How Athletes Move

Part 2

Flying

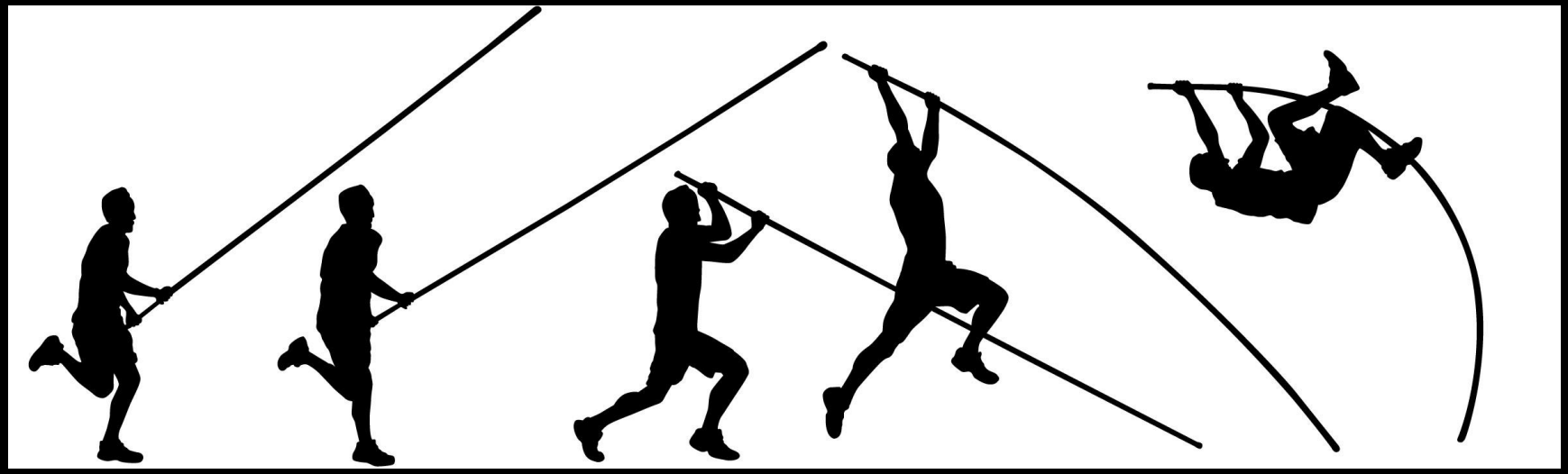
- Ski jumpers want to maximize their lift and minimize their drag at high speeds
  - Ramp – crouched low
  - Air – lean forward over skis

Flying

- 1980s: New technique! Put skiis in ‘V’ shape with ends together and tips apart.
  - Reduces drag by 30%
  - Increases lift by 36%

Flying

- Pole vaulters use fibreglass poles instead of wood or bamboo

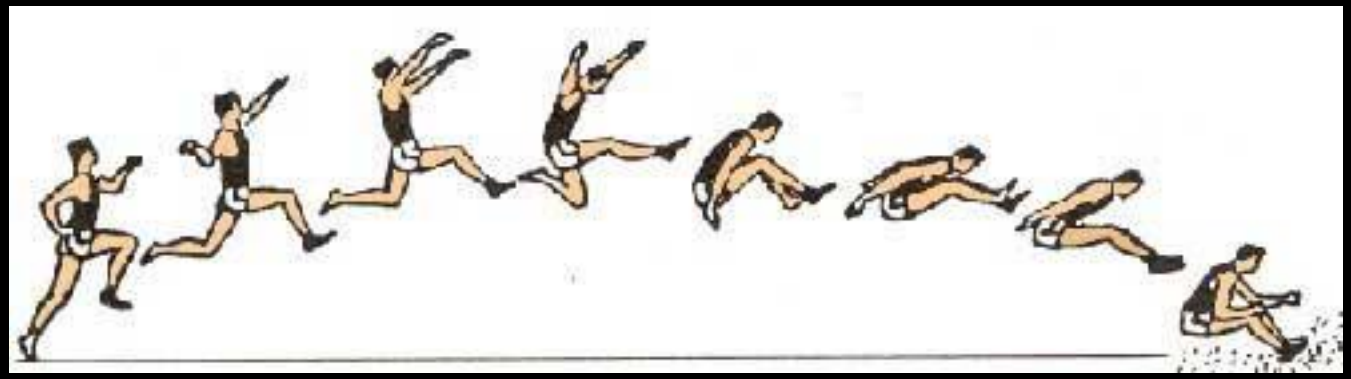


Jumping

- 1968 Olympics (Mexico City) Bob Beamon broke the long jump record by 2’!
- How???

