



AFL teacher edition

Fitness components & assessment

Key terms & definitions:

Capacity: The total amount of energy produced by the energy system (e.g. aerobic capacity or anaerobic capacity).

Power: The rate of energy production produced by the energy system (e.g. anaerobic power).

ATP: Adenosine triphosphate is a form of chemical energy that serves every cell's energy requirements.

VO_{2max}: The maximal amount of oxygen an individual can use per minute during exercise.

MSFT: A multistage fitness test is a maximal running aerobic fitness test. Common MSFT's include the Beep, Bleep and Yo-Yo test.

1 RM (Repetition Maximum): A 1 RM test requires the athlete to lift the most weight they can in one single repetition.

ROM: Range of motion refers to the range of motion about a particular joint.

Fitness components are routinely assessed and monitored in players to ensure training and on field performance is optimised.

These include;

1. Aerobic power
2. Anaerobic power
3. Strength
4. Flexibility
5. Body composition
6. Speed
7. Agility
8. Balance
9. Coordination
10. Reaction time

1. Aerobic power

Aerobic power refers to the maximal rate of energy (ATP) produced by the aerobic energy system or pathway. The aerobic system is less powerful than the anaerobic systems resulting in lower exercise intensities. However, they have a greater capacity for energy (ATP) production resulting in greater sustained exercise duration.

Application to AFL: Having a well trained aerobic system allows players to 'run out the game' to a greater extent than an opponent with a lesser trained aerobic system.

Sport specific test(s): 1 km time trial, 3 km time trial

Examples: Laboratory VO_{2max} test, multi stage fitness test (MSF)



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Image: A multi stage fitness test (MSFT) performed at the AFL draft combine.

Class activity:

1. Provide an example of a movement/skill that would require aerobic power in a game of AFL.
2. When would an AFL club test this component of fitness with their players?
3. Perform a MSFT or beep test with your class and record your result.
Compare yourself to an AFL player, 58ml/ kg/ min

2. Anaerobic power

Anaerobic power is the ability of the body to produce energy (ATP) anaerobically, using the ATP-CP or anaerobic glycolysis system. The anaerobic systems are more powerful, enabling higher exercise intensities than the aerobic system. However, they have a limited capacity for energy (ATP) production, resulting in shorter exercise durations.

Application to AFL: This fitness component is essential for an AFL player to chase down his opponent at high speed, to leap into the air to take a mark or to execute a powerful kick.

Sport specific test(s): Vertical jump, 20 m sprint test



Image: 20 m sprint test performed at the AFL draft Combine

Class activity:

1. Define the fitness component of anaerobic power.
2. Identify a test used to assess this component.
3. Discuss how this test is performed.
4. Provide an example of a movement/skill that would require anaerobic power in a game of AFL.



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3. Strength

Strength refers to the maximal force that a muscle or muscle group can generate, and is commonly expressed as the one-repetition maximum.

Application to AFL: An AFL player requires a muscular strength to hold off their opponent during contested situations, or to hold their ground. Muscular strength also forms a base for muscular power and endurance, both of which are extremely important to AFL.

Sport specific test(s): 1 RM or up to 10 RM testing



Image: Joel Wilkinson performing a 1 RM bench press

Class activity:

1. Define the fitness component of strength.
2. Identify a test used to assess this component.
3. Discuss how this test is performed.
4. Provide an example of a movement/skill that would require strength in a game of AFL.

4. Flexibility

Flexibility refers to range of movement (ROM) around one or multiple joints.

Application to AFL: Adequate flexibility will allow a player to move through the full range of motion in all activities important to AFL. For example, if a player is experiencing tightness, and a reduced range of motion at the hip joint, this will ultimately affect the amount of power they are able to generate through their lower body whilst running. In this case, their opponent may out run them and gain possession of the ball first.

Sport specific test(s): Sit and reach test, groin flexibility test

Class activity:

1. Define the fitness component of flexibility.
2. Identify a test used to assess this component.



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3. Discuss how this test is performed.
4. Provide an example of a movement/skill that would require flexibility in a game of AFL.

5. Body composition

Body composition refers to the components that constitute a person's body mass including; fat mass, muscle mass, bone and mineral density. Optimal body composition is important for performance in AFL. Skinfold measurements are typically taken on players throughout the year to assess changes in fat mass vs non-fat mass.

