(Compare the contact surfaces made by individuals with varying degrees of normal to flat-footedness, Figure 1.) Note that contact is always made by the heel (which strikes the substrate first in normal walking), the outside of the foot, the ball of the foot (the pad under the far or "distal" ends of the bones called "metatarsals"), and the big toe or "hallux." These contact surfaces reflect the normal walking cycle (see Figure 2): "Heel strike" first, followed by "midstance" (when the weight is transferred along the outside to the ball of the foot as the pelvic muscles contract to shift the weight of the body over the supporting leg), and finally "push-off" or "toe-off" (when a person propels himself or herself forward by pushing against the substrate with the big toe.) Even on a hard surface, one can see the imprint made by the heel, the outside of the foot, the ball, and the big toe. The little toes typically leave only slight marks on a hard floor, not merely because the pads of the little toes are smaller than the pad of the big toe but because they do not bear the weight of the body during push-off.

If a person walks across a medium such as wet sand, soft enough to yield to pressure but not so wet that the depressions won't hold after his or her feet are withdrawn, the tracks will exhibit another characteristic shape. They will lack an hourglass outline but their depth will vary from great at the heel and ball to shallow in the arch area. The ball will have made a distinct depression deeper on the inside than the outside - a record of the way pressure shifted just prior to push-off. Mud will have oozed into the curl of the little toes, forming a slightly raised line separating the imprints of the pads of the little toes from the ball. In contrast, the depression made by the great toe will show greater continuity with the ball. In short, the rolling stride of humans produces distortions on a yielding surface that show exceedingly well the anatomical features of the human foot and the characteristics of human striding.

The consistency of the supporting surface also affects stride length. A person's stride is impeded on mud because the degree to which foot pressure imparts motion to the body during push-off is proportional to the counterpressure of the supporting substrate. If the foot slips or sinks in soft mud, more pressure must be applied in order to achieve even slow progress, and the gait becomes relatively inefficient, the stride relatively short.