



Schools of Rugby Strength Programmes

Programme Notes

Introduction for parents, coaches and teachers.

Young people are not naturally physically prepared via their normal, everyday lives for the physical demands of rugby. Strength training may help to decrease the risk of rugby and other sports related injuries. The youngest age at which a player to sign a professional playing contract under current regulations is 18 years. In order to have any chance of being physically prepared to play professional rugby at that age, a player should start a deliberate strength training programme in his early teens. Planned strength training programmes should therefore be introduced no later than the second secondary school year (year 8).

The Rugby Football Union's position statement, Strength Training for Young Rugby Players, can be viewed via the Community Rugby website.

Although the schools of rugby strength programmes are allied to school years and thereby chronological age, there will be great individual variation in terms of biological maturity amongst children in each school year.

The adolescent growth spurt is of critical importance when comparing children of the same chronological age and when designing training programmes. The time when the child is undergoing the greatest rate of change in height is known as the Peak Height Velocity. Results show that PHV in boys could vary between 11 and 17 years; potentially a six year spread in physical maturity in a group of boys of the same chronological age. Reported average ages for PHV for European boys from different studies range between 13.3 and 14.4 years, with three quarters of the mean ages lying between 13.8 and 14.1 years of age. At this time a boy may be growing on average between 8.2 and 10.3cm per year.

Understanding how the development of the growing young player interacts with trainability is vital in order to help him achieve his maximum athletic potential. Boys enter adolescence at different ages and proceed through it at different rates. During this phase there are also spurts in muscular strength, motor performance, body mass and aerobic performance. Therefore boys of the same chronological age vary considerably in maturity and this may have a large effect on performance. Early maturing boys are on average taller, heavier and leaner than their chronological peers.

Pre-pubertal boys will respond with similar gains in strength to post-pubertal boys, but without the accompanying increase in muscle size. This is due to neural adaptation. Put simply, the brain gets better at stimulating efficient movements amongst the relevant muscle groups. As boys enter the growth spurt their responsiveness to strength training increases. This is largely due to changes in body composition and hormonal profile. A major window of opportunity for the development of strength occurs 12 - 18 months after Peak Height Velocity (i.e. on average at 14.8 to 15.6 years of age). In order to take full advantage of this a boy must already have learned the correct technique in major strength exercises and have undergone at least a twelve month (and ideally 36 month) strength preparation phase (known as "anatomical adaptation"), which will condition his fibrous connective tissues to handle the strength training loads.

The strength training programme developed for players within the schools of rugby is progressive and develops throughout the secondary school years. The programmes for years 8 (U13) and 9 (U14) are designed to be done at school, the local rugby club or at home and require the minimum of equipment e.g. a

light medicine ball (3kg), a Swiss Ball¹, 1.2m length of dowel (or a broom handle) and a pair of adjustable spinlock dumb bells. The sets and repetitions are generic and at the start of the programme the demands are quite low. Each individual will be different and his expectations and fitness levels will require that the number of repetitions be adjusted accordingly.

If the programme is being carried out by a group - as part of a club or school session - it may be more practical to use a specific duration (e.g. as many repetitions as possible within 30 seconds) rather than strictly defined numbers of repetitions for the individual exercises. This will be for the teacher or coach to decide. The programmes for years 8 and 9 have a major emphasis on abdominal and lower back strength as well as developing the strength of individual limbs in a wide array of movements. There is also an emphasis on developing balance and coordination through total body athletic movements using the player's own bodyweight. The programme for players in year 10 (U15) varies in that one of the sessions is designed to be done at a school or local strength training facility and introduces cables, machines and barbells.

There is still an emphasis on athletic development in years 10 and 11 (U16) but as these programmes progress there is a greater emphasis on strength endurance and for some individuals, muscle growth (hypertrophy) will be a consequence. Later on there is the introduction of training purely for strength and power. The individual maturity of each player is likely to become important during years 10 and 11 and this will lead to some players developing much more quickly than others. It is important at this stage that late maturing boys develop at their own pace without large increases in training load and intensity. A year 10 or 11 player who has a poor level of fitness and a low training base would be advised to do 6 weeks of the year 9 programme before starting on the programme specifically designed for his own age group.

Other fitness attributes such as speed, agility, endurance and flexibility must also be trained during these years and will be the subject of further guides.

