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The Role of Knowledge and Understanding in Fostering Physical Literacy

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Abstract

This paper explores the role of knowledge and understanding in fostering physical literacy which is considered fundamental to successful participation in physical activity and to valuing and taking responsibility for engaging in physical activities for life. Firstly, it highlights the place and importance of knowledge and understanding within the broad concept, cognitive domain, and attributes of physical literacy. The type, scope, and progression of knowledge and understanding deemed necessary to foster physical literacy are then explored with attention paid to knowledge of health within the school context in particular. To conclude, the paper outlines selected pedagogical approaches and practical strategies for developing and monitoring such knowledge and understanding.

Keywords: physical literacy, health, physical education, learning, progression

The Role of Knowledge and Understanding in Fostering Physical Literacy

Given physical literacy is concerned with lifelong participation in physical activity (Liedl, 2013; Whitehead, 2013) and valuing and taking responsibility for engagement in physical activities for life (Whitehead, 2010a), then arguably fundamental to achieving this is having the required knowledge and understanding of movement and health in terms of how to move, and of why, how, where, and with whom to engage in lifelong physical activity. This paper therefore contributes to the literature in this regard by exploring the role of knowledge and understanding in fostering physical literacy. Firstly, it highlights the place and importance of knowledge and understanding in physical literacy and it then explores the type and scope of knowledge and understanding deemed necessary to foster the concept. Consideration is given to the health knowledge young people should acquire as they progress on their physical literacy journeys through primary and secondary school in particular. The paper concludes by outlining some pedagogical approaches and practical strategies for developing such knowledge and understanding.

Place and Importance of Knowledge and Understanding in Physical Literacy

Recognition of physical literacy as a holistic concept which goes beyond physical and fundamental movement skills and encompasses knowledge and understanding is now widely acknowledged in the literature (Almond & Myers, 2017; Edwards, Bryant, Keegan, Morgan, & Jones, 2017; Ennis, 2015; Liedl, 2013; Lundvall, 2015; Whitehead, 2010a). Knowledge and understanding features explicitly within the International Physical Literacy Association's (IPLA, 2017) most recent definition of physical literacy which describes the concept as "the motivation, confidence, physical competence, knowledge and understanding to value and take responsibility for engagement in physical activities for life." Indeed, Ennis (2015) argues that "knowledge is at the heart of physical literacy" (p. 119) with it providing the foundation for knowing what to do and how and when to perform. Meanwhile, Lundvall (2015) warns that

without attention to embodied knowledge, “part of the literacy ambition will be lost” and young people “may not master the keys to lifelong learning through movement” (p. 117).

Knowledge and understanding is considered to be a core element within the cognitive domain as well as one of the key attributes of physical literacy (Edwards et al., 2017; Whitehead, 2010a). Following a systematic review of the physical literacy literature, Edwards et al. (2017) identified three core categories within the cognitive domain: (a) knowledge and understanding of activities; (b) knowledge and understanding of healthy and active lifestyles; and (c) the value to take responsibility for physical activity. With respect to knowledge and understanding of activities, a literate sports person (or exerciser) would be knowledgeable about sports/exercise rules, traditions, and values (Kirk, 2013), and in terms of knowledge and understanding of healthy and active lifestyles, they would have a sound awareness of the value of participating in a physically active lifestyle (Whitehead, 2013).

More specifically, and in terms of knowledge and understanding as an attribute, “acquiring knowledge in relation to movement and health” is one of the six attributes of physical literacy identified by Whitehead (2010a). She explains how individuals making progress on their physical literacy journey will:

... have the ability to identify and articulate the essential qualities that influence the effectiveness of their own movement performance, and have an understanding of the principles of embodied health with respect to basic aspects such as exercise, sleep and nutrition. (p. 14)

The relationship between the attribute of knowledge and understanding and other attributes of physical literacy is furthermore important to recognize. Indeed, knowledge and understanding is arguably fundamental to achieving the other attributes and the overall concept. For example, having physical competency alone, or any one attribute for that matter, is clearly insufficient to ensure lifelong engagement in physical activity. Knowledge and

understanding can be enriched by all aspects of participation and characteristically develops as the attributes of motivation, confidence, physical competence, and fluent interactions grow (Whitehead, 2010b). In turn, knowledge and understanding can positively influence these other attributes in that it will support the appreciation of developing physical competence and the perception of different environments (Whitehead, 2010b) and can enhance motivation and confidence to participate.

