



Spinal Fitness

The Human Spine, Adapted into the Adult S-Shaped Posture, Provides the Optimal Muscular Skeletal Lever System for Maintaining Upright Human Posture.

John S. Scherger, D.C.

The Spinal Fitness Center

19321 NE 10th AVE

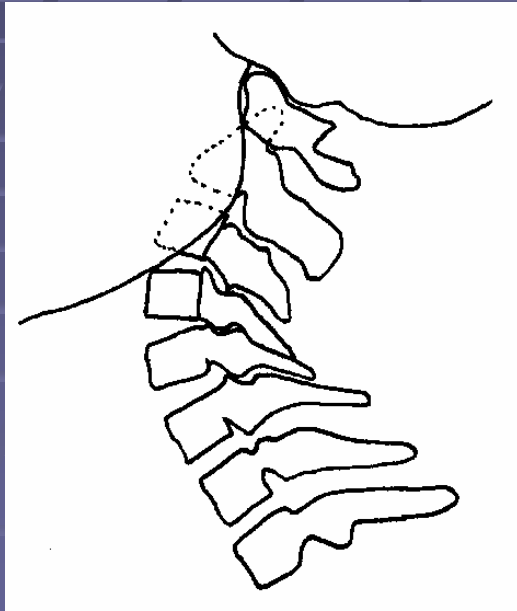
Vancouver, WA 98642

Phone: (360) 887-8600

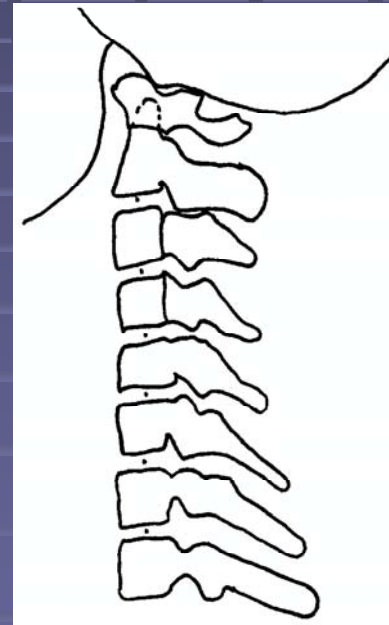
E-mail: spinalf@spinalfitness.com

www.spinalfitness.com

The adult S-shaped posture provides the best mechanical advantage both in terms of minimal muscle effort required for leveraging upright posture and minimal amount of forces created into the spinal joints (fulcrums).



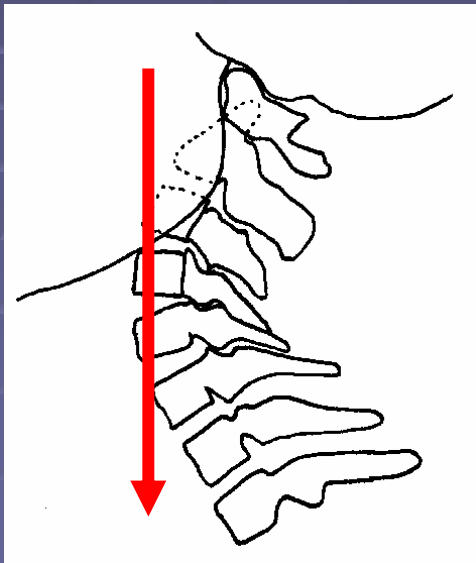
Proper posture,
good mechanical
advantage.



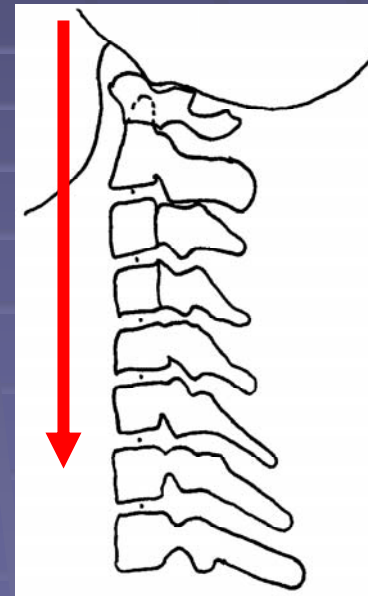
Improper posture,
poor mechanical
advantage.