The physical status of young rugby players who aspire to play at the elite level should be monitored throughout their careers. In order to do this the RFU elite rugby department has developed the fitness and anthropometric scoring template (*FAST*) system. This system monitors and provides feedback on a wide range of fitness and anthropometric variables specific to adolescents. Players who start on the performance ladder must be regularly tested as defined by the RFU in order to monitor their physical progress.

¹ The general rule for choosing the correct exercise ball size for core (abs/low back) exercises is to have your knees and hips bent to 90 degrees (thighs parallel to floor) when sitting on the ball.

Your Height	Ball Size (max. height/diameter)
less than 1.52m (5' 0")	45 cm (18 in.)
1.52 to 1.65m (5' 0" to 5' 5")	55 cm (22 in.)
1.68 to 1.85m (5' 6" - 6' 1")	65 cm (26 in.)
1.88 to 2.03m (6' 2" - 6' 8")	75 cm (30 in.)
2.06m (6' 9") and up	85 cm (34 in.)

Introduction for players

Your programme consists of eight blocks of activity, each six weeks long. Follow the instructions and exercise descriptions carefully. At the start of each block there is a table detailing the required numbers of sets and repetitions for each exercise. You can fill in the space next to the figure to record the weight you used or how many repetitions you actually achieved. "Repetitions" refers to the number of times you do a particular exercise consecutively before moving to the next exercise in the circuit, or before resting for the required time before doing the next "set" of repetitions of the same exercise.

Adjusting the weight and number of repetitions.

Programmes for Years 7, 8 and 9.

The number of repetitions has been set for each block using general guidelines. If you wish to be more individually specific then you can observe the following procedure.

1. Perform the first exercise of the circuit for 30 seconds and record the maximum number of repetitions achieved with good form
2. Rest for thirty seconds
3. Perform the second exercise for thirty seconds and record the maximum number of repetitions achieved with good form
4. Rest for thirty seconds and repeat for all the exercises within the circuit.
5. Divide the score achieved for each exercise by two- this is the number of repetitions you will use in week 1.

Therefore in the illustration below 24 quarter squats were achieved in test 1, therefore $24/2 = 12$ are used as the number of repetitions in week 1. Use this number of repetitions in weeks 1 to 3. Retest at the beginning of week 4 (test 2) to determine the number of repetitions to be used in weeks 4, 5 and 6. In this case the maximum number of repetitions done 30 seconds in the quarter squat has gone up to 26, therefore the new number used in the circuit is $26/2 = 13$.

Dates W/C	Test		Test 2	
Circuit	Reps	Wk1	Reps	Wk 4
Quarter squat	24	12	26	13
Dumb Bell Curl	18	9	20	10
Sit ups	20	10	22	11
Jumping Jacks	16	8	20	10
Supported Back Extension	16	8	18	9
Push Up Arms Elevated	17	9	20	10

If the use of additional weight is advocated in the form of a medicine ball or dumb bell the minimum number of repetitions that the player should perform is six. The total weight should not be above 30% of the player's body weight.

Once the player is familiar with the circuit training method progression can be weekly between tests e.g.

Week 1 Session 1 Max Rep/2

Week 1 Session 2 Max Rep/2 + 1

Week 2 Session 1 Max Rep/2 + 2

Week 2 Session 2 Max Rep/2 + 3

The same rules will apply for all the blocks in years 7, 8 & 9 with the exception of year 9 block 5 which uses timed intervals.

Players with a poor fitness level can start the programme from a lower base point using maximum repetitions/3 or maximum repetitions/4 as their repetition target for each exercise. As a player gets fitter he may progress from using maximum repetitions/2 to maximum repetitions x2/3 as his target when starting a new block. Players who respond quickly and find the circuits are not taxing can use maximum repetitions x2/3 or maximum repetitions x $\frac{3}{4}$ as their target for each station (though if using these more intense targets they must not sacrifice good technique, control or speed of movement).

With combination lifts e.g. alternate leg lunge + squats use the number prescribed in the tables.

Year 10.

The home circuit is to be carried out twice per week.

The number of repetitions has been set for each block using general guidelines. If you wish to be more individually specific then you can observe the following procedure.

1. For combination exercises use the sets and repetitions as outlined.
2. For exercises not involving additional weight you should be able to execute the repetitions in the table in fifteen seconds (per leg or arm if it is a single arm/leg exercise). If you cannot do this reduce the repetition number accordingly.
3. With exercises using additional weight the repetitions should still be able to be carried out within approximately 15 seconds and the amount of additional weight used should approximate to 40 to 50% of the "guesstimated" maximum amount of weight the player could lift in that exercise. As the player progresses through the block the amount of additional weight used is increased by a small amount (5% or less per week).