Given the above, it is perhaps not surprising that knowledge and understanding is either explicitly or implicitly embedded within the physical education curricula in most countries. To illustrate this, details of the relevant requirements within the National Curriculum in England are summarised later.

Type and Scope of Knowledge and Understanding in Physical Literacy

Just as physical literacy is a holistic concept, physical literacy knowledge and understanding should equally be seen holistically. As already noted, knowledge and understanding within the cognitive domain and as an attribute have different components, with two constituents to the latter. The first is concerned with grasping the essential principles of movement and performance and the other with health and fitness (Whitehead, 2010b). Whitehead argues that if lifelong involvement in physical activity is to be achieved then it is clearly important for individuals to take some responsibility for both.

The first constituent expects individuals who are making progress on their physical literacy journey to appreciate the basic components of movement and be able to evaluate their own performance and that of others, using appropriate vocabulary and observing movement (Whitehead, 2010b). With regards the constituent of health and fitness, Whitehead claims it is essential that individuals adopt an objective view of themselves in deciding how best to manage aspects of life suggesting “it would be unacceptable for the concept to omit the care, attention and respect individuals should show to their embodied dimension” (p. 66).

Such knowledge and understanding understandably then typically features within the physical education curricula in schools. In England, for example, and with respect to knowledge of movement, successive versions of the National Curriculum for Physical Education include the aspects of developing knowledge and understanding of ways to promote improvement through evaluation of one's own and others' performances and taking steps or making suggestions for improvement. Indeed, these elements feature explicitly in the current National Curriculum (Department of Education, 2013a, 2013b) for pupils from 7 years of age upwards. The programmes of study state that for 7-11 year olds (key stage 2), pupils "should develop an understanding of how to improve in different physical activities and sports and learn how to evaluate and recognise their own success," and be taught to "compare their performances with previous ones and demonstrate improvement to achieve their personal best" (2013a, p. 2). For 11-14 year olds (key stage 3), pupils "should understand what makes a performance effective and how to apply these principles to their own and others' work," and be taught to "develop their technique and improve their performance....," as well as "analyse their performances compared to previous ones and demonstrate improvement to achieve their personal best" (2013b, p. 2). For 14-16 year olds (key stage 4), pupils should similarly be taught to "develop their technique and improve their performance (in other sports or other physical activities)," plus "evaluate their performances compared to previous ones and demonstrate improvement across a range of physical activities to achieve their personal best" (2013b, p. 3).

As noted by Whitehead (2010b), the above clearly involve firstly being able to diagnose what is making a movement or movement pattern more or less effective and then understanding how to improve and develop it. This should encompass experiences within a wide range of activity settings and by involving participants in observation, analysis, description, and evaluation (Whitehead, 2010a, 2010b).

With regards to knowledge of health, and again drawing on the National Curriculum in England, ensuring that all pupils “are physically active for sustained periods of time” (Department of Education, 2013a, 2013b, p. 1) and “lead healthy, active lives” (p. 1) represent two of the main aims of the subject across the age range. Interestingly though, and despite these aims, reference to knowledge and understanding in relation to health in the programmes of study is somewhat limited and more implicit. For example, pupils aged 11-14 years (key stage 3) should “develop the confidence and interest to get involved in exercise, sports, and activities out of school” and in later life and “understand and apply the long-term benefits of physical activity” (2013b, p. 2), whilst 14-16 year olds (key stage 4) should “get involved in a range of activities that develops personal fitness and promotes an active, healthy lifestyle” (2013b, p. 3).

To achieve the above aims and notably to lead a healthy active life, a sound and broad knowledge and understanding in the area is clearly required. Further, it is contended that this needs to extend beyond the rather limited knowledge and understanding requirements implied in the National Curriculum and the “basic aspects” of exercise, sleep, and nutrition identified by Whitehead (2010a, p. 14). At the same time, it is fully accepted that physical literacy knowledge and understanding does not demand a grasp of technical biomechanical and medical scientific concepts (Whitehead, 2007, 2010b).