The secret to the curved spine's ability to provide the best mechanical advantage is in its ability to place the centers of mass of the trunk over the center of the anterior convex portions of the neck and lower back.

Proper Posture

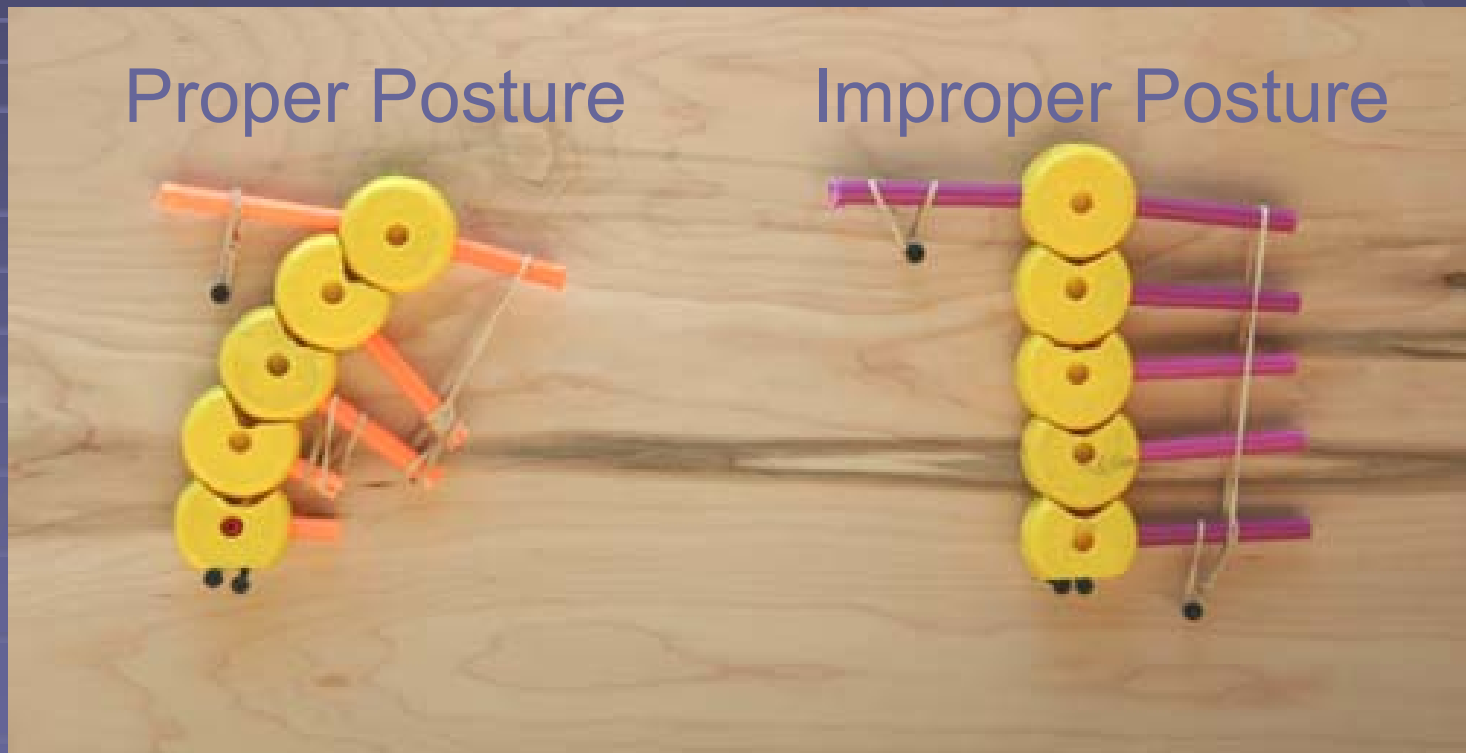


