A urine pump for the school urinal tank

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At Chisungu school an existing boys urinal was modified to collect urine and deliver it to a tank make of concrete and bricks.

A PVC pipe was cut along its length to capture the urine against an existing wall. The PVC pipe leads urine to a concrete tank below ground. It now requires a plastic pump to raise water from the tank into buckets.
The pump is best made in PVC. In Zimbabwe a modified all plastic Blair Pump is used. In other countries like Malawi, a Mark V pump could also be used.

A simple prototype Blair pump. The handle also acts as a water spout.
The Blair pump has an inner (25mm) and outer (50mm) PVC pipe. A valve is screwed into the bottom of each pipe.
The outer pipe

The inner pipe is fitted into the outer pipe and a hole is made higher up through the wall of the outer pipe to let excess water (or urine) out during pumping.

The outer pipe and foot valve

The outer pipe and foot valve
The valves in this case (piston valve and foot valve) are specially made items.

A hard rubber ball is used as a valve. It rests on a circular PVC seat inside the valve assembly.
To test the pump the inner pipe is fitted into the outer pipe and placed in a bucket of water. By pushing the inner pipe and up and down water is released from the handle.
The concrete slab covering the urine tank is made with two holes in it. One to allow urine in and one to fit the pump. A 50mm steel socket into which a PVC thread fitted around the outer pipe of the pump is fitted.

The urine inlet hole is fitted with a stainless steel screen to stop larger items falling in. In this case the pump handle has been made to look like a walking stick!
Close up photos of the actual pump

Full pump complete and inner and outer pipes
Close up photos of the actual pump

Pump handle
Close up photos of the actual pump

Upper fittings
Close up photos of the actual pump

Piston valve and foot valve
The pump is screwed into the socket mounted in the slab and the handle moved up and down.

It is best to wear plastic gloves for protection.

It is best to fit an overflow pipe through the upper wall of the tank to allow excess urine to flow into a seepage area which can be a group of banana trees.