



Pearson

# INSIDE TRACK

Online magazine designed to support the  
teaching of Pearson GCE PE | September 2018



## In this issue:

Is it all about winning..?

Buying success

A step too VAR

How fast can you go..?



Welcome to the fourth edition of *INSIDE TRACK*, the online magazine designed to support the teaching of Pearson GCE PE.

This termly magazine provides material to support centres in their delivery of the course, specifically the 2016 specification, with articles written by senior examiners and guest writers, together with reviews of resources that may be helpful for teaching or background reading.

Get in touch

It is hoped that *INSIDE TRACK* will be a helpful resource for centres delivering the Pearson specification. If you have particular requests for how the magazine can support you, or wish to contribute, then please contact the editorial team at [insidetrackpearson@hotmail.com](mailto:insidetrackpearson@hotmail.com) or [teachingpeandsport@pearson.com](mailto:teachingpeandsport@pearson.com).

Support materials

Topic guides, which provide additional detail about the content requirements of the specification, sample assessment materials, coursework examples and other useful resources to support the delivery of the course are available [here](#).

Past issues

Did you miss an issue? Need to catch up? Just now discovered us and wondering what you missed? You can browse through the past editions of *Inside Track* [here](#).

Principle Examiners' feedback

AS specification 2018

The senior examiners, detailed below, offer the summaries of what can be learned from the examinations in 2018. Copies of the full reports are available from the GCE PE subject page on the Pearson website.

Senior examining team:

Chair of examiners:  
Chief examiner:

AS Course

Component 1 (Scientific Principles):  
Component 2 (Psychological and Social Principles):  
Component 3 (Practical Performance):  
Component 4 (Performance Analysis):



Dr Phil Hayes  
Dennis Tattoo

Dee Gannon (DG)  
Andrew Armitstead (AA)  
Dane Smith (DS)  
Dane Smith (DS)

8PE01 – Scientific Principles of Physical Education

It was encouraging to see the improvement in the quality of answers with many exemplar answers across most questions, although there are still other students struggling to meet the demands of the paper in terms of using correct terminology and understanding the question.

Centres need to continue to encourage students to learn definitions from the glossary and to make sure they understand all the terminology used in the specification.

Centres should also aim to help students understand what each of the command words are looking for, as many students lost marks

in “explain” questions where, despite showing obvious knowledge, students did not link their answers.

Students also need to ensure with extended questions, that they read carefully what is being asked about and ensure they are answering the question.

The asterisked question (\*) requires students to show their knowledge from all areas of study across the specification and not limited to physiological aspects.

DG

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## 8PEo2 – Psychological and Social Principles of Physical Education

For the AO1 short responses, students need to understand exactly what the answer requires in terms of detail. For example, when the command word is 'List', the answer requires only short responses, even single words.

Students, if they know the topic, can cover this type of question very swiftly, allowing more time for the longer answers.

It is worth preparing students for this type of question through starter activities in lessons. For example, list the four dimensions of personality, the characteristics of English public schools, what is the Olympic ideal etc.

For the AO2 longer response questions, it is vital that students read the question carefully. For example, 'Explain' is a common command word and requires responses that give reasons or causes.

The goal setting question in 2018 required students to say how a coach would use targets. Good answers included reasons for inclusion.

For example, a coach would use specific goals because this allows performers to focus on one aspect of performance.

In the AO3 extended writing answers, students must structure their responses and include a directive introduction and a judgemental conclusion.

Students also need to cover all aspects of the question, for example cognitive and somatic anxiety and management techniques prior to and during performance were all part of question 5.

Students need to look for opportunities to refer to other areas of study to develop answers.

Many students scored very well on the extended writing questions as they had thorough knowledge and showed good technique. They had clearly been well prepared.

AA



*Key advice for all students includes, using the space provided and marks available as a guide on how much to write, to use examples to illustrate points and especially, to read the questions carefully.*



## 8PEo3 – Practical Performance

There were many positive aspects of this series. Live moderations were well organised with many motivated candidates.

The majority of sessions were structured and dynamic, although there were some centres that only included static and/or basic drills.

Centres are reminded that it is a requirement of the specification to show both skills within conditioned drills as well as a formal, competitive game/situation.

Moderators commented that when candidates performed in an environment that was relevant to their ability, marks were often readily supported.

Some centres opted to video the practical work on the moderation day so that it could be offered as evidence should the centre request a review of marks post moderation.

Some centres also opted to submit their practical evidence for DVD moderation. Identification of the candidates during the conditioned drills was generally clear, however there was some indifferent quality of video material in competitive situations that failed to support the marks awarded by the centre.

There were cases of centres submitting video evidence that had been edited. Centres are politely reminded that evidence submitted must be unedited in order to meet the specification requirements.

DS



## 8PEo4 – Analysis of Performance

### General comments

Most candidates produced work within the Level 3 (7-9 band) for both the physiological and the technical / tactical aspects of the coursework.

### Physiological

The majority of candidates identified three appropriate component of fitness but in some cases certain choices were not the most appropriate for the demands of the sport and were not fully justified.

More research is required by candidates that include a physiological overview of their chosen sport at the start of the task that will then justify the three most important components of fitness.

The majority of candidates offered mainly standard tests that were extracted from websites like [www.brianmac.co.uk](http://www.brianmac.co.uk) and [www.topendsports.com](http://www.topendsports.com).

Although a lot of these tests offer validity for the particular component being tested, they can lack validity for a specific sport.

Normative data for the standard tests were also used for the basis of analysis, however this data in a lot of the cases is dated.

Candidates who researched the elite and/or potential elite standards were often awarded higher marks. Some centres also used peer data as another layer of data for the basis of analysis to good effect; and this should be encouraged.

Candidates had referred to issues around reliability and validity but in some cases this

lacked depth and clarity. Some candidates did not fully understand both terms and in some cases the analysis for validity reflected reliability.

In the better submissions the test data was interpreted well, including appropriate analysis of the issues surrounding validity and reliability as well as the limitations of some tests was discussed in depth.

Most candidates suggested appropriate future priorities for training and development, but in some tasks not enough detail was included that demonstrated an understanding of top band work.

### Technical

Most candidates selected the technical analysis for their second task. In most cases candidates provided photos of themselves and higher level performers for comparison through the three phases of preparation, execution and recovery of the skill being performed.

Work that was marked at a higher level provided thorough analytical detail with a good balance between technical information, as well as the inclusion of biomechanical aspects.