On this issue, Armour and Harris (2013) claim that much of the international physical education community is unclear about the precise nature of appropriate health knowledge to be covered in the subject. Given the different views expressed in the literature, this claim would seem to be founded suggesting a need to identify the health knowledge and experiences required to be able to successfully engage in physical activities for life. For this reason, alongside well reported concerns over physical education teachers’ limited health knowledge and their delivery of health in the curriculum generally (Alfrey, Cale, & Webb,

2012; Cale & Harris, 2013; Castelli & Williams, 2007; Fardy, Azzollini, & Herman, 2004; Harris, 2010; Harris & Leggett, 2015; Hastie, 2017; Keating et al., 2009; Kulinna, McCaughtry, Martin, Cothran, & Faust, 2008; McKenzie, 2007; Puhse et al., 2011; Trost, 2006), the main focus of the discussion from hereon will centre on knowledge relating to health. In 2000, and in recognition of the above, a working group comprising representatives of national physical education, sport, and health organisations in England was formed in an attempt to achieve consensus on health-related learning within the subject, a key output of which was the publication of national guidance including health-related outcomes for children aged 5 to 16 years (Harris, 2000). These outcomes are detailed fully elsewhere (see Harris, 2000; Harris & Cale, 2018) and include a number of cognitive (knowledge and understanding), as well as affective and behavioural outcomes. To illustrate the scope in learning they are presented in four categories: safety issues, exercise effects, health benefits, and activity promotion, representing the key areas of learning considered necessary to engage in lifelong physical activity. In summary, for individuals to successfully engage in physical activity for life, it is important that they know and understand (a) how to take part in physical activity safely and effectively (safety issues), (b) the body's response to participating in physical activity (exercise effects), (c) the reasons for participating in physical activity (health benefits), and (d) what physical activity to take part in, where and how (activity promotion).

In addition, and in recognition of physical literacy as a journey through which individuals develop throughout their lifespan from cradle to grave (Edwards et al., 2017), gradually acquiring wider and deeper knowledge and understanding (Whitehead, 2010b), the learning outcomes (Harris, 2000; Harris & Cale, 2018) are presented by age group or key stage (KS): 5-7 years (KS1), 7-11 years (KS2), 11-14 years (KS3), and 14-16 years (KS4). These represent the middle stages of Whitehead's (2013) age-related stages which individual

journeys pass through and which span from preschool through to the older adult years. Thus, whilst it is acknowledged that individuals develop at different rates in light of their different abilities, contexts (social cultural and geographical), and experiences, the outcomes broadly illustrate how individuals' learning about health is expected to progress. Example knowledge and understanding outcomes for each of the age ranges and for each category are shown below. Although these were initially produced to support teachers in developing pupils' knowledge and understanding, they can and should equally be reinforced by parents and others, as appropriate. Learning outcomes associated with each age group are presented in Table 1. Table 1 is adapted from the initial work of Harris (2000).

Place Table 1 Here

With respect to the above knowledge, research has revealed that the more instrumental outcomes, for example, those relating to safety issues (e.g., safe practice and warming up and cooling down) and to exercise effects (i.e., the short term effects of exercise on the body) are more frequently addressed by physical education teachers than those associated with health benefits and activity promotion (Harris, 2010). Yet, it is evidently the latter outcomes which are mostly closely linked to valuing and engaging in physical activities for life. Alfrey and Gard (2014) similarly acknowledge how the profession is depicted as clearly focussed on the dualistic and instrumental understandings of health and the body, and consequently how in turn this leads to many teachers focussing on and applying the same narrow instrumental outcomes in their delivery. The need for a broader approach which pays more attention to health and activity promoting outcomes is therefore recommended (Harris, 2000; Harris & Cale, 2018) and it seems is needed if physical literacy is to be truly fostered. In addition, recent calls have been made for approaches which adopt a socially-critical perspective to health knowledge and information (Burrows, Wright, & McCormack, 2009; Haerens, Kirk, Cardon, & De Bourdeaudhuij, 2011). Example knowledge and understanding outcomes

related to health benefits and activity promotion illustrating how they progress with school age are shown in Table 2.

