

Name : _____ Date : _____ Hour : _____

Human Body: Pushing the Limits Strength

1. Our skeleton is made up of _____ bones. They give us a tough _____ frame. Pound for pound bone is stronger than _____. It has a strength to weight ratio found in no other substance on earth. It is a matrix of _____ cells. It gets its rigidity from _____ and phosphorus. Almost half of our bone mass is soft and alive, allowing our bones to bend. Every _____ years a healthy human body completely replaces every single bone cell.
2. A runner grows stronger _____ bones than a swimmer, and a _____ player has bigger bones in his racquet arm. A thigh bone can withstand almost a _____ of stress before snapping.
3. Muscle tissue works by _____, pulling on bone, using it like a lever. Each muscle has thousands of individual _____, bundled like wires in a cable. Muscles may get bigger or smaller, but we are born with every muscle fibre we will ever have.
4. Most of us use only about a _____ of our muscle fibres at one time. In an emergency, the brain can signal the muscle to use all fibres. Most people can't voluntarily make their muscle do that.
5. Running puts a strain on our body _____ times our body weight. A jump can put the skeleton under stress equal to _____ times our body weight. On landing, leg muscles absorb energy, like giant elastic bands. The knee bones are connected by _____, which are twice as tough as nylon rope, with a combine breaking strain of nearly a ton. Between the bones lie _____. It is merely a fraction of an inch thick. It is made of _____. In our joints a weave of collagen fibres is surrounded by 80% _____. On impact it acts like a water filled cushion. It can bear _____ tons before it gives way. It is almost _____, allowing the knee bones to roll over each other like well oiled bearings.
6. Damage to our body causes pain we all sense. We are similar in our pain _____, but there is a difference in pain _____. In ballet, the pressure on the toes bone

can equal _____ stacked on top of each other, balancing on one leg. Pain sensors in the toe joints trigger signals that fire along nerves in the leg and spinal cord to the brain. Studies suggest _____ feel pain sooner than _____, but have a higher tolerance for it.

7. A heightened state of alert triggers a powerful biochemical reaction, releasing _____. It is a _____ that heightens all senses. These glands are found just above the _____. Some reactions caused by a release of adrenaline include increased _____ rate, increased _____ flow, and increased _____ is released.
8. Energy can be stored for quick bursts of energy. This energy is called _____. It fuels our muscles. It can be made by burning _____ or _____.
9. The human body is powered by over _____ muscles. Walking involves coordinating over _____ muscles. Not all muscles have the same number or controlling nerves. The biggest in the legs may have _____ nerves. _____ nerves control our hands. Each time a soccer player kicks a ball, his _____ records and stores his muscles strength and timing, making each successive attempt easier. Soon without thinking, signals fly down to the muscles at more than _____ per second and the movement becomes _____. Connections can be strengthened while we sleep, especially during _____ sleep.
10. Fat is a vital way of storing _____. _____ stored in the liver and muscles quickly convert to glucose, then combine with oxygen to power the body. This will not last indefinitely. An athlete may hit the wall after two to three hours of activity. Low _____ levels make you feel so bad you want to quit. The body will then have to feed off its own fat. Fat takes _____ to process than carbohydrates. Converting fat to fuel requires extra _____.
11. The average person has a _____ litre cardiac output, while a trained person can put out about _____ litres of blood out of the heart. This much more blood delivers more _____, which helps supply more _____.