Dragon Challange V1.0

Manual

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How to reference this manual:

Acknowledgements

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Background and Overview

The clock is ticking. The health and well-being of our nation is at crisis point and there has never been a more critical time to ensure children have a healthy, positive development. The Welsh Government has long recognised that the quantity and quality of physical activity and physical literacy, respectively, is paramount to shaping the health and well-being of children; Wales was the first country to legislate for Play (2002), the first to introduce an "Active Travel Act" to its statute books (2014) and the first to consider physical literacy as being as important as numeracy and literacy (2013). In parallel, Sport Wales have received significant funding from the Welsh Government to deliver a long term improvement in physical literacy and an increase in physical activity among children in schools in Wales, helping younger generations get hooked on sport for life and to adopt healthy lifestyles. Recently Sport Wales convened a Physical Literacy Expert group who have created a physical literacy framework to drive this work forward. Strategically programmes across Wales should contribute towards the framework (e.g. the Physical Literacy Programme for Schools). As such, there is growing interest from parents, teachers, sports coaches, health professionals and researchers regarding children's levels of physical literacy and in particular physical competence.

Understanding Physical Literacy

A child who is physically literate is able to move capably and confidently, read the physical environment, anticipate movement needs, and respond intelligently and imaginatively in a range of physically challenging situations (Whitehead, 2001). The development of physical literacy therefore gives children the motivation and confidence to maintain regular participation in physical activity throughout their life. Children are more likely to follow normal growth and development pathways and reduce risks to their health during adulthood if they are physically fit and active (Stratton et al, 2007; Department of Health, 2011). Furthermore, there is a growing body of evidence in the UK that reports a positive relationship between participation in physical activity and academic achievement (Booth et al., 2014).

What is Physical Competence?

Physical competence represents an important component of physical literacy and can be defined as a child's ability to use their bodies and physical skills. Physical competence therefore includes the acquisition of health-related components of fitness, such as aerobic fitness, strength and flexibility, and skill-related components of fitness like balance, agility, power, speed, reactions and coordination, as well as fundamental movement skills like catching, throwing and running.

Physical competence is gradually acquired through a complex process of brain and neuromuscular development. The development of physical competence occurs sequentially, progressing from reflexive movements in the first few months of life to the acquisition of a broad repertoire of sport- and context specific movements in middle to late childhood, adolescence and adulthood (Gallahue et al., 2011). When a child is learning to read they first learn words such as cat, sat, mat. Similarly as a child learns physical skills they learn skills such as how to run, jump, throw and balance. Children then string words together into sentences and read them. In the same way, physical skills are linked together to create movement and perform activities such as riding a bike, swimming or performing the long jump.

The Importance of Developing Physical Competence

Physical or motor development is considered to be an important dimension of child development and in the development of cognition (Piaget, 1952). From an early age, the capacity to move gives children the ability to explore and interact with their physical world.

Research suggests that children and adolescents who develop high motor competence are more likely to participate in physical activity (Foweather et al., 2014; Holfelder & Schott, 2014; Lubans et al., 2010). The development of physical skills also plays a significant role in giving children the confidence to be active (Babic et al., 2014). This creates a positive spiral of engagement in various physical activity behaviours that are inherently linked to cardiorespiratory fitness (Vlahov, Baghurst, & Mwavita, 2014), academic performance (Jaakkola, Hillman, Kalaja, & Liukkonen, 2015), and maintenance of a healthy weight (Rodrigues, Stodden, & Lopes, 2015).

Conversely, children who cannot demonstrate physical competence might not have the skills or confidence to be physically active and may therefore drop out of physical activity in later life (Stodden et al., 2008). Worryingly, the available evidence suggests there may be a "proficiency deficiency" (Cliff et al., 2012), although investment in physical education and school sport can support the development of physical skills (Foweather et al., 2008).

Assessment of Physical Competence

Given that the development of physical competence is important for both the health and wider development of children, there is a rationale for establishing the level of competence. At present there are a number of validated assessment tools that have been used to measure aspects of health and skill-related fitness, movement skills and physical activity. However, many of these tools require detailed analysis and expertise and are cost and time prohibitive. Further, current movement skill assessments were originally developed to identify children with physical developmental issues and involve the performance of skills in isolation, limiting their transferability and application to multi-skill and sport environments. It was therefore recognised that existing tools were unsuitable for population level measurement of physical competence in older children (aged 10-12).

Overview of the Dragon Challenge

Sport Wales, in partnership with Swansea University, Glyndwr University and Liverpool John Moores University, have carefully constructed a single practical assessment "Dragon Challenge V1.0" that aims to accurately and reliably assess the physical competence of children in years 6 to 7.

The Dragon Challenge assessment is a surveillance tool that was systematically developed through a number of iterations between 2013-14. Initially a professional review was conducted of other physical competency assessment tools. Subsequently, a pilot version of the Dragon Challenge was designed and tested. Then, with significant input from over 100 expert practitioners in physical education and sport from across Wales, the assessment tool was further developed and refined until Dragon Challenge Version 1.0 was finalised. It is expected that this version will be revised and updated according to the data and user feedback.

The Dragon Challenge is designed to be a dynamic and engaging assessment tool that provides a developmentally appropriate challenge of children's physical competence. The following sections outline the Dragon Challenge V1.0 and describe the tasks and preparatory procedures, the assessment process and criteria, as well as data management and the interpretation of results.

Description of the Dragon Challenge

Mapped to Multi-Skill and Multi-Sport Activity Cards

Purpose

- The purpose of the Dragon Challenge is to assess children's physical competence.

Target Population

- Dragon Challenge has been designed for children in school years 6 and 7 (aged 10-12 years).

Dragon Challenge Assessment Tasks

The Dragon Challenge assessment tasks are shown in Table 1, while the types of physical skills involved are shown in Table 2. Children complete 9 activities in a continuous circuit that assesses a number of stability (skills that involve balancing the body in one place or while in motion), locomotion (skills that involve moving the body in any direction from one point to another) and manipulative skills (skills that involve handling or controlling objects with the hand, foot or an implement). The circuit is completed in a timed trial that is designed to be fun, engaging and challenging.

The activities involve motor abilities such as agility, balance, coordination, strength, power, speed and reactions. The circuit requires spatial awareness (changes in direction and levels) and awareness of effort (changes in speed, force and flow) in relation to various objects, goals, and boundaries. Participants also utilise important cognitive attributes such as confidence, decision-making and reading the environment as they navigate through the tasks against the clock.

Table 1. Description of Dragon Challenge assessment tasks

Task	Description
1. Balance Bench	Walk the length of the narrow side of a bench beam, completing a 360 degree turn at mark before dismounting at the end of the bench.
2. Core Agility	Complete 4 body shape positions (dish - arch - dish - arch), rotating the body in both directions.
3. Wobble Spot	Complete 5 bean bag 'passes' around the body while balancing on the wobble spot on one leg.
4. Overarm Throw	Throw a tennis ball, using an overarm throw, at a target approximately 9 metres away.
5. Basketball Dribble	Using either hand, dribble a basketball around 4 coloured spots positioned in a 'z' formation.
6. Catch	Catch a tennis ball thrown underarm at a rebound net from any distance.
7. Jumping Patterns	Complete a jumping pattern sequence that includes a series of hops and jumps (2 footed jump over hurdle > 2 footed landing > 2 left hops > 2 right hops > 2 foot jump over hurdle > 2 footed landing).
8. T-Agility	Complete t-agility run, facing forwards throughout.
9. Accelerate-Sprint	10m acceleration to a sprint over finish line.

Table 2. Types of physical skills utilised during each Dragon Challenge assessment task

Task	Body Management	Locomotion	Manipulative
1. Balance Bench	●	○	
2. Core Agility	●		
3. Wobble Spot	●		●
4. Overarm Throw			●
5. Basketball Dribble		○	●
6. Catch	●	○	●
7. Jumping Patterns	●	●	
8. T-Agility		●	
9. Accelerate-Sprint		●	

● = primary skill category involved in task; ○ = secondary skill category involved in task

How long does the Dragon Challenge Assessment take?

Children typically take between 90 and 240 seconds to complete the Dragon Challenge. Groups of children can be assessed in a single session or multiple assessment days may be required for larger groups. A team of two assessors and one administrator can assess ten children in about 60 minutes. If testing is completed in a large sports hall with the necessary equipment and multiple assessors and administrators available, then a number of Dragon Challenge circuits can be set up to assess several children simultaneously.

Uses of the Dragon Challenge

The Dragon Challenge assessment has primarily been developed as a surveillance tool to assess patterns and trends in the levels of physical competence among children across Wales. Dragon Challenge data will also become a "Key Performance Indicator (KPI)" for Sport Wales "Every Child Hooked on Sport" and Physical Literacy strategies.

Preparing for the Dragon Challenge Assessment

This section discusses important matters that should be considered before administering the Dragon Challenge Assessment.

