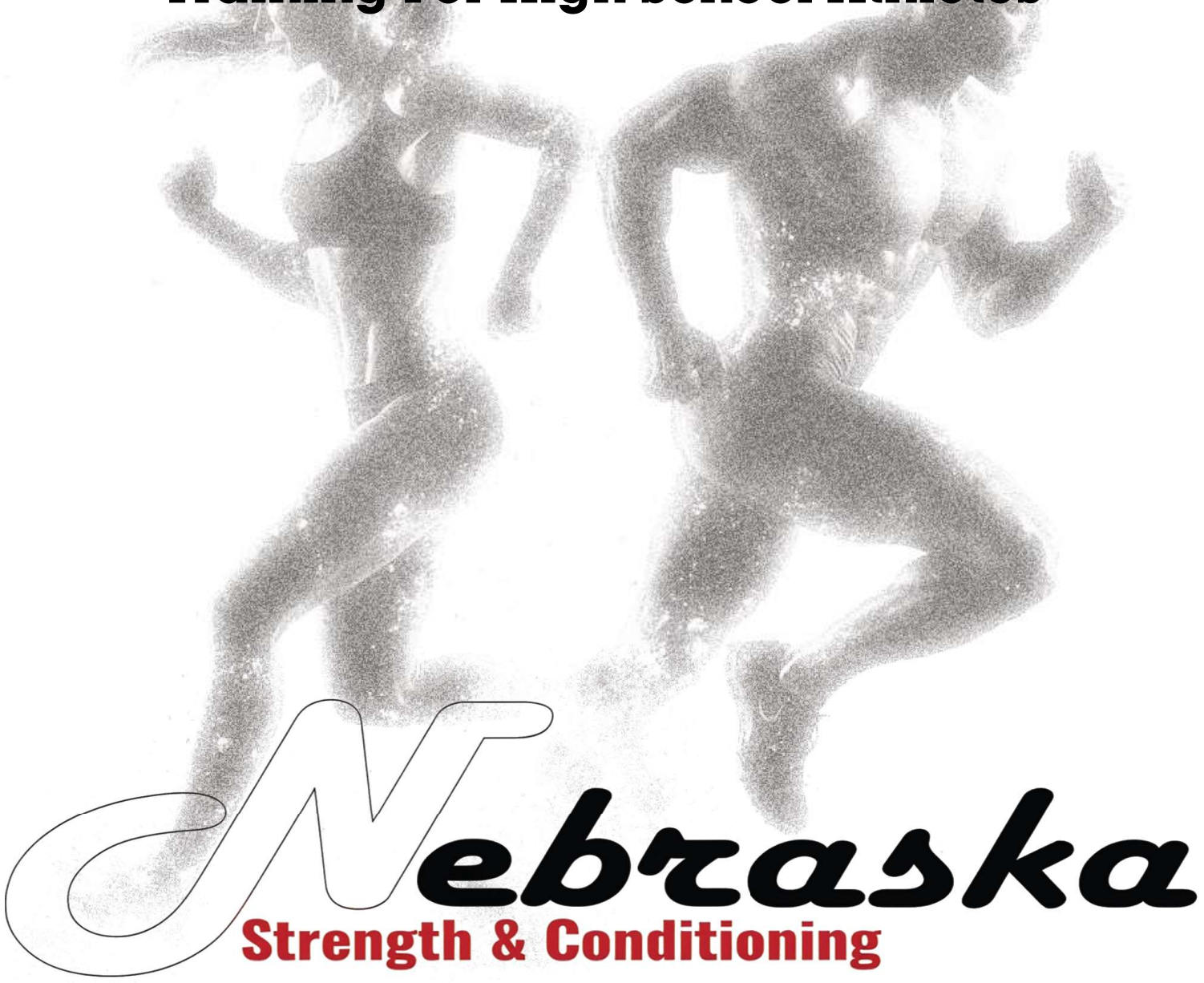
Speed & Agility

Training For High School Athletes



Nebraska

Strength & Conditioning

Brian Kmitta II
bkmitta@nebraskasc.com

Jon Pfeifer
jpfeifer@nebraskasc.com

Eric Johnson
ejohnson@nebraskasc.com

nebraska_sc

nebraskasc.com

nebraska_sc

Nebraskasc-JonPfeifer

Speed & Agility

A well-structured program enhances an athlete's acceleration, maximal speed, and ability to change direction efficiently. This guide provides coaches with a framework to develop a comprehensive speed and agility program

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Speed

in athletes refers to the ability to move quickly across the ground or perform a movement in the shortest possible time.