Place Table 2 Here

Fostering Knowledge and Understanding in Physical Literacy

According to Almond (2010, p. 124), “physical literacy and its associated characteristics (or attributes) have no value unless they can be applied to and influence common practice.” In fostering knowledge and understanding of physical literacy, the content and its delivery are clearly key and need to be appropriate to ensure that all individuals have the opportunity to acquire knowledge and understanding both of movement and of health, and of the relationship between physical activity and health (Murdoch & Whitehead, 2010).

In developing knowledge and understanding, there are some general principles which should be subscribed to. Physical literacy is, by definition, concerned with the physical and as such the concept and attributes should be developed within and through the physical, and through a range of activities, with knowledge and understanding of movement and health being no exception in this regard. Developing the former through the physical is common and clearly common sense, but evidence suggests this is not always the case for the latter. Despite it being found to be relatively ineffective (Cale & Harris, 2006), classroom-based delivery of health-related theoretical concepts and information in schools is often reported (Cale, 2017; Cale & Harris, 2006). A further limitation with classroom-based delivery is that it is sedentary, thereby detracting from potential active time, and with the focus tending to be restricted to information transmission rather than developing knowledge via a combination of understanding, experiencing, decision making and evaluating (Cale, 2017; Cale & Harris, 2013). On the other hand, learning about health through active participation in purposeful physical activity is not only consistent with the physical context of the subject and with messages relating health benefits to frequent physical activity, but it helps to increase activity

levels and contribute to young people’s overall physical activity (Harris, 2000; Harris & Cale, 2018). As highlighted later, and if taught effectively, it also potentially allows both knowledge and understanding of movement and of health to be developed simultaneously, whilst developing other core attributes of physical literacy as well.

Other principles which are fundamental to developing knowledge and understanding, and arguably to all good teaching, are the inclusion and empowerment of all pupils, and their subsequent shift with enhanced knowledge and understanding from dependence on the teacher to independence. In considering approaches to physical literacy development, Almond and Myers (2017) argue we need to consider the gradual process of emerging empowerment, independence, and agency as central to how we nurture young people's learning paths. The provision of positive, relevant, meaningful, and rewarding physical activity learning experiences is central to facilitating this process and fostering empowered and independent individuals capable of making informed lifestyle choices. On this, Elbourn and James (2013) identify three key elements important to the empowerment of young people with respect to healthy active lifestyles: (a) appropriate content, (b) appropriate context, and (c) effective pedagogy. Appropriate content is that which is deemed to be safe, progressive, relevant, well informed, inclusive, and fun, whilst appropriate context relates to the range of activities through which learning can be promoted such as a variety of games, dance, gymnastic, or fitness or exercise activities. Effective pedagogy is that which, amongst other things, is “personalised, enabling, and collaborative, and which facilitates informed decision making and uses active learning strategies” (Elbourn & James, 2013, p. 2).

Different organisational approaches to developing knowledge and understanding of health are available which have been the subject of much debate and critique over the years (Cale & Harris, 2005, 2009, 2013; Murdoch & Whitehead, 2010). Health-related learning outcomes can be taught within the curriculum, within and beyond physical education. If

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247 within physical education, learning can be permeated through the core traditional activities
248 such as athletics, dance, games, gymnastics, outdoor education and swimming, taught
249 discretely in separate health-related units of work, or delivered via a combination of these
250 approaches. There are merits as well as drawbacks with each. To summarise, the strengths
251 of a permeation approach are that health knowledge and understanding can be seen as related
252 and integral to all physical education experiences and thus pupils learn that all physical
253 activities can contribute towards health, thus endorsing the close relationship between health
254 issues and participation (Harris, 2000; Murdoch & Whitehead, 2010). Via a permeated
255 approach, a skilled teacher may also be able to effectively develop both aspects of physical
256 literacy knowledge and understanding, that is, of movement and of health. However, a key
257 limitation levelled at this approach is that integrating the health-related learning through the
258 teaching of the core traditional activities may result in it becoming lost or marginalised and it
259 taking second place to other learning such as skill development or tactical understanding
260 (Cale & Harris 2005; Harris & Cale, 2018). The discrete approach avoids this issue and
261 ensures health is not overlooked, but a drawback in teaching it in isolation through separate
262 units may imply that it does not relate closely to other learning and elements of physical
263 education, physical literacy, and other curriculum subjects (Harris & Cale, 2018; Murdoch &
264 Whitehead, 2010). On balance, a combined approach is advocated in that it builds on the
265 strengths of each, helps to reinforce and ensure the consistency and coherence of learning,
266 and provides a realistic opportunity to more adequately address the required knowledge base
267 (Cale & Harris, 2009). It also allows links to be made to other physical education and
268 physical activity experiences and health behaviours and subjects (Cale & Harris, 2005, 2009).
269 For example, it is recommended that links are made with learning in related subjects such as
270 personal, social and health education science (PSHE), and food technology, plus with extra-
271 curricular and/or community activity experiences where appropriate. Furthermore,

