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 ___________.