Speed is a combination of several factors, including:

Acceleration – How fast an athlete can increase their speed from a standstill or low velocity.

Maximal Speed – The highest velocity an athlete can achieve.

Speed Endurance – The ability to maintain high speeds over time or during repeated efforts.

Agility – The ability to change direction quickly while maintaining speed and balance.

Reaction Time – The time it takes to respond to a stimulus, such as a starting gun or an opponent's movement.

Short to Long Sprint Program Sample

Mesocycle 1 (4weeks)	Wk.1			Wk.2			Wk.3			Wk.4		
Sprints	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
	2-4	5yds		3-5	10yds		3-5	15yds		3-5	20yds	

Mesocycle 2 (4weeks)	Wk.1			Wk.2			Wk.3			Wk.4		
Sprints	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
	2-4	10yds		3-5	15yds		3-5	20yds		3-5	25yds	

Mesocycle 3 (4weeks)	Wk.1			Wk.2			Wk.3			Wk.4		
Sprints	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
	2-4	15yds		3-5	20yds		3-5	25yds		3-5	30yds	

Mesocycle 4 (4weeks)	Wk.1			Wk.2			Wk.3			Wk.4		
Sprints	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
	2-4	20yds		3-5	25yds		3-5	30yds		3-5	35yds	

Speed is crucial in sports like sprinting, football (soccer), basketball, and combat sports, and it can be improved through specific training that includes sprint drills, plyometrics, strength training, and neuromuscular coordination exercises.

Acceleration

In team sports, acceleration refers to the ability of an athlete to increase their speed rapidly over a short distance. It is the rate at which an athlete can change their velocity from a standstill or low speed to their maximum speed.

In the context of team sports, acceleration is important for:

Starting Quickly:
when a play begins or when an athlete has to react to a stimulus (e.g., the ball being passed, a change in the opponent's position)

Changing direction:
effectively to evade defenders or adjust positioning

Bursting to a Spot:
to receive a pass, intercept the ball, or get into scoring position

In sports like soccer, basketball, football, and volleyball, acceleration plays a key role in outpacing opponents, making effective tackles or blocks, and creating opportunities for attack. The quicker an athlete can accelerate, the better their chances of gaining an advantage during high-intensity moments in the game.

Max Speed

In team sports, max speed refers to the highest velocity an athlete can reach during a movement or sprint over a short distance. It is the athlete's top speed, typically reached in a sprint or other high-intensity movement, after they have fully accelerated.

In the context of team sports, max speed is important for:

Power-to-Weight Ratio:
the athlete's strength relative to their body mass, which impacts their ability to move quickly

Running Technique:
efficient biomechanics, like proper posture, stride length, and frequency, are crucial for maximizing speed

Energy System:
the anaerobic energy systems come into play during max speed efforts, and an athlete's conditioning will impact how long they can maintain top speed

Max speed is essential for sports where quick sprints or fast runs are needed, such as in track and field, football, soccer, or basketball. However, in many team sports, it's not just about achieving top speed but also about maintaining a high speed while performing other skills (e.g., dribbling, passing, or changing direction). Improving max speed can involve sprint training, strength and power exercises, and optimizing running form.

Agility

In team sports, agility refers to an athlete's ability to quickly and efficiently change direction, speed, or position while maintaining control of their body. It involves a combination of reaction time, balance, coordination, and speed, enabling athletes to adjust to dynamic situations during gameplay.

In the context of team sports, agility is important for:

Evading Opponents:
(e.g., a basketball player dodging a defender or a soccer player changing direction to avoid a tackle)

Reacting to Unpredictable Situations:
Reacting to unpredictable situations (e.g., a volleyball player adjusting to a change in the ball's direction or a football player reacting to a pass

Maintaining Balance & Control:
while moving in multiple directions quickly

Agility training for sports focuses on developing an athlete's ability to rapidly change direction, accelerate, decelerate, and maintain control of their body during dynamic movements. It combines several physical qualities such as speed, balance, coordination, flexibility, and reaction time to enable athletes to quickly adapt to changing situations in a game. Agility training is crucial for improving change of direction (COD) ability and maneuverability, both of which are key components of agility in sports.

