**Hurdling iMovie**

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**General Science**

**3rd Period**

**2/13/14**

**Hurdling**

**A. History**

 **- Technique**

**Evolved from tuck jumps to low-line sprints**

 **- Barriers**

**Initially heavy wooden structures embedded into ground**

**1895 : T-shaped frame**

**1935 : L-shaped frame (tips over)**

 **- Distances**

**Originally a 100-yard race**

**1864 : 120-yard distance**

**1898 : 110-meter high hurdles (Women : 100-meter hurdles)**

 **- Olympics**

**1st appeared in 1896**

**1928 : Women’s event included**

 **- Records**

**12.21 seconds (1986) : Yordanka Donkova (Bulgaria)**

**12.87 seconds (2008) : Dayron Robles (Cuba)**

**B. Technical Aspect #1**

 **- Technique : Stepping**

 **- Principle Applied : Velocity & Acceleration**

 **- 8 Steps to the 1st Hurdle**

**Need quick acceleration**

**Avoid 10 individual races (Establish rhythm)**

 **- Between Hurdles**

**3 Steps (Boys); 3 – 4 Steps (Girls)**

 **- Less steps = Less time to cover distance**

**3 vs. 4 Steps = 40 less steps**

**C. Technical Aspect #2**

 **- Technique : Take-Off**

 **- Principle Applied : Projectile Angle**

 **- Take –off 1 – 1 ½ meters away from hurdle**

**Running Vs. Jumping**

 **- ATTACK with a low angle**

**Limits hang time of trajectory**

**Can’t run in the air**

 **- Lean into the hurdle**

**Limits air resistance**

**Lowers center of mass (less disruptions)**

**Contributes to linear momentum**

**D. Technical Aspect #3**

 **- Technique : Leg Action**

 **- Principle Applied : Rotational Dynamics**

 **- Lead Leg – “Up, Out, Down”**

**Avoid swinging leg up**

**Disrupts center of mass**

**Adds rotational dimension**

 **- Trail Leg – “Pull through fast”**

**3 points of flexion**

**Avoid “clipping” hurdle**

**Contributes to linear momentum**

 **- “Snap” lead leg**

**Limits hang time of trajectory**

**Can’t run in the air**

**E. Technical Aspect #4**

 **- Technique : Arm Motion**

 **- Principle Applied : Rotational Inertia**

 **- Avoid “Helicoptering”**

**Leads to Conservation of Momentum**

**Disrupts landings**

 **- Avoid increasing Angular Velocity**

**Maintain linear velocity & acceleration**

 **- Avoid crossing mid-line of body**

**Throws off center of mass**

**F. Recommendations**

 **- Win the 3 parts of the race**

**1. Accelerate in 8 steps to 1st hurdle**

**2. Maintain 3 stepping through the middle**

**3. Slingshot over the last hurdle to the finish line**

 **- Take off away from the hurdle**

 **- Limit hang time trajectory**

 **- Keep arms under control**

 **- Think linear momentum, not angular momentum**