Video Resources

A series of training videos are available to familiarise instructors and assessors with the challenge and its constituent activities. Video material is presented in a real context and guidance on preparation, setting up, administering, assessment and scoring Dragon Challenge are available online. (Appendix A)

Training

Standardised procedures govern the administration and assessment of Dragon Challenge to ensure that the assessment is a reliable and valid measure of physical competence.

All assessors (examiners) of Dragon Challenge must have received training in assessment. Training is provided by Gold Standard Assessors who have been involved in the development of the Dragon Challenge and received intense training to implement assessments.

Each region has a lead Gold Standard Assessor who is supported by a team of support Gold Standard Assessors. These individuals act as leads, mentors, trainers and quality assurers on behalf of Sport Wales. The Lead Gold Assessors, their regions, and e-mail addresses are listed on the Sport Wales website **http://sport.wales/community-sport/education/dragon-multi-skills--sport.aspx**

Training is necessary to ensure that assessors have a clear understanding of the purpose, content and construction of the Dragon Challenge. Further, assessors should feel competent in procedures of administration and assessment, scoring and interpretation, and data management. Assessors should thoroughly practice giving and scoring each individual task and the full circuit until they feel confident in assessment.

Assessors are required to reach 85% agreement (3 disagreements per child) with the scores recorded by a Gold Assessor before assessing in a real situation. This agreement should be achieved using live or pre-recorded performances of sets of 10 children. Once acceptable agreement is reached assessors will be appropriately trained and will be assigned a unique identifier number by the Regional Lead Gold Assessor (see page 29).

Administrators of the Dragon Challenge should also receive basic training. This may include practicing administering the Dragon Challenge while being observed by an experienced administrator. Gold Standard Assessors will be able to provide information on training.

Child Data

Each child's Dragon Challenge assessment data needs to be input into an excel data sheet by the assessor(s) (see pages 27 to 30 for a detailed overview of data organisation and management). In preparation for the assessment, schools will need to provide pertinent information relating to individual child characteristics including:

- **Date of birth**
- **School year**
- **Sex**
- **Ethnicity**
- **Home postcode**
- **Free school meal status**
- **Learning difficulties or disabilities status**

Swansea and Edge Hill University academics in collaboration with Sport Wales will gain ethical approval for utilising data for further research and data linkage purposes. Data will be carefully protected and only used strategically for education and research purposes.

Space

It is important that a suitably adequate and safe space is available to conduct the Dragon Challenge assessment. The layout of the Dragon Challenge (see Figures 1a and 1b) has been designed to fit within the dimensions of a full size badminton court (13.4m x 6.1m); school gymnasiums and community sports centres are likely to have badminton court markings and sufficient space. Larger sports halls, with multiple badminton courts, can facilitate multiple concurrent child assessments.

Layout

A floor plan of the Dragon Challenge is illustrated in Figures 1a and 1b. The activities and equipment should be set up using the precise lay out and measurements given. The distances should be double-checked to ensure assessment conditions are identical. Layout and equipment should be reset following each child performance. Tape should be used to secure relevant pieces of equipment to the floor (e.g. spots, feet markers).

Equipment

The equipment required to run the Dragon Challenge is listed in Table 3. It is important that only the equipment listed is used and that guidelines relating to the air pressure of the basketball and wobble spot are adhered to; the assessment was standardised using this equipment and any change /improvisation may invalidate the results. Most of the equipment used can be found in primary or secondary schools or is available from Physical Literacy Programme for Schools teams. The availability of spare equipment such as balls and bean bags should also be considered. An iPad or other tablet is required and should be pre-loaded with the Dragon Challenge keynote/ppt. presentation slides that display the order of activities (see Appendix B and C).

Staffing

A team of two assessors and 1 administrator are required to run the Dragon Challenge. It is desirable that both males and females are represented on the team. At least one member of this team will need to give demonstrations. In groups, an additional member of staff (e.g. physical education teacher) will be needed to run activities to occupy children while they wait for their individual assessment. With additional staffing and space, multiple children can be assessed simultaneously.

Preparing Students

Children should prepare for the Dragon Challenge through participation in physical education, sport and extra-curricular activities. In line with changes to the curriculum, the children should not practise the Dragon Challenge with the specific intention of improving their scores or in fact "train" for the assessment. Children will need to be wearing appropriate footwear and clothing.

Health and Safety

Risk assessments and health and safety policies and procedures must be followed in accordance with standard practices in physical education. Adverse events that occur during the challenge should be recorded. It is requested that reports are anonymised and emailed to the regional lead gold assessor to ensure that the Dragon Challenge remains a safe measurement tool.

Table 3 Equipment required to deliver the Dragon Challenge V1.0

| |
|---|
| 1 x 30 metre measuring tape |
| 1 x 5 metre steel measuring tape |
| 1 x Reel of coloured electrical/masking tape (2-3 inches wide) |
| 1 x Rebound net (2m x 2m) |
| 1 x Wooden bench (minimum length of beam: 2.5m; maximum width: 65mm) |
| 1 x Large gym mat or 2 x standard gym mats (approx. dimensions: 2m x 2m) |
| 1 x Fully inflated balance cushion (i.e., wobble spot) |
| 1 x Bean bag |
| 4 x Rubber floor spots |
| 2 x Small plastic indoor hurdles (height: 30cm/12") |
| 12 x Rubber 'feet' markers (6 x left foot, 6 x right foot) |
| 2 x Small traffic cones |
| 1 x Hula hoop |
| 1 x Basketball (size 5; 0.5-0.6 bar; 7-9 PSI) |
| 2 x Tennis balls |
| 1 x IPad/tablet, fully charged and with Dragon Challenge presentations uploaded (Appendix B and C) |

