

An Expansion PEP Flowchart

A diagram of the sequence of actions for completing a PEP with some examples.

A PAR-Q must be completed before carrying out your programme. This must be placed in the appendix as a supporting document and you must make reference to this at some point in the main body. It is important that you make a short statement about the outcomes of this PAR-Q with particular reference to any health issues.

*After carrying out a PARQ (Appendix 1), I will respect **individual needs** by considering my previous extensor tendonitis, ensuring to decrease intensity upon reoccurrence.*



1. Aim and planning analysis

Introduce the physical activity/sport that you are currently undertaking. Be specific about what events you are participating in and your personal best or if relevant, the position you are playing and how often you train and participate in competition for your sport. State your strengths and weaknesses within an aspect of your physical activity/sport. You **must** concentrate on **one** area of your performance that could be improved and **must** have data to support this. Make this a short statement and reference the data and any detail in the appendix

I began running competitively 5 years ago and currently run for Ultimate Athletics, training 3 times weekly and representing the club in many races annually. Over 3000m, my main weakness is maintaining a constant speed. Toward the end, I often slow down and am overtaken. This prevents me from time improvements, unable to work long durations.

I'd like to increase the number of line breaks I make per rugby game. I'm finding this difficult during my rugby performance. In rugby, it's important to be strong, fast, and powerful.



Collect initial fitness and performance data. Use this data to draw up a pre-PEP fitness test data table to score your performance on fitness tests. You should run a battery of fitness tests to cover a range of components of fitness that are relevant and appropriate to your sporting performance. Ensure that you link these to the **one** area of your performance you are aiming to improve.



Interpret and analyse initial fitness and performance data and how it can affect your performance, both strengths and weaknesses. Based on your data analysis, highlight the component of fitness you will develop in your PEP.

Normative data shows my strengths - cardiovascular-fitness and weakness - speed. Conversely, compared to athletes of similar standards, I still view cardiovascular-fitness as a weakness. My coach's qualitative data (Appendix 2) highlights my weakness of cardiovascular fitness, underlining my tendency to decrease intensity in long repetitions. Furthermore, my quantitative notional analysis (Appendix 3) highlights my inability to maintain effective form, and inability to maintain negative splits throughout races, slowing by one second per lap on average, reflecting need for improved endurance.

My fitness tests revealed that my speed and strength are both "excellent" whereas my power results were only "above average". Strengths is important for pushing through defending opposition. Speed is a fundamental element of rugby and is beneficial for both attack and defence. Power is vital for generating speed in short distances - perfect for running attacking lines (and breaking them).



Select and justify a component of fitness that you want to improve following the results of the initial fitness test. This is where you should state your **aim(s)** to improve/optimize your sporting performance. This should include **one** aim to improve a component of fitness and **one** aim to improve your sporting performance - both aims must be SMART. Remember, when conducting future tests, only the **relevant** fitness tests should be performed.

I aim to focus my PEP on improving cardiovascular-fitness to prevent me from early fatigue and slowing at critical points, becoming a stronger competitor.

Therefore the focus of my PEP should be on improving power to “excellent” as having more power than my opposition will enable me to break the line more, increasing my chances of scoring, enhancing my game standard.



Select and justify a training method to achieve the aim to improve your component of fitness and improve/optimize your sporting performance. It must be clear why this is the most **suitable** training method to use to achieve your aims and therefore improve your future performance.

To achieve these, I have chosen continuous training, running and cycling between 30-90 minutes. This is the most effective method to improve cardiovascular-fitness, involving constant effort within aerobic training zone, increasing aerobic capacity and adaptations for 3000m. Fartlek is an alternative option but is less specific to the 3000m due to constant variation in pace.

Circuit-training develops all components of fitness through different exercises. However, I don't need to improve components like cardiovascular-fitness or muscular-endurance. Power's my fitness weakness so I should mainly try to improve this. Plyometrics focuses on improving power by combining speed (explosive movements) and strength (bodyweight) training resulting in stronger, faster actions like running attacking lines or bouncing off tacklers. Therefore, I've chosen to train plyometrics as it's the most appropriate method of training to build power.



Evaluate the application of SMART targets to create your goals for the six-to-eight-week programme in order to improve your sporting performance. Briefly justify why your target is SMART. Not all SMART targets need to be discussed but relevance needs to be given to both fitness and performance goals/improvement.

