

Friday the 13th

Fear not, 13 is a happy number.

What?

A happy number is a number which eventually reaches 1 when replaced by the sum of the squares of each digit.

Any number that is not happy is ... sad.



1. What do you wonder?

Here's a demo of how the Happy function works.

Is 19 a Happy number?	Is 5 a Happy number?	
$1^2 + 9^2 = 82$ $8^2 + 2^2 = 68$ $6^2 + 8^2 = 100$ $1^2 + 0^2 + 0^2 = 1$ 19 is Happy!	$5^2 + 0^2 = 25$ $2^2 + 5^2 = 29$ $2^2 + 9^2 = 85$ $8^2 + 5^2 = 89$ $8^2 + 9^2 = 145$ $1^2 + 4^2 + 5^2 = 42$ $4^2 + 2^2 = 20$ $2^2 + 0^2 = 4$	$4^2 = 16$ $1^2 + 6^2 = 37$ $3^2 + 7^2 = 58$ $5^2 + 8^2 = 89$ But we've already seen 89 as a sum. So this sequence will just keep repeating. 5 is not a Happy number ... Sad

2. Show that 13 is Happy?
3. Starting at 12 and using smaller and smaller numbers, is there a happy number less than 13?
4. When is the next "Happy" number after 13? (This can be discouraging. Learn from your previous digits squared and try to persevere.)
5. Explain any short cuts that you figured out.



Enjoy this Happy Day!