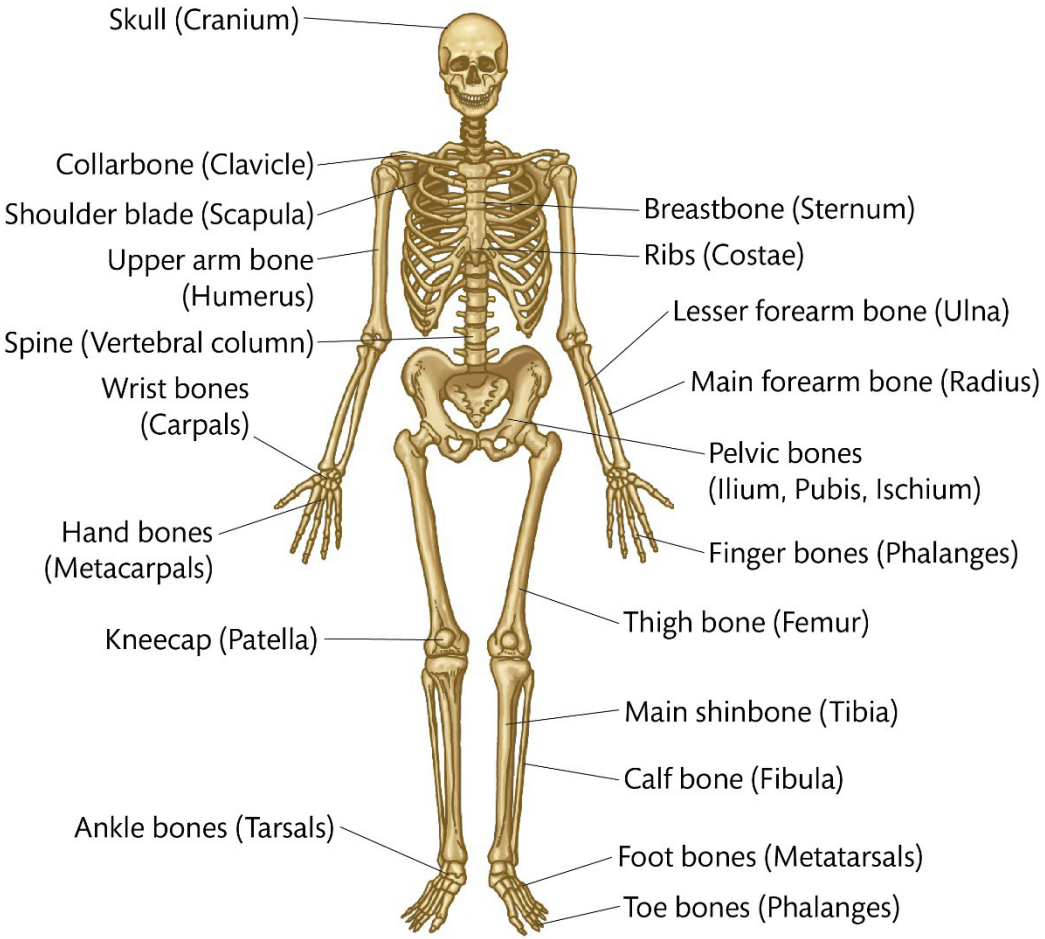
Unit 1: Anatomy and Physiology

Learning aim A

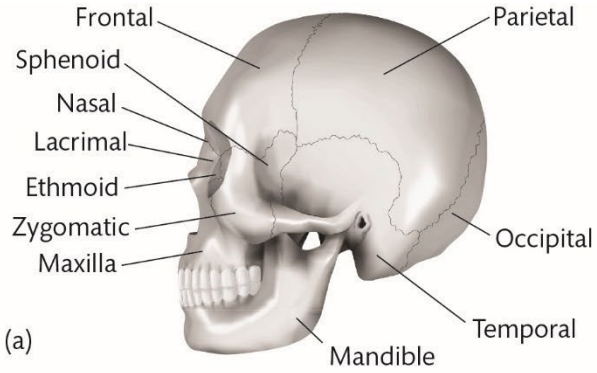
Structure of the skeletal system

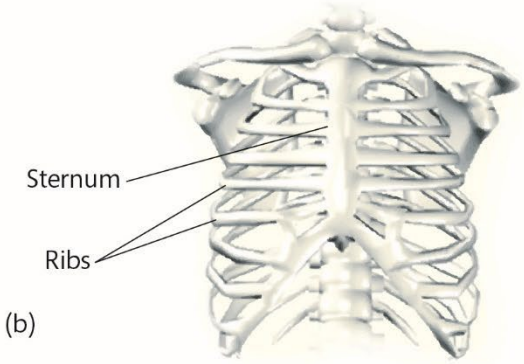


