Developing and Supporting Physical Development in Early Childhood

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Alarming headlines

The Guardian



Education

Some children starting school 'unable to climb staircase', finds England and Wales teacher survey

Opinion

Children are starting school unable to sit up or hold a pencil – and I know the culprit

Kathryn Peckham

As an early years specialist, I've seen the drastic impact of screens replacing physical activity and face-to-face interaction





Primary schools

Laxatives and nappies: how schools are coping with constipation in pupils

Poor motor skills have dramatic consequences for health



Just 22% of 8-11 year olds meet Physical Activity Guidelines

1 in 4 children aged 4-5 years in Wales are obese or overweight

1 in 3 children in Wales are not confident trying new sports

Modern society has reduced movement and physical play in early childhood

Baby prisoners (gadgets)

Increased time in buggies

Screen time

Risk Aversion













Lack of green space / time in nature

Lack of active transport

Busy working parents

Lack of places to play

We are facing a ‘Perfect Storm’ of inactivity

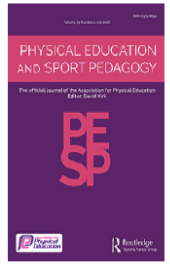
- The combination of many factors are all contributing to children moving less in early childhood.

- Why is this a problem?



Findings

- Children were **NOT** developing all aspects of their physical competence (FMS)
- Despite the having lots of play- base learning, pupils did not improve their Object Control Skills (catching, throwing, kicking)- **NEED to be TAUGHT**
- Teachers did not know **how to teach these skills**



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Physical Education and Sport Pedagogy

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Laying the foundations for physical literacy in Wales: the contribution of the Foundation Phase to the development of physical literacy

Nalda Wainwright, Jackie Goodway, Margaret Whitehead, Andy Williams & David Kirk



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Education 3-13
International Journal of Primary, Elementary and Early Years Education

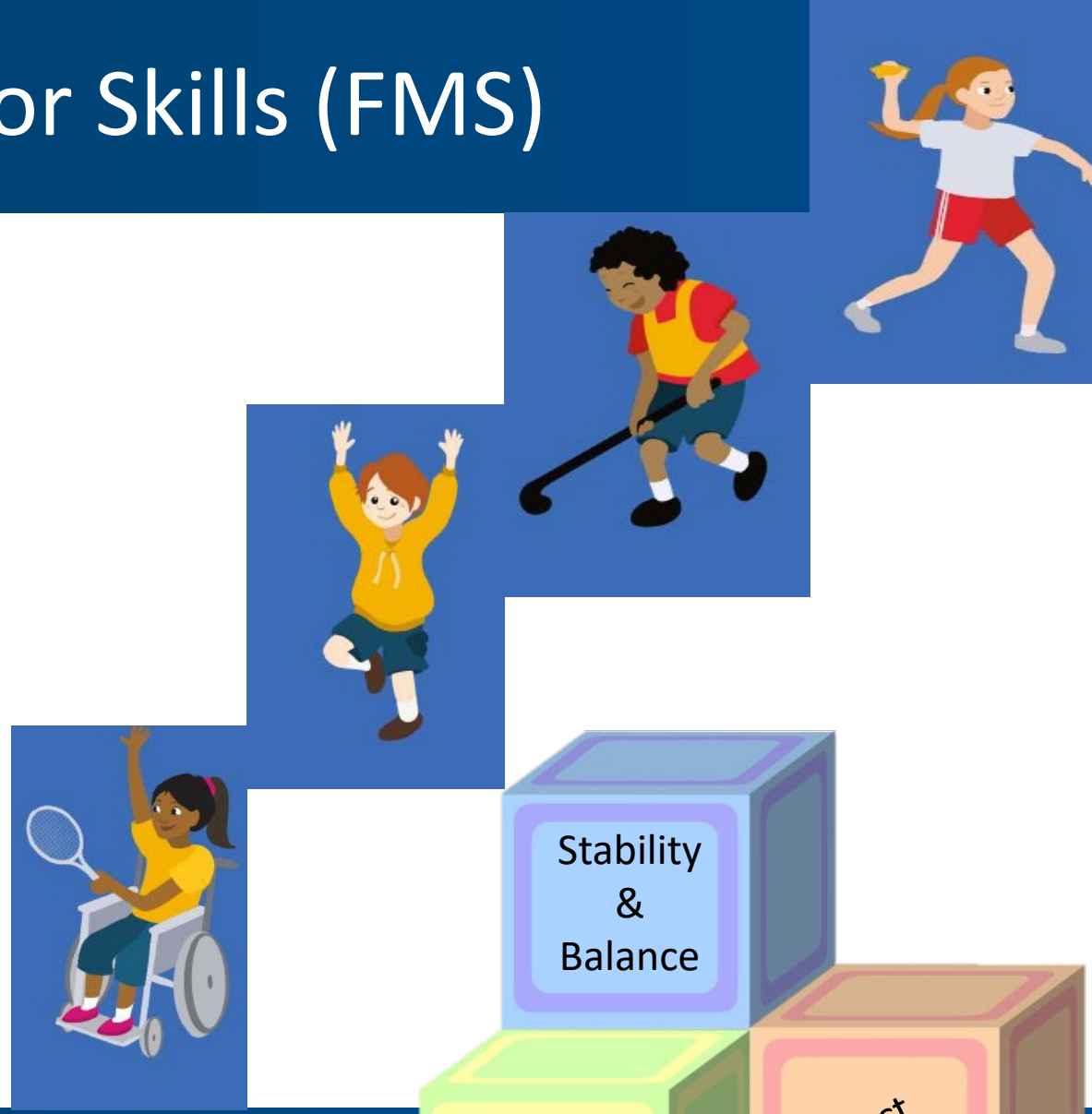
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The Foundation Phase in Wales – a play-based curriculum that supports the development of physical literacy

N. Wainwright, J. Goodway, M. Whitehed, A. Williams & D. Kirk

Fundamental Motor Skills (FMS)

- Children develop their **FMS** between the ages of 2 and 7
- FMS are the **building blocks** for more advanced movement skills
- Competence in **FMS** are necessary to be able to engage in sports and physical activity



Why is this an issue?



- OC skills predict physical activity in adolescents



- FMS lay the foundations for physical competence
- A misconception is that children ‘naturally’ learn FMS, however they need to be **taught, reinforced and practiced** in the correct environment



- Without this foundation in the early years, an individual is less likely to participate in a variety of physical activity contexts in later life….

