Self-assigned student numbers

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Here is an interesting riddle created and solved by various conversations with my friends:

Consider an *isolated* group of n students. They wish to assign themselves unique student numbers from 1 to n (no repetitions!) in such a way that each student will know his own student number, but each student should have *no information* about any other student's number. Devise a procedure for the students to achieve their goal with 100% probability.

Some clarifications:

1 "*isolated*" means the students have no external aids of any kind (e.g. no pencils or paper or hats); the only actions available to them are talking to each other publicly or privately in groups of their choosing.

2 The students cannot conceal their real identities in any way. So if X talks to Y, then Y recognizes X and Y recognizes X (for example, by tone of voice, scent, etc.).

3 "*no information*" even excludes probabilistic information: student X should have no estimates whatsoever about student Y's number except that it is a number from 1 to n that is not his own.

4 You can assume that the students all want to achieve this goal, and that they have "idealized minds" like in most thought experiments.

5 **For a harder version**, assume that you must decide before the procedure begins how many steps (communications) it will take!

For the answer(s), email me: critch at math dot berkeley dot edu. Enjoy :)