Candidates with lower marks offered mainly descriptive work that lacked analysis. The use of computer-generated images was also used by a minority of candidates that did not allow for real-life analysis, and generally lacked depth overall.

Overall, higher band work provided detailed qualitative analysis and the use of some data to evaluate strengths and weaknesses that were used to justify key areas for development.



### Tactical

Most candidates had selected tactics that were relevant to their activity and development as a performer.

It was clear that most candidates understood the purpose and how the tactic can be implemented into a competitive environment and the benefits it has to performance.

Candidates who were judged to be in the higher mark band provided detailed annotated images that analysed the application of the tactic in a competitive scenario that included specific elite examples.

In most tasks this could have been extended further by including more qualitative and/or quantitative analysis of the candidate's own application of the tactic for comparison.

Some candidates used data to substantiate the analysis and evaluations made, and in these cases most of the candidates had achieved higher marks.

Analysis of how the tactic could be adapted to changing circumstances was completed with inconsistency. Candidates receiving lower marks either did not include this or the information provided was too brief.

The use of annotated images to demonstrate the changes and alterations to specific tactics enhanced the clarity of the presentation, especially when relevant elite examples were used.

### Summary

**The work was generally well structured, although to achieve top band marks candidates must include more contemporary research that is specific to their sport, as well as making sure the work is within the word limit.**

**DS**

# Principle Examiners' feedback

## A Level specification 2018

### Senior examining team:

Chair of examiners:

Chief examiner:

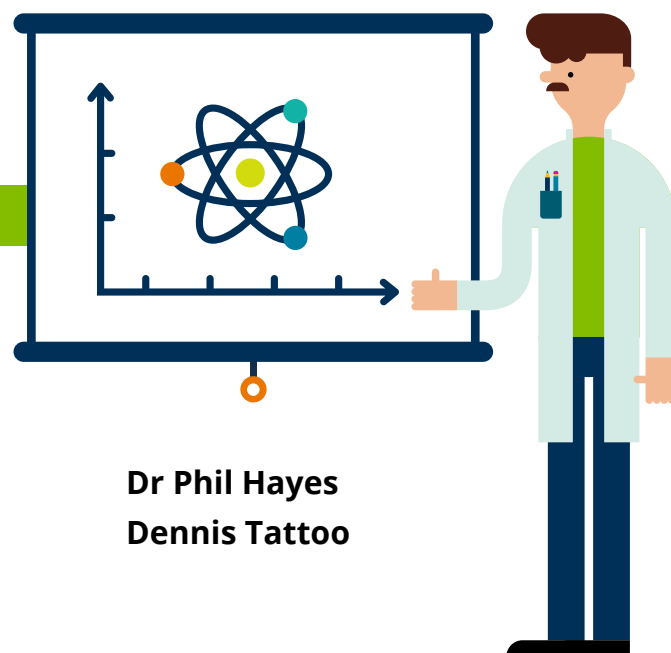
### A Level Course

Component 1 (Scientific Principles):

Component 2 (Psychological and Social Principles):

Component 3 (Practical Performance):

Component 4 (Performance Development Programme):



**Dr Phil Hayes**

**Dennis Tattoo**

**Ellie Bunston (EB)**

**Colin Maskery (CM)**

**Dennis Tattoo (DT)**

**Dennis Tattoo (DT)**

## 9E01 – Scientific Principles of Physical Education

Candidates performed well on the content that has featured in previous specifications and there is encouraging evidence to suggest that many candidates are utilising the Inside Track publication and the topic guides to support their understanding.

One important issue is that candidates often write considerably more than the space provided.

The space made available for responses indicates the level of answer required; there is no need for candidates to write more and more.

Students need to understand that it is the quality of response that is more important than the length of the answer.

Hand writing is also an issue for some. Hand writing needs to be legible. If, in timed practise responses, the writing is illegible this is something the centre should be working on with students.

Knowledge of key terminology is important for success in this paper. Definitions and key terms should be learnt from the specification and the topic guides.

It was encouraging to see that longer answer questions showed evidence of clear structure in many of the responses. Candidates need to be taught to analyse, perhaps with pros and cons, or application to performance to access higher mark bands.

**EB**



## 9PE02 – Psychological and Social Principles of Physical Education

Many candidates made impressive attempts to answer the 15 mark extended answers although a number of candidates scored less well due to a lack of subject knowledge and limited writing structure.

In a few cases candidates failed to address the question set and seemed to misunderstand the command word for the question. Centres are advised to provide plenty of opportunities for extended writing practice.

Candidates struggled on the eight-mark question which focused on East Germany when many answers contained broad generalised statements when a more detailed and specific answer was needed to score well.

Some candidates spent too long writing complicated and detailed examples in support of the points they were making; when used to develop or illustrate a point examples should be short, punchy and to the point.

Overall, the paper produced a good range of marks that differentiated between candidates. There were a number of detailed and interesting answers with many candidates able to show depth of knowledge that reflected good quality teaching.

**CM**



## 9PEo3 – Practical Performance

The quality of performances observed ranged from being good to outstanding. Moderators commented that the attitude and enthusiasm of the candidates and of others involved in the moderation, for example peers adding to the team numbers or primary school children for the coached sessions, was exceptional.

Moderators at live moderation days commented on well organised events with motivated candidates who worked hard with many centres providing impressive and well planned practical sessions.

There was an increased number on the previous year who opted to be assessed as a coach; the standard again ranged from good to outstanding.

The vast majority of practical sessions were designed to enable candidates the opportunity to demonstrate skills in both formal settings and, when necessary, under the pressure of opposed scenarios.

There were a few instances when the level of demand of some activities was hampered by having insufficient numbers to enable more exacting practices to take place. A number of centres opted to provide recorded evidence. When this was done well, candidates were clearly identified and the video provided good quality and unobstructed action of the candidate performing.

However, some of the video evidence was disappointing. Moderators reported that a number of candidates could not be clearly identified, that the recordings were of poor quality, and that the level of performances observed did not support centre marks.

In particular, centres are reminded of the need to provide evidence of skills, techniques and decision making under pressure, to meet the demands of a conditioned practice as well as the formal/competitive situation.

Overall it is pleasing to be able to report on the high quality of much of the work observed.

DT



*Practices must be demanding. Straight forward, static practices do not offer the candidates a chance to demonstrate their best performance.*



*Tactics – such as the use of a libero in volleyball – can be analysed by comparing data from the candidate's own club/school team and that of an elite team.*

## 9PEo4 – Performance Development Programme

As with the practical performance, the majority of candidates completed this task as a performer.