information and advice about such opportunities can be communicated to pupils as well as their families in a variety of ways (e.g., via newsletters, visual displays, parent email, parent consultations, assemblies, school web site; Harris & Cale, 2018). This is in fact akin to a whole school approach to health which is growing in popularity and increasingly being advocated within and beyond the United Kingdom (All-Party Commission on Physical Activity, 2014; Blanchard, Shilton, & Bull, 2013; Cale, Harris, & Duncombe, 2016; McMullen, Ní Chróinín, Tammelin, Pogorzelska, & van der Mars, 2015).

Concerns over the delivery of health were alluded to earlier. Indeed, alongside a lack of clarity about the nature of appropriate health knowledge to cover, it is suggested teachers also lack appropriate PE-for-health pedagogies (Armour & Harris, 2013; i.e., strategies for delivering health). Consequently, a number of researchers have called for more and alternative methods, strategies, or models to effectively teach health-related knowledge (Armour & Harris, 2013; Haerens et al., 2011; Hastie, Chen, & Guarino, 2017; Hodges, Kulinna, Lee, & Kwon, 2017). Indeed, critical of prevailing approaches, Armour and Harris (2013) argue there has been surprisingly little new knowledge on health pedagogies that could support teachers in re-contextualizing health knowledge to meet the diverse learning needs of pupils and therefore call for a renewed focus on developing PE-for-health pedagogies.

In recognition of this, there have been some recent encouraging pedagogical developments which are considered to have potential, two notable ones of which are outlined below and include the Health-Based Physical Education Model (HBPE; Haerens et al., 2011) and the Physically Active Lifestyle (PAL) Principles (Harris, Cale, Casey, Tyne, & Samaria, 2016). These have typically built on and been informed by the lessons learnt from previous health-related approaches originating primarily from the United States and Australia (Haerens et al., 2011). In addition, other relevant developments which have shown promise recently

include Knowledge in Action Lesson Segments (Hodges et al., 2017) and the Project-Based Learning Model (Hastie, Chen, & Guarino, 2017).

The HBPE model is considered to be highly compatible with the aims of physical literacy, having as its central theme “pupils valuing a physically active life, so that they learn to value and practice appropriate physical activities that enhance health and wellbeing for the rest of their lives” (Haerens et al., 2011, p. 321). Since 2011, the model has undergone an extensive period and comprehensive process of development with teachers, teacher educators, and pupils resulting in some positive outcomes for teachers and pupils (Bowler, Sammon, Casey, Haerens, & Kirk, 2012; Bowler et al., 2015). The model draws on self-determination theory, the social ecological model, and theories of behaviour change and identifies four goals for HBPE including the characteristics of habitual, motivated, informed, and critical movers. The affective domain is prominent in planning for learning emphasising the importance of valuing a physically active life as a sustainable long-term process, knowledge as a significant component, and of focussing beyond the individual to the wider community. In this respect, and whilst intended to be used flexibly to inform learning outcomes and the delivery of health knowledge and content, the model proposes that: (a) pupils’ psychological needs for autonomy, competence, and relatedness should be prioritised; (b) teachers should promote physical activity within and beyond lessons, maximising lesson opportunities and interacting with parents and community bodies; (c) lessons should include physical activity learning opportunities, such as current guidelines, age-related statistics, local opportunities, and safe/effective practice; and (d) pupils should understand physical activity barriers, potential strategies to overcome these and become movement activists for their peers/family (Bowler et al., 2012).