Early Childhood Lays the Foundations for Physical Activity

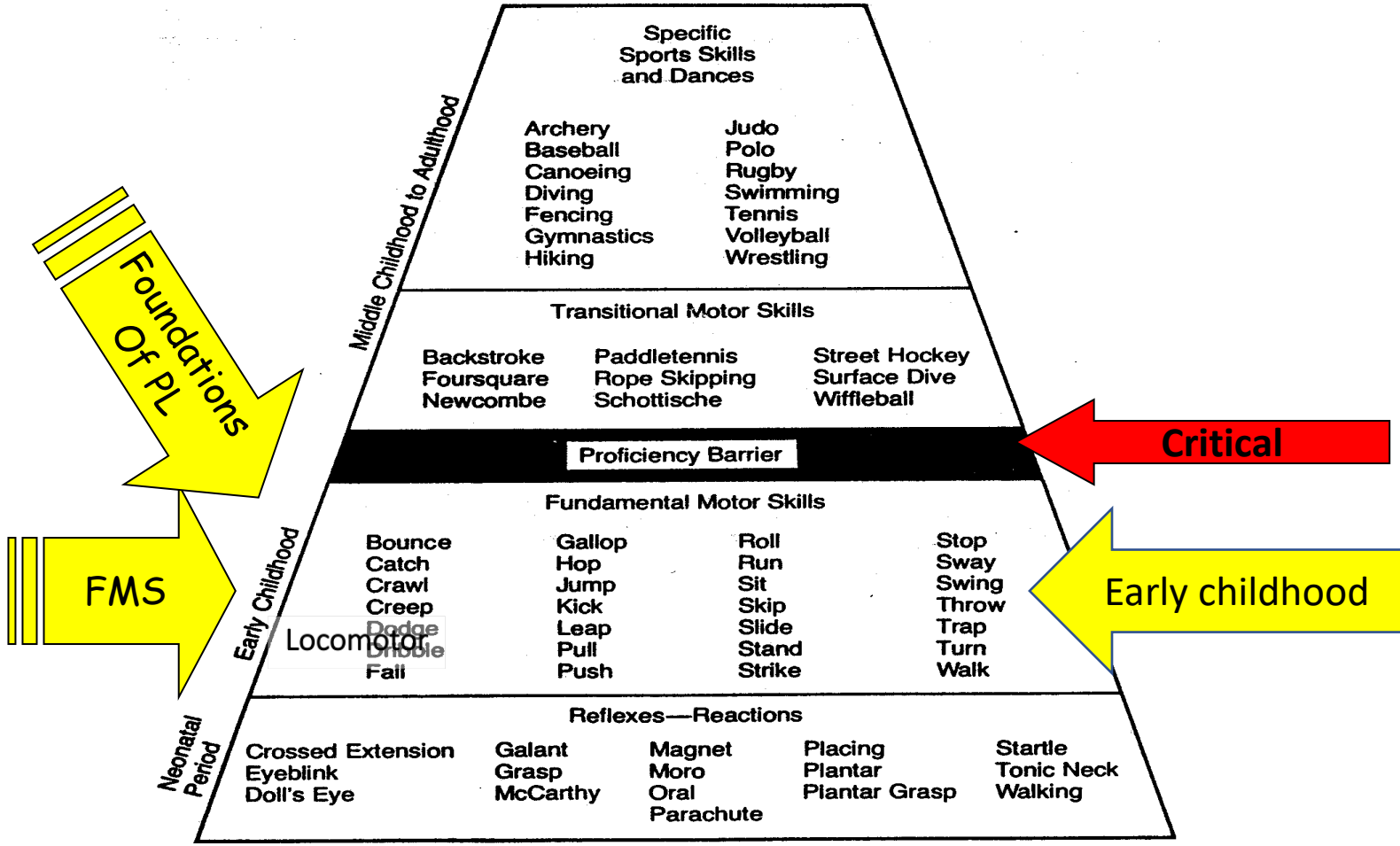
- **High Quality** movement is needed to build the broad movement vocabulary **needed for later physical activity (PA)**



Motor Skills Lay The Foundations for Later Physical Activity

- Children should acquire a proficient level of motor skills to successfully be able to apply these skills and break through the proficiency barrier

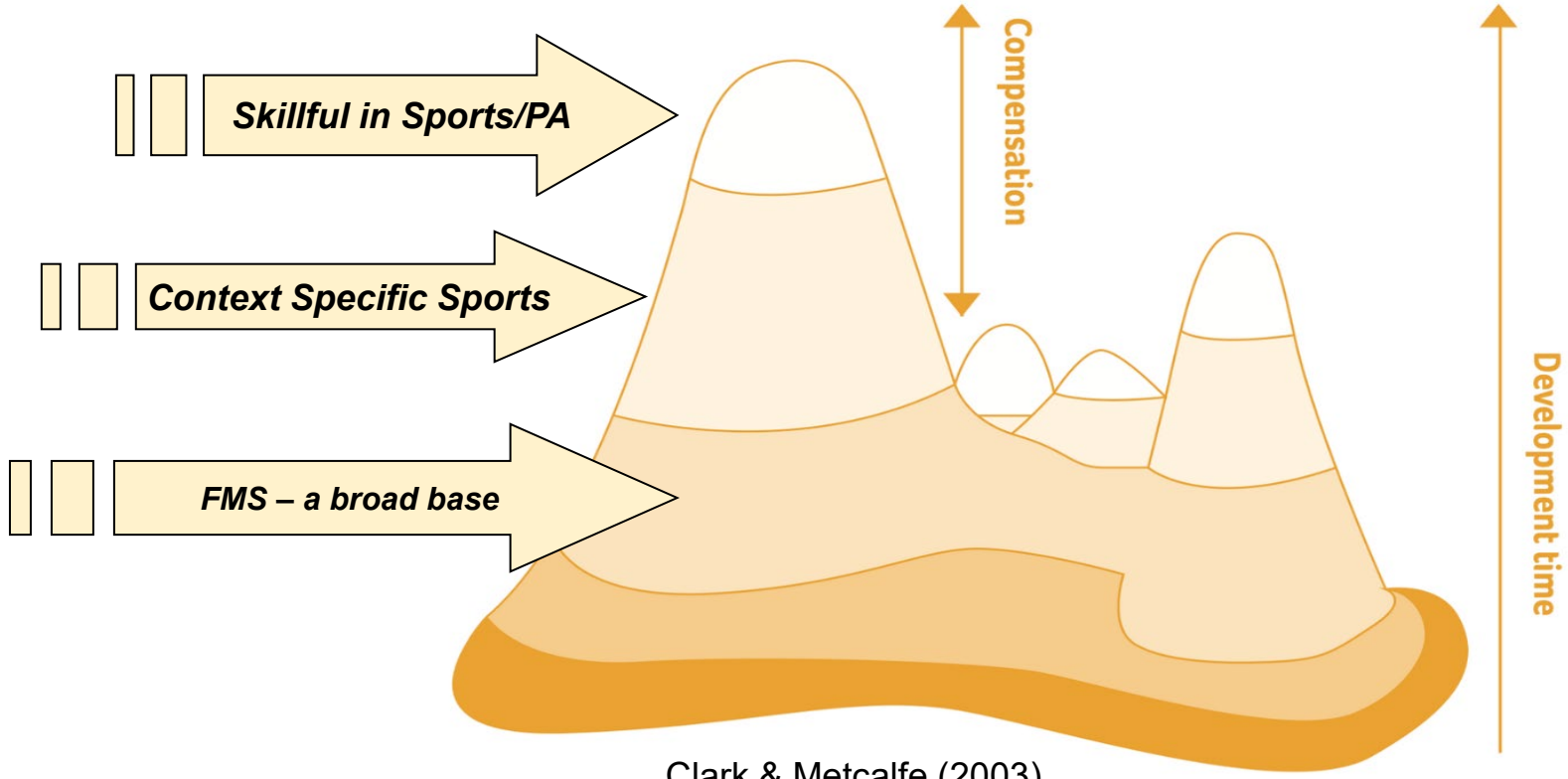
- This model highlights the importance of developing these skills in early childhood



(Seefeldt, 1980, p317)