Jumping

- Long jumpers use the hitch-kick to stop the forward rotation of their body in the air. They stop the hitch-kick right before they land so they move forward as they plant their feet.

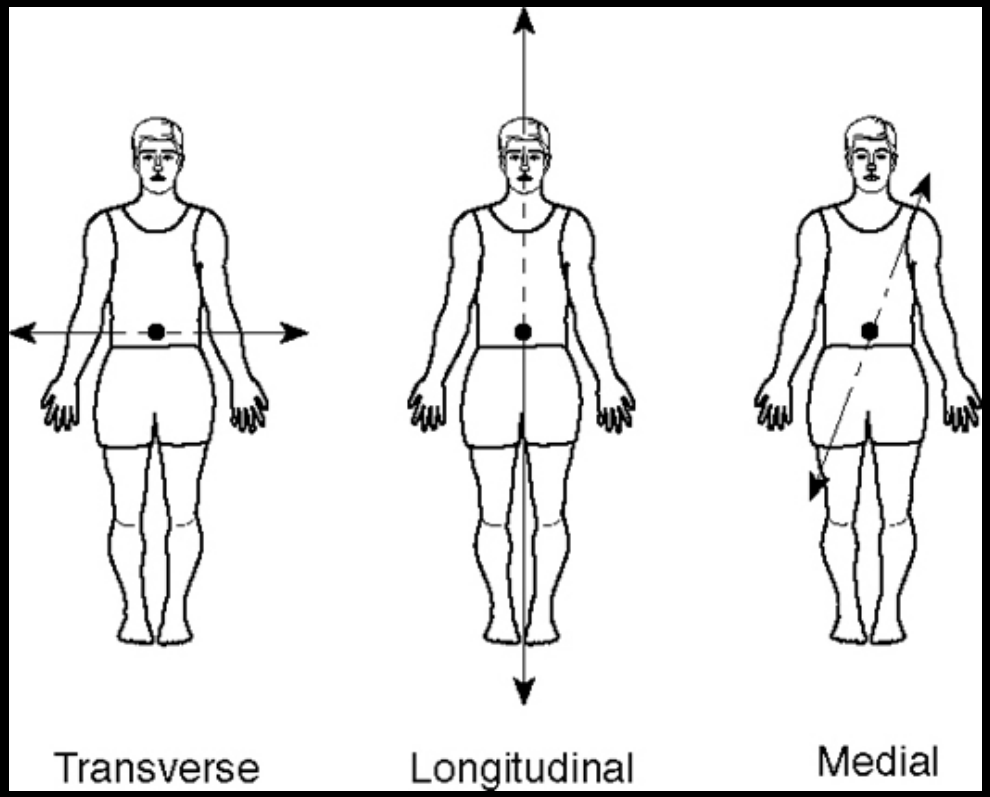


Jumping

- High jumpers use the ‘Fosbury Flop’ (named after Kick Fosbury 1968). They twist their body so that their center of gravity as actually outside their body and travels under the bar. The jumper must keep as much of their body under the bar at all times. (This is impossible using the scissor technique.)