Some candidates did not write succinctly enough and exceeded the word count. It was the lack of analysis that often limited candidates to mark bands below the top band (9-10) marks.

### Physiological

Much of the work offered for this task was well structured and of good quality.

There is still a tendency for candidates to offer standard tests and refer to normative data which is readily available on websites.

To achieve top band marks, candidates should be encouraged to undertake additional research so as to appreciate current trends in testing at elite level performance.

Candidates should be encouraged to consider elite and peer level performances (age group at club and school) as well as normative data as this provides candidates additional possibilities for analysis.

Most candidates understood issues around reliability and validity but in some cases this needed additional clarity.

Many candidates suggested appropriate future priorities for training and development but additional analysis was needed in some of the work in order to achieve work in the highest mark band.

### Tactical

Candidates presented their work in an orderly and structured way and used suitably annotated images to describe the tactic.

However, although analysis had frequently been attempted, this was sometimes rather brief and failed to fully demonstrate how the tactic could be applied in a competitive situation or how it might be adapted in changing circumstances.

Candidates should avoid simply copying and pasting diagrams and text from popular websites and merely adding a few words of their own. Some candidates lost marks because they over-relied on this kind of material. Candidates should be encouraged to undertake research but then present their own work.



Technical

The best work included detailed and accurate annotated diagrams which were used effectively by many candidates.

Those who scored less well offered work which was primarily descriptive and did not include sufficient analytical detail.

Higher quality work also provided data to support a thoughtful analysis of strengths and weaknesses in order to justify key areas for development.

Planning of the PDP

Most candidates defined and applied SMARTER targets which were applied accurately.

In some cases, this was not sufficiently well applied to the personal circumstances of the candidate. More work was needed by some candidates to fully explain how SMARTER targets underpins the planning of an effective PDP.

The work on principles and methods of training was often detailed and largely of a very good standard, although some candidates need to personalise this better.

In recent years though, many sports have developed more refined tests that are sport specific. Candidates should be encouraged to undertake research to identify more valid tests.

Evaluation of the PDP

Many candidates would have benefitted from having additional qualitative data to support the overall effectiveness of the plan.

For example, evidence based on a notational analysis of a performance and/or coach observations would have provided welcome additional evidence of the benefits of the PDP to a competitive setting.

Centres should encourage candidates to consider the changes in the test scores and references to certain potential physiological changes where appropriate.

Recommendations for future development was covered well by many, but candidates could also make reference to the need for modifying methods or principles of training or finding additional research to enable further improvements in performance levels.



In a number of cases, the work in the final section was disadvantaged because of the candidate not applying words evenly across the four tasks.

Several evaluations lacked depth because so few words were available as a result of excessive words being used in the previous sections.

Accordingly, candidates should be encouraged to note the word count at the end of each section and a total at the end; in turn, this might aid the candidate in ensuring an even distribution of words across the assignment, vital for high marks.

Finally, candidates should be aware that the word count for this work is 3500. Many candidates exceeded this number in the 2018 series, in some cases significantly.

Although supporting evidence can be presented in graphs, charts, tables and flow diagrams, candidates' own words in text boxes used to describe and analyse techniques and tactics would form part of the word count.

DT



# Teaching the Olympic Games

Principal Examiner **Andrew Armitstead** suggests one way of teaching aspects of the Olympic Games, an important topic in the Sport and Society topic (5.3.4)

The Olympic Games is a fascinating and incredibly diverse topic. Most students really enjoy the subject and the most difficult part of teaching the Olympics is trying to cover all bases.

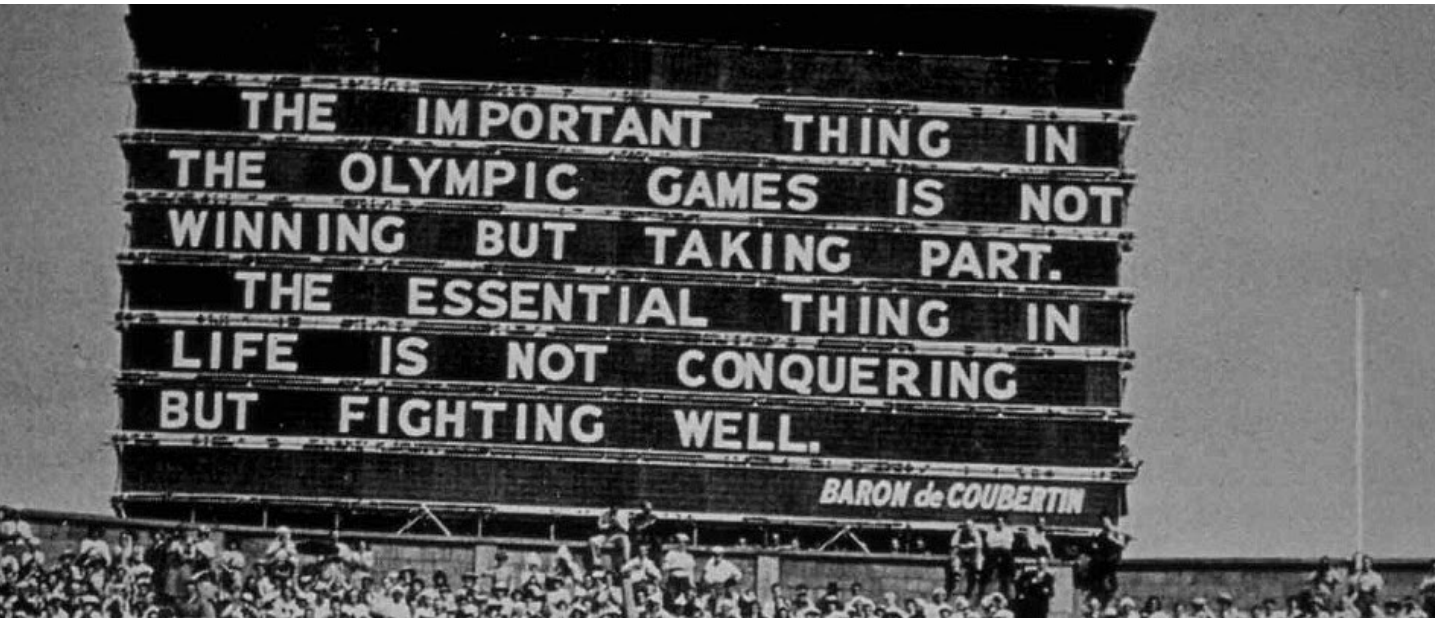
The 1972 Munich Olympics provided us with the haunting images of the hooded figures in Connolly Strasse which was described by Jim McKay as “the cockpit of World events” but it also allows us to examine the context and ideals of the Olympic Games.