Figure 1a Floor Plan Layout
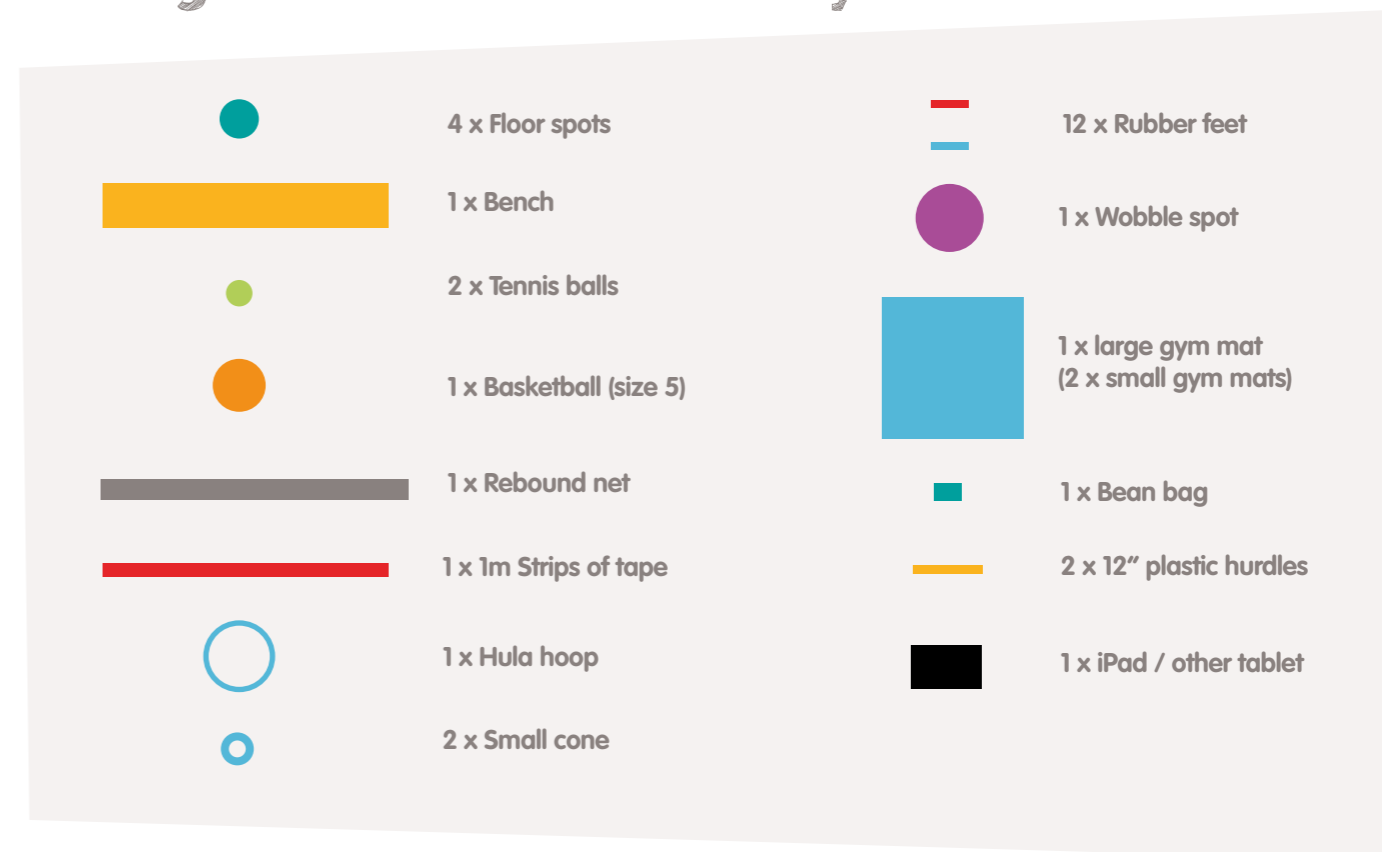
Figure 1b Floor Plan Layout
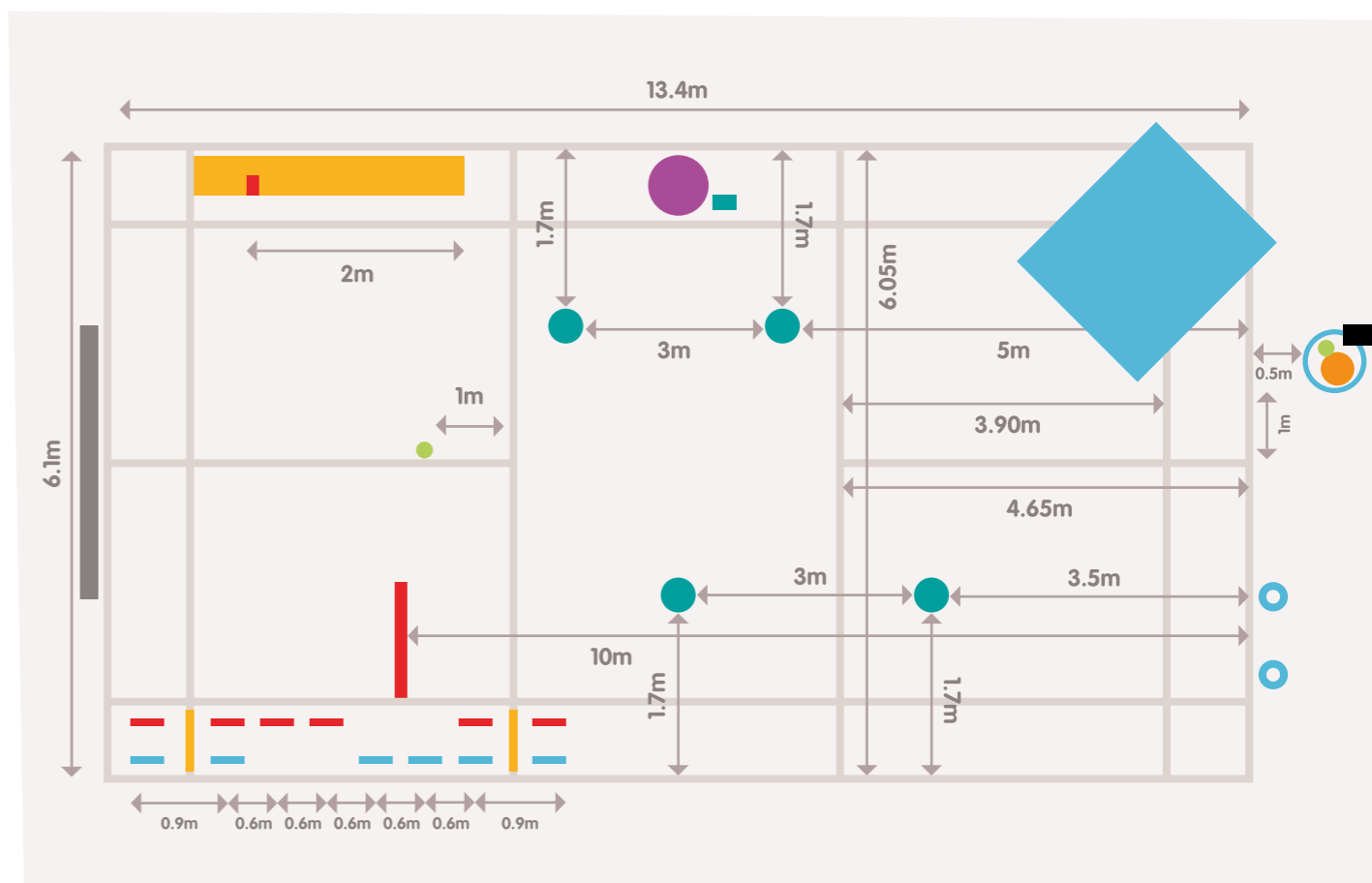
How to Administer the Dragon Challenge Assessment

This section provides directions for the administration of the Dragon Challenge. It is important that the Dragon Challenge is administered as specified so that a valid interpretation of a child's physical competence can be achieved and the results can be assessed across time. Therefore administrators should be trained in the live administration of Dragon Challenge. A range of video resources are available to support administrator training and development (see Appendix 3).

Step 1 - Preparation

- Possess a hard copy of this manual to be used as a reference
- Set up the Dragon Challenge using the equipment (Table 3) and floor plan (Figures 1a, b)
- List of children to be assessed
- Scoring sheets printed, including spare copies, and pens/pencils are available.
- Conduct a short briefing with assessors and administrators
  - o Discuss how the assessment session will be managed, considering such factors as the number of children being assessed and the time available, which members of the team will be responsible for the introduction and demonstrations, as well as what other children will be doing during individual assessments
  - o Review all the tasks and assessment criteria to ensure both assessors and administrators have full understanding of the Dragon Challenge procedures. This is particularly important if assessors/administrators lack experience.

Step 2 - Introduction

At the start of the session, make sure children have a clear side-on view of the Dragon Challenge layout. Children should then receive a verbal explanation of the Dragon Challenge, including what will be assessed, how they will be assessed and how the results will be used. Additional instructions and information relating to lesson/session management can also be given. See Box 1 for a suggested script that can be used for the introduction and explanation.

During your physical education lessons you have been taught to play many sports and activities that require you to use your physical skills. Today you will be completing the Dragon Challenge, which is an obstacle course that assesses some of these physical skills.

The Dragon Challenge is being completed by children all over Wales and involves skills like balance, agility, catching, throwing and jumping. You complete 9 different activities and you are assessed and timed by a teacher.

So Dragon Challenge is a balance between technique, accuracy and speed – you should try to complete the course as well as you can but also as quickly as you can. Getting the balance right is up to you; if you go too fast then you many not complete all the activities but if you go too slow then you may not get a good time. Sometime after you've finished the Dragon Challenge you will be given a score. This is your personal score and it will be used by teachers to improve your physical skills.

The Dragon Challenge is supposed to be fun so enjoy it and try your best!

Let's run through the activities so you know what to do!" [Move onto Step 3 – Demonstrations]

Box 1. Script for introducing the Dragon Challenge to children

Step 3 - Demonstration of Dragon Challenge

After the introduction, children then receive a practical demonstration of the Dragon Challenge activities. An assessor, administrator or specially recruited individual can demonstrate the activities. It is important that demonstrators perform each task accurately with sound technique. Demonstrations are important in ensuring that children understand the task requirements. However, they should not be used to teach or coach children.

During the demonstrations another member of the team (usually the same person that gave the introduction) provides a running commentary with precise instructions and directions. The script and actions for the demonstrations are given in Table 4 below. Demonstrations are given for individual activities before a full demonstration of Dragon Challenge from start to finish at maximum speed is provided. While the order of activities is standardised in the real assessments (see Table 1), for demonstration purposes a random order is given, with the 'random' iPad presentation being used (Appendices B & C).

Table 4 Actions and script for Dragon Challenge demonstrations

Activity	Actions	Scripts
Start - iPad	Begin standing stationary by the hoop containing the I-Pad	*children to gather round the iPad and hoop* "The Dragon Challenge uses an iPad to show you the activities that you need to do. This is what you see on the screen when you first see the iPad. You will start by the hoop and when you are ready, I will say 3-2-1-go." "What do you think you do next?" [answer: touch or swipe the screen] "Touching is usually more accurate than swiping" "Whatever picture you see on the screen will be the task you need to complete next" "What picture is shown here? So where is the next activity?" **Questions to check understanding:** "How do you know which activity to do next?" [answer: iPad and the picture] "What's the best way to see the next activity?" [touching the screen]
Balance Bench	Run to bench. Walks length of beam, completes full turn at 3/4 mark without falling off, dismounts at end zone. Repeat Return to iPad	"This activity is called balance bench. You get onto the bench, walk along, do a 360 degree turn and then get off the bench at the other end." "If you fall off the bench then you stop and return to the iPad." **Questions to check understanding:** "What do you do at the tape mark?" [answer: 360 degree turn] "Where do you get off the bench?" [at the end, not the side] "What happens if you fall off?" [run to iPad]
Core Agility	Run to mat. Completes 4 positions in correct order (dish on back - arch on front - dish on back - arch on front), rotating both ways Demonstrate dish only Demonstrate arch only Repeat in full Return to iPad	"This activity is called core agility. You need to run to the mat." "Dish on your back-arch-dish and then change direction back to arch." *administrator uses hand gestures to indicate which direction the body should be rotated* "What shape is this?" [answer – a dish] "What shape is this?" [answer – an arch] "Let's see it all again….what do you notice about their shoulders? Did they touch the floor?" [answer: off the floor throughout] **Questions to check understanding:** "What order do you do the shapes in?" [answer: dish-arch-dish-arch] "Show me a dish? Show me an arch?" *children perform shapes* "Do you start on your front or back?" [back]

