# MANY CHEERFUL FACTS

presents

## Scitamehtam

a talk by Johanna Franklin

11:10 am - 12:00 on Wednesday, March 22nd, in room 1015.

The standard way to do mathematics is to start with a list of axioms and ask what can be proven from it. In reverse mathematics, unsurprisingly, the question is altered. Given a theorem, which axioms are necessary to prove it?

Reverse mathematics is carried out in second-order arithmetic. I will present the basic axiom systems used, the sorts of structures that satisfy them, and some theorems provable from (and, often, equivalent to) them. If the sheer quantity of mathematics provable within $\mathrm{RCA}_0$ doesn't make you cheerful, I don't know what will.

*I am the very model of a modern Major General,*
*I've information vegetable, animal, and mineral,*
*I know the kings of England, and I quote the fights historical*
*From Marathon to Waterloo, in order categorical;*
*I'm very well acquainted, too, with matters mathematical,*
*I understand equations, both the simple and quadratical,*
*About binomial theorem I'm teeming with a lot o' news,*
*With many cheerful facts about the square of the hypotenuse!*

- Gilbert & Sullivan $P \circ P$