Six students form a friendship club. Everytime they meet they shake hands with one another. How many times do they shake hands at one meeting?

Solution:

The first of the 6 students will shake hands with 5 others. Only 5 because no person is going to shake hands with themselves. The second person also shakes hands with 5 people, but you have already counted one of those handshakes, namely the one with the first person. Therefore, the second person shakes hands with only 4 NEW people. Then the third person adds 3 new handshakes, etc., down to the 2nd to the last person who adds 1 new handshake. The last person has no one new, so all of the last person's handshakes are already counted. In summary:

$$5 + 4 + 3 + 2 + 1 = 15$$

Answer: 15 shake hands