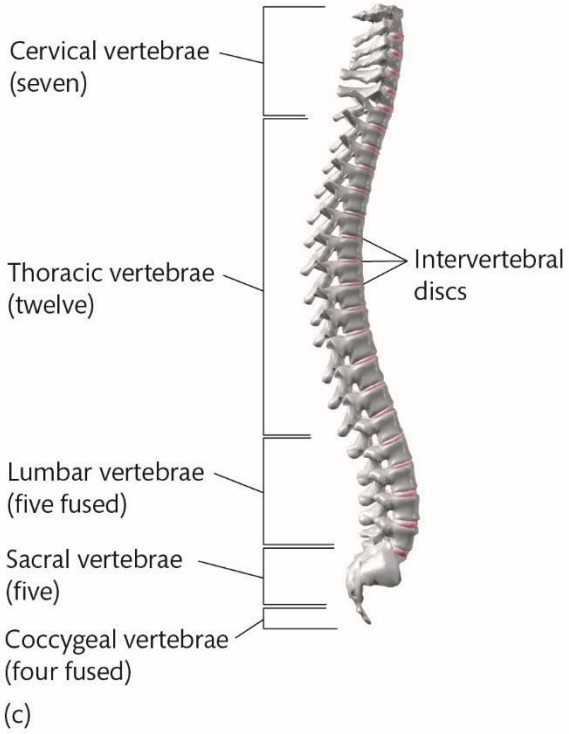
Types of bone

- Long bones e.g. femur
- Short bones e.g. carpals
- Flat bones e.g. sternum
- Irregular bones e.g. spinal vertebrae
- Sesamoid bones e.g. patella