Another pedagogical approach to promoting knowledge and understanding of health is the adoption of PAL Principles (Harris et al., 2016). These principles emanated from a

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small-scale action-based study with teachers and trainee teachers which aimed to develop and trial a principle-based approach to promoting active lifestyles which could inform policies, delivery, and resources suitable for use by teachers and schools (Cale, Harris, & Hooper, 2017). Informed by the literature and underpinned by social cognitive theory and the social ecological model, participants were involved in developing, trialling, evaluating, and agreeing on a number of whole school and physical education-specific PAL principles, some of which explicitly focus on the development of knowledge and understanding in this area. Key considerations in the design and implementation of the principles were in ensuring their flexibility, simplicity, accessibility, and sustainability. Thus, there are no rigid rules and no prescriptive or structured programme for teachers to follow in incorporating them and minimal training and no or few resources are needed to do so. The findings from the study were encouraging revealing changes in teachers' pedagogies to increase activity levels and positive responses from pupils (Cale et al., 2017).

Examples of whole school PAL principles which require and involve the development of appropriate knowledge and understanding include (Harris et al., 2016):

- Include the physical activity for health guidelines for children in the teaching of PSHE (alongside other health guidelines) as well as in physical education.
- Discuss the promotion of active lifestyles, including marketing the 'one hour a day' physical activity guideline, with all staff, governors, pupils and parents/carers.
- Promote active travel to school (cycling, walking, scooting)... (p. 52)

Likewise, relevant examples of physical education PAL principles include (Harris et al., 2016):

- Teach pupils about the broad range of benefits (physical, psychological and social) of a healthy, active lifestyle, including the role of physical activity in healthy weight management.

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- Include assessment of learning and progress in active ways (e.g. show me...; demonstrate...; shadow...).
- Routinely inform pupils where they can be active within 3-5 miles of the school radius (in every unit of work and via the school's intranet/library).
- Teach pupils how active they should be, involve them in monitoring their activity levels so they become aware of how active they are, and inform them of multiple ways of increasing their activity levels.
- Identify low active pupils and offer them (and their parents/carers) support/guidance/information and targeted/bespoke activity sessions. (p. 52)

In developing knowledge and understanding, not only is identifying appropriate knowledge and approaches for delivering it important, but so too is monitoring the acquisition of this knowledge to establish the progress being made. Knowledge and understanding of health can be assessed via written, verbal, and active responses to focussed questions and tasks as well as via teacher observation (Cale & Harris, 2009). Peer- and self-assessment of health-related learning are also very appropriate as they directly involve pupils in making judgements and decisions about their own and others' learning (Harris & Cale, 2018). Furthermore, just as knowledge should be developed through the physical it is recommended that, whenever possible, assessment of knowledge should be through the physical for the same reasons. Active assessment methods represent one of the physical education PAL principles and can involve physical responses to focussed questions and practical tasks and activities which require demonstration and application of knowledge and understanding. Various assessment methods, taken and/or modified from elsewhere (e.g., Cale & Harris, 2009; Harris & Cale, 2018) are presented below. Whilst these assessments can be applied to different ages and abilities, it is anticipated that they be adapted, as appropriate, and that the nature and depth of expected response will similarly be different.

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Focused questions/activities (pupil-teacher or pupils-pupil) include: (a) Show me and name which muscles are working hard when you run/jump/throw; (b) Why is it important to stretch muscles after you have worked them hard?; (c) How much (and what type of) activity should young people do?; (d) Explain to a partner why physical activity is good for your health; and (e) What are some of the main reasons why young people are not active? Practical tasks include: (a) Show me a stretch for the muscles in..... the back of your leg/hamstring/calf, the front of your thigh/quadriceps, chest/pectorals, etc.; (b) Perform an exercise which will strengthen your.... tummy/stomach/abdominal muscles, leg/thigh muscles/quadriceps, arms/triceps, etc.; (c) With a partner, plan and perform a warm up which includes mobilising and pulse raising activities followed by stretches of the main muscles; (d) Observe another group's cool-down for sprinting and decide how effective it is (in reducing heart and breathing rates and stretching out the main muscles that were worked hard); and (e) Prepare some advice for a member of your family who wishes to become more active. Identify and include 10 top tips/pieces of information you think will help them to take part safely and achieve their goal (of enjoying a physically active lifestyle).