Simon Reeve’s book “*One Day in September*” and the subsequent Michael Douglas narrated film of the same title (accessible on YouTube) present an interesting account of the events of those days in September in 1972.

It is also a great teaching opportunity to engage and involve students.

Further research – *Operation Wrath of God*.

**Warning:** the film is emotional and told from the perspective of the daughter of one of the hostages. My year 12 girls cried.



### Teaching ideas

- Put the above quote on display. Ask students to pick out parts of the Games that De Coubertin would have approved of and parts he would not. Extend the learning by getting students to consider how the Israelis, the Germans and the Palestinians could have justified their actions
- Divide your group into German police, Israeli government and the IOC. Stop at points in the film and ask what each group would do now and why?
- Create a table with three columns for each Olympic ideal and get students to fill in with evidence from the film. Some ideas have been added to get them started.

Respect	Excellence	Friendship
Andre Spitzer shakes hands with Palestinian fencer	Olga Korbut floor routine	Terrorists helped into compound by other athletes

- Do the same for context

Athletic prowess	Gathering of World nations	Glorious victory and honourable defeat	Display of nationalism, commerce and politics
Mark Spitz 7 Golds in the pool	The Olympic Park	USSR beat USA in final second of the basketball final. This defeat was not so honourable and to this day, the USA team have refused to accept their silver medals	Palestinian actions; retirement of Avery Brundage opened doors to commercialisation; “The Games must go on”



# Levers and their mechanical advantages and disadvantages

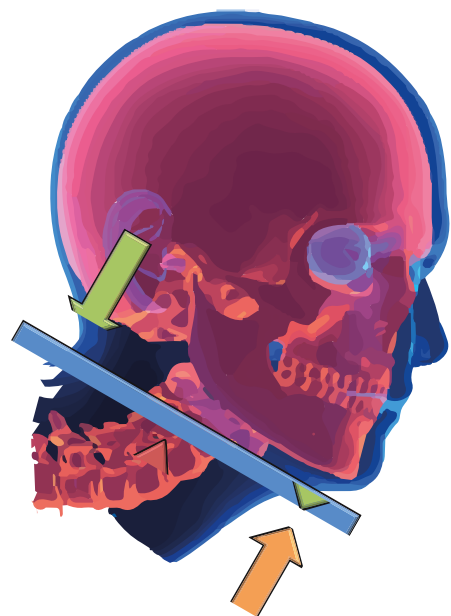
Principal Examiner Dee Gannon highlights the key points around levers and their mechanical advantages and disadvantages which is an important component of topic one (1.1.4)

- The **effort arm** is the distance between the effort and the fulcrum
- The **load arm/resistance arm** is the distance between the fulcrum and the load (resistance)
- The mechanical advantage is worked out by dividing the effort arm by the resistance arm:

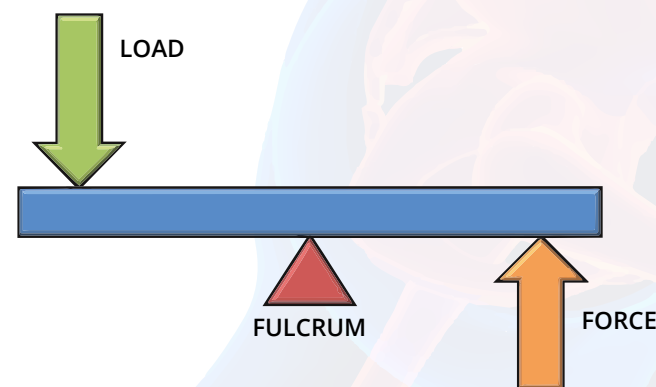
A high mechanical advantage occurs when a **lever's effort arm is longer than the load arm**. This means the lever can move a large load with a small amount of effort.

## First Class Lever

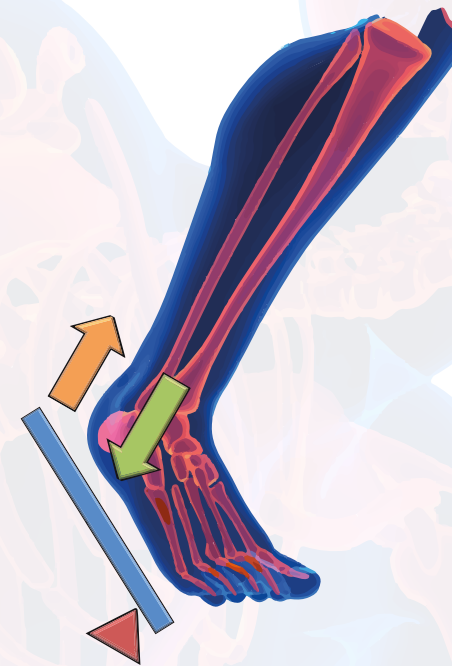
First class levers can produce a mechanical **advantage** when the fulcrum is close to the load, creating a short load/resistance arm.



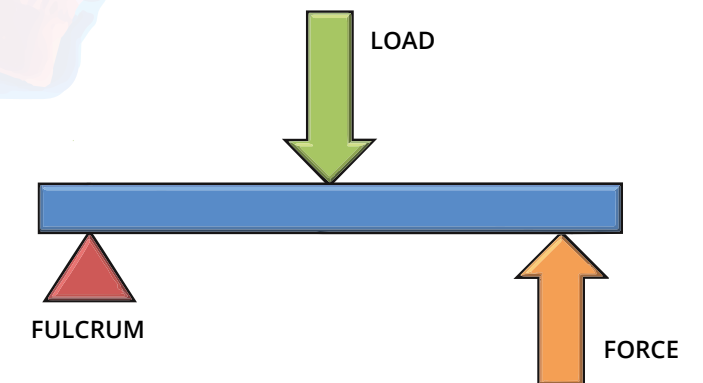
There are very few first-class levers in the body and some perform at a mechanical advantage when strength is most important (but others, such as the action of the triceps muscle in extending the forearm against a load, operate at a mechanical disadvantage as speed and distance are more important than strength)



## Second Class Lever



Second class levers provide the **most mechanical advantage** as they have a short load arm/resistance arm.

