plexing hardware needed to transfer sixty-four bits of data over an interface that has a width of sixteen bits.

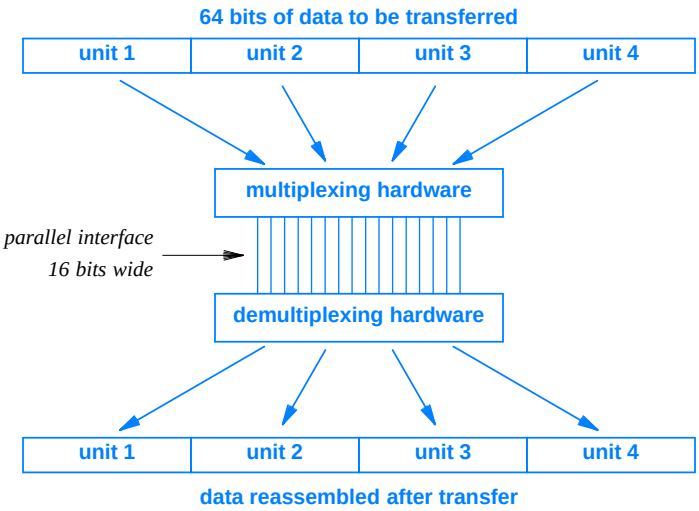

Figure 13.3 Illustration of the transfer of sixty-four bits of data over a sixteen bit interface. Multiplexing hardware divides the data into sixteen bit units and sends one unit at a time.

In practice, most physical connections between a processor and external devices use multiplexing. Doing so allows the processor to transfer arbitrary amounts of data without devoting many physical pins to the connection. In the next section, we will learn how multiplexing also improves CPU performance.

To summarize:

Multiplexing is used to construct an I/O interface that can transfer arbitrary amounts of data over a fixed number of parallel wires. Multiplexing hardware divides the data into blocks, and transfers each block independently.

13.10 Multiple Devices Per External Interface

The examples in this chapter imply that each external connection from a processor attaches to one device. To help conserve pins and external connections, most processors do not have a single device per external connection. Instead, a set of devices at-