The Four Basic Tissue Types of the Human Body

Tissues are groups of cells with a common structure (form) and function (job). There are four main tissues in the body – epithelium, muscle, connective tissue and nervous tissue.

I. Epithelium (Epithelial Tissue)

Functions (jobs):
- It protects us from the outside world – skin.
- Absorbs – stomach and intestinal lining (gut)
- Filters – the kidney
- Secretes – forms glands

Characteristics (Traits):
1) Closely attached to each other forming a protective barrier.
2) Always has one free (apical) surface open to outside the body or inside (cavity) an internal organ.
3) Always had one fixed (basal) section attached to underlying connective tissue.
4) Has no blood vessels but can soak up nutrients from blood vessels in connective tissue underneath.
5) Can have lots of nerves in it (innervated).
6) Very good at regenerating (fixing itself). i.e. sunburn, skinned knee.

Classifications (types) of Epithelium:
1) By shape:
   a) squamous - flat and scale-like
   b) cuboidal - as tall as they are wide
   c) columnar - tall, column-shaped
2) By cell arrangement:
   a) simple epithelium - single layer of cells (usually for absorption and filtration)
   b) stratified epithelium - stacked up cell layers (protection from abrasion - mouth, skin.)
   c) pseudostratified epithelium - looks like stacked cell layers, but is actually a single layer of cells (trachea and upper respiratory tract, it secretes mucus and its cilia helps to propel foreign material out of the body through coughing.)
II. Connective Tissue

Functions (jobs):
- Wraps around and cushions and protects organs
- Stores nutrients
- Internal support for organs
- As tendon and ligaments protects joints and attached muscles to bone and each other
- Runs through organ capsules and in deep layers of skin giving strength

The 3 Elements of Connective Tissue:
- Ground substance – gel around cells and fibers
- Fibers – provide strength, elasticity and support
- Cells

Special Connective Tissues

1) Cartilage

Functions (jobs):
- Provides strength with flexibility while resisting wear, i.e. epiglottis, external ear, larynx
- Cushions and shock absorbs where bones meet, i.e. intervertebral discs, joint capsules

2) Bone

Functions (jobs):
- Provides framework and strength for body
- Allows movement
- Stores calcium
- Contains blood-forming cells

3) Blood

Functions (jobs):
- Transports oxygen, carbon dioxide, and nutrients around the body
- Immune response
III. Nervous Tissue

Functions (jobs):
- Conducts impulses to and from body organs via neurons

The 3 Elements of Nervous Tissue:
1) Brain
2) Spinal cord
3) Nerves

IV. Muscle Tissue

Functions (jobs):
- Responsible for body movement
- Moves blood, food, waste through body's organs
- Responsible for mechanical digestion

The 3 Types of Muscle Tissue:
1) **Smooth Muscle** – found in organ walls and blood vessel walls, involuntary muscle (works without our control), spindle-shaped cells for pushing things along (blood, food, waste) through the body's organs.

2) **Skeletal Muscle** – makes up large body muscles, voluntary (we control them), striated muscle packed into bundles and attached to bones for movement.

3) **Cardiac Muscle** – found in the heart wall, involuntary muscle (works without our control), striated muscle with intercalated discs connecting cells for synchronized contractions during heart beat.