Key Elements of Agility

Coordination:
synchronizing the movements of various body parts to maintain efficient movement

Balance:
maintaining stability and control while moving rapidly

Rection Time:
the ability to respond instantly to a stimuli, such as an opponent's movements or the ball

Quick Directional Changes:
the ability to decelerate and then accelerate in a new direction

Key Components of Agility Training

Change of Direction (COD) Ability:

This involves the ability to decelerate, stop, and then rapidly change direction while maintaining speed and balance. It's important for sports like soccer, basketball, and volleyball, where athletes often have to pivot or shift direction in response to the ball or opponents.

Maneuverability:

This is the ability to move fluidly and effectively within a confined space, making quick, controlled movements to avoid opponents or navigate around obstacles.

Training Focus: Strengthening deceleration muscles, improving reaction time, and learning efficient footwork

Drills to Improve Agility, COD Ability, and Maneuverability

Cone Drills:

(e.g., T-Drill, Zig-Zag Drill) These drills focus on rapidly changing direction while maintaining control and balance

Ladder Drills:

These improve foot speed, coordination, and quickness, which are essential for agility

Shuttle Sprints:

Short bursts of sprints in multiple directions simulate real-game scenarios

Plyometrics:

(e.g., lateral bounds, squat jumps): These help develop explosive power, which is important for quick direction changes

Reaction Drills:

(e.g., ball drop or partner reaction drills): Improve reaction time to external stimuli, such as a coach's whistle or an opponent's movement

Agility training for these skills enhances an athlete's overall ability to quickly maneuver on the field or court, making them more effective at reacting to dynamic situations.

Periodization of Speed for Team Sports		
1st Phase	2nd Phase	3rd Phase
Acceleration	Max Speed	Agility
Max. Speed	Agility	Acceleration
Agility	Acceleration	Max Speed

Phase 1 Sample Program

Day 1		Wk.1			Wk.2			Wk.3			Wk.4		
		Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
Warm up													
Sprints	Sprints	2-4	5yds		3-5	10yds		3-5	15yds		3-5	20yds	
Max Speed	Flying 10s	2-4	10yd/10yd		3-5	10yd/10yd		3-5	10yd/10yd		3-5	10yd/10yd	
Resisted Sprint	Sled Pull	3	15yds	Heavy	4	15yds	Heavy	5	15yds	Heavy	6	15yds	Heavy
Plyo's	Box Jump	3	2	Low	4	2	Mod.	5	2	Mod.	6	2	High

Day 2		Wk.1			Wk.2			Wk.3			Wk.4		
		Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
Warm up													
Shuffle													
Cone													
Line													
Reaction Drill													

Day 3		Wk.1			Wk.2			Wk.3			Wk.4		
		Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
Warm up													
Sprints	Sprints	2-4	5yds		3-5	10yds		3-5	15yds		3-5	20yds	
Max Speed	Flying 10s	2-4	10yd/10yd		3-5	10yd/10yd		3-5	10yd/10yd		3-5	10yd/10yd	
Resisted Sprint	Sled Push	3	15yds	Heavy	4	15yds	Heavy	5	15yds	Heavy	6	15yds	Heavy
Plyo's	Pogo Hop	3	10		4	10		5	10		6	10	

Day 4		Wk.1			Wk.2			Wk.3			Wk.4		
		Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
Warm up													
Shuffle													
Cone													
Line													
Reaction Drill													

Phase 2 Sample Program

Day 1		Wk.1			Wk.2			Wk.3			Wk.4		
		Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
Warm up													
Sprints	Sprints	2-4	10yds		3-5	15yds		3-5	20yds		3-5	25yds	
Max Speed	Flying 20s	2-4	10yd/20yd		3-5	10yd/20yd		3-5	10yd/20yd		3-5	10yd/20yd	
Resisted Sprint	Sled Pull	3	15yds	Mod.	3	15yds	Mod.	3	20yds	Mod.	3	20yds	Mod.
Plyo's	Depth Jump	3	2	Low	4	2	Mod.	5	2	Mod.	6	2	High

