Age Estimation

In forensic anthropology – the study of the human body for medical and legal purposes - we can use our knowledge of the development of bones to predict what age a person is.

1. The ‘long’ bones of the body, including the bones of the hand, grow until the ends of the bones join (fuse) with the shaft (middle) of the bone.

2. This doesn’t happen at the same time in all of the bones of the body – instead it happens at different times in different bones.

3. This fusion of bones occurs in a pattern in children, so by seeing which bones are fused we can guess a child’s age.

4. In younger children the bones will look quite far apart - as the child grows older the bones will get closer together.

5. The area where bone growth is occurring, and where fusion will eventually occur, looks like a dark space or line, between the ends of the bones and the middle of the bones on an x-ray (and can sometimes be confused with a fracture!). It get smaller as we get older.........

6. As the ends of the bone finally fuse together with the shaft, this line will disappear, so it can no longer be seen in older individuals.

Examples of this growth and fusion (joining together) are shown in the hand x-rays pictures.

If there are no areas that look like this in the hand bones of the skeleton you have found, then that means the skeleton belongs to an adult.
Activity 1 – Age Estimation Using Hands

Female

1. 1 year and 2 months
2. 5 years and 9 months
3. 10 years
4. 14 years
5. 17 years
Female or Male?

In forensic anthropology – the study of the human body for medical and legal purposes - we can use our knowledge of the bones to predict whether a skeleton belong to a female or male.

1. Male and females bones are usually most different in the pelvis and the skull

2. Look at the images of the pelvis first and try to match it to your skeleton

3. A female pelvis usually has lots more space in it than a male pelvis
   - This is so there is lots of room for a baby

4. A male pelvis usually looks more heavy and has less space
   - It doesn’t need any room for a baby

5. Now look at the images of the skull and try to match it to your skeleton

6. A female skull is usually lighter looking, with more round eye sockets (orbits) and the angle of the jaw is more gently sloped

7. A male skull is usually heavier looking, with squarer looking eye sockets (orbits) and the angle of the jaw is more square
Female Pelvis
Male Pelvis
Clues to look for…….

**Female**

- **Yellow** – sub-pubic arch is **wider** in females than in the male
- **Red** – pelvic inlet and outlet (openings at top and bottom of pelvis) are **larger** in females than males
- **Blue** – Pelvic cavity (height/space between inlet and outlet) is more **shallow** in females than in males
Female Skull
Clues to look for.......

Female

Male

1 2 3 4 5

Nuchal Crest

1 2 3 4 5

Mastoid Process

1 2 3 4 5

Supraorbital Margin

1 2 3 4 5

Supraorbital Ridge/Grabella

1 2 3 4 5

Mental Eminence
Clues to look for…….

Yellow – orbital is rounder in females than in the male
Red – angle of jaw is more gently sloped in females than males
Blue – Mastoid process is less prominent in females than in males
### Clues to look for

<table>
<thead>
<tr>
<th>Trait</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Size</td>
<td>Large</td>
<td>Small</td>
</tr>
<tr>
<td>Architecture</td>
<td>Rugged</td>
<td>Smooth, rounded</td>
</tr>
<tr>
<td>Occipital Area</td>
<td>Marked nuchal crests; Large protuberance</td>
<td>Nuchal crest smoother; small or no protuberance</td>
</tr>
<tr>
<td>Supraorbital ridges</td>
<td>Medium to large</td>
<td>Small to medium</td>
</tr>
<tr>
<td>Glabella</td>
<td>Pronounced</td>
<td>Faint</td>
</tr>
<tr>
<td>Mastoid Processes</td>
<td>Medium to large; broad base</td>
<td>Small to medium, narrow base</td>
</tr>
<tr>
<td>Frontal eminence</td>
<td>Small</td>
<td>Pronounced</td>
</tr>
<tr>
<td>Parietal eminence</td>
<td>Small</td>
<td>Pronounced</td>
</tr>
<tr>
<td>Orbits</td>
<td>Squared, lower, with rounded margins</td>
<td>Rounded, higher, with sharp margins</td>
</tr>
<tr>
<td>Forehead</td>
<td>Sloping, less rounded</td>
<td>Vertical, full</td>
</tr>
<tr>
<td>Zygomatics</td>
<td>Heavier, more laterally arched</td>
<td>Lighter, more compressed</td>
</tr>
<tr>
<td>Palate</td>
<td>Larger, broader, U-shaped</td>
<td>Smaller, parabolic</td>
</tr>
<tr>
<td>Occipital condyles</td>
<td>Larger</td>
<td>Smaller</td>
</tr>
<tr>
<td>Mandible</td>
<td>Larger, increased symphysis height, broad ramus</td>
<td>Gracile, reduced symphysis height, more gracile ramus</td>
</tr>
<tr>
<td>Mental eminence</td>
<td>Pronounced</td>
<td>Slight</td>
</tr>
<tr>
<td>Gonial angle</td>
<td>~90°</td>
<td>&gt;90°</td>
</tr>
<tr>
<td>Gonial flare</td>
<td>Pronounced</td>
<td>slight</td>
</tr>
</tbody>
</table>
Height

In forensic anthropology – the study of the human body for medical and legal purposes - we can use our knowledge of the bones to predict what height a person was from the length of the femur.

1. The femur is the thigh bone and is the longest bone in the body

2. To work out a person’s height we can measure the length of the femur, as shown in the image.

3. We then put that measurement into a sum (maybe the grown-ups could help here with a calculator!)

   - Height in centimetres = \((\text{Length of femur} \times 2.38) + 61.41\)

4. The answer to the sum gives us the height of the person
Height

Femur length (cm)