

### **3. Landforms, faults and folds**

***Faulting*** usually occurs during an earthquake.

**Fault** = fracture in a rock which involves a movement along one side or both sides.

**Shift** = total movement

**Throw** = vertical displacements

**Heave** = horizontal displacements

**Normal fault** = result of a tension, strata are pulled apart, one side of it is thrown down => increase of land area (divergence)

**Reverse (thrust) fault** = result of a compression, one side of the fault plain is thrust over the other (convergence) => overlapping of the strata and the surface area is decreased, e.g. steep slopes are formed of more resistant rocks, gentle slopes are found on softer rocks that are thrown down (by erosion)

**Wrench (tear) fault** = movement is horizontal but the fracture is vertical, nearby plate boundaries (product of an earthquake)

**Example:** *San Andreas fault* = northward moving Pacific plate and southward moving North American plate (1000 km long, average annual shift = 7 cm), it moves in a series of major earthquakes (1906 in Frisco – west side of the land moved 6 m to the north and vertical displacement was only 1 m)

#### **Landforms produced by faults**

**Horst** = upland area bounded by low ground either side (fault scarps) <=>

a) uplift of a block

b) depression of surrounding land

**Examples:** Harz Mts., Black Forest

Extensive horst produce plateau areas (block mountains). Further Earth movements tilt the blocks = *tilted blocks* = they are divided by faults into subsided (wide deep basins) and elevated sections (mountains).

**Rift valley (graben)** = reverse of a horst, it's formed by tension, compression or parallel faults and accompanied by horsts on either side, also can be formed nearby plate boundaries where the plates are pulling apart (e.g. East African Rift Valley).

**Example:** Rhine Rift Valley with Vosges and Black Forest on either side. Largest is East African Rift Valley. Red Sea is a widened and flooded rift valley as a result of African plate moving west and Arabian plate moving east.

***Folding*** occurs when layers of rock are distorted but not fractured.

**Fold** = distorted layers of rock

**Simple fold** = anticline + syncline

**Recumbent fold** = crumpled several times

**Asymmetric fold**

**Over fold**

#### **Keywords:**

normal/reverse/wrench fault, shift, throw, heave, horst, uplifting, depression, fold, plateau, block mountains, tilted blocks, East African Rift Valley, graben, simple/recumbent fold, asymmetric/over fold