TOPIC: MICROSCOPIC ANATOMY OF BONES: BONE MATRIX

- The extra cellular matrix of bone has _____ basic components.

1. Inorganic Matrix: _____ crystals.
   - **Hydroxyapatite**: _____ and phosphate.
     - _____ of bone mass.
     - Makes bones _____.
     - *Think plaster (hard but fragile)*

2. Organic Matrix (**Osteoid**):
   _____ fibers & ground substance.
     - _____ of bone mass.
     - Makes bones strong _____.
     - *Think gauze (flexible but strong)*

Think a _____
(Rigid and tough)

EXAMPLE: In the image below, one bone was treated with acid to dissolve the *inorganic* matrix while one bone was treated with enzymes to dissolve the *organic* matrix. What bone was treated with the acid and which with the enzyme?

Normal bone

Treatment

Treatment

Bone is brittle and shatters easily.

Bone was likely treated with:
_____

Bone is flexible and bends easily.

Bone was likely treated with:
_____

PRACTICE: At her annual checkup, the doctor tells Pilar that she should add leafy greens like spinach and collard greens to her diet to help keep her bones strong. What vitamin or mineral in the vegetables would contribute to bone strength?

a) Iron
b) Calcium
c) Collagen
d) Vitamin D

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PRACTICE: If the hydroxyapatites were replaced with more typical gel-like extracellular matrix, how would you expect the bones to be affected?

a) The inorganic matrix would lack the hardness necessary for bones to bear weight.

b) The organic matrix would lack the hardness necessary for bones to bear weight.

c) The inorganic matrix would be unable to provide tensile strength.

d) The organic matrix would be unable to provide tensile strength.