Spinning

- There are 3 axes any object can spin around:
- 1. Longitudinal
- 2. Transverse
- 3. Median

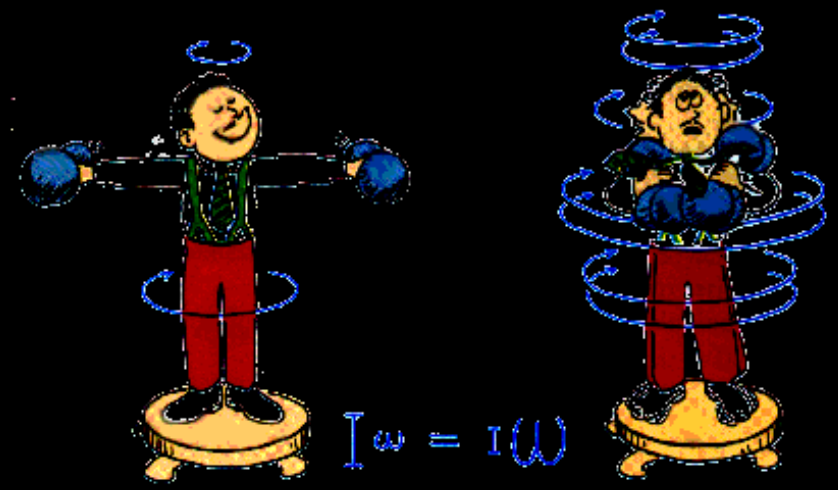


Spinning

- How fast you spin depends on how far your mass is from the axis
- Example: Skaters and divers tuck in their arms and legs when they spin

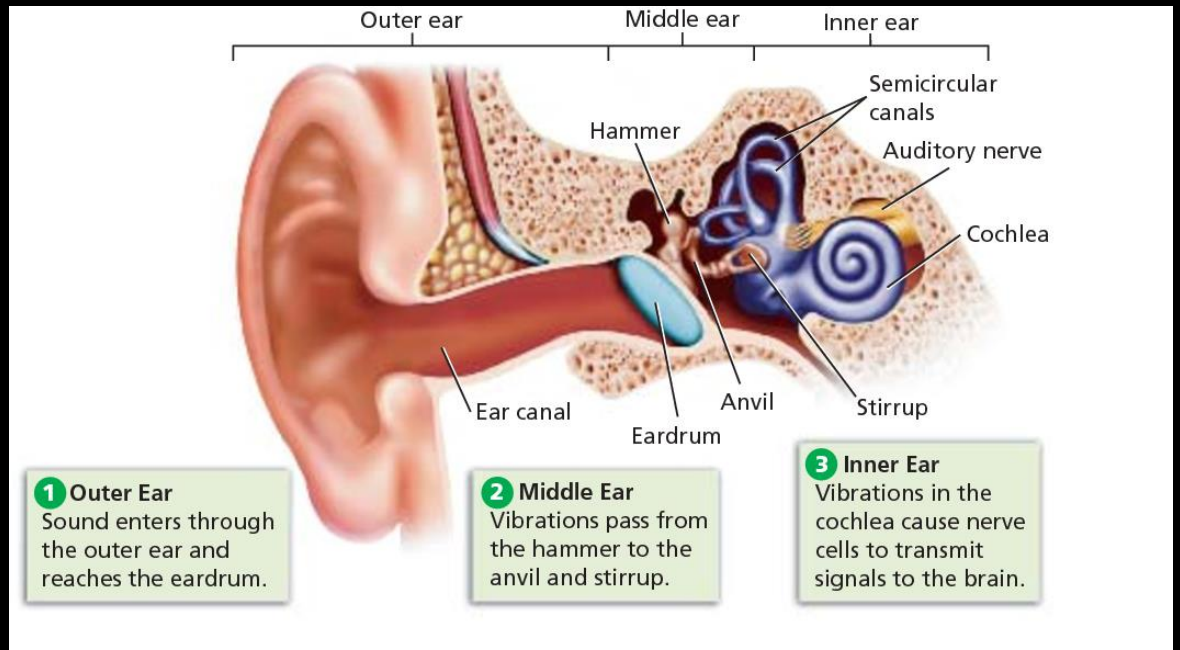
Spinning

- Angular momentum = mass x velocity x radius
- If you decrease your radius, your velocity will increase to keep your angular momentum the same. (You can make your body spin 20X faster!)



Spinning

- How do you keep from getting dizzy?
- Sense of balance comes from your semi-circular canals in your ears filled with fluid called endolymph.



Spinning

- When you stop spinning, it keeps moving, so your body thinks you're moving even though you're not… this makes you dizzy.
- To fight this effect, dancers use a spotting technique, skaters toss their heads the opposite way when they're done their spin.