*To increase my 12-Minute Cooper Run test distance from 2840m to 3050m within 6 weeks. To reduce my 3000m time from 11:20 to 11:05 within 6 weeks. Both targets are **measurable**; the test is running and similar in length to 3000m and therefore event **specific**. Achieving significant improvements is unrealistic as I am beginning the programme fit so I am aiming for 110m and 210m increase (3.9%, 7.5%) and a 15 second decrease (2%), making my targets*

achievable. Having all necessary resources at school and my club to train, my targets are **realistic.** After 3 and 6 weeks, both targets are **time-bound.**

*Improve the power in my lower body, demonstrated by increasing my vertical-jump score to >60cm (excellent) (increments of 1.5cm/week) by the end of my PEP. Increase the number of times I penetrate the oppositions defensive line to 4xper game for the upcoming cup semi-final in 2months. These targets are: **Specific** - It's clear what I want to achieve; **Measurement** - I'll measure progress weekly on the vertical-jump test and in matches (appendix 7+8). This'll make it clear to see when the targets are achieved; **Achievement** - Splitting the vertical-jump test goal into smaller increments makes the goal seem more achievable and manageable so I can remain motivated and achieve the targets; **Realistic** - The aims don't require unrealistic equipment/time. I'm a member of the local gym so I have access to exercise equipment; **Time-bound** - There is a finite deadline for completion.*



Evaluate the application of principles of training to explain how you intend to apply the relevant training principles to your selected training method to help you achieve your SMART target, therefore to improve your sporting performance. Not all principles of training need to be discussed.

*I will ensure **specificity** through continuous training of mainly running (type) to achieve hypertrophy of muscles most relevant to 3000m, improving my ability to repeatedly exert these for long durations. I will apply the thresholds of training principle by training within my aerobic zone (intensity), calculated using the Karvonen formula (122-163bpm), ensuring specificity as 3000m is mainly aerobic. Ensuring gradual **progressive overload**, I will increase only one difficulty aspect each session (time/speed) and will train only 2 sessions weekly (frequency) using continuous training (type), decreasing potential for injury and the reversibility principle upon injury. To avoiding **overtraining**, I will include 2+ days between sessions for rest and recovery and every fortnight will replace running with cycling, less pressure on my joints giving longer to replenish energy stores and reduce fatigue.*



2. Carrying out and monitoring the PEP

Outline your training sessions over six to eight weeks. This should be placed in the appendix and data should be referenced where appropriate in the main body.



Commence your six to eight weeks training programme by recording all your training sessions (Pearson's form or centre-devised form), highlighting and explaining the adaptations to your PEP. Use the principles of training throughout the programme to adapt the training programme as necessary. It is encouraged that you adapt your PEP where necessary, as it progresses, for example increase your training intensity or duration when it becomes too easy.



3. Evaluation of the PEP

Collect and draw up post-PEP fitness test data to record your scores from the specific fitness tests that assess your chosen component of fitness. You only need to refer to the fitness test that relates to the component of fitness you have been working on. The use of graphs, charts, tables and diagrams are valuable ways to show evidence to support effective analysis and evaluation of your PEP.

Overall, I exceeded my SMART targets (Appendix 4&30) so was very pleased with my programme. With improved cardiovascular-fitness, I am fitter, meeting demands to work for longer durations without fatigue, evident from my improved 3000m - 11:04. Attaining mid-PEP targets increased my motivation (mainly 1's in Sessions 7-12), specifically at Race-Night, achieving my personal best (11:04). Achieving SMART-target 1 (12-Minute Cooper Run - 3100m) shows clear improvement in cardiovascular-fitness to sustain faster speeds over 12 minutes, also reflected in my coach's qualitative analysis (Appendix 5). Furthermore, my recovery time decreased (5 to 4 minutes) in my final 3 sessions (Appendix 32), highlighting improved aerobic capacity and cardiovascular-fitness. This progression increased cardiac-output, increasing my 12-Minute Cooper Run distance, explaining my ability to achieve negative splits when racing (Appendix 4), now with the endurance to avoid slowing. Overall, I believe continuous training was an effective training method as it has improved my 3000m by 16 seconds (11:20 pre-PEP - 11:04 post-PEP) - the primary focus of my PEP. As it involves no rest, it has helped me maintain higher intensities for longer when racing without fatigue, improving cardiovascular-fitness. Although I could have used fartlek, varying intensity may have involved anaerobic effort, decreasing specificity to the 3000m's demands - a mainly aerobic event. I effectively applied principles of training including progressive overload to achieve increased workload. By increasing the speed or length of each run, my body adapted to increased workloads, leading to fitness gains, improving my 3000m performance. Although gradual progressive overload helped avoid injury and reversibility, in some sessions intensity was too low (Appendix 6,9, 18, 21)



Compare pre- and post-PEP fitness and performance data to measure the overall effectiveness of your PEP in improving your sporting performance. We recommend using graphs or diagrams to show clear correlation between the activity and improvements in performance. All performance data should be analysed also, to either support your improvement in performance or give reasons for why improvements have not taken place. You should only focus on evaluation of changes in performance data.