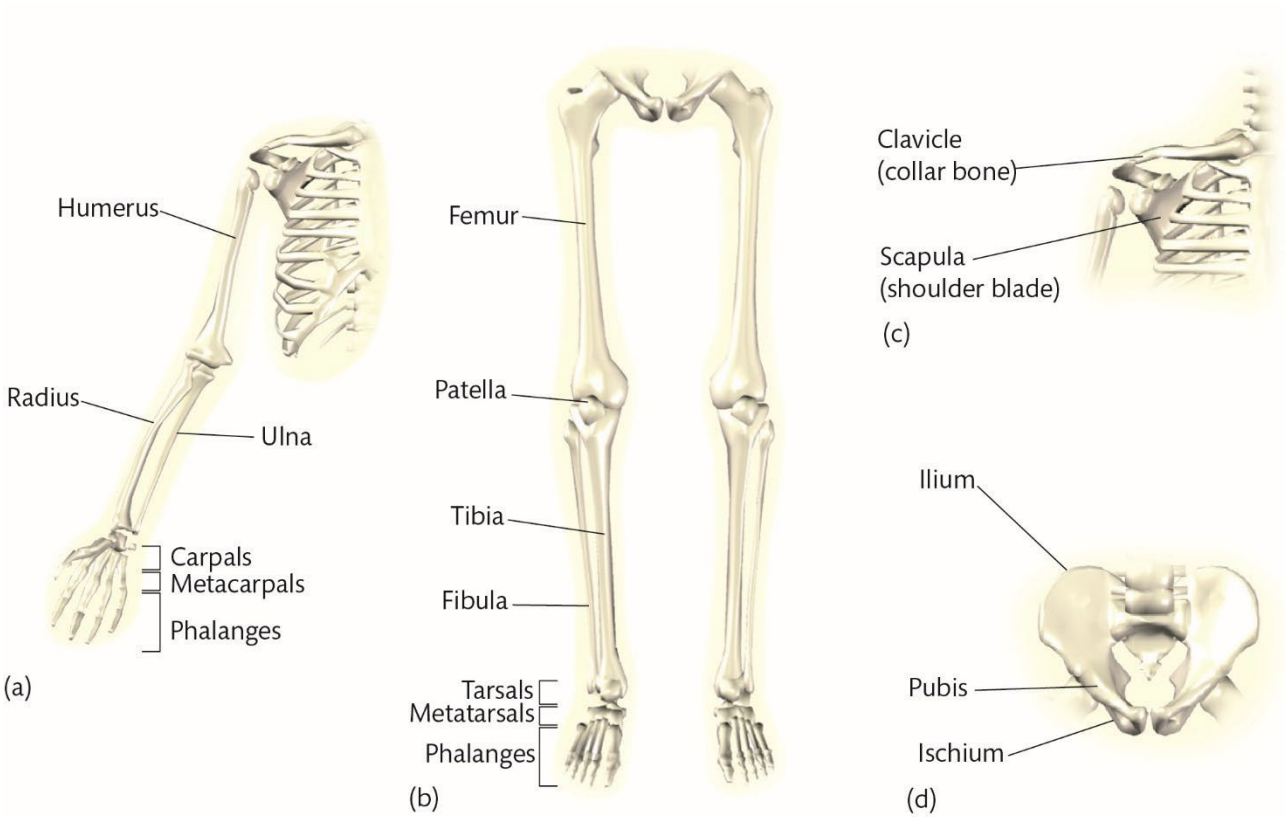
The axial skeleton







The appendicular skeleton



Spine (vertebral column) (1)

- Extends from base of the cranium to the pelvis
- Provides a central axis for the body
- Made up out of 33 irregular bones (**vertebrae**)
- Makes up 40% of person's overall height
- Held together by powerful **ligaments** allowing little movement between adjacent vertebrae but a great deal of flexibility across the spine

Five main regions of the spine

- Cervical – 7 vertebrae of the neck, forming a pivot joint for the head
- Thoracic – 12 vertebrae of the mid-spine, articulating the ribs
- Lumbar – 5 largest vertebrae in the lower back, supporting weight
- Sacral – 5 vertebrae fused together to form the sacrum, the back wall of the pelvic girdle
- Coccygeal – 4 vertebrae at the bottom forming the coccyx

Functions of skeletal system

- Supporting framework
- Protection
- Attachment for skeletal muscle
- Source of blood cell production
- Minerals store
- Leverage
- Weight bearing
- Reducing friction across a joint