Conclusion

Fundamental to physical literacy and to participating, valuing, and taking responsibility for engaging in physical activities for life is knowledge and understanding of movement and health, which is either explicitly or implicitly embedded within the physical education curricula in most countries. To foster the above, and notably to lead a healthy active life, a sound, broad, and holistic knowledge and understanding is clearly required. With reference to health specifically, and in an attempt to achieve consensus on and illustrate the scope in health-related learning, health-related outcomes for children have been published covering four key categories: safety issues, exercise effects, health benefits, and activity promotion. The latter outcomes relating to health and promoting activity are, however,

mostly closely linked to valuing and engaging in physical activities for life, and the need to pay more attention to these is therefore recommended and indeed deemed necessary if physical literacy is to be truly fostered.

In fostering knowledge and understanding in physical literacy, the content and its delivery are clearly key and there are some general principles which should be subscribed to. These include: learning through the physical, and through a range of activities; the inclusion and empowerment of all pupils; and the shift from dependence on the teacher to independence. Different organisational approaches to developing knowledge and understanding of health are also available which warrant consideration, each of which has strengths and limitations. Within physical education, for example, learning can be permeated through core traditional activities, taught discretely in separate health-related units of work, or via a combination of these approaches. On balance, a combined approach is advocated.

Following concerns over the delivery of health, there have been calls for more and alternative approaches to effectively teach health-related knowledge and for a renewed focus on developing PE-for-health pedagogies. Encouragingly, there have been some recent pedagogical developments which are considered to have potential in this regard, two notable ones of which include the HBPE Model and the PAL Principles. Finally, not only is identifying appropriate knowledge and approaches for delivering health important, but so too is monitoring the acquisition of this knowledge to establish the progress being made. This can be done in various ways and it is recommended that, where possible, assessment should be through the physical (i.e., active, and via a range of practical strategies and methods).

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542 Table 1

543 *Learning Outcomes Associated with National Curriculum Key Stages*

544

545 Pupils who are 5-7 years can:

- 546 • explain that activity starts with a gentle warm up and finishes with a calming cool
- 547 down (safety issues)
- 548 • recognise and describe the effects of exercise, including changes to: breathing (e.g.
- 549 becomes faster and deeper), heart rate (e.g. heart pumps more quickly), temperature
- 550 (e.g. feel hotter), appearance (e.g. look hotter), feelings (e.g. feeling good, more
- 551 energetic, tired) (exercise effects)
- 552 • explain that regular activity improves health by making you feel good (e.g. happy,
- 553 pleased, content) and helping body parts (e.g. bones and muscles) to grow, develop
- 554 and work well (health benefits)
- 555 • identify when, where and how they can be active at school (in and out of lessons)
- 556 (activity promotion).

557 Pupils who are 7-11 years can:

- 558 • explain the need for safety rules and practices (e.g. adopting good posture, changing
- 559 clothes and having a wash after energetic activity, wearing suitable footwear,
- 560 following rules, safe lifting) (safety issues)
- 561 • explain and feel the short-term effects of exercise (e.g. breathing increases in order to
- 562 provide more oxygen to the working muscles, the heart rate increases to pump more
- 563 oxygen to the working muscles, body temperature increases because working muscles
- 564 produce energy as heat) (exercise effects)
- 565 • explain that exercise strengthens bones and muscles (including the heart) and helps to
- 566 keep joints flexible (health benefits)

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- identify when, where and how they can be active in school and outside... and explain that individuals have different feelings about the types and amounts of activity that they choose to do (activity promotion).

Pupils who are 11-14 years can:

- explain the value of preparing for and recovering from activity and the possible consequences of not doing so, and the purpose of each component of a warm up and cool down (i.e. mobility exercises, whole body activities, static stretches) for general activity and for a specific activity (safety issues)
- explain a range of short-term effects of exercise on the cardiovascular system (e.g. changes in: breathing and heart rate, temperature, appearance, feelings, recovery rate) and musculo-skeletal system (e.g. increases in muscular strength and endurance and flexibility, improved muscle tone and posture, enhanced functional capacity) (exercise effects)
- explain a range of long-term benefits of exercise on physical health (e.g. reduced risk of chronic disease (e.g. heart disease), reduced risk of bone disease (e.g. osteoporosis), reduced risk of some health conditions (e.g. obesity, back pain), improved management of some health conditions (e.g. asthma, diabetes, arthritis) (health benefits)
- know ways of incorporating exercise into their lifestyles (e.g. walking or cycling to school or to meet friends, helping around the home/garden) (activity promotion).

