Thoracic cavity is divided into 3 compartments:

- Left and right lung surrounded by pleura (parietal and visceral)
    - Parietal lines the outside of the lungs
    - Visceral lines the pulmonary cavities e.g. alveoli
    - Visceral and parietal are continuous at the hilum
    - Parietal pleura named after structure it is in contact with (e.g. cervical, costal, diaphragmatic)
- Mediastinum encapsulate the heart and other thoracic components
    - Heart, blood vessels
    - Trachea
    - Oesophagus
    - Phrenic and cardiac nerves
    - Thoracic duct
    - Lymph nodes
    - Thymus
- Mediastinum borders:
    - Thoracic inlet at the neck
    - Diaphragm at the bottom
    - Mediastinal pleura laterally

- Structure and borders of the lung:
    - Apex extend into the clavicles
    - Two recesses (space b/w parietal and visceral pleura: costodiaphragmatic, Costomediastinal)
    - Right: Superior lobe, horizontal fissure, Medial lobe, oblique fissure, Inferior lobe
    - Left: Superior lobe, oblique fissure, inferior lobe, cardiac notch, lingula
    - Surfaces: costal, diaphragmatic, mediastinal
    - Borders: anterior, posterior, inferior

- Lung position: surface markings:
    - When the arm is raised, medial border of scapula marks the oblique fission
    - When arm is raised, viewed from the side
        - Posterior - anterior rib 5-4 marks horizontal fissure
        - Posterior - anterior rib 5-6 marks oblique fissure
        - Rib 8 marks inferior border / visceral pleura
        - Rib 10 marks parietal pleura
    - When viewed from the front:
        - Sternal line rib 2-4 marks anterior border
        - Mid-clavicle line rib 6 marks lingula / medial lobe apex

- Trachea: rings of cartilage, split into two
- Bronchus with blocks of cartilage
    - Hilum: where the pulmonary artery/veins and bronchus enters the lung
    - Right anterior left superior: relative position of pulmonary artery to the bronchus
    - Right bronchus more verticle, left bronchus more horizontal and longer.
- Lobar bronchus - 1 per lobe

- Segmental bronchus - 1 per segment
    - 10 segment in right lung, 8-10 in left lung.
    - Each supplied by a segmental bronchus, artery and vein
- Bronchioles: from here the walls does not contain cartilage
- Terminal bronchiole
- Respiratory bronchioles, each connect to ~10 alveolar duct, each duct connect to ~5 alveoli
- Alveoli

Breathing action: changing thoracic volume by changing the three axis (Ant-Post, Med-Lat, Sup-Inf)

- Inspiration
    - Lower rib becomes more horizontal, lateral width increase
    - Ext. intercostal contract, elevate sternum, Ant-Post length increase
    - Ext. intercostal contract lifts ribcage up, vertical height increase
    - Diaphragm contract, increase vertical height.
- Pressure decrease, air drawn in.

Lung development

- Lung bud outgrow from endoderm / ventral foregut from the start of 4th week
- Lung bud branching, endoderm form lining and glands, splanchnic mesoderm form smooth muscles, cartilage, neurons
- All lung segments formed by the 8th week, signalling b/w mesoderm & endoderm allow correct branching.
- Bronchiole tree develop in 5 stages:
    - Embryonic: week 0-8, development of trachea and bronchi, segmentation, pulmonary artery and veins
    - Pseudoglanular: week 8-17, develop terminal bronchioles, develop neural networks
    - Cannaliculi: Week 17-24, primitive alveoli starts to form
    - Saccular: Week 24-36, Alveolar sac forms, surfactant synthesis, reduce surface tension
    - Alveoli: Week 36 to 2 years old: maturation of alveoli, expansion of gas exchange surface

Compartments of the thorax

Contents within each

Pleura segments

Lung structure, borders, surface

Lung surface markers

Breathing 3D

Development, 5 stages.