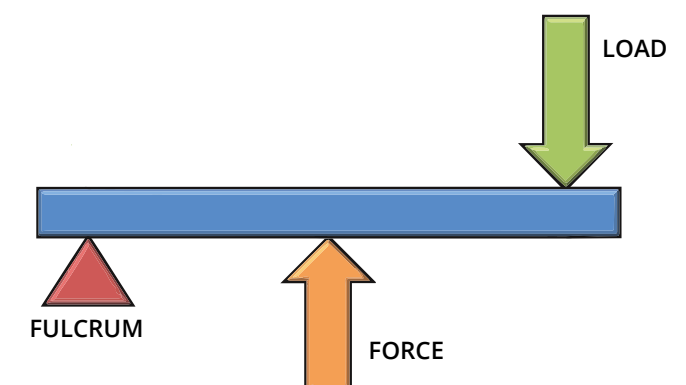
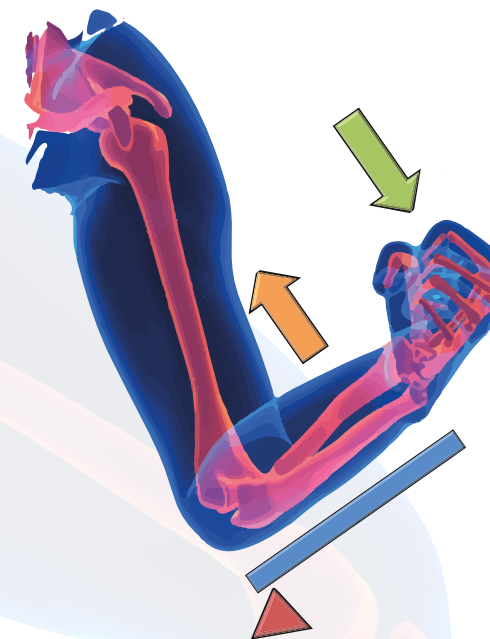


For example, when lifting oneself up on to tip toes, the athlete uses a second-class lever at the ankle, using a small amount of effort to lift their full body weight into the air. The effort arm is longer than the load arm.

A mechanical **disadvantage** occurs when a lever's **load arm is longer than the effort arm**. A short effort arm will require a lot of effort to move a relatively small load (but will allow quick movements over a larger range).

## Third Class Lever

Third class levers always operate at a **mechanical disadvantage** due to a small effort arm.



So, **first class levers** can operate at both a mechanical advantage and disadvantage, **second class levers** always operate at a mechanical advantage and **third-class levers** always operate at a mechanical disadvantage



# Contemporary Fitness Testing to underpin the PA and PDP tasks

Following on from the summary of his report, Principal Examiner **Dane Smith** continues with our occasional series of advice for the written coursework tasks.

In the second edition of [Inside Track \(Issue 2\)](#), I included information about how to get the best from the students for the PA and PDP tasks. Both include important information about fitness tests. The main points to take from this article were:

1. Making sure that the physiological requirements are researched and the three most important components are justified.
2. Ensuring that specific fitness tests are conducted.

One of the main areas for development in both the PA and PDP tasks is to include more sports specific tests instead of the non-specific/invalid tests being used to monitor fitness levels by some candidates.

Most candidates continue to use generic tests from websites such as [www.brianmac.co.uk](http://www.brianmac.co.uk) and [www.topendsports.com](http://www.topendsports.com).

The issue with this is that the tests are sometimes not specific and the normative data used does not reflect the contemporary standards required at elite level.



## Top Tips:

1. Research tests that elite level sportspeople/teams use (please refer to [Inside Track Edition 3](#) as an example - All Blacks standards)
2. Contact National Governing Bodies to gain access to elite level standards; these are sometimes available on official NGB websites
3. Gather data from sportspeople from a more elite level
4. Include peer data, so candidates have an idea of their standards compared to the performers they compete with.

## Point 1: Elite tests and standards.

This is one of the major reasons why some candidates do not gain marks in higher mark bands, due to lack of specificity and depth of analysis.

For example, candidates on some occasions have used the 'ruler drop test' to test their reaction time, the 'T-test' to measure agility and the 'hand grip dynamometer' to measure strength.

All tests are valid in the fact that they test the relevant component, however they are not specific to many sporting activities.

A more contemporary test that could be used for a sport like badminton to test agility could be the badminton agility field test (pictured right).

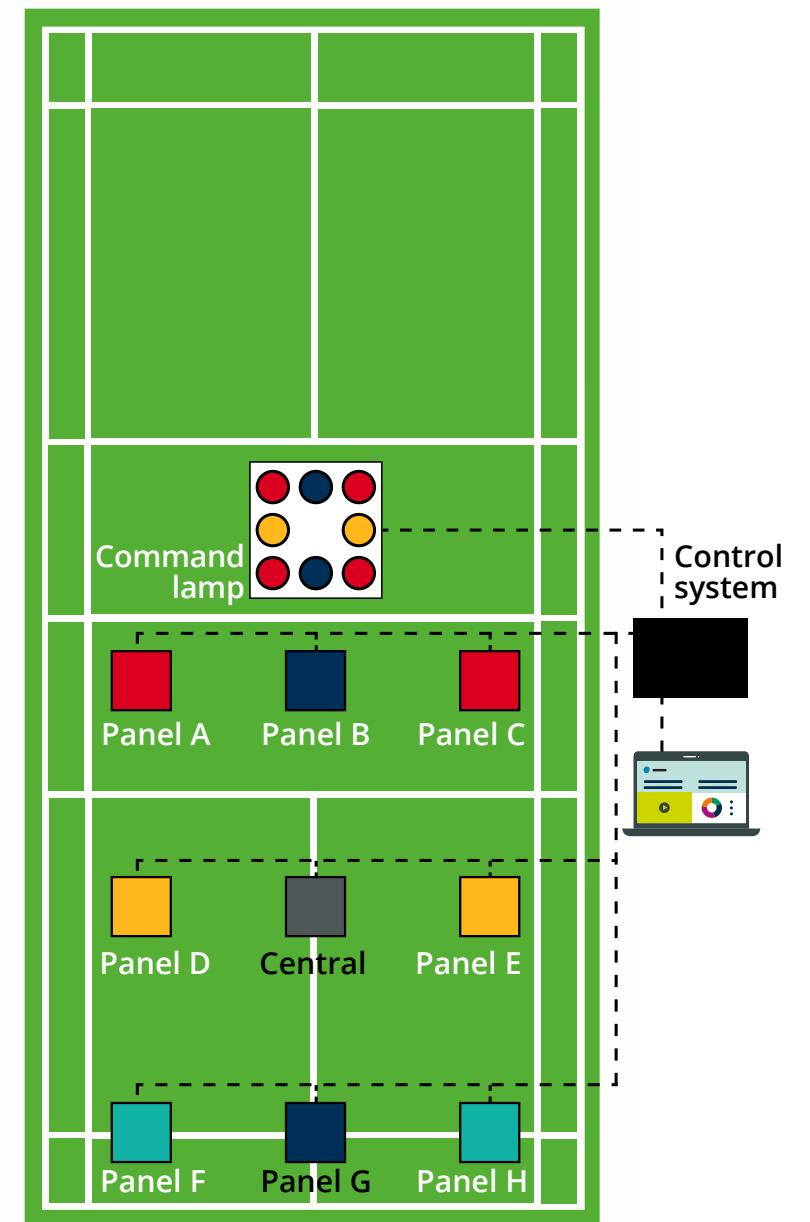
In this test, performers move to the area that has been indicated, with times recorded for each movement sequence.

