

Bone Crusher Fracture Worksheet **Answer Key**

Questions

1. In general, which bones will require more force to break? Explain why.

The more dense bones require more force to break because they are the ones that support the weight and movement forces of the body and help the body to move. They must withstand more force because they are impacted by forces more directly than other bones. For example, when you jump, the femur and tibia must be able to withstand the impact when your body returns to the ground.

2. Does the direction in which the force is applied make a difference? Explain.

Yes, the direction the force is applied does make a difference because bones are made to withstand impact in certain directions, but not others. Thus, more injuries are seen in football because the body is incurring forces at odd angles.

3. Which bones in the body are harder to repair?

The bones located at joints, such as elbows, hips and knees, are harder to repair because the ability to isolate the fracture is limited. When these joints are immobilized, such as with casts, calcification begins to occur. So the casts must be removed before the fracture is completely healed.

Data Collection

Bone (from cat)	Bone Mass (g)	Bone Volume (ml)	Bone Density (g/ml)	Predicted Fracture Force (N or lbs)	Experimental Fracture Force* (N or lbs)
femur					100 lbs in tension
tibia		Answers will vary.			120 lbs in compression
fibula					85 lbs in compression
humerus			Note: Compression mode requires more force to break bones than tension mode. →		80 lbs in tension
rib					15 lbs in compression
tail					35 lbs in compression

* Indicate whether the bone was subjected to tension or compression force.

Were your predictions of bone strength accurate? Explain.

Answers will vary, depending on students' predictions.

Fracture Examination and Type Determination

Bone (from cat)	Description of How the Bone Fractured	Type of Bone Fracture
femur	Answers will vary.	Answers will vary.
tibia	Example answers: The bone broke into multiple pieces; it broke at the end or the middle; the break is straight across, angled or spiral; the break was not all the way across, etc.	Example answers: avulsion, comminuted, fissure, greenstick, impacted, oblique, transverse
fibula		
humerus		
rib		
tail		

Types of bone fractures: avulsion, comminuted, fissure, greenstick, impacted, oblique, transverse