Pi Day

Biddy Cameron
Rustenburg Girls' High School

I discovered π day while I was looking up information about π on the Internet. Since "nine-eleven" (9-11) we have been made more aware of the way that the Americans write their dates, with the month first and then the day. Following this pattern, 14 March would be written 3-14. As these are the first 3 digits of π, 14 March was designated as π day. π o'clock is at 1.59 pm. (i.e. π = 3,14159, taking π to 5 decimal places.)

We, as teachers, can use this information as an excuse to have a bit of fun in the classroom. I have celebrated π day for the last two years. The students are allowed to bring pies to school and eat them in class. Some bring small meat pies while others make apple pies and share them. This year I was asked whether they could bring doughnuts. I said that they could as long as they were round. I am also sticking the digits of π around the classroom. There are 140 digits stuck up so far. I have a computer in my classroom and on that day the screen saver says "Happy π day". There are also π songs to sing.

I have designed a lesson for March 14 for each grade using π or circles:

Grade 8: They are introduced to π by measuring the diameters and circumferences of a variety of objects and then calculating the ratio $\frac{\text{circumference}}{\text{diameter}}$ which should give the value of π.

Grade 9 and 11: I take them to the library where they look up information about π in books and on the Internet.

Grade 10: As they have not learned any circle geometry, I let them do constructions and then make conjectures about angles in circles.

Grade 12: They make a π pizza (not a real pizza). In each slice they fill in different aspects of circles that they have learned over their school career, for example the formula: $c = \pi d$, or the fact that opposite angles of a cyclic quadrilateral are supplementary.

Look on the Internet for other ideas and information about π. Type in "pi" on any search engine. You can also find more information about π in a dictionary, in the Guinness Book of Records and in Mathematics books. I have enjoyed the many comments that my students have made. One matric student in a thank-you note said: "And how could I forget my one and only pie class! " So relax and enjoy what your students will learn and teach you on π day.

Imagine dropping a cocktail stick onto a floor made of parallel floorboards. Sometimes the stick will land so that it crosses or touches a line between boards, and at other times it will land so that it lies entirely on only one board. If the width of a floorboard is w, and the length of the stick is L (with $L < w$), then Buffon (1707 - 1785) showed that the probability of the stick falling so as not to be entirely within one board is $\frac{2L}{w\pi}$. It follows that if the stick is dropped N times, and is observed to cross lines on P of those occasions, we can estimate the value of π by saying $\frac{2L}{w\pi} = \frac{P}{N}$ and so $\pi = \frac{2LN}{Pw}$. The larger N is, the more accurate this equation will be, and so if you let stick-dropping happen throughout the day

and keep a record of the results, by the evening you should have a pretty good estimate for π – this is something everybody in the school can contribute to.

CALCULATING π : a worksheet for Grade 8

Materials needed: Measuring tape; 3 round objects

Directions: for each object:

Measure the circumference (distance around the edge).
Measure the diameter.
Fill in the values on the table.
Calculate the ratio $\frac{circumference}{diameter}$ correct to 3 decimal places.

Object	Circumference	Diameter	$\frac{circumference}{diameter}$

1. How does the length of the circumference compare to the length of the diameter? Is it twice as large? Three times, four times…as large?
2. Is the ratio $\frac{circumference}{diameter}$ nearly the same for all your circles?
3. This value $\frac{circumference}{diameter}$ is given the name π, and π ≈ 3,14159. Compare your value to 3,14. Is your value greater or less than 3,14?
4. Why do you think that your answers could be different to the value of π?

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Accuracy of estimate	Between 3 and 3,2 3 x 3	Between 2,7 and 3,5 3 x 2	Between 2,2 and 4 3 x 1
Questions 1 to 3	Correct answers 2	Incorrect answers 1	No answers 0
Question 4	Good reasons 3	Fair answers 2	None 0