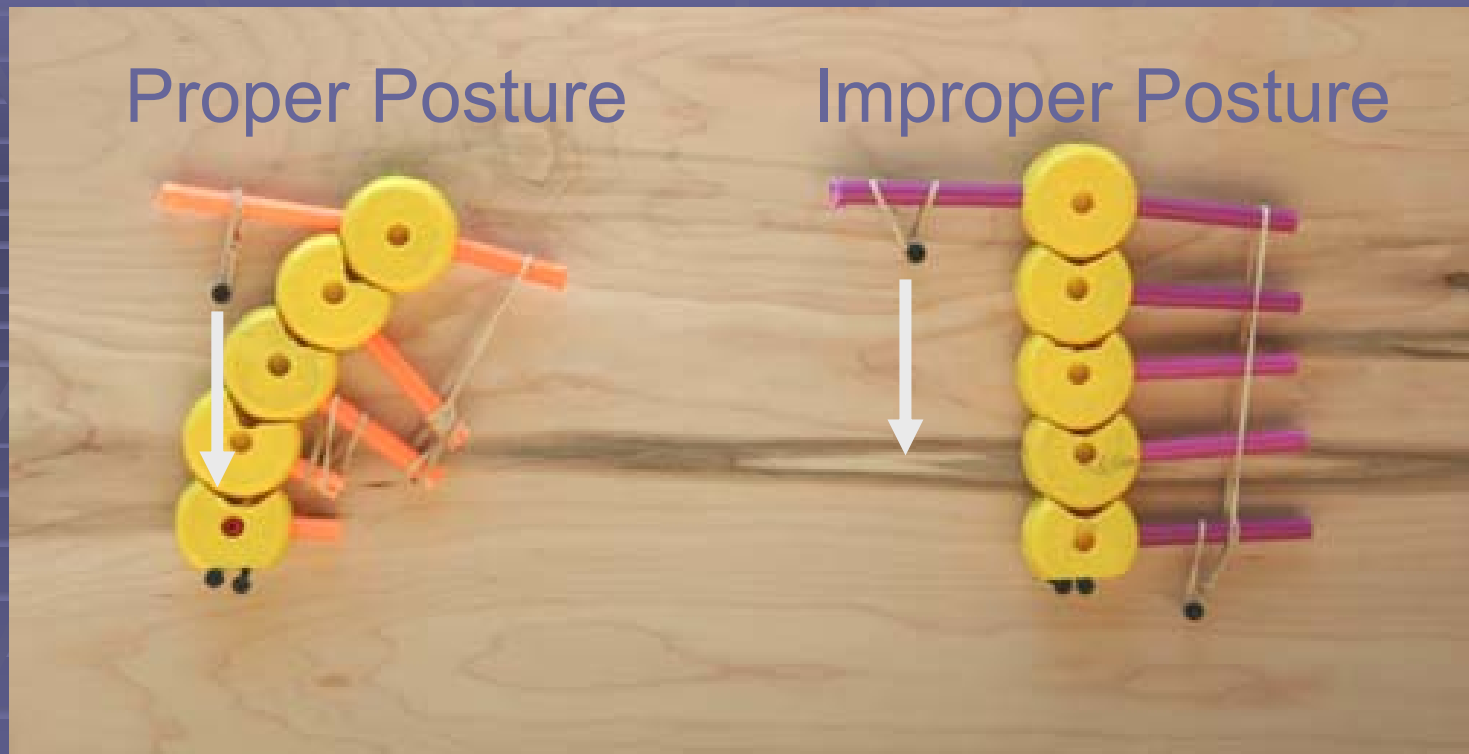
Improper Posture



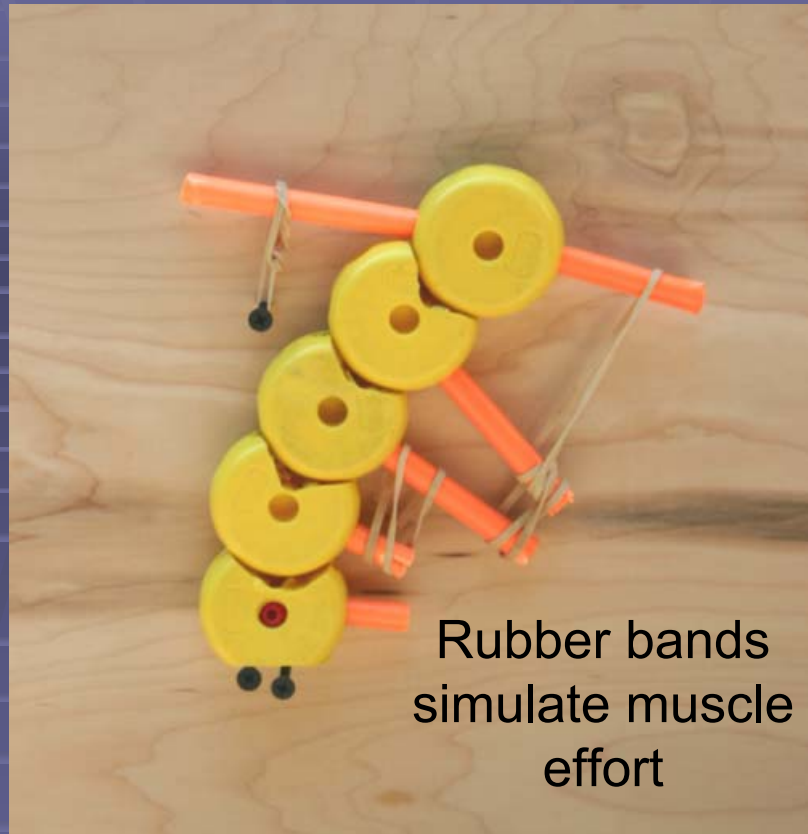
Center of mass indicated by red arrows.

In this slide we demonstrate two structures that mimic the proper cervical muscular skeletal complex (on the left) and one with poor structure (on the right).