Pupils who are 14-16 years can:

- recognise and manage risk and apply safe exercise principles and procedures (e.g. not exercising when unwell or injured, avoiding prolonged high impact exercise, administering first aid including resuscitation techniques, avoiding excessive exercise) (safety issues)

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- explain that frequent and appropriate activity enhances the physical, social and psychological well-being of all individuals including the young and old, able-bodied and disabled, and those with health conditions (e.g. asthma, depression) and chronic disease (e.g. arthritis) (health benefits)
 - explain that training programmes develop both health-related components (cardiovascular fitness, muscular strength and endurance, flexibility, body composition, composure, decision-making) and skill-related components of physical and mental fitness (agility, balance, co-ordination, power, reaction time, speed, concentration, determination) (exercise effects)
 - explain factors affecting participation and constraints to being active and explore how to overcome the latter in order to gain access to and sustain involvement in activity (activity promotion). (Taken and adapted from Harris, 2000).
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606 Table 2

607 *Example Knowledge and Understanding Outcomes Related to Health Benefits and Activity*

608 *Promotion*

Learning Outcome	5-7 Year Olds	7-11 Year Olds	11-14 Year Olds	14-16 Year Olds
Health Benefits	<p>explain that regular activity improves health by:</p> <ul style="list-style-type: none"> -making you feel good (e.g. happy pleased, content) -helping body parts (e.g. bones and muscles) to grow, develop and work well 	<p>explain that activity strengthens bones and muscles (including the heart) and helps to keep joints flexible</p> <p>explain that activity can help you to feel good about yourself and can be fun and sociable</p> <p>explain that regular activity permits daily activities to be performed more easily</p> <p>explain that being active helps to maintain a</p>	<p>explain a range of long-term benefits of activity on physical health:</p> <ul style="list-style-type: none"> -reduced risk of chronic disease (e.g. heart disease) -reduced risk of bone disease (e.g. osteoporosis) -reduced risk of some health conditions (e.g. obesity, back pain) -improved management of some health conditions (e.g. asthma, diabetes, arthritis) <p>explain that activity can enhance mental health and social and psychological well-being (e.g.</p>	<p>explain that frequent and appropriate activity enhances the physical, social and psychological well-being of all individuals including the young and old, able-bodied and disabled, and those with health conditions (e.g. asthma, depression) and chronic disease (e.g. arthritis)</p> <p>explain that activity can help to manage stress and contribute to a happy, healthy and balanced lifestyle</p> <p>appreciate the risks associated with a sedentary lifestyle and with excessive behaviour (e.g. eating disorders and over-</p>

		<p>healthy body weight</p>	<p>enjoying being with friends; increased self-esteem; decreased anxiety) and that an appropriate balance between work, leisure and activity promotes good health</p> <p>explain that increasing activity levels and eating a balanced diet can help to maintain a healthy body weight (energy balance equation) but the body needs a minimum daily energy intake to function properly, and strict dieting and excessive exercising can damage one's health</p> <p>explain how each activity area (e.g. athletics, dance, games) can</p>	<p>exercising)</p> <p>identify how each activity area (e.g. gymnastics, swimming) can contribute to specific components of health-related fitness (e.g. gymnastics develops muscular strength/endurance and flexibility)</p>
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			contribute to physical health and to social and psychological well-being (e.g. can improve stamina, assist weight management, be enjoyable)	
Activity Promotion	identify when, where and how they can be active at school (in and out of lessons)	identify when, where and how they can be active in school and outside ...explain that individuals have different feelings about the types and amounts of activity that they choose to do	...know ways of incorporating activity into their lifestyles (e.g. walking or cycling to school or to meet friends; helping around the home/garden) know how to go about getting involved in activities	explain and demonstrate a practical understanding of the key principles of activity programming and training, including: -progression -overload -specificity -balance, moderation and variety -maintenance -reversibility -cost benefit ratio explain factors affecting participation and constraints to being active and explore how to overcome the latter in

				order to gain access to and sustain involvement in activity
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