

# Paging Advantages

- ✓ Easy to allocate memory
  - Memory comes from a free list of fixed size chunks
  - Allocating a page is just removing it from the list
  - External fragmentation not a problem
- ✓ Easy to swap out chunks of a program
  - All chunks are the same size
  - Use valid bit to detect references to swapped pages
  - Pages are a convenient multiple of the disk block size

# Paging Limitations

- Can still have internal fragmentation
- Requires 2 or more references, which could limit performance
- ➔ **Solution:** use a hardware cache of lookups (coming next)
- The amount of memory to store the page table is significant
  - Need one PTE per page, with 32 bit address space w/ 4KB pages =  $2^{20}$  PTEs
  - 4 bytes/PTE = 4MB/page table
  - 25 processes = 100MB just for page tables!
- ➔ **Solution :** page the page tables (coming next)