The test could also be used as a reaction time test. Information regarding testing protocols and elite standards can be found in the American Journal of Sports Science 2015; 3(1): 18-28 (<http://article.sciencepublishinggroup.com/pdf/10.11648.j.ajss.20150301.14.pdf>).

Candidates who select aerobic endurance as the main aim for their PDP should consider using GPS data.

This can measure the performers distances covered in a performance, as well as the speeds and the times spent at different intensity zones.

In Premiership Football, players can cover an average of 10-11km with average max. speeds for attacking players at 9.2 metres per second (2).





# Franchises in the World of Sport

In netball, candidates could also use GPS data to monitor their intensity levels and compare the results to elite position specific data, as shown below (3).



This type of information is crucial if candidates are to appreciate the levels required to perform at a higher level, as well as providing them with more relevant information that will potentially add further scientific rigour to their analysis.

GPS units can be quite expensive, however there are cheap and/or free apps that can be used (e.g. Strava).

Please note that all raw data should be included within the task for authentication purposes.

## Bibliography

1. <http://article.sciencepublishinggroup.com/pdf/10.11648.j.ajss.20150301.14.pdf>
2. <https://www.playertek.com/blog/playertek-data-amateur-professional-footballers/>
3. [https://www.researchgate.net/publication/299347674\\_Player\\_Load\\_in\\_Elite\\_Netball\\_Match\\_Training\\_and\\_Positional\\_Comparisons](https://www.researchgate.net/publication/299347674_Player_Load_in_Elite_Netball_Match_Training_and_Positional_Comparisons)

## Top Tip for the Review and Evaluation

Remember, the NEA task is called a Performance Development Programme (PDP), therefore it is not just the analysis of the fitness tests that should be included.

There should also be evidence of quantitative data that can demonstrate the impact the training has had on the PDP to their performance.

This could be in the form of GPS data, notational analysis and/or a witness statement etc.

**Principal Examiner Colin Maskery offers an overview of one of the new topics on the specification (5.3.5).**

A new topic for students to study is the concept of team 'franchises' in sport as a way of structuring or organising a league.

Essentially a franchise is buying the right to own a team in a particular league. The concept is typically a North American one and therefore enables a comparison with our traditional European model of leagues with promotion and relegation.

In France, Italy, and even England, teams can rise from nowhere. In theory at least, you can set up 'Tiny Town Rovers' and watch your creation, if it keeps winning, rise through the various levels of the English game to the Premier League itself.

The first professional league to use franchises was baseball in the 1871 when 10 teams paid \$10 to join the National Association of Professional Baseball Players (NA).

Today we will have heard about the leagues of MLS, NBA and the NFL. Leagues are based on regional conferences, making the play-offs the aim and seasons relatively short.

The only cases of a professional teams moving in England in recent times is that of Wimbledon FC who in 2004 moved from south London to relocate and re-form as the Milton Keynes Dons; this is a rarity in football but can also happen in Rugby Union.

In 2014 Wasps successfully relocated from High Wycombe to play in Coventry having previously been located in Sudbury and then Loftus Road - both in London.





Normally a franchises gives the right to belong to a league and are given for a single team in one larger urban or metropolitan area – larger areas such as Los Angeles have more than one team in a league. Owners or consortiums are very rich and financially driven.

Franchises can be bought and sold. This is not unfamiliar in English sport as teams such as Manchester United, Chelsea and Manchester City have all be bought in modern times by richer overseas owners.

The number of available franchises in a leagues can increase as popularity and demand rises as seen recently with the expansion of the MLS and, headed by David Beckham, the new franchise of a MLS soccer team based in Miami; the league is expanding from 23 to 24 teams by 2020 and further to 28 teams.

Only if their owners so decide is their number increased, in a process called “expansion”, dictated not by the excellence of a new team, but the potential of a new market.

The essential features of leagues based on franchise ownership include no promotion or relegation, teams can move, given league permission, if they feel a larger fan base could be found in another metropolitan area and players at times in some leagues sign to the league not as such to the club.



In 2005 when Canada's Montreal's Expos baseball team moved south to become the Washington Nationals the price was an agreement by the city to build a \$600m stadium, plus financial compensation to the existing Baltimore Orioles franchise 40 miles away to compensate for any shrinkage of its' market. Not only did the team move cities but also to another country.

Could English sport change and adopt the franchise model - what if the Premier League's foreign owners want to scrap promotion and relegation?

From sundry US billionaires, Russian oligarchs, Indian poultry magnates and Arab zillionaires, thus far no comment. But if the plan ever came to fruition, English football would be transformed.

The future might look all too similar to the major sports in America where leagues are set in stone, clubs are moveable franchises and stadiums gorgeous, labour disputes are grinding and championships spread around.



## Pros and Cons: Is the American model the one to follow?

### European model

#### For:

- Any team can rise from bottom to top (and vice-versa)
- Relegation means fewer meaningless end-of-season games
- Overall the product for fans is more exciting
- Leagues system can be for all levels of ability
- Play-offs generate extra completion and financial returns.

#### Against

- The spectre of relegation forces teams to overspend on players
- This means that stadiums can be sub-standard
- The excess spending power of a few clubs has reduced competition
- Leagues are dominated by the richer clubs, over-priced and paid players and success in European competitions becoming more important.

### Franchise system

#### For

- Teams are on a more level financial playing field.
- No relegation reduces the fear of failure, panic buying and endless manager sackings.
- More teams have a realistic chance to win championships.
- Stadiums and spectator amenities are excellent, even when the resident teams are not.
- Play-off systems creates extra higher level competition for more teams.
- Draft pick system aims to provide equality of ability between teams.