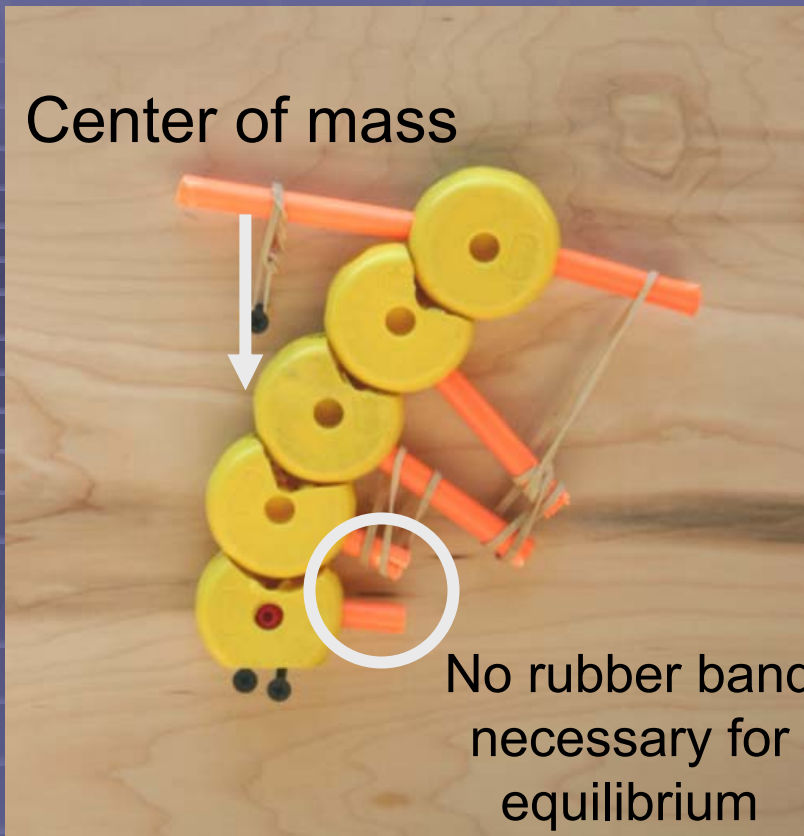




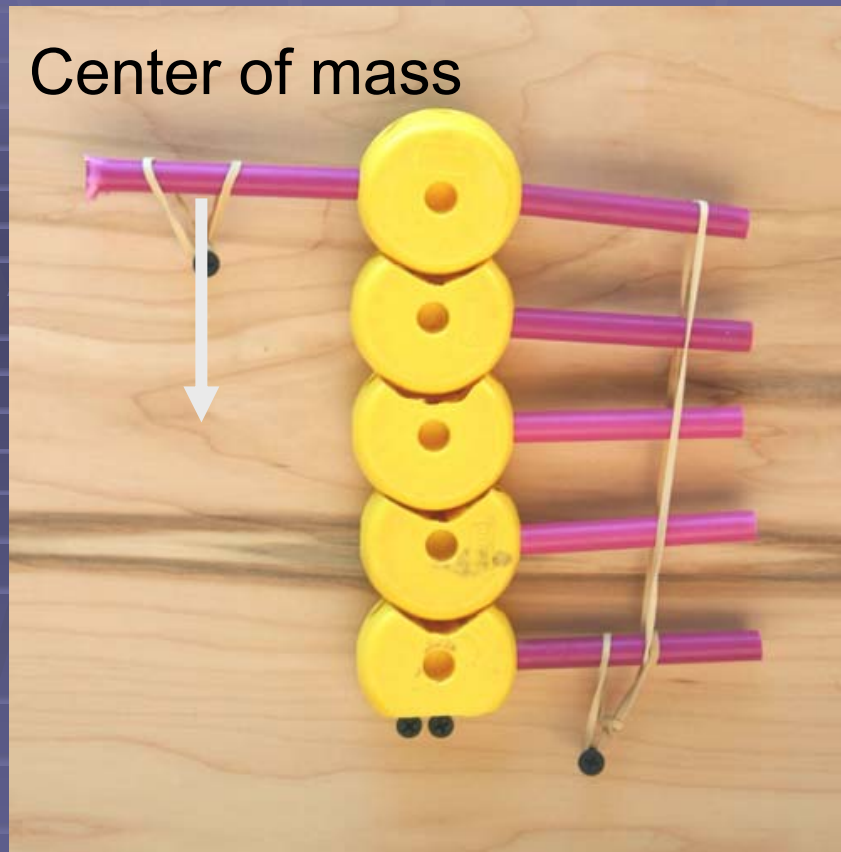
The pull of the rubber band (representing the center of skull mass) is centered over the convex portion of the proper curve. On the improper posture, the pull of the rubber band is anterior to all the joints.