Fixed and slightly moveable joints

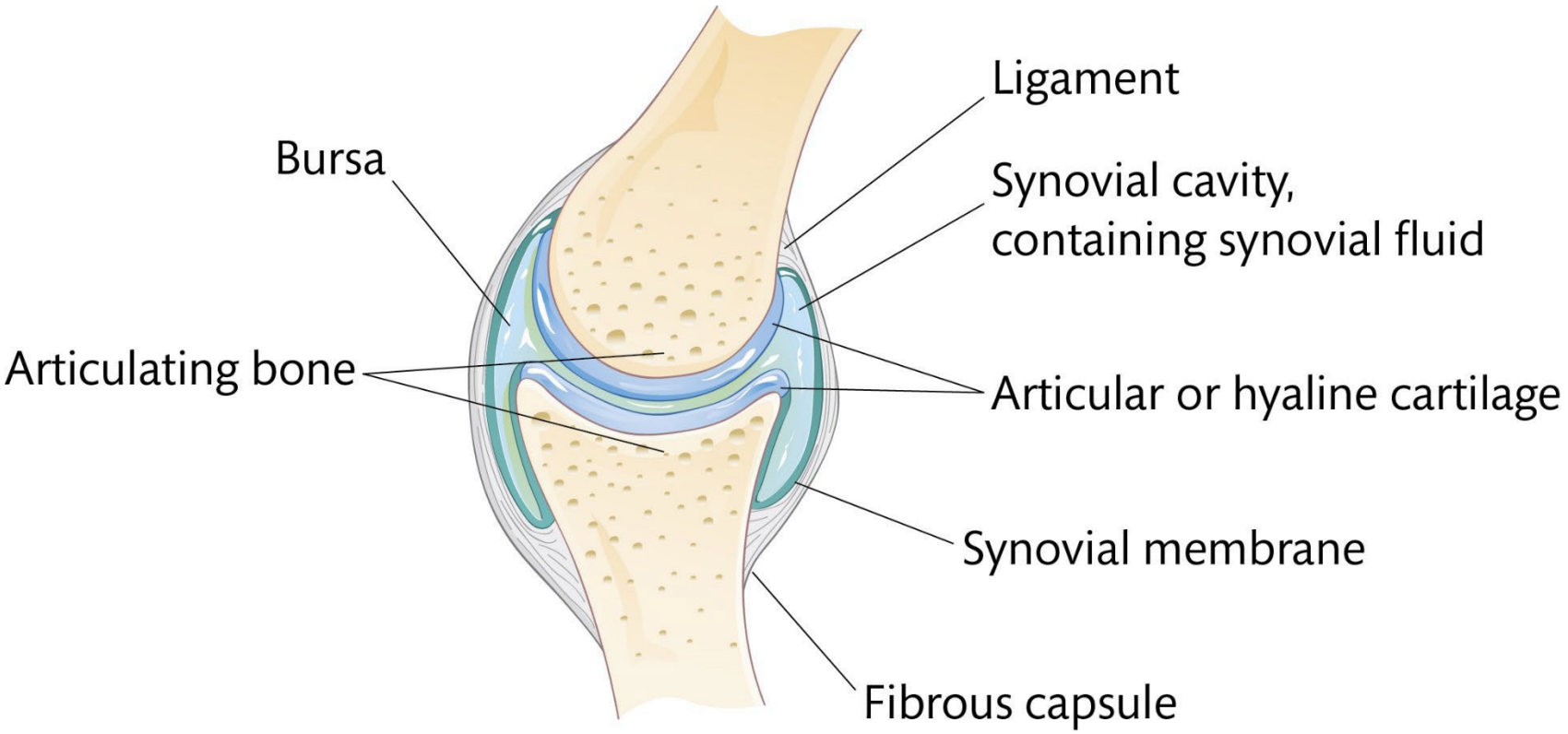
Fixed joints

- Do not move
- Form when bones interlock and overlap during childhood
- Held together by tough, fibrous tissue
- e.g. bone plates in the cranium