#### Against

- The cartel structure of the leagues blocks new entrants.
- Regional monopolies allow owners to charge excessive prices.
- Communities can lose their team as a franchise moves markets.
- Teams that do not make the play-offs have very short seasons.



# Technology in sport

**Chief Examiner Dennis Tattoo highlights aspects of the specification involving technology in sport.**

The recent FIFA World Cup was an excellent example of the way in which technology in sport continues to evolve and shape the world of sport.

VAR, the Video Assistant Referee, was involved in an average of 7.1 incidents in the 64 games, with FIFA arguing that this new technology had contributed successfully to the 'resounding success of refereeing' at the event. VAR involves an official watching the game away from the stadium but with access to every camera angle and goal-line technology cameras.

Technology in sport is constantly changing and students studying the Edexcel A Level specification are expected to demonstrate their understanding of how technology is used in physical activity.

Questions about this topic have already appeared in the examinations. In 2018 for example, there was a question about the benefits of wearable technology to monitor fitness.

There are a number of key aspects of the specification that embrace technology. Increasingly, technology is used to monitor fitness and performance.

Performers of all abilities have access to heart rate monitors or apps to track how far an athlete has run. Elite basketballers in the USA use tracking technology which provides intelligent real-time feedback on certain physiological aspects of performance by

incorporating electromyography that monitors aspects of muscle performance during exercise. Sensors are embedded into the fabric of kit that sends bio-signals to mobile devices through Bluetooth technology.

At the 2018 FIFA World Cup, EPTS technology was provided for all 32 competing nations in part to help limit the digital divide between the rich nations and those with limited funds.

EPTS uses cameras and wearable technology to relay information to computers with access to an analyst pitch side, one in the stand, and also to medical teams.

The data includes player positioning, speed, tackles, and passing and can also be linked to heart-rate monitors and other devices to measure physiological factors.

Another aspect of the specification considers the ways in which technology can be used to aid recovery.

Cryotherapy, which can be used to speed up recovery from activity, was described in the second edition of Inside Track.

Cold water immersion (CWI) is advocated by Dr Versey at the Australian Institute of Sport (AIS) which has recently completed the building of a Recovery Centre incorporating this.

The temperature of the pools at the AIS, which should be below 15 degrees centigrade for CWI, can be adjusted rapidly with Dr Versey advocating immersion for between 6 – 12 minutes within half an hour of the ending of a match or training session.

Theories for the benefits of CWI suggest that improvement in recovery time and reduction in the delayed onset of muscle soreness (DOMS) is due primarily to a

combination of vasoconstriction (blood vessel constriction), the analgesic (pain relieving) effect of the cold water and the potential for reducing inflammatory pathways by reducing nociceptor sensitisation and reducing exercise induced oedema (accumulation of fluid beneath the skin).



*Of the 29 penalties awarded at the World Cup 2018, VAR, which lets referees use video to review questionable plays, helped officials make a decision 11 times.*





*Heart rate monitors provide helpful data to monitor progress. However, although they are increasingly affordable, there are still concerns about their accuracy.*

The specification asks students to give contemporary examples of how athletes receive feedback about their performance. GPS devices, like those developed by Northern Ireland company STATSport, measure distances covered, speed and acceleration, providing important real-time data to coaches.

Another example is the Babolat Smart tennis racquet which uses a sensor, accelerometer and gyroscope to track contact point, racquet speed and spin generated with the recorded data sent to any given device via Bluetooth. Rafa Nadal has commented: "The Babolat Play & Connect racquet is a tremendous tool. Having this new technology to capture information will mean a new way of analysing my game."

As indicated above, the impact of wearable technology on participation has already featured on an exam. Students need a working knowledge about the technology including advantages and disadvantages.

Fitness trackers, for example, are increasingly affordable, easy to use and becoming more feature rich. These devices no longer count your steps; they are becoming more accurate and can focus on heart rate monitoring, tracking in sport and monitoring the quality of sleep.

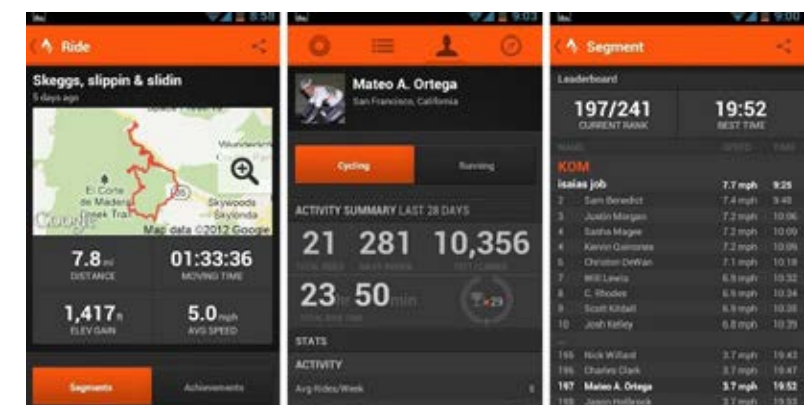
Garmin recently introduced a water proof activity tracker with heart-rate monitor and fitness monitoring tools, including VO2 max and a rep counter.

Students also need to have knowledge of the impact of technology on the viewing experience, including the advantages and disadvantages of the development of media packages and the growth of 'pay-per-view'.

Students would be aware, for example, of the enhanced experience of watching matches at home with the use of more cameras and player-cam options and through the data provided for pundits such as the speed and angle of shots on target and being able to watch certain sports through glass walls, like squash.

However, students will also appreciate that many people are unable to access important events because of the costs involved.

Finally, it is worth students being mindful of how they might utilise wearable technology to provide evidence in support of their NEA.



The highly regarded Strava Cycling app, for example, measures speed, distance and elevation as you ride and also offers a facility to compare your performance with others who have ridden the same route.

The app can be used for running and swimming as well as cycling. Most smart watches will sync with it too. Students can record and upload from a watch, or just record on the phone app.



# Determinants of running performance

**Principal Examiner Ellie Bunston summarises the key points on the factors which influence how fast performers can move and run.**

A key factor is submaximal aerobic fitness. This is the ability to maintain a high percentage of VO<sub>2</sub> max for a prolonged period of time.

In the Summer 2018 paper this definition was not as well-known as it might have been; students are encouraged to have a working knowledge of all key terms.

This can determine how long an athlete can work for and will be essential for long duration aerobic activity.

Another determinant of performance is maximal aerobic fitness.

This is the maximum volume of oxygen that can be utilized in one minute.

This is the upper limit of the aerobic system (the person's VO<sub>2</sub> max). This would become a main determinant for short exertion sprint work.