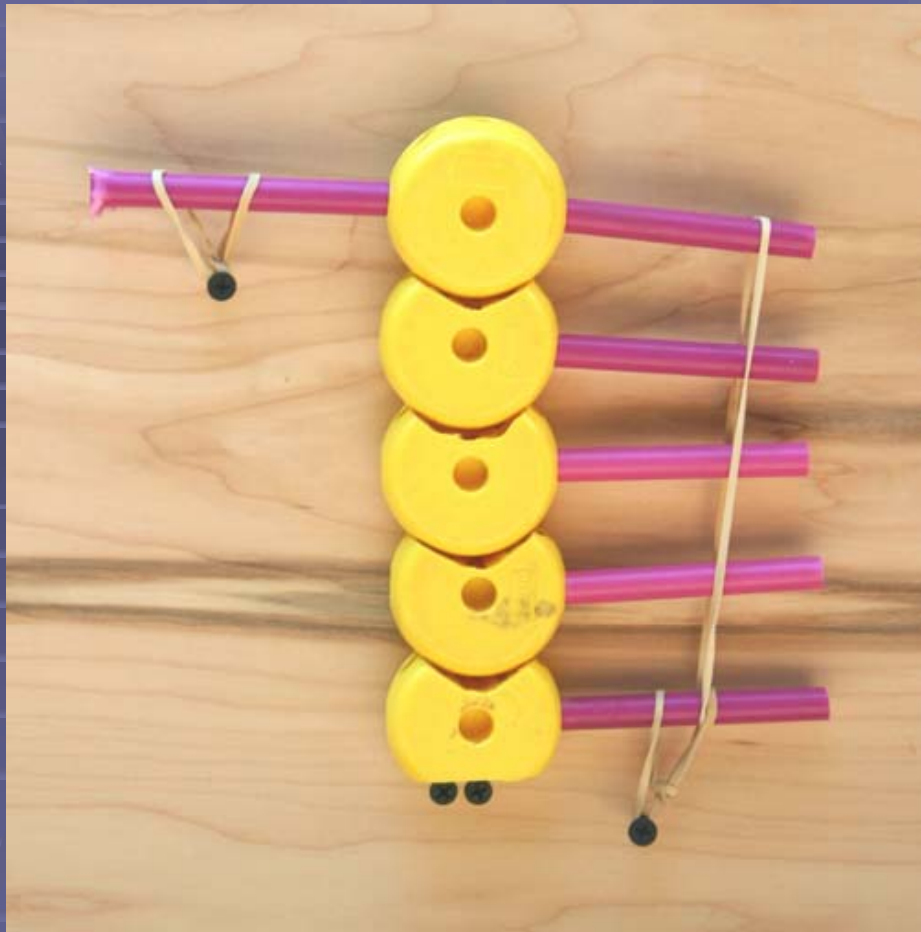
The pull of the top bone would rotate or torque it downward so a muscle pull is necessary on the opposite side represented by another rubber band. The sticks that the rubber bands are attached to represent the spinous bones of the vertebrae.