Activity	Actions	Scripts
Wobble Spot	Run to wobble spot. Pick up bean bag. Get set. Completes 5 bean bag passes around body while balancing on wobble spot on one leg. Return to Ipad.	"This is called wobble spot. You need to balance on 1 foot, after picking up the bean bag." "Get yourself set, what do I mean by set?" [answer: balanced before starting] "Then pass the bean bag around your tummy 5 times." "1-2-3-4-5." *administrator counts aloud* "If you fall off, put your foot down or drop the bean bag, you stop and return to the iPad." **Questions to check understanding:** "How many times do you pass the bean bag?" [answer: 5] "What happens if you fall off after you have started?" [return to iPad]
Overarm Throw	Pick up tennis ball from hoop. Run and overarm throw, hitting the target (i.e. rebound net; no bounce). Repeat. Return to Ipad.	"It's overarm throw. You need to pick up the tennis ball and you will be throwing the ball overarm to hit the target." "You have to throw the ball before the T-point [badminton service box line]" "When you have thrown the ball leave it and return to the iPad" **Questions to check understanding:** "What type of throw is it?" [answer: overarm] Where do you need to throw the ball towards?" [rebound net] "Can it bounce before it hits the target?" [no] "Where is the line that you have to throw the ball before?" [T-point]
Basketball Dribble	Collect basketball from hoop. Dribble basketball around all spots and back to hoop using either hand (body & ball must move around outside of spots). Cannot catch ball/use two hands simultaneously. Repeat. Return to Ipad.	"Basketball dribble!" "Bounce the ball using your hand around the spots." "The first spot is to your left, you need to go in a zig-zag around the spots." "Then keep dribbling back down the middle and put the ball down in the hoop." "You need to make sure that your body and the ball move around the outside of the spots" "You can't catch the ball or put two hands on the ball at the same time." **Questions to check understanding:** "Can the ball bounce inside the spots if your body is on the outside?" [answer: no] "What do you do when you've finished the zig zag spots?" [dribble down middle back to hoop] "Am I allowed to use 2 hands at the same time?" [no]
Catch	Run forward and collect tennis ball from floor. Underarm throw tennis ball against the net and then catch (must be caught without a bounce). Return to iPad	"It's the catch! Run forward to the tennis ball on the floor." "Pick it up." "Underarm throw against the net and then catch" "You can go as close as you want to the net, but do your best to throw accurately and then catch the ball." If you don't catch the ball then leave it and return to the iPad. **Questions to check understanding:** "What type of throw do you use?" [answer: underarm] "How close can you go?" [as close as you like] "What do you do if you drop the ball or miss the catch?" [return to iPad]
T-agility	Moves at half speed through all points of 'T' facing forwards (must enter both right & left court tramlines). Repeat at full speed. Return to iPad.	"T-run is marked on the [insert tape colour] line. Show me the shape of a "T"." *performs T-shape with arms* "You start moving forwards and then side-step into the tramline on the left then the tramline on the right." "You will always face forward and you need to move and change direction as fast as you can." **Questions to check understanding:** Which direction will you always be facing? [forwards] Where are the tramlines? *indicate where tramlines are* What speed should you change direction? [quickly as possible]
Jumping Patterns	Run to and complete jumping patterns sequence (2 footed jump over hurdle > 2 footed landing > 2 left hops > 2 right hops > 2 footed jump over hurdle > 2 footed landing). No contact with hurdles. Repeat.	"This is called jumping patterns" Where do you think this is?" "You have to follow the same pattern as the feet on the floor." "Jump two feet over the hurdle to land on two feet" "Two hops on the left foot and then two on the right" "Jump two feet over the hurdle to land on two feet." "You need to make sure you follow the foot markers and don't touch the hurdles." **Questions to check understanding:** How do you know whether to hop or jump? [rubber foot markers] Can you touch the hurdles? [no]
Sprint	Runs through start gate & then through to finish line	"The sprint….run through the gate and then sprint as fast as you can over the line." "Go as fast as you can but slow down as soon as you cross the line!" **Questions to check understanding:** "How fast do you go?" [as fast as you can] "When do you start slowing down?" [as soon as you've crossed the line]
Full Demonstration	Demonstrate the full Dragon Challenge, from start to finish.	Cueing instructions are given in Step 5. Give children an opportunity to ask questions at the end.

Step 4 - Opportunities for Practice

While children do not have the opportunity to practice the full Dragon Challenge from start to finish, they should be provided with two practice trials for each individual task prior to assessment to assure that the child understands what to do. Following the demonstrations, children can be split into small groups, rotating around the activity stations to provide an opportunity for practice. When the child does not appear to understand the task, one additional demonstration can be given. No coaching tips or technical guidance should be given during practice opportunities.

Step 5 - During the Assessment

The administrator plays a critical role during the Dragon Challenge assessments. The administrator ensures that the stated protocols are adhered to and that consistent procedures are followed. In addition, the administrator also influences the motivational climate for the child performance. Dragon Challenge assessments should therefore be conducted using an inclusive approach in a positive, supportive environment to ensure children feel confident and enjoy the assessment process. This will help children feel engaged, motivated and committed to doing their best. General guidelines for administrators include:

- Ensure that the equipment and layout is correct prior to each child performance
- Introduce oneself to the child and ask their name
- Check that the child understands what they need to
- Help the child feel ready, relaxed and motivated to do their best
- Use the verbal cues given in Table 5 and note the additional directions in Table 6
- Keep in close proximity to the child during the Challenge, moving alongside them in a calming and relaxing manner (Do not race the child!)
- Use general encouragement and supportive language to promote sustained effort during the challenge (e.g. "keep going; try your best"; "don't worry", "never mind")
- Words of praise (e.g. "well done; excellent") should be reserved until after the assessment is completed.
- DO NOT "teach" or "coach" the child during the assessment.
- Congratulate the child upon completing the Dragon Challenge and say 'well done!'
- If any deviations occur during the assessment from the standard protocol, ensure these errors or deviations are noted on the child performance record.

Table 5 Actions and verbal cues given by the administrator during the assessment.

Step	Position	Scripts	*Actions*
1. Begin standing stationary by the hoop containing the iPad	iPad	"Ready…3-2-1-Go!"	
2. Immediately after child has touched iPad	iPad	"Balance bench"	*point to bench*
3. As they get on the bench	Bench	"Walk to the tape…"	*point to tape*
4. As they approach the ¾ mark on the bench	Bench	"Turn"	
5. As soon as they complete the turn	Bench	"Off the end"	*point to end of bench*
6. As soon as they leave the bench	Bench	"Back to the iPad"	*point towards the ipad*
7. As soon as they touch the iPad	iPad	"Core agility"	*point towards the mat*
8. Once the child is on the mat	Gym mat	"Dish on your back"	
9. As soon as they have attempted the dish	Gym mat	"Arch"	*gesture to turn*
10. As soon as they have attempted the arch	Gym mat	"Dish"	*gesture to turn*
11. As soon as they have attempted the dish	Gym mat	"Back to an arch"	
12. After they complete the arch	Gym mat	"Back to the iPad"	*point towards the ipad*

Step	Position	Scripts	*Actions*
13. As soon as they touch the iPad	iPad	"Wobble spot"	*point towards the spot*
14. As they approach the wobble spot	Wobble spot	"Pick up the bean bag and get yourself set"	
15. As soon as they are set on the wobble spot	Wobble spot	"Go – 1, 2, 3, 4, 5"	
16. As soon as they leave the wobble spot	Wobble spot	"Back to the iPad"	*point towards the ipad*
17. As soon as they touch the iPad	iPad	"Overarm throw, tennis ball"	*point towards the tennis ball in the hoop*
18. As soon as they pick up the tennis ball	iPad	"Run up to the line and throw the ball at the target"	*point at the T-junction line*
19. Once the child has thrown the ball	iPad	"Leave the ball, back to the iPad"	*point towards the ipad*
20. As soon as they touch the iPad	iPad	"Basketball dribble"	*point towards the basketball in the hoop*
21. As soon as they pick up the basketball	Floor spots	"Around all the spots with the ball and your feet"	
22. As they are going around the final spot	Floor spots	"Dribble all the way back to the hoop"	
23. As soon as they touch the iPad	iPad	"Catch"	*point towards the tennis ball*
24. As soon as they start running towards the tennis ball	Tennis ball	"Underarm throw from wherever you like, make sure you can catch the ball"	
25. Once the child has either caught the ball or missed/dropped a catch	Tennis ball	"Back to the iPad" [& "leave the ball", if dropped/missed]	
26. As soon as they touch the iPad	iPad	"T-Run"	*point to bottom of T*
27. As they move up the middle	T-Agility	"Face forwards, quick as you can"	
28. As the child is approaching the T-junction	T-Agility	"All the way to the sides"	*point to tramlines*
29. Once they have changed direction for the second time	T-Agility	"Backwards to the start"	
30. As soon as they touch the iPad	iPad	"Jumping patterns"	*point to hurdles*
31. Once they land after the final hurdle	Jumping patterns	"Back to the iPad"	
32. As soon as they touch the iPad	iPad	"Sprint, through the gate"	*point to cone gate*
33. As they approach the cone gate	Sprint	"As fast as you can"	
34. Once they cross over the finish line	Sprint	"Well done, great effort!"	*clap hands, high five child*

