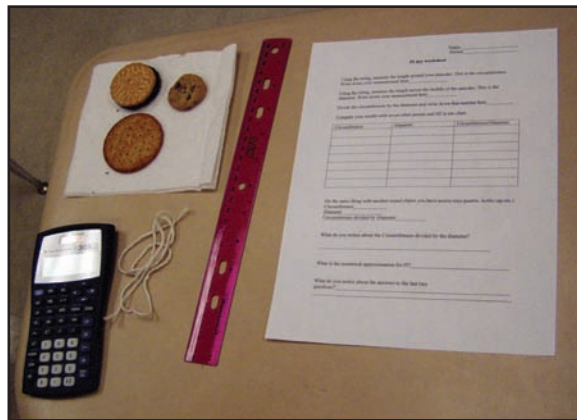
Students will better understand the meaning of the mathematical number π . They will have the opportunity to see the spatial relationship between the diameter and circumference of all circles no matter what the size. They will be able to measure the diameter and the circumference of a circle.

Rationale:

Students at the high school level usually think of Pi as 3.14. They do not go past that. They know they are to plug the number into certain formulas to get the area or circumference of a circle. They are unaware that Pi is actually a relationship between the circumference and the diameter of any circle. Teenagers are also always hungry and are highly motivated to finish the activity because they cannot eat the pancakes until they have done the measurement. They are allowed to eat before they compare their results with their classmates.

Materials:

- Pi Day Worksheet (see last page)
- String
- Linear measuring tool
- Pancakes or other round objects



Steps:

1. All students are given a piece of string, a pancake (Pancakes can be made during the lesson, or any round object will do), and a ruler.



2. Each student is to measure the length around their pancake with the string to determine the circumference. Straighten the string and line it up next to the ruler to get a linear measurement. This teaches them that it is possible to measure round things even though a ruler is straight. Then they are to measure across the center of the pancake to determine the diameter. They will then divide the measurement around by the measurement across (circumference/diameter).



3. After this initial activity, they are allowed to get more pancakes and syrup. Then they spend a few minutes eating.



4. Next the students compare their results and write down the results in a table on the given worksheet. They will then answer questions on the worksheet assessing what they learned about the activity.



Name: Zachary Haines
Period: 2-100-3-00

PI day worksheet

Using the string, measure the length around your pancake. This is the circumference.
Write down your measurement here: 20.2cm

Using the string, measure the length across the middle of the pancake. This is the diameter. Write down your measurement here: 12.2cm

Divide the circumference by the diameter and write down that number here: 2.228cm

Compare your results with seven other people and fill in the chart.

| Circumference | Diameter | Circumference/Diameter |
|---------------|----------|------------------------|
| 13.5cm | 4cm | 16.5cm |
| 14cm | 7cm | 2cm |
| 27cm | 12cm | 2.25cm |
| 21cm | 6cm | 3.5cm |
| 15cm | 5cm | 3cm |
| 12cm | 3.5cm | 3.42cm |

Do the same thing with another round object you have access to (a quarter, bottle cap etc.)
Circumference: 3.85
Diameter: 2
Circumference divided by Diameter: 1.925

What do you notice about the Circumference divided by the diameter?
The circumference divided by the diameter is half of the diameter

What is the numerical approximation for PI? 3.142857143...

What do you notice about the answers to the last two questions? The answers to the last two questions were both related to PI

Name: _____

Period: _____

Pi Day Worksheet

1. Using the string, measure the length around your pancake. This is the circumference. Write down your measurement here _____.

2. Using the string, measure the length across the middle of the pancake. This is the diameter. Write down your measurement here _____.

3. Divide the circumference by the diameter and write that number here _____.

4. Compare your results with seven other people and fill in the chart.

| Circumference | Diameter | Circumference/Diameter |
|---------------|----------|------------------------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

5. Do the same thing with another round object you have access to (a quarter, bottle cap, etc.).

Circumference _____

Diameter _____

Circumference Divided by Diameter _____

6. What do you notice about the circumference divided by the diameter?

7. What is the numerical approximation for PI? _____

8. What do you notice about the answers to the last two questions?