

Palindromic Dates – A Classroom Exercise

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INTRODUCTION

We all know what a palindrome is – words like mom, dad, level and rotator – that read the same both forwards and backwards. Sentences can also be palindromic, such as ‘Madam, I’m Adam’, and the mathematical example ‘never odd or even’. This year we had an interesting palindromic date on Tuesday 22nd February – 22022022 when written in the form DDMMCCYY. To explore numerical palindromes you may wish to share the following exercises with your class. The activities are geared towards Grade 7 to 9, and pupils should ideally work in groups of two or three so as to encourage discussion and sharing of ideas.

ACTIVITY 1

As an initial activity, introduce the idea of a palindrome and then get each group to come up with five or so palindromic words. Next get them to calculate each of the following:

- | | | | | |
|-------------|--------------|---------------|-------------|-------------|
| (a) 11^2 | (b) 11^3 | (c) 11^4 | (d) 121^2 | (e) 212^2 |
| (f) 111^2 | (g) 1111^2 | (h) 11111^2 | (i) 202^2 | (j) 101^2 |

ACTIVITY 2

Now get each group to explore the following questions. Each question relates to palindromic dates written in the form DDMMCCYY. Don’t provide any direction or scaffolding, just let each group explore and mathematise in their own way. As you wonder around the class listening to the mathematical discussions you will be amazed!

- After the 22nd February 2022 (i.e. 22022022), what are the next two palindromic dates?
- What are the two nearest palindromic dates prior to 1st January 2000?
- How many dates in the 21st century are palindromic?

DISCUSSION AND SOLUTIONS

Activity 1 is meant as a warm-up activity, but hopefully it will get pupils wondering about why these answers are all palindromic. Sowing the seeds of curiosity is such an important thing! For activity 2, I would encourage you to explore these three questions yourself before giving them to your pupils. This will give you some insight into how they might approach the questions, and the kinds of discussions you should listen out for.

- Trying 2023 as 32022023 doesn’t work, and this should hopefully lead to 2030 as the next viable year. The two dates are 03022030 and 13022031.
- With a bit of trial and error it should soon become apparent that the month needs to be November. This gives 29111192 and 19111191.
- The ‘Aha!’ moment should come when one realises that we need only consider February. The answer is thus 29 (since 2092 is a leap year).

¹ Peter Bishop is a retired mathematics teacher. His recently published book *Give Meaning to Maths* is reviewed at the end of the journal.