(Appendix 30) Post-PEP, I aimed for a 210m increase - 2840m to 3050m - which I exceeded with 3100m, 9% increase. This was more than expected as I achieved exactly my mid-PEP target (2950m), thinking I was precisely on track, suggesting long-term aerobic adaptations arose. (Appendix 4) My quantitative analysis clearly indicates improvement: increased ability to maintain effective form (40% to 100%) indicates develop cardiovascular-fitness, now strong to avoid fatiguing (dropping arms, shortening stride). Specifically, going from 40% of races at season best to all highlights improved cardiovascular-fitness, able to work harder for longer. (Appendix 5) Throughout my PEP, my coach identified clear improvement in cardiovascular-fitness, targeted in training. Now I work at consistently higher intensities without fatigue, effects of continuous training and improved cardiovascular-fitness, helping improve my 3000m and achieve SMART -target 2 - 3km:11:04.

Pre and post PEP fitness test (Appendix 3c) show I've improved my vertical-jump test by 8.2cm and have broken the defensive line 4x per game twice. Weekly testing (Appendix 7) shows a clear increase in power from 53cm to 61.2cm (Appendix 3). From Pre-PEP to week 2 there's a 1.6cm range, significantly smaller than from week 3-6 where it's 4.7cm. The small number of repetitions during my early training sessions meant my muscles weren't worked enough to improve 1.5cm/week. In contrast, from 3-6weeks, my increases became steeper as the number of repetitions increased meaning more power gains. I broke the line x4/game by the 5th and 6th week (Appendix 8). There's a direct correlation between an increase in vertical-jump score, increased power, and the number of lines broken. The anomalous result of the 2nd week a muddy pitch meant I didn't break the line, as there was no grip to exert power from. From week 3-5 I increased by +1line-break every game due to increased power levels from training which is ideal, gradual, and was intended. By collecting data each week regarding both targets it was easy to track progress and project my endpoint, if I was falling behind I would've upped the workload to reach the target.



Evaluate the application of the method of training, SMART goals and principles of training in your PEP and the impact they have had in improving/optimising your

performance. Discuss if your method of training caused the adaptations you needed to improve your fitness; whether your SMART targets were achieved; whether the principles of training were appropriately applied.

*Plyometrics was clearly the correct **method of training** as it developed fast-twitch muscle fibres that are required for fast, powerful movements like running attacking lines and evading defenders. Plyometrics has improved my speed and strength, assisting me in achieving my performance aim of breaking the line more frequently, due to the nature of plyometrics as power is the product of combined speed and strength. I'm stronger so can push opponents off when fending contact. I'm faster so can escape pursuing opponents once I break the line. Plyometrics focuses on these three component three components like no other method so plyometrics was a brilliant choice for me. I was irrefutably able to achieve my aim and targets due to increased power because of the weekly-tests show progress (appendix7). Rugby **specific** training sessions on grass was more difficult due to decreased traction to generate power but playing rugby was easier. The number of repetitions was suited to my **individual needs** as I followed the training plan however struggled near 6weeks (eg. Appendix 4) as many repetitions meant the overload was uncomfortably steep, consequently requiring longer rest between sets to maintain proper form to avoid **overtraining**. Repetitive bounding can cause stress on joints which could've aggravated my (past) injury. Risked overtraining due to lack of attention to my timetable (Appendix 13). It was difficult to work so **intensely** for more repetitions (and **time**) nearing the 6 weeks and I accumulated lots of lactic acid build-up the next day (DOMS) due to prolonged anaerobic respiration. My warm-ups/cool-downs were effective but they took a long **time** to complete so became boring (appendix 11). The **type** of exercises were all lower-body effectively benefiting rugby because most effort comes from my legs.*



Recommend ways to improve your training further, based on the effectiveness of your PEP, to ensure continued improvement in your sporting performance. You could discuss the amendments to principles/methods of training with justification based on your fitness and/or performance data to further improve your sporting performance.

In future I will focus on speed, helping overtake opponents when sprinting for the line to further improve performance. Targeting speed, I will use interval training, involving short sprint repetitions within my anaerobic training zone (80-90%) and long recovery, allowing sufficient recovery time to maintain high intensities, leading to effective anaerobic fitness gains. I will also include session with longer repetitions and short recovery, maintaining cardiovascular-fitness gains from this PEP, the most vital fitness component for 3000m, whilst incorporating speed. This will increase variation as continuous training sessions became slightly repetitive. Moreover, I may include fartlek, increasing variation and thus motivation, whilst reducing impact on joints through changing surface (grass/sand), decreasing possible injury thus avoiding reversibility.

Within 8 weeks I'd increase the total repetitions by +7/8 each session instead of +11, making the progressive-overload more gradual/manageable. I'd combine weight training and plyometrics by using a weighted vest while exercising, meaning I wouldn't have to perform as many repetitions to get results. I'd revise my timetable to avoid being fatigued from other activities prior to training sessions. Avoiding overtraining and ensure adequate rest.
(Rugby Union PEP)