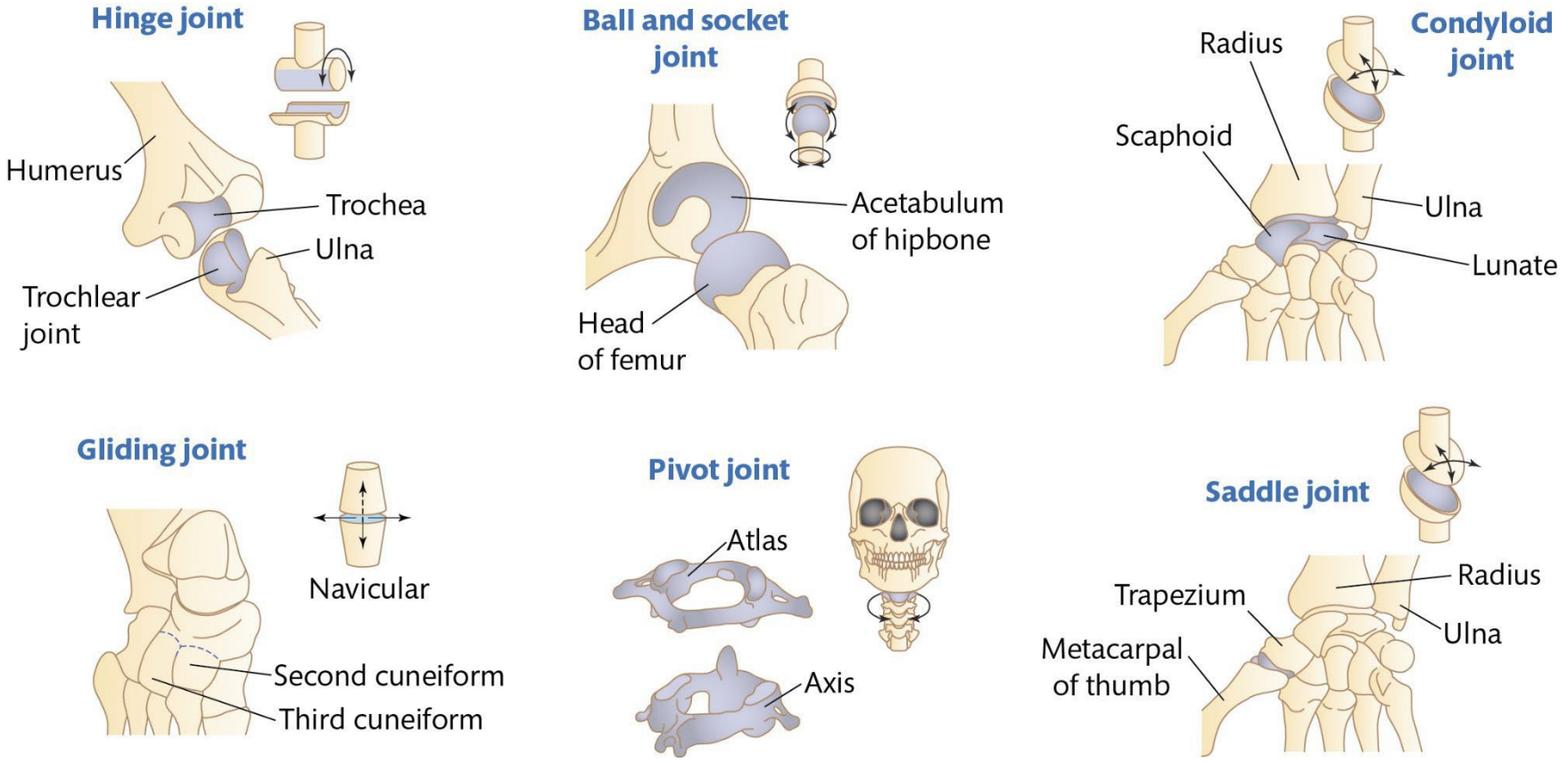
Slightly moveable

- Allow slight movement
- Bone ends covered with smooth, shining covering (articular cartlidge)
- Bones separated by pads of white firbrocartlidge which compress to allow movement

Synovial joint structure



Types of synovial joint



Responses of skeletal system to a single sport session:

- Increase in mineral uptake within bones due to weight-bearing exercises

Adaptations of skeletal system to exercise:

- Increased bone strength
- Increased ligament strength

Additional factors affecting skeletal system

Arthritis

- Inflammation within a synovial joint

Osteoporosis

- Weakening of bones caused by a loss of calcium or a lack of vitamin D

Age

- Putting too much force on a child's bones can damage the epiphyseal plates, causing stunted growth