Basis partitions are minimal partitions corresponding to successive rank vectors. We show combinatorially how basis partitions can be generated from primary partitions which are equivalent to the Rogers-Ramanujan partitions. This leads to the definition of a signature of a basis partition that we use to deduce and explain certain parity results involving partial theta series. We then study a special class of basis partitions which we term as complete. Finally we discuss basis partitions and minimal basis partitions among partitions with non-repeating odd parts by representing them using 2-modular graphs, and establish two new parity results involving partial theta series. (Received January 28, 2014)