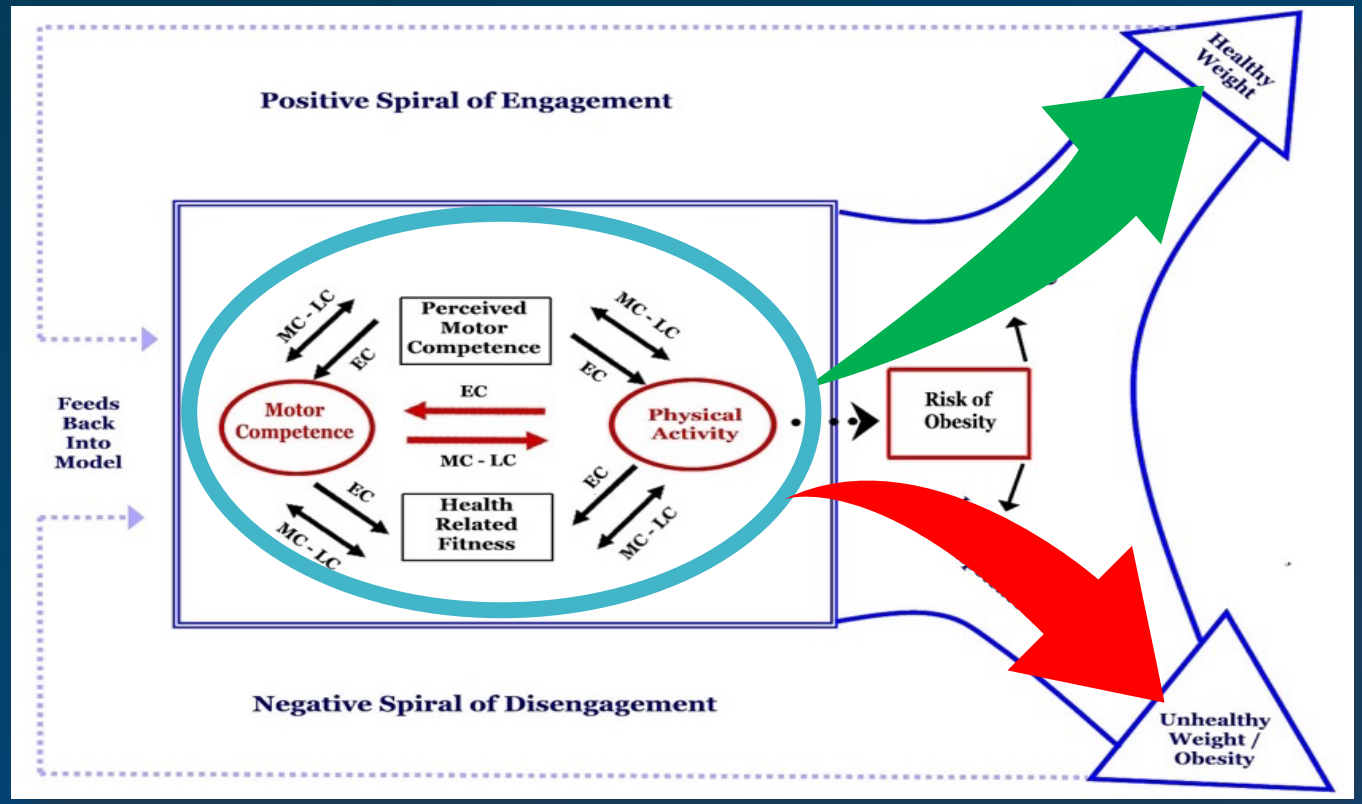
A broad base of skills gives access to many mountain peaks (different sports)

FMS are the **"base camp"** to the **Mountain of Motor Development**. Each child needs to develop motor competence (MC) to travel up the mountain to skillfulness.



Clark & Metcalfe (2003)

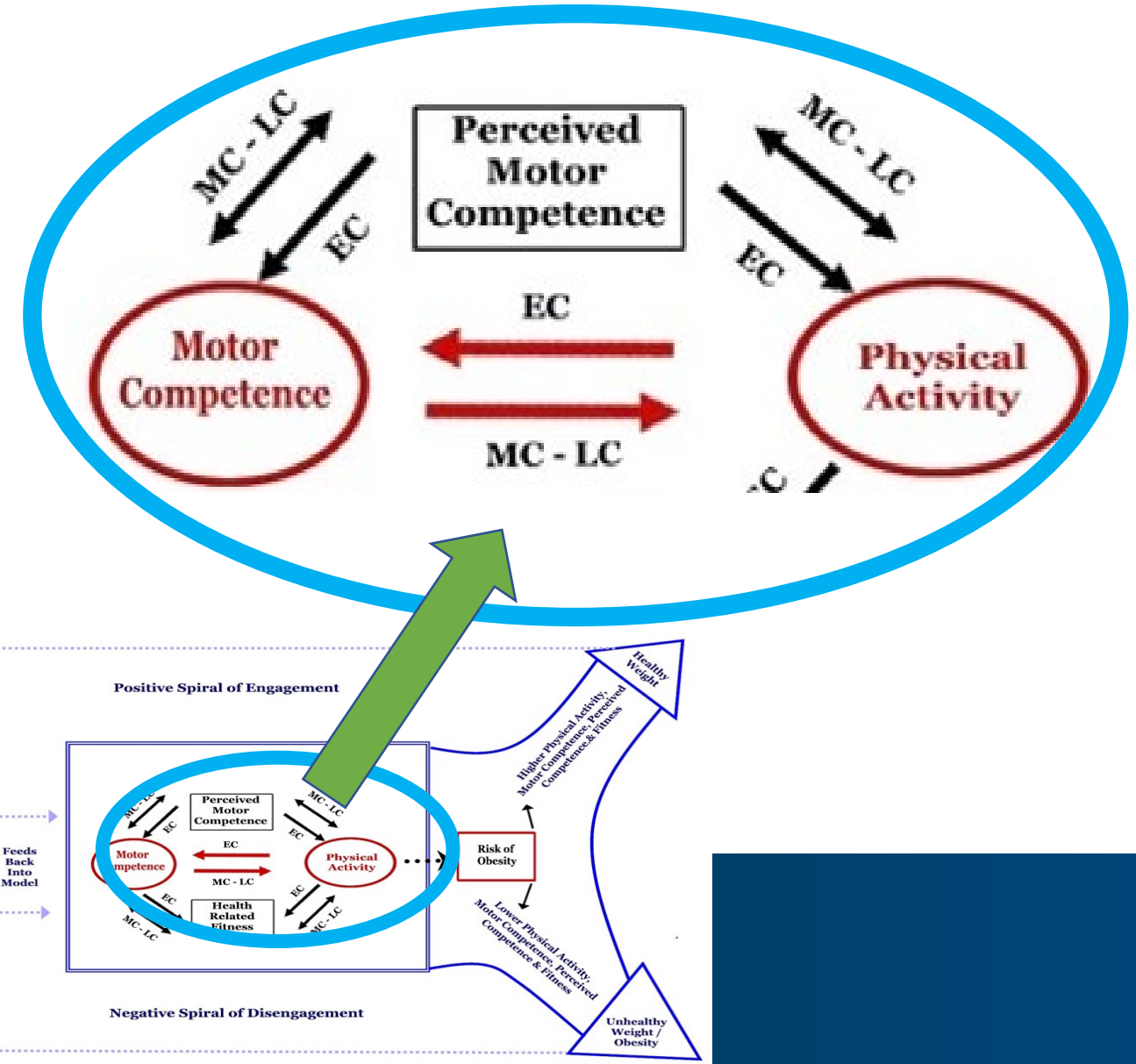
Motor Competence Drives Physical Activity and Health



Stodden et al. (2008)

- Motor competence in early childhood drives a positive health trajectory.
- This spiral begins as young as 7 years old