Application to AFL: AFL players are required to move their body across large distances during a game of AFL as well as keep their feet in a collision. A certain amount of muscle bulk is required but not to the detriment of being able to run out a game. The higher the player's body mass, the harder the body needs to work to carry it.

Sport specific test(s): Skinfolds, height, mass, girth, dual-energy x-ray absorptiometry (DEXA), field sum of seven skinfolds



Image: Lance Franklin getting his skinfolds taken

Class activity:

1. Define the fitness component of body composition.
2. Identify a test used to assess this component.
3. Discuss how this test is performed.

6. Speed

Speed refers to how fast you can move your body (or body part) across a given distance. Both maximal and repeat speed ability are critical fitness components for optimal AFL performance.

Application to AFL: To chase down an opponent and lay a tackle or to sprint away from an opponent requires AFL players to possess good speed development.



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The video below demonstrates how important speed is to an AFL player.



Video: Daniel rich chases down an opponent from behind.

Click to play

Sport specific test(s): 20 m sprint (standing or running start), 6 x 30 m repeat sprint ability (RSA)



Image: A 20 m sprint test being performed at the AFL draft combine

Class activity:

1. Define the fitness component of speed.
2. Identify a test used to assess this component.
3. Discuss how this test is performed.
4. Provide an example of a movement/skill that would require speed in a game of AFL.

7. Agility

Agility refers to the body's ability to rapidly change direction (decelerate & accelerate) while maintaining balance.

Application to AFL: AFL players need to weave in and out, between opponents to avoid being tackled or losing possession of the ball.

Sport specific test(s): AFL agility test, reactive agility test



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Video: A Calder Cannons player performing an agility test.

[Click to play](#)

Class activity:

1. Define the fitness component of agility.
2. Identify a test used to assess this component.
3. Discuss how this test is performed.
4. Provide an example of a movement/skill that would require agility in a game of AFL.

8. Muscular power

Muscular power is the ability to produce force resulting in an explosive movement or action, e.g. kicking or jumping. Specific weight training and plyometrics enhance muscular power development.

Application to AFL: Explosive movements like leaping up to take a mark or kicking for goal all require muscular power.

Sport specific test(s): Vertical jump test (standing or running start), countermovement jump (CMJ) on a force plate



Video: Jay Schultz leaps to take a spectacular mark

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Class activity:

1. Define the fitness component of muscular power.
2. Identify a test used to assess this component.
3. Discuss how this test is performed.
4. Provide an example of a movement/skill that would require muscular power in a game of AFL.

9. Coordination

Coordination refers to the ability to execute a sequence of movements smoothly and accurately.

Application to AFL: Every activity that we participate in requires the ability to successfully coordinate our limbs, from walking, to the more complex movements involved in AFL such as kicking a football.

Sport specific test(s): Hand coordination test, Matthew Lloyd skills clean hands test



Video: Matthew Lloyd's clean hands test being executed by a draftee hopeful

Class activity:

1. Define the fitness component of coordination.
2. Identify a test used to assess this component.
3. Discuss how this test is performed.
4. Provide an example of a movement/skill that would require coordination in a game of AFL.

10. Balance

Balance refers to the ability to maintain equilibrium or stability whilst stationary or in motion.

Application to AFL: A player with good balance will be able to keep their feet in a one on one contest



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with an opponent, as well as landing safely after taking a mark, either on one, or both feet.

Sport specific test(s): Stork stand test, balance beam test

Class activity:

1. Define the fitness component of balance.
2. Identify a test used to assess this component.
3. Discuss how this test is performed.
4. Provide an example of a movement/skill that would require balance in a game of AFL.

11. Reaction time

Reaction time refers to the interval between the presentation of a stimulus and the initiation of a muscular response to that stimulus.

Application to AFL: An AFL ruckman must have good reaction time when responding to the umpires centre bounce. If they react too slowly, the opposition's ruckman will win the tap.

Sport specific test(s): Nathan Buckley skills kicking test, reactive agility test



Video: *Reactive cutting drills*

Click to play

Class activity:

1. Define the fitness component of reaction time.
2. Identify a test used to assess this component.
3. Discuss how this test is performed.
4. Provide an example of a movement/skill that would require good reaction time in a game of AFL.