Table 6 Additional directions for the administrator

Task	Additional Directions
iPad	Prior to starting each trial, ensure that the iPad is sufficiently charged and that the Dragon Challenge presentation is at the beginning.
Balance Bench	If the child falls off the bench at any time then end the task immediately.
Core Agility	Observe child's shoulders during task. If child's shoulders contact the floor at any time then administrator should signal to assessors by placing their hand on their shoulder.
Wobble Spot	Allow child to 'get set' before starting task. If non-support foot is put down on the floor or on the wobble spot after first beanbag pass then end the task immediately. Count the number of bean bag passes aloud. Observe the child during the task from the rear and indicate to the assessors if the child is resting their non-support leg on their support leg or foot, or on the wobble spot. Do not stop the task early if this is the case.
Basketball Dribble	If a child is clearly struggling to dribble then the administrator should use their judgement and end the task as soon as this is apparent.
Jumping Patterns	The administrator should try to ensure that they do not block the view of the assessors by running alongside the jumping pattern

How to Record and Assess a Child's Dragon Challenge Performance

This section provides information in relation to how to record and assess a child's performance at the Dragon Challenge. As noted on page **13**, all assessors of Dragon Challenge must have received training in assessment and be confident and competent in assessing children.

Child Performance Record

Child performance is scored in situ by trained assessors and recorded on the Child Performance Record form (Figure 2, also see Appendix D). This form is used to record pertinent information about the child (name, sex, and school), the date of the assessment, the assessor(s), the results, as well as noting any issues with the testing conditions that may be relevant for the interpretation of results. Assessors subsequently input Child Performance Record results into an excel file (See Data Management, page 26).

Figure 2 Child Performance Record Form

Child Name: _____   Date:_____
School: _____
Sex: Male [ ] Female [ ]   Assessor:_____

DRAGON CHALLENGE
Child Performance Record

Activity	Quality Indicator 1	Score	Quality Indicator 2	Score	Task Completed?	Score
1. Balance Bench	Moves without hesitation **up to turn**	1.1	Body posture stable (*head & trunk stable, minimal arm flailing*)	1.2	Walks length of beam, completes full turn at 3/4 mark without falling off, dismounts at end zone	1.3
2. Core Agility	Hands & legs **extended** & held **with tension**, with shoulders & feet off the floor	2.1	Controlled & fluent **transition** through shapes	2.2	Completes 4 positions in correct order (*dish on back - arch on front - dish on back - arch on front*), rotating both ways	2.3
3. Wobble Spot	Non-support foot does not touch support leg/foot/wobble spot/floor	3.1	Body & head are stable/still	3.2	Completes 5 bean bag passes around body whilst balancing on wobble spot on one leg # 'correct' passes 0 1 2 3 4 5	3.3
4. Overarm Throw	Throwing arm moves in a backward arc to **initiate** throw (*shoulder rotates*)	4.1	Steps with the foot opposite throwing hand towards target	4.2	Overarm throw directly hits target (*ball should not bounce prior to hitting target*)	4.3
5. Basketball Dribble	Pushes ball with fingertips (*not slapping at the ball*)	5.1	Controlled directional dribbling	5.2	Dribbles around all spots using either hand. (*body & ball must move around outside of spots*). Cannot catch ball/use two hands simultaneously	5.3
6. Catch	Feet move in line **with rebound**	6.1	Catches ball with **hands only** (*must be caught without a bounce*)	6.2	Successful catch off rebound net (*must be caught without a bounce*)	6.3
7. T-Agility	**Plants** & **drives** off **outside foot** (*right to left & left to right*)	7.1	Side-stepping on balls of feet (*right to left & left to right; feet don't cross*)	7.2	Moves through all points of 'T' facing forwards (*must enter both right & left court tramlines*)	7.3
8. Jumping Patterns	Arms drive over first hurdle (*elbows bent & arms swing to produce force*)	8.1	Rhythmical pattern throughout	8.2	Completes jumping pattern sequence correctly. No contact with hurdles	8.3
9. Sprint	Drives off balls of feet, leaning forwards	9.1	Arms bent, driving forward & backwards (*arms bent at approximately right angles*)	9.2	Runs through start gate & then through to finish (*must be running not walking*)	9.3

Notes Please comment below if there are any issues with child performance or assessors' ability to accurately score. For example, falls, injuries, noise, temperature, equipment, space or adminstration issues. Also note any worrying or excellent performances.

Time to completion: _ _ : _ _

Score each quality indicator and task outcome as: 1 = performs criteria correctly; 0 = does not perform correctly

Assessment Criteria

Child performance at Dragon Challenge is assessed through:

• Time to completion

• Skill performance criteria (technique and outcome)

• The time and skill performance criteria are given equal weighting; children need to find the optimal
  balance between speed and accuracy, using the appropriate technique

Time to Completion

Using a stopwatch, time to completion is recorded (to nearest 0.1s) from the word 'Go' and stopped as soon as the child crosses the finish line. An assessor will use a stopwatch to record time. Time to completion is recorded on the child performance record (Figure 2).

Performance Criteria

Dragon challenge assessment criteria include indicators that measure both process and product characteristics of performance (See Table 7). Process characteristics address qualitative aspects of movement and have to do with how a child moves the body in performing a task (i.e. assesses movement form, quality and technique). Product characteristics have to do with the end product or outcome of the movement (e.g. 'throw hits target').

During the child performance, the assessors record whether the child meets the performance criteria. Assessors record a 1 if a child performs a criterion correctly or a 0 if not.

Table 7 Dragon Challenge assessment performance criteria

DC Task	Technical Criterion	Technical Criterion	Outcome Criterion
1. Balance Bench	1.1 Moves without hesitation up to turn	1.2 Body posture stable (head & trunk stable, minimal arm flailing)	1.3 Walks length of beam, completes full turn at 3/4 mark without falling off, dismounts at end zone
2. Core Agility	2.1 Hands & legs extended & held with tension, with shoulders & feet off the floor	2.2 Controlled & fluent transition through shapes	2.3 Completes 4 positions in correct order (dish on back - arch on front - dish on back - arch on front), rotating both ways
3. Wobble Spot	3.1 Non-support foot does not touch support leg/foot/wobble spot/floor	3.2 Body & head are stable/still	3.3 Completes 5 bean bag passes around body while balancing on wobble spot on one leg # 'correct' passes 0 1 2 3 4 5
4. Overarm Throw	4.1 Throwing arm moves in a backward arc to initiate throw (shoulder rotates)	4.2 Steps with the foot opposite throwing hand towards target	4.3 Overarm throw directly hits target (ball should not bounce prior to hitting target)
5. Basketball Dribble	5.1 Pushes ball with fingertips (not slapping at the ball)	5.2 Controlled directional dribbling	5.3 Dribbles around all spots using either hand. (body & ball must move around outside of spots). Cannot catch ball/use two hands simultaneously
6. Catch	6.1 Feet move in line with rebound	6.2 Catches ball with hands only (must be caught without a bounce)	6.3 Successful catch off rebound net (must be caught without a bounce)
7. T-Agility	7.1 Plants & drives off outside foot (right to left & left to right)	7.2 Side-stepping on balls of feet (right to left & left to right; feet don't cross)	7.3 Moves through all points of 'T' facing forwards (must enter both right & left court tramlines)
8. Jumping Patterns	8.1 Arms drive over first hurdle (elbows bent & arms swing to produce force)	8.2 Rhythmical pattern throughout	8.3 Completes jumping pattern sequence correctly. No contact with hurdles
9. Sprint	9.1 Drives off balls of feet, leaning forwards	9.2 Arms bent, driving forward & backwards (arms bent at approx. right angles)	9.3 Runs through start gate & then through to finish (must be running not walking)