Early Childhood - A Magic Window

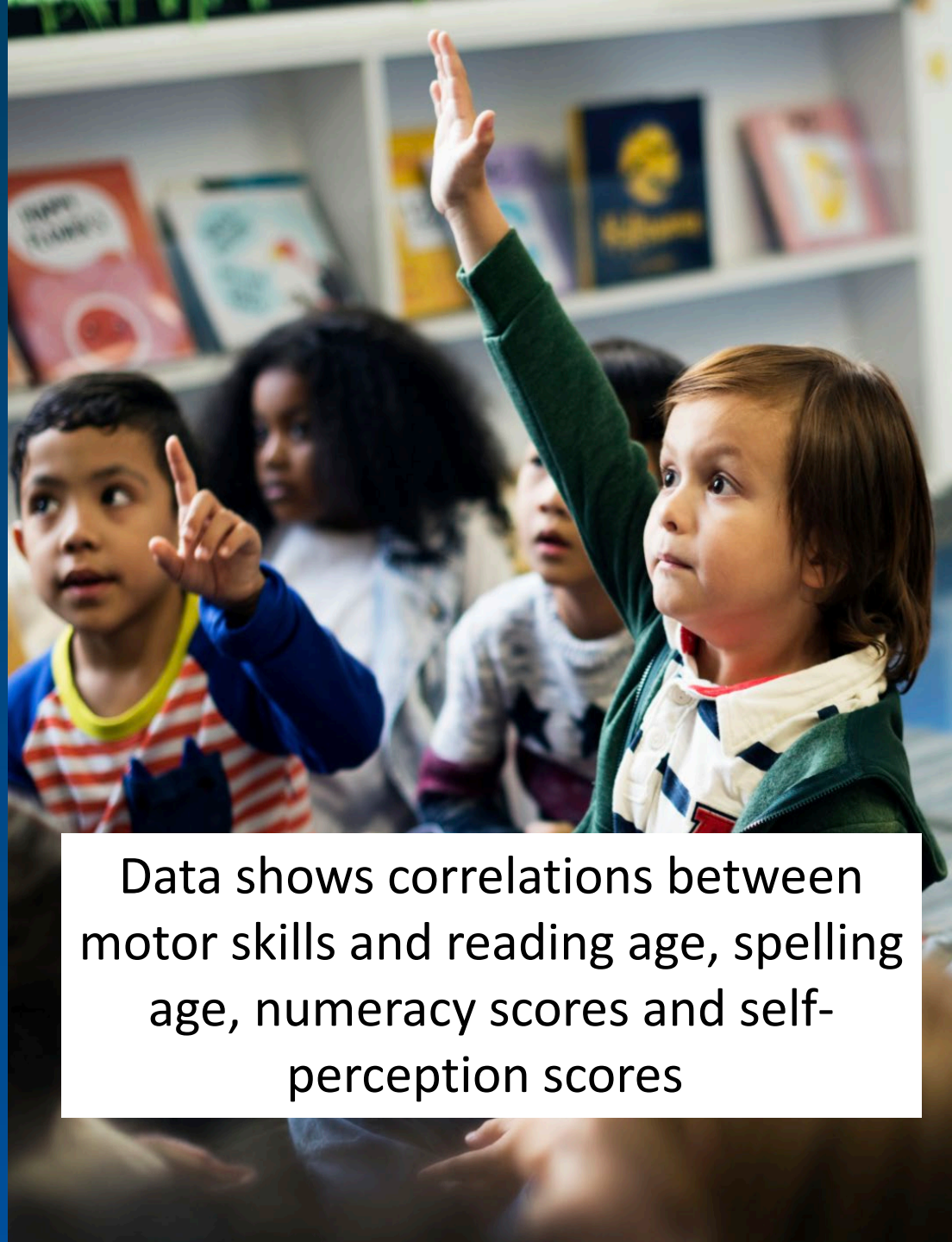


- Young children are not able to accurately judge their competence
- They think they are good if they try hard and we praise them
- They're **eager to try new activities**
- Around age 7, they have an accurate **perceived competence**
- Before this, there is a **magic window** for mastering motor skills (age 2-7)

Evidence from Neuroscience show children with better motor skills have better academic and health outcomes

Motor skills are associated with:

- Cognitive development and academic outcomes
- School readiness
- Speech and language
- Emotional regulation & social behaviour
- Confidence and self esteem
- Physical activity
- Weight Status



Data shows correlations between motor skills and reading age, spelling age, numeracy scores and self-perception scores

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Diamond (2015), Iverson (2010), Van der Fels et al. (2015), Bedard et al. (2017)

This begins with reflexes

- Some begin to develop in the womb in last 3 months of pregnancy
- Help with turning, kicking and sucking
- A response to a stimulus which causes a movement
- Begin to wire motor and sensory systems together
- Movement experiences integrate the reflexes as children develop
- Early foundations for motor skills
- Need to be inhibited and disappear as baby develops





Sensorimotor Integration





Movement and play experiences in the early years underpins **all learning and development.**



