

# 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)