Day 2		Wk.1			Wk.2			Wk.3			Wk.4		
		Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
Warm up													
Shuffle	Cone Shuffle	3	4	3yds	4	4	4yds	4	4	4yds	5	4	5yds
Cone	Zig Zag 6 Cone	3	6	3yds	4	6	4yds	4	6	4yds	5	6	5yds
Line	Sprint 5 Backpedal 5	3	2		4	2		4	2		5	2	
Reaction Drill	3-5-7	3	3		4	3		4	3		5	3	

Day 3		Wk.1			Wk.2			Wk.3			Wk.4		
		Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
Warm up													
Sprints	Sprints	2-4	5yds		3-5	10yds		3-5	15yds		3-5	20yds	
Max Speed	Flying 10s	2-4	10yd/10yd		3-5	10yd/10yd		3-5	10yd/10yd		3-5	10yd/10yd	
Resisted Sprint	Sled Push	3	15yds	Mod.	3	15yds	Mod.	3	20yds	Mod.	3	20yds	Mod.
Plyo's	Power Skips	3	10e		3	10e		3	10e		3	10e	

Day 4		Wk.1			Wk.2			Wk.3			Wk.4		
		Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
Warm up													
Shuffle	Cone Shuffle	2	4	3yds	3	4	4yds	3	4	4yds	4	4	5yds
Cone	Small Box	2	6	3yds	3	6	4yds	3	6	4yds	4	6	5yds
Line	Sprint 5 Backpedal 5	2	2		3	2		3	2		4	2	
Reaction Drill	3-5-7	2	3		3	3		3	3		4	3	

Phase 3 Sample Program

Day 1		Wk.1			Wk.2			Wk.3			Wk.4		
		Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
Warm up													
Sprints	Sprints	2-4	15yds		3-5	20yds		3-5	25yds		3-5	30yds	
Max Speed	Flying 30s	2-4	10yd/30yd		3-5	10yd/30yd		3-5	10yd/30yd		3-5	10yd/30yd	
Resisted Sprint	Sled Pull	3	20yds	Light	3	20yds	Light	3	25yds	Light	3	25yds	Light
Plyo's	Hurdle Hops	3	5	Low	3-4	5	Mod.	3-5	5	Mod.	3-5	5	High

Day 2		Wk.1			Wk.2			Wk.3			Wk.4		
		Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
Warm up													
Shuffle	Cone Shuffle	3	4	3yds	4	4	4yds	4	4	4yds	5	4	5yds
Cone	Big Box Drill	3	6	4yds	4	6	5yds	4	6	5yds	5	6	7yds
Line	Sprint 10 Backpedal	3	2		4	2		4	2		5	2	
Reaction Drill	1-2-3	3	3		4	3		4	3		5	3	

Day 3		Wk.1			Wk.2			Wk.3			Wk.4		
		Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
Warm up													
Sprints	Sprints	2-4	5yds		3-5	10yds		3-5	15yds		3-5	20yds	
Max Speed	Flying 10s	2-4	10yd/10yd		3-5	10yd/10yd		3-5	10yd/10yd		3-5	10yd/10yd	
Resisted Sprint	Sled Push	3	20yds	Light	3	20yds	Light	3	25yds	Light	3	25yds	Light
Plyo's	Skater Hop	3	10e		3	10e		3	10e		3	10e	

Day 4		Wk.1			Wk.2			Wk.3			Wk.4		
		Set	Reps	Load	Set	Reps	Load	Set	Reps	Load	Set	Reps	Load
Warm up													
Shuffle	Cone Shuffle	2	4	3yds	3	4	4yds	3	4	4yds	4	4	5yds
Cone	Small Box	2	6	3yds	3	6	4yds	3	6	4yds	4	6	5yds
Line	Sprint 5 Backpedal 5	2	2		3	2		3	2		4	2	
Reaction Drill	Pro-Agility	2	3e	5-10-5yds	3	3e	5-10-5yds	3	3e	5-10-5yds	4	3e	5-10-5yds