

Subtraction game

This game is a variation to Nim working with larger numbers.

The game is, a number is picked at random between 100 and 300, and then myself and the student take turns picking numbers between 8 and 40, and subtracting the original number by the chosen number, then subtracting the result by the newly chosen number, etc. and the first to reach zero wins. To an inattentive observer it will appear like I will be picking numbers at random but I will actually make my results land on a multiple of 48, to insure myself winning.

Example *let's say we start with 260.*

Student picks a random number 40, so we are left with 220
I will then pick 28, and we are left with 192 (a multiple of 48)
The student picks 40, $192-40= 152$
I will then pick 8, and we are left with 144(a multiple of 48)
The student picks 21, $144-21= 123$
I will then pick 27, and we are left with 96(a multiple of 48)
The student picks 35, $96-35= 61$
I will then pick 13, and we are left with 48

Now whatever number the student picks, I will be able to win.

Proposed by Sean Barry

References:

<http://www.cut-the-knot.org/>