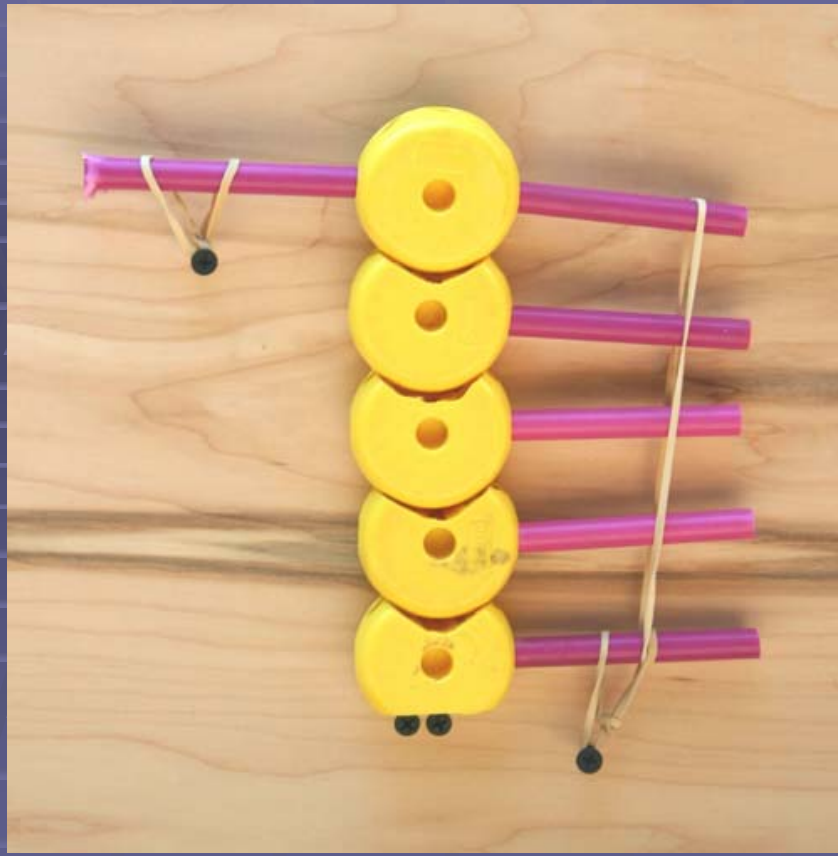
The significance of this physics demonstration is, as we descend down to the most convex portion of the curve represented by the last bone (which is centered underneath the pull of the rubber band representing the center of skull mass), the forces on the posterior side keep getting less and less until between the last two vertebrae, there is no rubber band required to stabilize any torque.