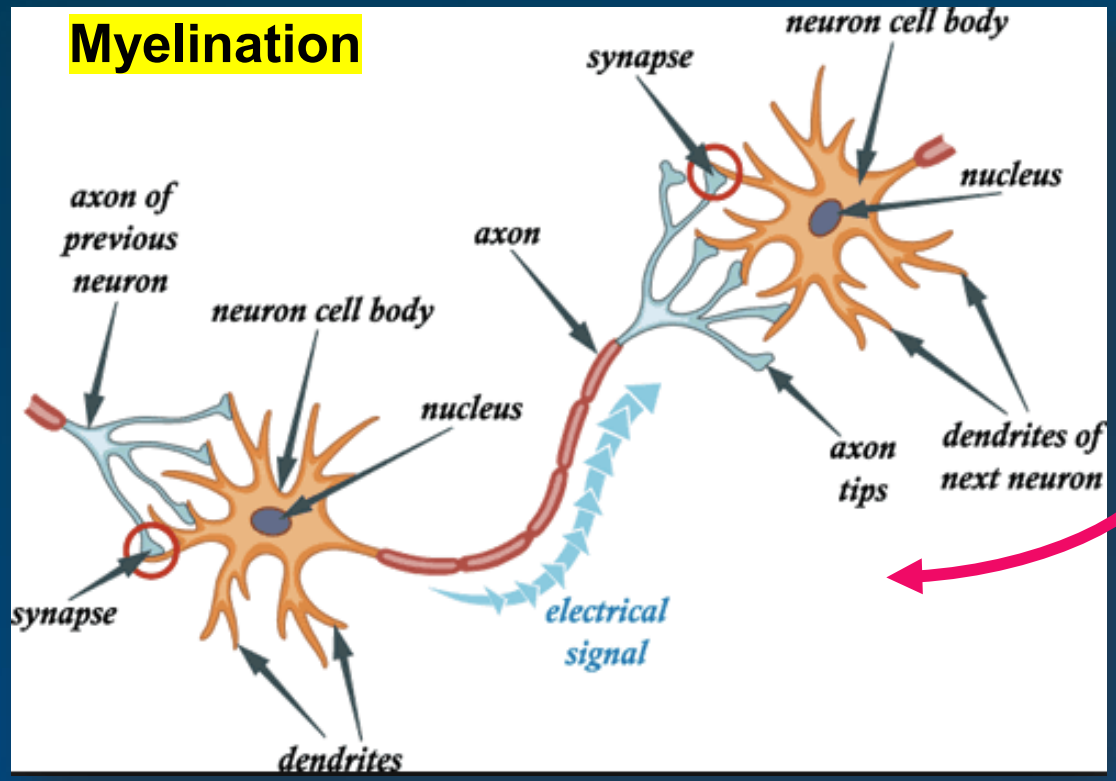


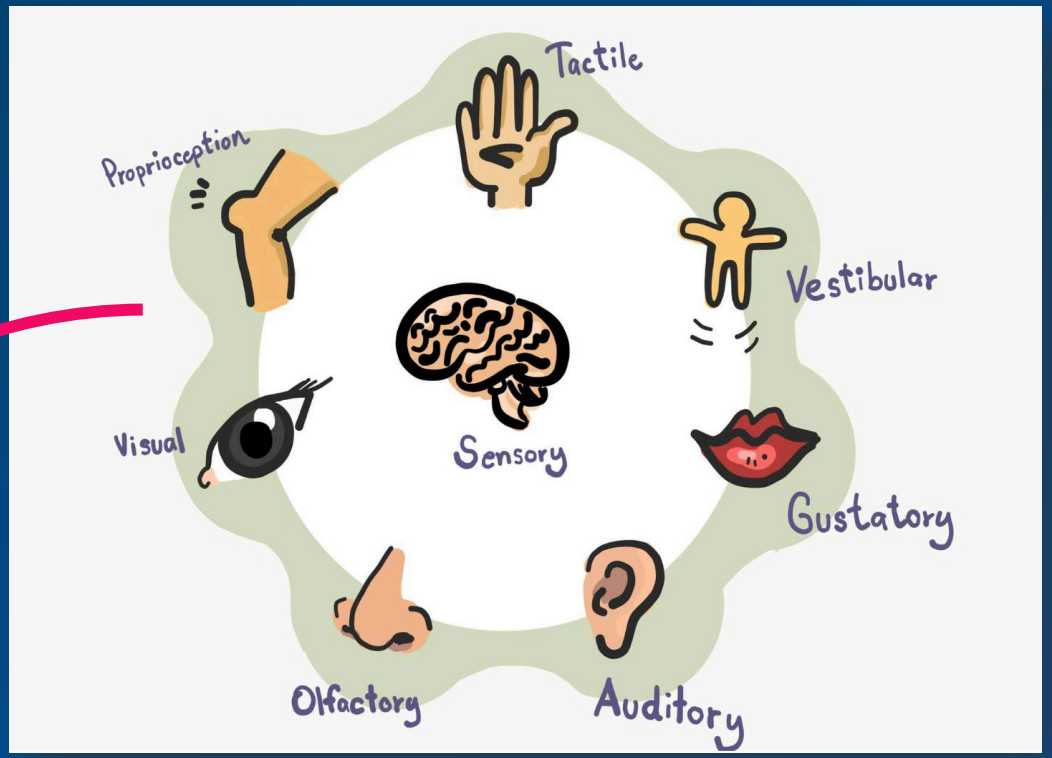


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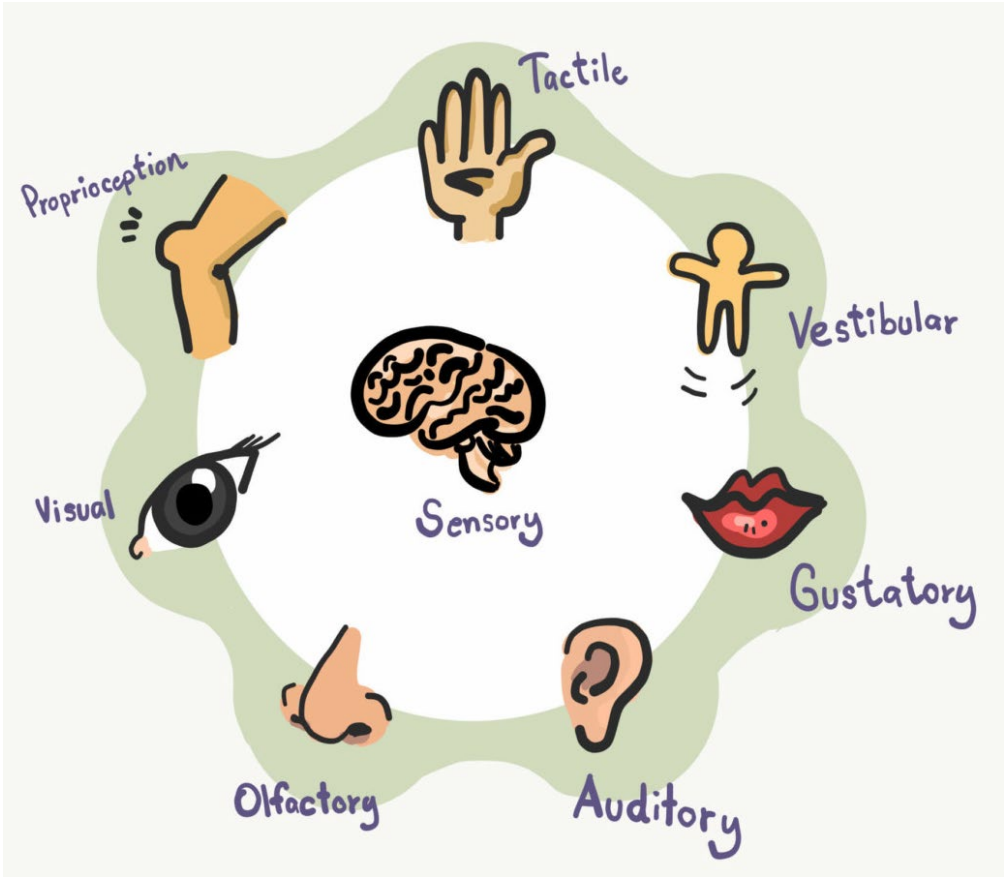
As a baby or toddler moves and plays, sensory input fires neural pathways





- Body awareness
- Motor planning
- Perception of movement
- Fine motor control
- Touch
- Visual skills
- Language processing

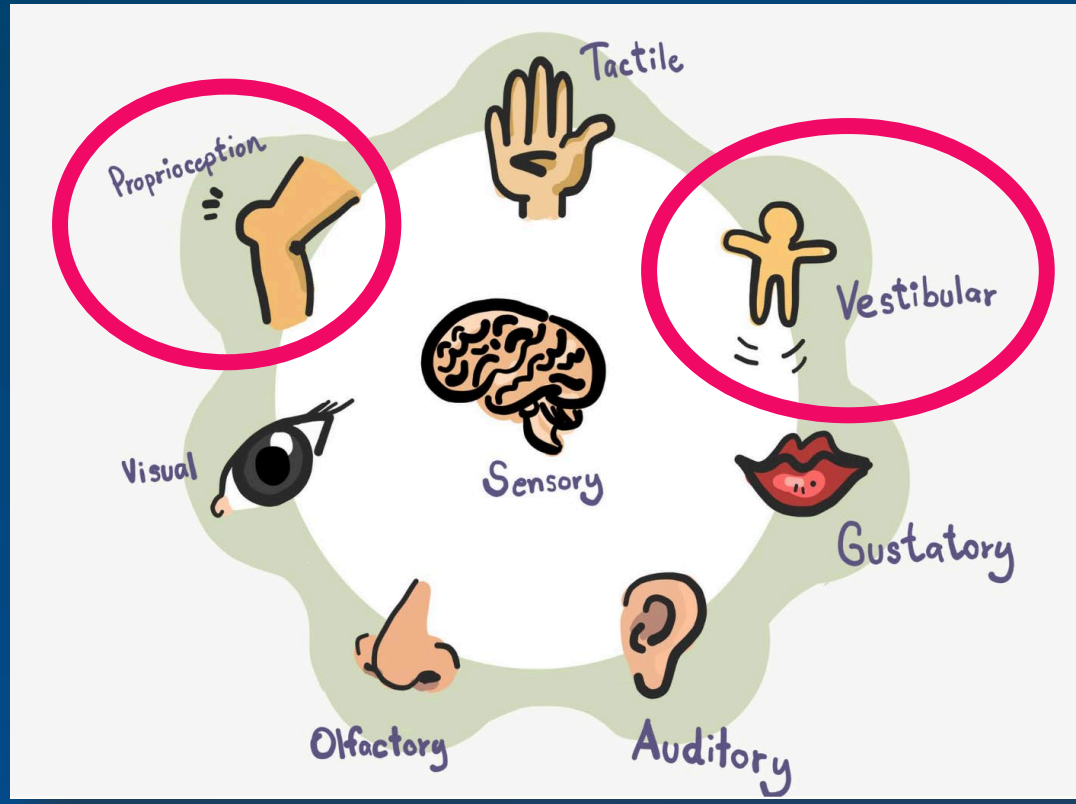




They are learning to integrate their motor systems

- **Proprioception -** Body awareness comes from information from sensors in muscles and joints- ‘sixth sense’ knows where your limbs are without having to look

