PROBLEM 1.

(a) There are ____ students in this class (fill in the blank). If you all decided to shake hands with each other, how many handshakes would that be?

(b) Again, there are ____ students. How many ways can I pair you up? This means breaking up the whole class into groups of two. How many ways can I break up the class into groups of three?*

* We will talk about what to do if the number is not even or a multiple of three.

PROBLEM 2. A *binary necklace* is a collection of blue and yellow beads strung along a circle. We count to necklaces as being the same if one can be obtained from the other by sliding the beads. Thus, the two necklaces in Figure 1 are the same. However, when you are comparing necklaces to see if they are the same, you are *not* allowed to flip them over.

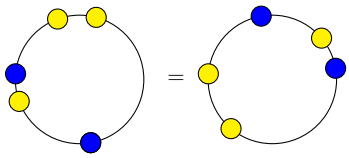

Figure 1: Two views of the same necklace.

(a) For $n = 0, 1, 2, 3, 4$, count the number of binary necklaces with n blue beads and $n + 1$ yellow beads.

(b) When you are satisfied with your answers, go to the Online Encyclopedia of Integer Sequences (`oeis.org`) and search for your sequence.