Calculating the Dragon Challenge Score

The Dragon Challenge composite score is calculated from the same trial as follows:

| Technique (0 to 18) | + | Outcome (0 to 18) | + | Time (0 to 18) | = | Dragon Challange Total Score (0 to 54) |
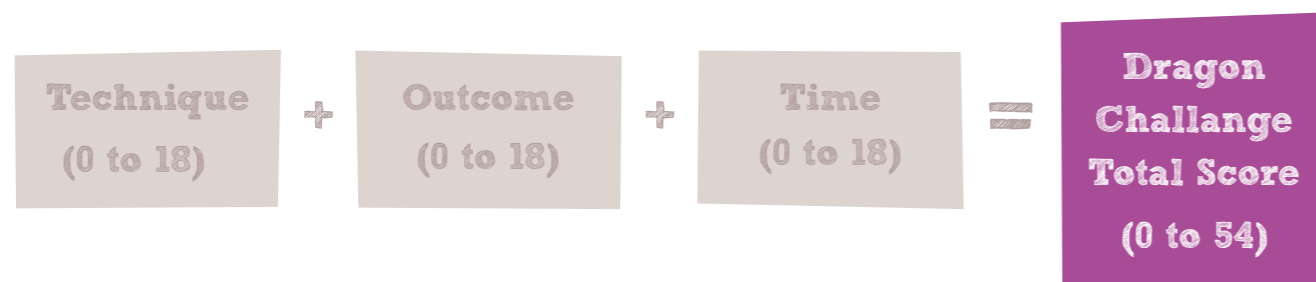
The time, technique and outcome scores are assigned equal weighting, as the more physically literate child will be able to find the optimal balance between speed and accuracy using the necessary technical quality. The obstacle course score is calculated in the same way for every child, regardless of the child's age and sex.

Calculating the Technique Score

There are 18 technique (or process) assessment criteria (see Table 8). Participants are awarded 1 point for each technique criteria successfully demonstrated. The 'technique' score therefore ranges from 0 to 18.

Calculating the Outcome Score

There are 9 performance 'outcome' (or product) assessment criteria (see Table 8). Participants are awarded 2 points for each successful performance outcome demonstrated (i.e., the number of criteria successfully demonstrated is doubled). The 'outcome' score therefore ranges from 0 to 18.

Calculating the Time Score

The time taken to complete the Dragon Challenge obstacle course, recorded in seconds, is converted to a score between 1 and 18 (see Table 9). Faster times are assigned a higher score.

Table 8 Scoring the Technique and Outcome Skill Performance Criteria

Skill	Technique (Process)			Outcome (Product)		
	DC Criteria #	Points per criteria	Scoring range	DC Criteria #	Points per Criteria	Scoring
Balance Bench	1.1, 1.2	1	0-2	1.3	2	0, 2
Core Agility	2.1, 2.2	1	0-2	2.3	2	0, 2
Wobble Spot	3.1, 3.2	1	0-2	3.3	2	0, 2
Overarm Throw	4.1, 4.2	1	0-2	4.3	2	0, 2
Basketball Dribble	5.1, 5.2	1	0-2	5.3	2	0, 2
Catch	6.1, 6.2	1	0-2	6.3	2	0, 2
T-Agility	7.1, 7.2	1	0-2	7.3	2	0, 2
Jumping patterns	8.1, 8.2	1	0-2	7.3	2	0, 2
Sprint	9.1, 9.2	1	0-2	7.3	2	0, 2

Table 9 Calculating and interpreting the Time Score   Notes. a = **platinum ranking**, b = **gold**, c = **silver**, d = **bronze**

Time (mm:ss)	Time (s)	Score
<1:25	<84	18[a]
1:25 to 1:33	85 to 93	17[a]
1:34 to 1:42	94 to 102	16[a]
1:43 to 1:51	103 to 111	15[a]
1:52 to 2:00	112 to 120	14[a]
2:01 to 2:09	121 to 129	13[b]
2:10 to 2:18	130 to 138	12[b]
2:19 to 2:27	139 to 147	11[c]
2:28 to 2:36	148 to 156	10[c]
2:37 to 2:45	157 to 165	9[d]
2:46 to 2:54	166 to 174	8[d]
2:55 to 3:03	175 to 183	7[d]
3:04 to 3:12	184 to 192	6[d]
3:13 to 3:21	193 to 201	5[d]
3:22 to 3:30	202 to 210	4[d]
3:31 to 3:39	211 to 219	3[d]
3:40 to 3:49	220 to 228	2[d]
3:49 to 3:58	229 to 237	1[d]
>3:59	>238	0[d]

Interpreting the Dragon Challenge Results

Interpreting the Dragon Challenge Total Score

A child's Dragon Challenge total score can be interpreted by examining their performance in relation to other similar children. The score is interpreted the same way for every child, regardless of the child's age or sex.

Specific cut-points were generated for the total score using the 33rd, 66th, and 95th percentiles based on pilot data collected across Wales by gold assessors in Spring/Summer 2015. These percentile thresholds were selected to categorise 10-12 year old typically developing children into Bronze, Silver, Gold and Platinum awards, consistent with other Sport Wales programmes. In addition, * categories are included for bronze, silver and gold awards to indicate those children that are at the top of a level and working towards the next category. This banding system is shown in Table 10.

Table 10 Descriptive rating for Dragon Challenge total score for 10-12 year old children

Bronze	*	Silver	*	Gold	*	Platinum
<27	28, 29	30 to 34	35, 36	37 to 43	44, 45	46 to 54

Bronze Award

Children in the bronze category are in the bottom tertile for motor competence*. These children have low levels of motor competence compared to other children their age and their physical skills are still emerging and require significant improvement. These children need significant encouragement, support and opportunities for practice and instruction to develop their physical competence.

Silver Award

Children in the silver category fall within the middle tertile for motor competence*. These children have levels of motor competence that are similar to other children their age but their physical skills are still developing and require improvement. These children may benefit from opportunities for instruction and practice to refine their skills.

Gold Award

Children in the gold category fall within the upper tertile for motor competence*. These children have good levels of motor competence compared to other children their age and have acquired a broad range of physical skills. These children are doing well and should be encouraged to keep practising and exploring different sports and activities to advance and maintain their physical skills.

Platinum Award

Children in the platinum award fall within the top 5% of children*. These children have exceptional levels of motor competence compared to similar aged children and are proficient and accomplished at using their physical skills. These children are very talented and should be congratulated on their skills and encouraged to keep up the fantastic work!

*based on pilot data (n=584) collected across Wales in Spring/Summer 2015

Interpreting Time Scores

Judgements surrounding the speed in which a child completes the Dragon Challenge can be made by drawing comparisons to other children. As shown in Table 10, each time score is assigned a bronze, silver, gold or platinum ranking. The classification boundaries are at the 33rd, 66th and 95th percentile, consisted with those used for interpreting the overall score.

Interpreting Technique and Outcome Scores

Technique and outcome scores are criterion-referenced measures of performance and therefore scores are interpreted at the individual level only.

By reviewing the information from the child performance record, the practitioner can identify which skills the child needs to improve, and whether particular technique or outcome aspects of the skills need to be addressed (see Tables 2 and 7).

Practitioners should feedback the results to the child, discussing their strengths and weaknesses at different aspects of the Dragon Challenge and agreeing goals for improvement and particular skills to work on. The results can also be used by practitioners to plan and design developmentally-appropriate programmes.

Cautions in Interpreting Dragon Challenge Results Scores

The Dragon Challenge has been designed as a surveillance tool and is merely a single observation of a child's physical competence.

A child's score represents a performance at a given time, under a particular situation. Many factors can influence a child performance, including their motivation, confidence, nerves or other contextual factors.

Therefore, while the results of Dragon Challenge can make a useful a contribution to global judgements of physical competence, teachers and practitioners should not base their judgements exclusively on the results.

Data Management

This section discusses important matters concerning the recording and collation of Dragon Challenge results. Data management needs to be accurate and timely, and requires careful attention. The collation of results is important for subsequent analysis and monitoring, enabling detailed profiles of children's performances to be generated, for example at the regional or national levels, or within various sub-groups like males and females. Sport Wales will collate results at a national level and use these as a key performance indicator. This performance indicator will guide subsequent policy and strategy in physical literacy development.

Data Input

Two data files need to be kept. The first Excel file with a list of participant names and their assigned ID code (held locally), the second with their ID code and main data (this is submitted to a central database in the cloud – see below).

Each individual Child Performance Record (Figure 2) needs to be input into an excel file (Figure 3), which represents the main data sheet. The main data sheet includes over forty variables.

The first section of variables record information about the child (e.g. date of birth, sex), as well as the organisation of the assessment (date of assessment, assessors). The second section of variables records the scoring during the assessment tasks (e.g. against performance indicators). Table 11 gives an overview of the variables and the scoring method for each.