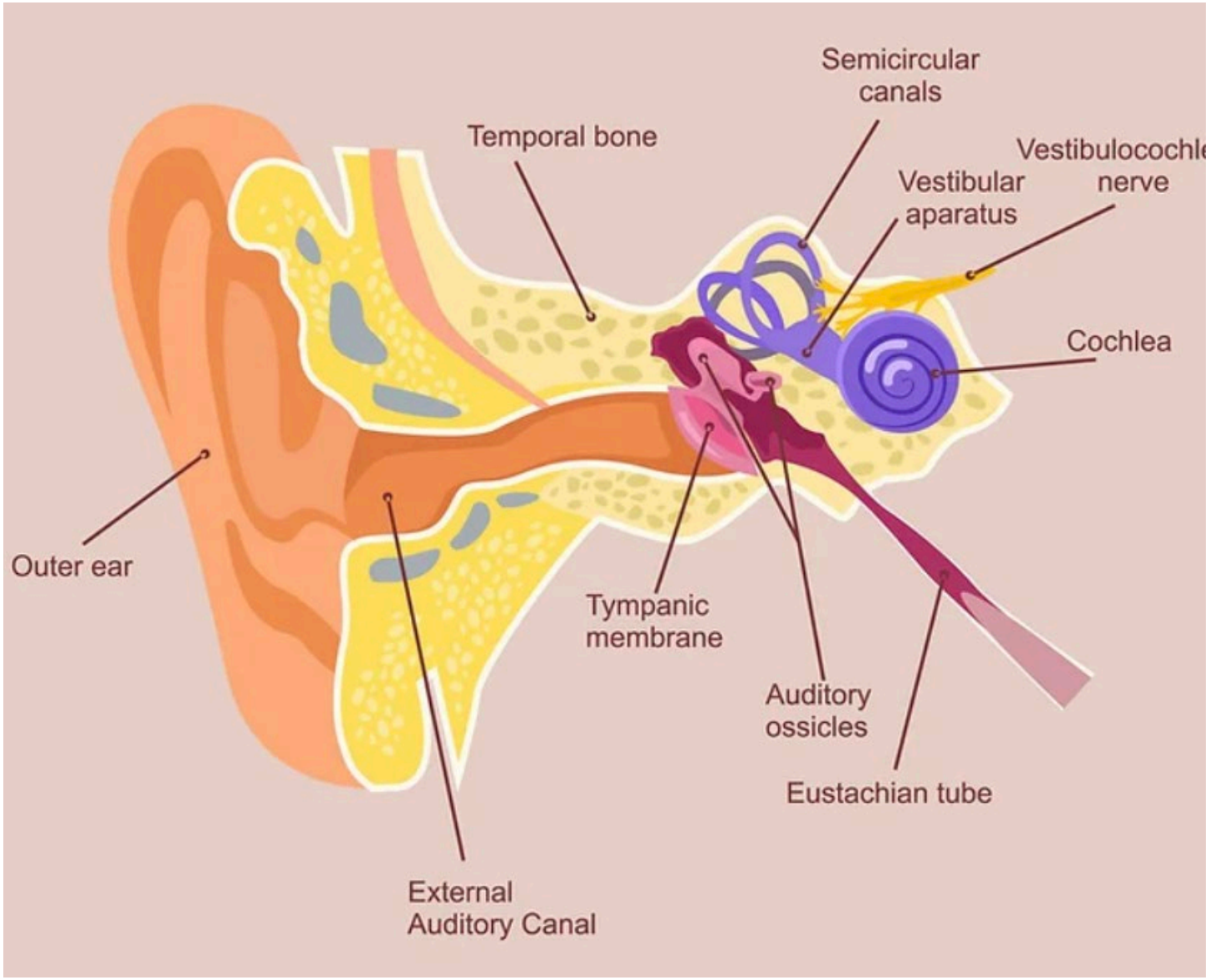
- **Vestibular system** is key for balance and stability-



Perception of Movement

Vestibular System

- Located in the inner ear and includes three fluid-filled semicircular canals to detect rotational head movements
- Stability underpins all voluntary movement





Learning to stand and walk requires the integration of many systems

- Standing and walking is complex taking about a year
- The balance system also controls attention
- Good vestibular and motor integration is needed for stillness and calm

Moving lays the foundations for learning

7 or 8 years of moving and play are required to give the child a sensorimotor intelligence that can serve as a foundation for intellectual, social and personal and physical development

(Ayres, 2005)

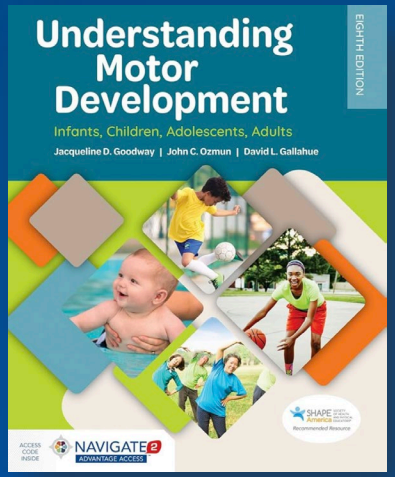


Project SKIP *(Successful Kinesthetic Instruction for Pre-schoolers)*



- Developed by Professor Jackie Goodway, Michigan State University over 20 years ago
- Addressed developmental delays in areas of deprivation
- Identified principles based on motor development theory to reverse delays
- Multiple research interventions globally have tested SKIP

MICHIGAN STATE UNIVERSITY



SKIP- Cymru

- Developed using the principles of SKIP
- Programme of professional development for Teachers- to help **‘plug the gap’** in children’s OC skills
- Give them the knowledge and understanding to analyse children’s movement
- **NOT** an **INTERVENTION** needed to be embedded in practice





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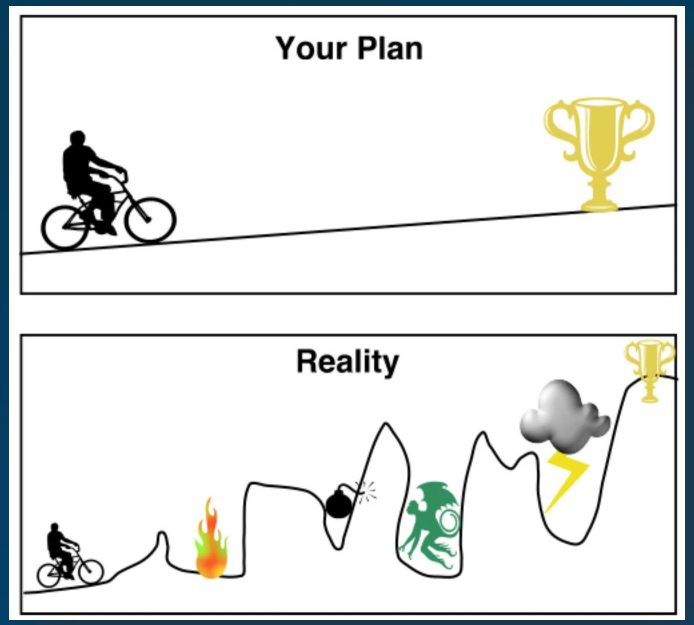
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Developing children’s motor skills in the Foundation Phase in Wales to support physical literacy

Nalda Wainwright, Jackie Goodway, Amanda John, Kirsty Thomas, Kate Piper, Kate Williams & David Gardener

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Dynamic Systems Theory, Newell's Constraints & Play



Analyse stage of development

Individual Constraints

Structural *Functional*

DIFFERENTIATION IN THE PHYSICAL

Set up the right task/activity

Task Constraints

Environmental Constraints

Choose the right Equipment and Space

Playful Pedagogy

Child interpreted cues for **Play vs Work**

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MINI MOVERS

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Play and Engagement in Learning

