Party Time

Level E

A husband and his wife invite 5 other couples to a dinner party. As the guests arrive before dinner, they shake hands. Later, as they sit down to dinner, the husband asks each other person, including his wife, how many hands he or she shook. The husband notices, to his surprise, that they all shook a different number of hands, but that he, the husband, shook the same number of hands as one other person.

The dinner party guests realize that in order for this to be true, the following conditions must have been met:
- Not everybody shook everyone else's hands.
- No one shook hands with their spouse.

Model how the guests exchange handshakes with each other and the hosts. What patterns do you notice?

Generalize this pattern for inviting **n** couples. If a husband and his wife invite **n** couples, how many hands will each of them shake?