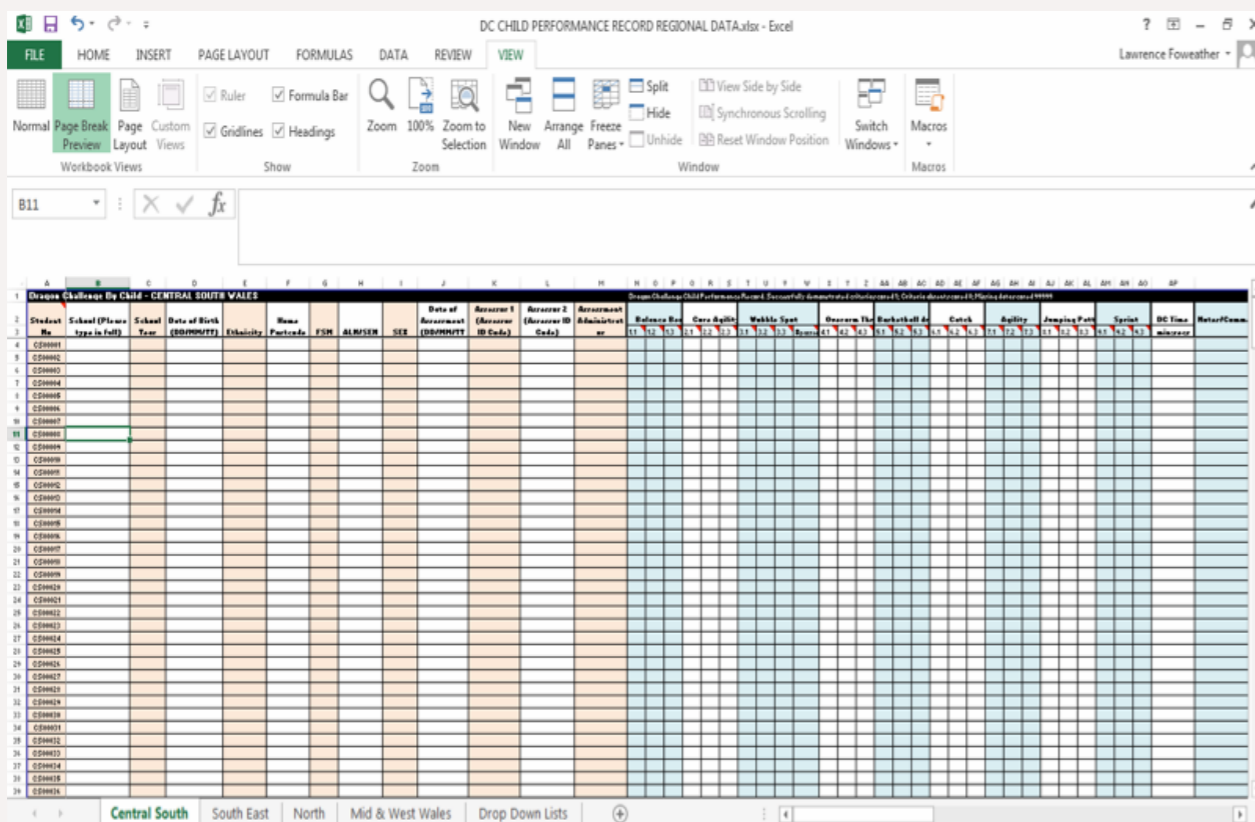**Figure 3 Main Excel Regional Data Sheet "DC Child Performance Record Regional Data**

Table 11 Main data sheet: Explanation of variables and coding

Variable	Input	Missing data
Student No.	A 7-character unique child identifier number (page x)	n/a
School	Type school name in full	99999
School year*	"YEAR 6" or "YEAR 7"	99999
Date of birth	dd/mm/yy	99999
Ethnicity*	"White" or "Mixed" or "Asian / Asian British" or "Black / Black British" or "Chinese / Chinese British" or "Any Other"	99999
Home Post Code	Type in full using capitals, include space (e.g. CF12 1PG)	99999
Free School Meal*	"YES" or "NO"	99999
ALN (Additional Learning Needs) / SEN (Special Educational Needs)*	"No special provision" or "School action + Stat assess" or "School action +" or "School action" or "Statemented"	99999
Sex*	"MALE" or "FEMALE"	99999
Date of test	dd/mm/yy	99999
Assessor 1	A 10 character unique assessor identifier number (see page x)	99999
Assessor 2	A 10 character unique assessor identifier number (see page x)	99999
Administrator	Type full name or use assessor ID code (if applicable)	99999
Balance Bench 1.1	"1" [if criteria was present] or "0" [if criteria was absent]	99999
1.2	"1" or "0"	99999
1.3	"1" or "0"	99999
Core Agility 2.1	"1" [if criteria was present] or "0" [if criteria was absent]	99999
2.2	"1" or "0"	99999
2.3	"1" or "0"	99999
Wobble Spot 3.1	"1" [if criteria was present] or "0" [if criteria was absent]	99999
3.2	"1" or "0"	99999
3.3	"1" or "0"	99999
Overarm throw 4.1	"1" [if criteria was present] or "0" [if criteria was absent]	99999
4.2	"1" or "0"	99999
4.3	"1" or "0"	99999

Basketball dribble 5.1	"1" [if criteria was present] or "0" [if criteria was absent]	99999
5.2	"1" or "0"	99999
5.3	"1" or "0"	99999
Catch 6.1	"1" [if criteria was present] or "0" [if criteria was absent]	99999
6.2	"1" or "0"	99999
6.3	"1" or "0"	99999
T-Agility 7.1	"1" [if criteria was present] or "0" [if criteria was absent]	99999
7.2	"1" or "0"	99999
7.3	"1" or "0"	99999
Jumping Patterns 8.1	"1" [if criteria was present] or "0" [if criteria was absent]	99999
8.2	"1" or "0"	99999
8.3	"1" or "0"	99999
Sprint 9.1	"1" [if criteria was present] or "0" [if criteria was absent]	99999
9.2	"1" or "0"	99999
9.3	"1" or "0"	99999
Time	"mm:ss" (e.g. 02:01)	99999
Notes/Comments/ Issues with assessment		99999

*Drop down menu

Unique Identifier Number: Children

Children should be assigned numbers in the order of their school register. However, when individual child data is transferred into the regional dataset, each student is given a unique regional identifier number. For example the first student from Mid- and West Wales will be recorded as WE00001, the second WE00002, third WE00003 and so on for the M H school, BUT numbers continue independent of school so D T school starts at 00061, 00062, 00063 and so on. This enables the data to be blinded by school for some parts of the analysis. Example of student numbers are illustrated in Table 12.

Table 12 Example of unique identifier numbers for children

Student No	School (Please type in full)	School Year
WE00001	M H School	YEAR 7
WE00002	M H School	YEAR 7
WE00060	M H School	YEAR 7
WE00061	D T School	YEAR 7
WE00062	D T School	YEAR 7
WE00063	D T School	YEAR 7

Unique Identifier Number: Assessors

After successfully completing training, each assessor is given a unique identifier number by the regional lead Gold Standard Assessor. This number is validated against a regional database of assessors to avoid duplication. The coding helps identify the assessor's region, gender and professional role. The method for generating a unique identifier number for assessors is shown in Table 13 below:

Table 13 Explanation of how to generate a unique identifier number for assessors

Character number	1	2	3	4	5	6	7	8	9	10
Component	Region		Gender	Training		Initials		Number		
	2 letters, indicating the region which the assessor will be operating within. [South East: SE] [Central South: SC] [Mid-West: MW] [North Wales: NW]		1 letter, indicating the assessor's gender. [Male: M] [Female: F]	2 letters, calculated based on whether the individual is qualified to teach PE. [Physical Education Trained: PE] [Non-Physical Education Trained: NP]		2 letters, comprised of the assessors initials (first name, last name).		A three digit number, unique to each regional assessor.		
Example 1: Jon Evans PE teacher South East	S	E	M	P	E	J	E	0	0	1
Example 2: Leanne Jones Non-PE South East	S	E	F	N	P	L	J	0	0	2

Data Analysis

Data will be uploaded to a central cloud database held by Sport Wales and governed by Sport Wales and Swansea University. Data will then be analysed and trends identified. The results will then be used to adjust policy and strategy in relation to physical literacy development.

Quality Assurance

It is important that regular checks are made to assure the quality of the Dragon Challenge assessment process and to check for intra- and inter observer drift.

One out of every 10 children should have a repeat assessment. This can occur through sharing video data of a child performance with a gold assessor (after obtaining the necessary permissions) or through paired observations with a gold assessor during in situ live assessments. All quality assurance checks should be documented by the lead regional gold assessor and appropriate re-training given if required.

REFERENCES

Babic, M.J., Morgan, P.J., Plotnikoff, R.C., Lonsdale, C., White, R.L., & Lubans, D.R. (2014). Physical activity and physical self-concept in youth: systematic review and meta-analysis. Sports Medicine, 44(11): 1589-601.