Play		Work	
Emotional cues	**Environmental cues**	**Emotional cues**	**Environmental cues**
Voluntary	On the floor	Compulsory	At a table
Under child's control	Lacks adult involvement	Under adult control	Includes adult involvement
Easy	No adult evaluation	Hard	Includes adult evaluation
Fun	Can be continued-focus on the process	Can be fun	Has to finish-focus on the product
	Physical		Not physical

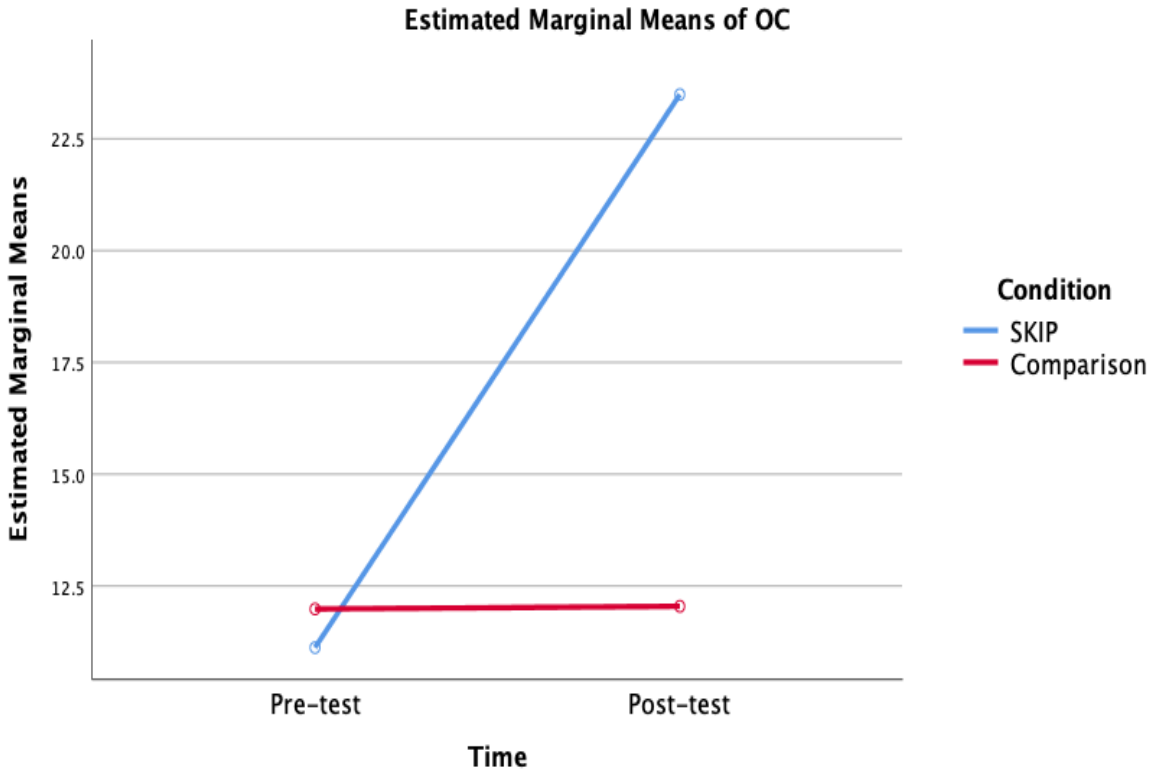
Howard, J. and McInnes, K. (2010) 'Thinking Through the Challenge of a play-based curriculum, increasing playfulness via co-construction', in Moyles, J.R. (ed.) *Thinking about play*, Berkshire: Open University Press