Exercise economy also determines performance. This is the energy required to maintain a constant velocity of movement.



For example, if two people running at the same speed, one of them could be using less energy than the other because they are more economic.

This determines how well a person can perform as it is their ability to transfer energy into movement.

Anaerobic capacity is another determinant. This is the greatest amount of energy that can be released from the anaerobic system.

There is only a limited amount of energy that can be produced anaerobically, when it is used up the athlete must slow down.

However, it can be (partially) replenished during rest intervals or low-intensity periods of a match.

This can influence performance in both sprints and intermittent activities.

If two athletes are equal in terms of movement economy, the athlete with the greatest anaerobic power will be the fastest. It is an important factor in sprint speed but not the only factor.

This is the fastest rate at which energy (ATP) can be produced anaerobically during an activity.

There are many factors which can determine how fast we can move and run. They influence how well we perform in sprints, endurance and intermittent activities to a lesser or greater degree.

Anaerobic power is a determinant of performance. Maximum Sprint speed is another determinant.

For example – how fast a performer can sprint in an athletic event or as an element of an intermittent activity.



# Resources Review

## The Pressure Principle

The general public was reminded of this interesting and insightful book following the 2018 Open when Francesco Molinari won his first golf major at Carnoustie.

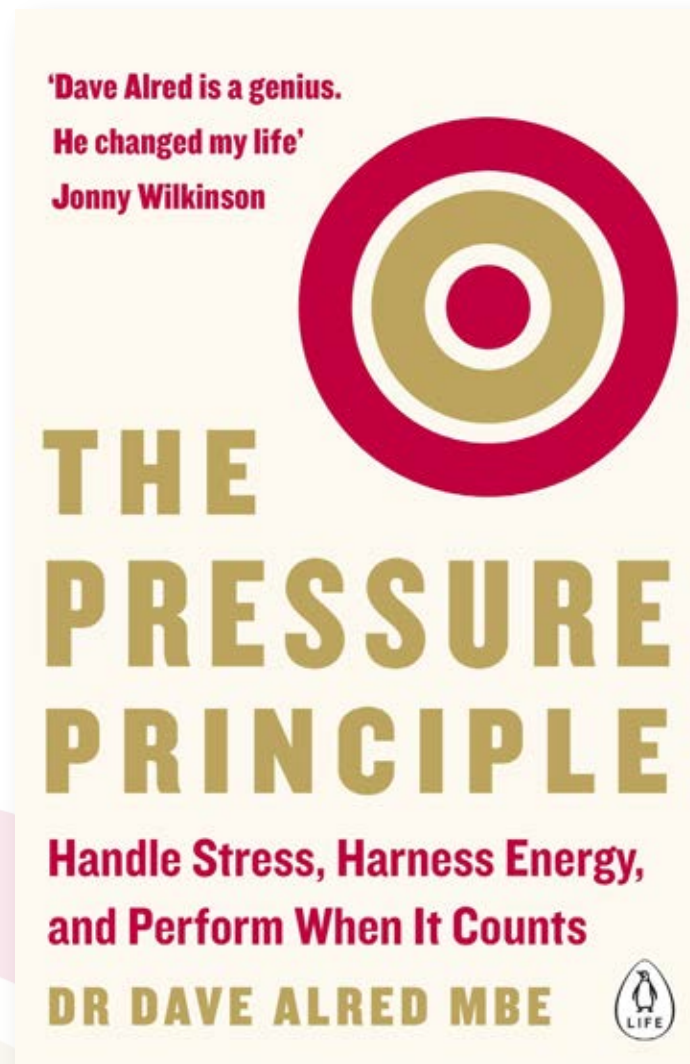
Dave Alred has worked with Molinari for several years as well as many other elite athletes, including rugby international Jonny Wilkinson and golfer Luke Donald and international rugby teams like England and the British and Irish Lions.

He has also successfully applied key principles to the worlds of business and commerce.

Dr Alred gained his doctorate in Performing Under Pressure from Loughborough University.

Alred argues that his role as a coach is to help manage learning effectively so that a performer can perform at their best in all settings.

The book considers how different forms of practice can help prepare individuals for performing under pressure.



## The IAAF

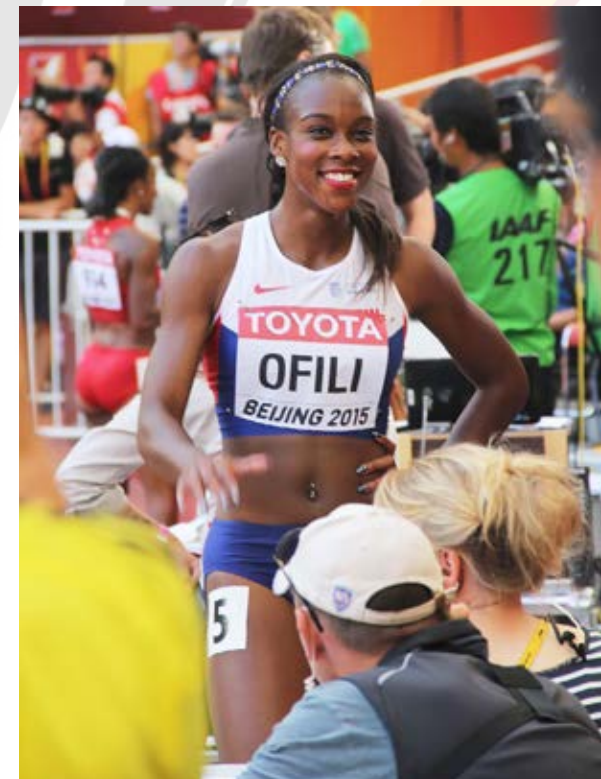


The official website for the world body of athletics is one of many governing body sites to offer a huge range of information for people interested in the sport.

Given ongoing debates about doping, regulations concerning female classification, and the transfer of allegiance from one nation to another there is a wealth of helpful documents for research purposes and additional reading.

There are also detailed reports and official guidance about a wide range of topics, including nutrition, rehabilitation from injury, methods of training and transfer of allegiance.

Although there is a requirement to register for some of the resources, this is straight forward. By doing so, teachers and students would have access to a wide range of interesting and contemporary resources as well being able to delve into the history of a global sport.



*100m hurdler Cindy Ofili was born and raised in Michigan but, despite competing for the United States as a junior, made the switch to represent Britain where her mother was born.*

*Details of official rules and regulations about transfer of allegiance can be found on the excellent [IAAF website](#).*