The gym session is to be carried out once per week.

The sets of a particular exercise are carried out straight on from each other not in the form of a circuit. In this case the number of repetitions is carried out as per programme. For exercises not involving additional weight you should be able to execute the repetitions in the table in fifteen seconds (per leg or arm if it is a single arm/leg exercise). If you cannot do this reduce the repetition number accordingly.

For exercises requiring the use of additional weight, the weight is selected so that you can carry out each set with the required number of repetitions in good form with energy left for other one or two more repetitions. The weight in the first set will start at approximately 50% of what could be lifted for one repetition. In subsequent sets weight will be added up to a maximum of 75% of that that could be lifted for one repetition. (In year 10 the maximum can be estimated by using a 5 repetition maximum and adding 5kg for exercises with a barbell or machine and by adding 2.5kg to exercises with dumb bells).

Year 11.

The gym sessions are to be carried out three times per week.

The sets of a particular exercise are carried out straight on from each other not in the form of a circuit. In this case the number of repetitions is carried out as per programme. For exercises not involving additional weight you should be able to execute the repetitions in the table in fifteen seconds (per leg or arm if it is a single arm/leg exercise). If you cannot do this reduce the repetition number accordingly.

For exercises requiring the use of additional weight, the weight is selected so that you can carry out each set with the required number of repetitions in good form with room for other one or two repetitions in the tank. The weight in the first set will start at approximately 50% of what has been estimated that could

be lifted for one repetition. In subsequent sets weight will be added up to a maximum of 75% of that that could be lifted for one repetition. The amount of weight lifted in the barbell exercises during the early stages of the programme should not be greater than 50% of the player's body weight.

Year Eleven Advanced.

This programme is designed for the early maturing athlete and should only be undertaken by those players who have completed year's nine and ten and also must be under the supervision of a competent and suitably qualified coach. It may also be used by players in years 12 and 13 who have followed the programmes in years 10 and 11. The amount of weight lifted in the barbell exercises during the early stages of the programme should not be greater than 50% of the player's body weight. The weight lifted in the early stages of learning the total body power exercises should not exceed 30% of the player's body weight. Only when the correct technique has been learned should modest increases in load be used. Players should be marked and encouraged to develop "perfect technique" and any competition between players should be based upon technique and not weight lifted.

The weight in the first set will start at approximately 50% of what could be lifted for one repetition. In subsequent sets weight will be added up to a maximum of 80% of that that could be lifted for one repetition i.e. the weight lifted in the barbell exercises should not represent more than 80% of the one repetition maximum even if more weight could be lifted for the prescribed number of repetitions within that set e.g. if the programme calls for 5 repetitions in the barbell deadlift and the estimated one repetition maximum is 100kg the highest weight lifted will be 80kg.

Estimation of one repetition maximum.

This is based upon an estimation of 5 repetitions maximum (5RM) and is used in the major multi-joint exercises. The player starts after a warm up with ten repetitions using an empty bar then performs 5 repetitions at 50% of his perceived 5RM, he takes a 2 minute rest and then repeats with 75% and 90% before attempting his 5RM. The maximum number of repetitions in a range of 4 – 7 is completed and the score plus the amount of weight lifted is converted to a 5RM (this is done automatically for the squat and bench press in the RFU FAST Protocol).

Guidelines for players starting after Year 7.

Many players will be new to this form of training and will have missed previous parts of the programme therefore it is important to offer some basic guidelines. Remember, these are general and all players are individuals, however it is always better to err on the side of caution as the player will have many years of injury free training in front of them to develop strength.

- A player year 8 player has not completed year 7 programme: although he will be disadvantaged by missing year 7 he will still be able to enter in year 8
- A year 9 player has not completed year 8 programme: although he will be disadvantaged by missing year 8 he will still be able to enter in year 9, however he may benefit from completing at least one block from year 8 prior to starting year 9.

- A year 10 player has not completed year 9 programme: he will be disadvantaged by missing year 9 and should complete at least two blocks from year 9 prior to starting year 10.
- A year 11 player has not completed year 10 programme: he should complete two blocks from year 9 and then start the year 10 programme
- A player is a late maturer and very underdeveloped for his age: he may start on a programme for a player of a younger age and then move into his year's programme as he develops but increases the load very modestly and in fact he may need to reduce the total number of sets within the workout. (In a club or school group session he should still train with his age group cohort but on a modified programme).