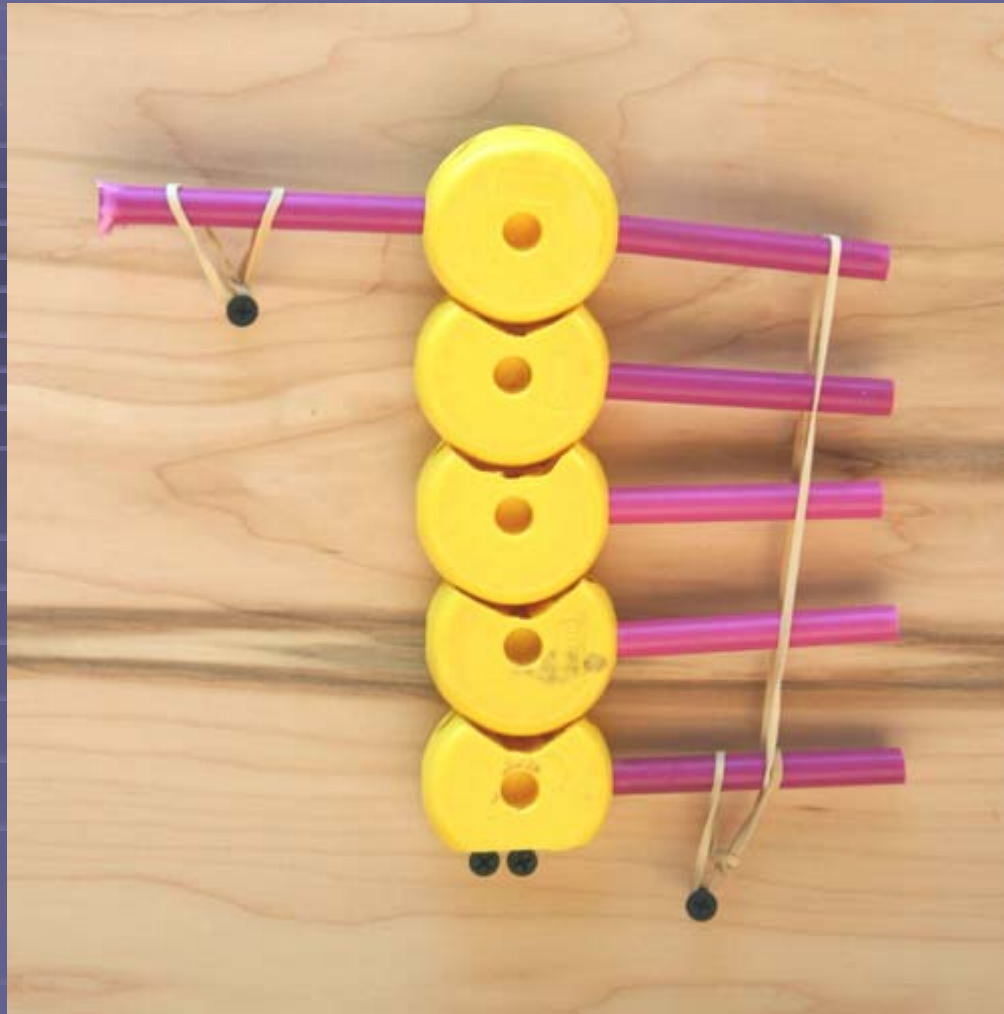
In poor posture, the center of mass is far to the anterior of each joint. At each joint on the posterior side, equal effort must be expended and does not diminish as it descends. The significance of this demonstration is that the poor posture must expend more energy than the proper posture to stabilize itself in the upright position.



Another significant point, for those that want to study more about muscular skeletal leverage, you will notice between the last two vertebrae there is a rubber band connected between the two spinous processes.



In the upper four vertebrae, the rubber band connects from the first to the fourth without touching the middle two. The two middle joints are kept in equilibrium just as if the rubber band attached directly from joint to joint as in the bottom two.



In muscular skeletal leverage, a muscle can cross three or more joints, and it will affect the joint it crosses the same as if it attached directly to that joint.