Booth, J.N., Leary, S.D., Joinson, C., Ness, A.R., Tomporowski, P.D., Boyle, J.M., & Reilly, J.J. (2014). Associations between objectively measured physical activity and academic attainment in adolescents from a UK cohort. British Journal of Sports Medicine, 48(3): 265-70

Cliff, D.P., Okely, A.D., Morgan, P.J., Jones, R.A., Steele, J.R., & Baur, L.A. (2012). Proficiency deficiency: mastery of fundamental movement skills and skill components in overweight and obese children. Obesity, 20(5): 1024-33

Department of Health (2011). Start Active, Stay Active: A report on physical activity from the four home countries' Chief Medical Officers. London, UK.

Foweather, L., McWhannell, N., Henaghan, J., Lees, A., Stratton, G., & Batterham, A.M. (2008). Effect of a 9-wk. after-school multiskills club on fundamental movement skill proficiency in 8- to 9-yr.-old children: an exploratory trial. Perceptual & Motor Skills, 106(3): 745-54

Foweather, L., Knowles, Z., Ridgers, N. D., O'Dwyer, M. V., Foulkes, J. D., & Stratton, G. (2014). Fundamental movement skills in relation to weekday and weekend physical activity in preschool children. Journal of Science and Medicine in Sport(0). doi: http://dx.doi.org/10.1016/j.jsams.2014.09.014

Gallahue, D. L., Ozmun, J. C., & Goodway, J. D. (2011). Understanding Motor Development: Infants, Children, Adolescents, Adults (7th ed.). Boston, MA: McGraw Hill.

Holfelder, B., & Schott, N. (2014). Relationship of fundamental movement skills and physical activity in children and adolescents: A systematic review. Psychology of Sport and Exercise, 15(4), 382-391. doi: http://dx.doi.org/10.1016/j.psychsport.2014.03.005

Jaakkola, T., Hillman, C., Kalaja, S., & Liukkonen, J. (2015). The associations among fundamental movement skills, self-reported physical activity and academic performance during junior high school in Finland. Journal of Sports Sciences, 1-11. doi: 10.1080/02640414.2015.1004640

Lubans, D. R., Morgan, P. J., Cliff, D. P., Barnett, L. M., & Okely, A. D. (2010). Fundamental movement skills in children and adolescents: review of associated health benefits. Sports Med, 40(12), 1019-1035.

Piaget, J. (1952). The origins of intelligence in children. New York: International Universities Press.
Rodrigues, L. P., Stodden, D. F., & Lopes, V. P. (2015). Developmental pathways of change in fitness and motor competence are related to overweight and obesity status at the end of primary school. Journal of Science and Medicine in Sport, doi: http://dx.doi.org/10.1016/j.jsams.2015.01.002

Stodden, D. F., Goodway, J. D., Langendorfer, S. J., Roberton, M. A., Rudisill, M. E., Garcia, C., & Garcia, L. E. (2008). A Developmental Perspective on the Role of Motor Skill Competence in Physical Activity: An Emergent Relationship. Quest, 60(2), 290-306.

Stratton, G. Canoy, D., Boddy, L.M., Taylor, S.R., Hackett, A.F., & Buchan, I.E. (2007) Cardiorespiratory fitness and body mass index of 9-11 year old English children: a serial cross-sectional study from 1998 to 2004. International Journal of Obesity, 31(7): 1172-8

Vlahov, E., Baghurst, T. M., & Mwavita, M. (2014). Preschool motor development predicting high school health-related physical fitness: a prospective study. Perceptual and Motor Skills, 119(1), 279-291. doi: 10.2466/10.25.PMS.119c16z8

Whitehead, M. (2001). The concept of physical literacy. European Journal of Physical Education, 6(2): 127-138.

APPENDICES

APPENDIX A – LIST OF VIDEO RESOURCES

Video Material to Support Delivery of Dragon Challenge V1.0

Title	Link
Dragon Challenge Promotional Video for Kids (English)	https://youtu.be/Ddr17NbqV5I
Dragon Challenge Promotional Video for Kids (Welsh)	https://youtu.be/DEs2kyLiaok
Dragon Challenge Equipment & Setup	https://youtu.be/bg8QUxs78qo
Dragon Challenge Introduction and Demonstration	https://youtu.be/3Pg_IHyAGxE
What is Dragon Challenge?	https://youtu.be/9XD-ejbfaE8
Children's Guide to the Dragon Challenge	https://youtu.be/ebLNCS7DTv0
The Role of Administrators /Assessors during the Dragon Challenge	https://youtu.be/POq5cu0PWGQ

APPENDIX B – DRAGON CHALLENGE 'ACTUAL' PRESENTATION OUTLINE

APPENDIX C – DRAGON CHALLENGE 'RANDOM' PRESENTATION OUTLINE

APPENDIX D – CHILD PERFORMANCE RECORD

DRAGON CHALLENGE
Child Performance Record

Child Name: _____
School: _____
Sex: Male [ ]   Female [ ]

Date: _____
Assessor: _____

Activity	Quality Indicator 1	Score	Quality Indicator 2	Score	Task Completed?	Score
1. Balance Bench	Moves without hesitation **up to turn**	1.1	Body posture stable (*head & trunk stable, minimal arm flailing*)	1.2	Walks length of beam, completes full turn at 3/4 mark without falling off, dismounts at end zone	1.3
2. Core Agility	Hands & legs **extended & held with tension**, with shoulders & feet off the floor	2.1	Controlled & fluent **transition** through shapes	2.2	Completes 4 positions in correct order (*dish on back - arch on front - dish on back - arch on front*), rotating both ways	2.3
3. Wobble Spot	Non-support foot does not touch support leg/foot/wobble spot/floor	3.1	Body & head are stable/still	3.2	Completes 5 bean bag passes around body whilst balancing on wobble spot on one leg # *correct passes 0 1 2 3 4 5	3.3
4. Overarm Throw	Throwing arm moves in a backward arc to **initiate** throw (*shoulder rotates*)	4.1	Steps with the foot opposite throwing hand towards target	4.2	Overarm throw directly hits target (*ball should not bounce prior to hitting target*)	4.3
5. Basketball Dribble	Pushes ball with fingertips (*not slapping at the ball*)	5.1	Controlled directional dribbling	5.2	Dribbles around all spots using either hand. (*body & ball must move around outside of spots*). Cannot catch ball/use two hands simultaneously	5.3
6. Catch	Feet move in **line with rebound**	6.1	Catches ball with **hands only** (*must be caught without a bounce*)	6.2	Successful catch off rebound net (*must be caught without a bounce*)	6.3
7. T-Agility	**Plants & drives off outside foot** (*right to left & left to right*)	7.1	Side-stepping on balls of feet (*right to left & left to right; feet don't cross*)	7.2	Moves through all points of 'T' facing forwards (*must enter both right & left court tramlines*)	7.3
8. Jumping Patterns	Arms drive over first hurdle (*elbows bent & arms swing to produce force*)	8.1	Rhythmical pattern throughout	8.2	Completes jumping pattern sequence correctly. No contact with hurdles	8.3
9. Sprint	Drives off balls of feet, leaning forwards	9.1	Arms bent, driving forward & backwards (*arms bent at approximately right angles*)	9.2	Runs through start gate & then through to finish (*must be running not walking*)	9.3

Time to completion: _ _ : _ _

Notes Please comment below if there are any issues with child performance or assessors' ability to accurately score. For example, falls, injuries, noise, temperature, equipment, space or administration issues. Also note any worrying or excellent performances.

Score each quality indicator and task outcome as: 1 = performs criteria correctly. 0 = does not perform correctly

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APPENDIX E – INFORMATION FOR PROFESSIONALS AND PARENTS/CARERS

Information for professionals (teachers/teaching assistants, Sports Development, Sport Ambassadors, coaches, dance teaches, etc.)

Dragon Challenge (DC) V1.0 is a tool designed to assess the physical competence of children in school years 5 through 7. DC V1.0 represents the culmination of Sport Wales, Swansea, Glyndwr and Liverpool John Moores Universities test development efforts, informed by the assessment of more than 1,000 children and with input from a representative group of over 100 researchers and practitioners involved in physical literacy development. DC V1.0 requires children to complete 9 physical activities in a continuous circuit. During this period children are scored for their quality of movement and whether they successfully complete the task. These scores are combined with "completion time" to calculate an overall DC V1.0 score. DC V1.0 will provide surveillance data that will be collated by age, gender, ethnic group, school, local authority, and region.

Information for carers/parents

Wales is leading the way in the development of children's "physical literacy."

Physical literacy is "the motivation, confidence, physical competence, knowledge and understanding that children and adults develop in order to maintain physical activity at an appropriate level throughout their life. The Dragon Challenge V1.0 has been developed to assess the physical competence part of your child's physical literacy. The Challenge involves your child attempting a circuit including 9 physical activities. These activities include balance, agility, throwing and catching, ball control and running skills. The Challenge should be completed in between 2 and 4 minutes. Your child will be observed and assessed during the circuit of activities by a trained assessor. The assessor may be a teacher, teaching assistant or qualified professional. After your child has completed the task s/he will be given an overall score. This score will be used to inform, teachers and professionals about how your child is developing physically and will be used to plan new physical education and sport activities at school and within the local community.

Notes