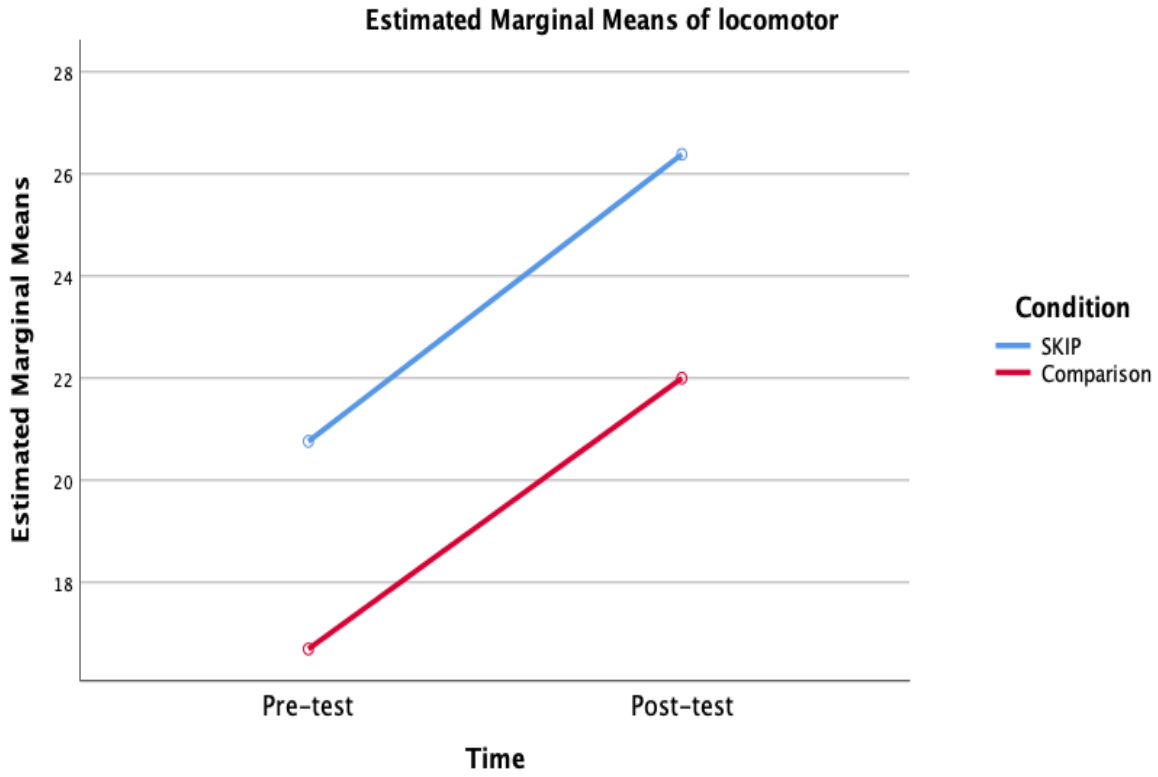




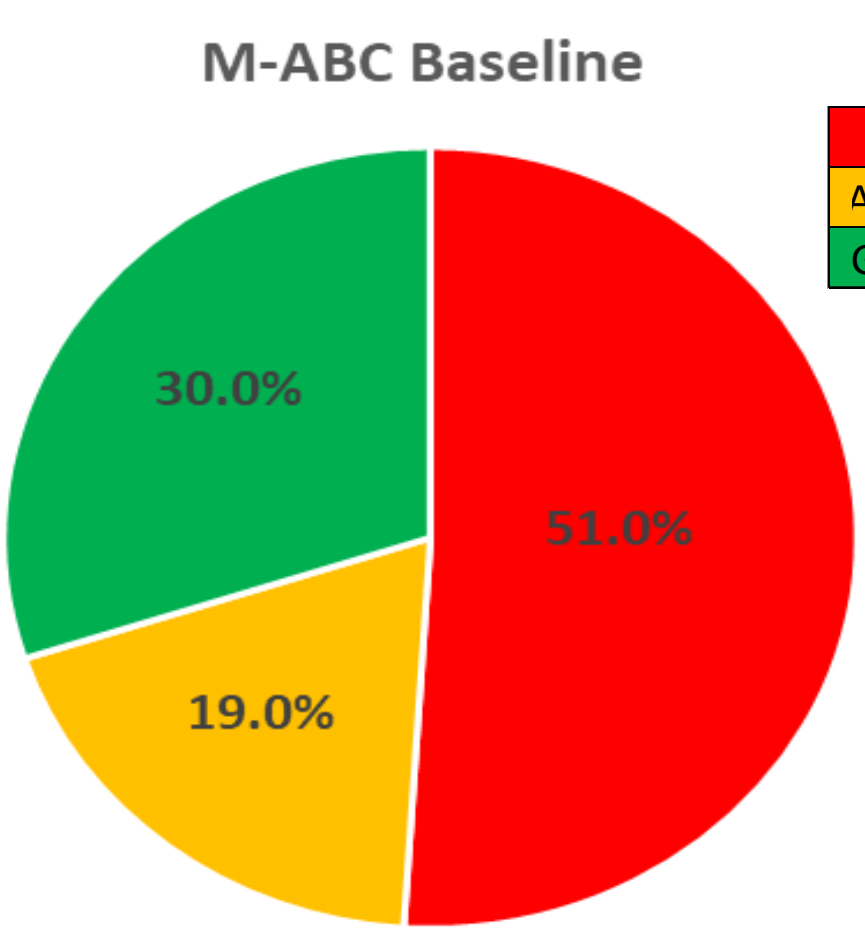



TGMD- Process
SKIP Cymru data 2018/2019



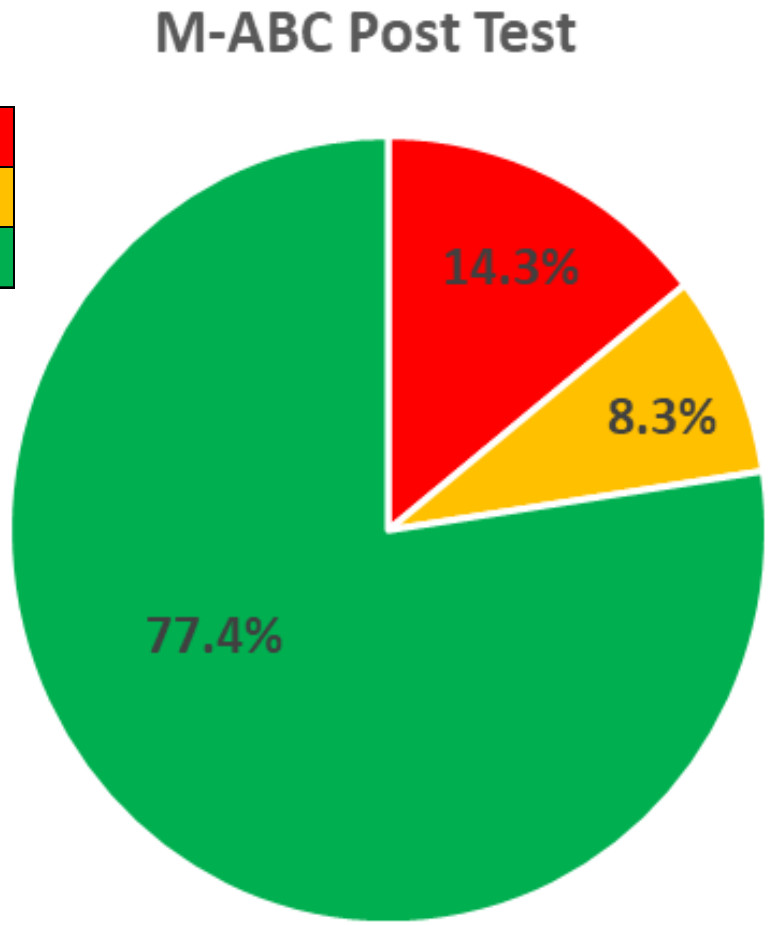


M-ABC- Product Measure 2018/19



Red: below 5th percentile
Amber: 5th to 15th percentile
Green: Above 15th percentile

Significantly
less children in
delay after SKIP-Cymru



- Improved MC in as little as 10 weeks- Significantly less delayed children at post test
- Gap in teacher knowledge & understanding prior to the training
- **49%** (176 min) of the school day (9am- 3pm) spent in sedentary behaviour
- **9%** (32 min) spent in Moderate to Vigorous Physical activity (MVPA)
- OC, Jump and age predicted sedentary behaviour and MVPA
- Inconsistency in Fidelity of implementation- developed Level 3 and 4 accredited modules

children

MDPI

Article

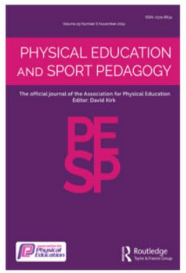
The Relationship between Physical Activity and Motor Competence of Foundation Phase Children in Wales during the School Day

Amanda John [1], Nalda Wainwright [1], Jacqueline D. Goodway [2,*] and Andy Williams [1]

[1] Wales Academy for Health and Physical Literacy, University of Wales Trinity Saint David, Carmarthen SA31 3EP, UK; amanda.john@uwtsd.ac.uk (A.J.); n.wainwright@uwtsd.ac.uk (N.W.); a.williams@uwtsd.ac.uk (A.W.)

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Examining the fidelity of implementation of SKIP Cymru (Successful kinaesthetic instruction for pre-schoolers- Wales) by early childhood teachers in Wales following a programme of professional development

Amanda John, Nalda Wainwright, Jacqueline D. Goodway & Andy Williams

SKIP in Wales: SKIP-Cymru
A programme of Professional Development

- Blended learning for accessibility
- Measurable impact on pupil outcomes
- Builds expertise for long term sustainable impact
- Accredited at Level 3 and 4 for education and health professionals
- **Not just an intervention**







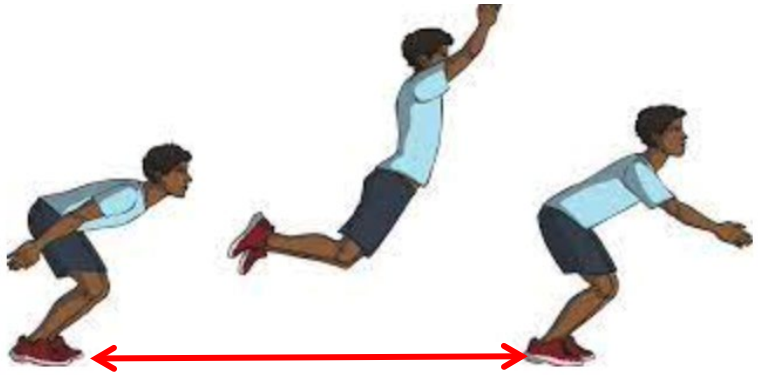


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POST TEST MEASURES									
Child			Standing Long Jump		Single Leg Balance 30 seconds				Catch
ID	Date of birth	Height (cm)	Jump 1	Jump 2	Left 1 (sec)	Left 2 (sec)	Right 1 (sec)	Right 2 (sec)	Stage

Standing Long Jump



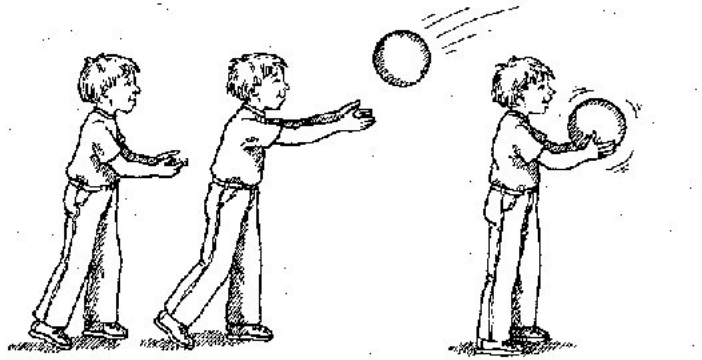
- Two feet to two feet
- Must land on feet- no use of hands to support

One- Leg Balance

- Each leg is tested
- Maximum time 30 seconds
- Maximum of 2 trials per leg



Catch

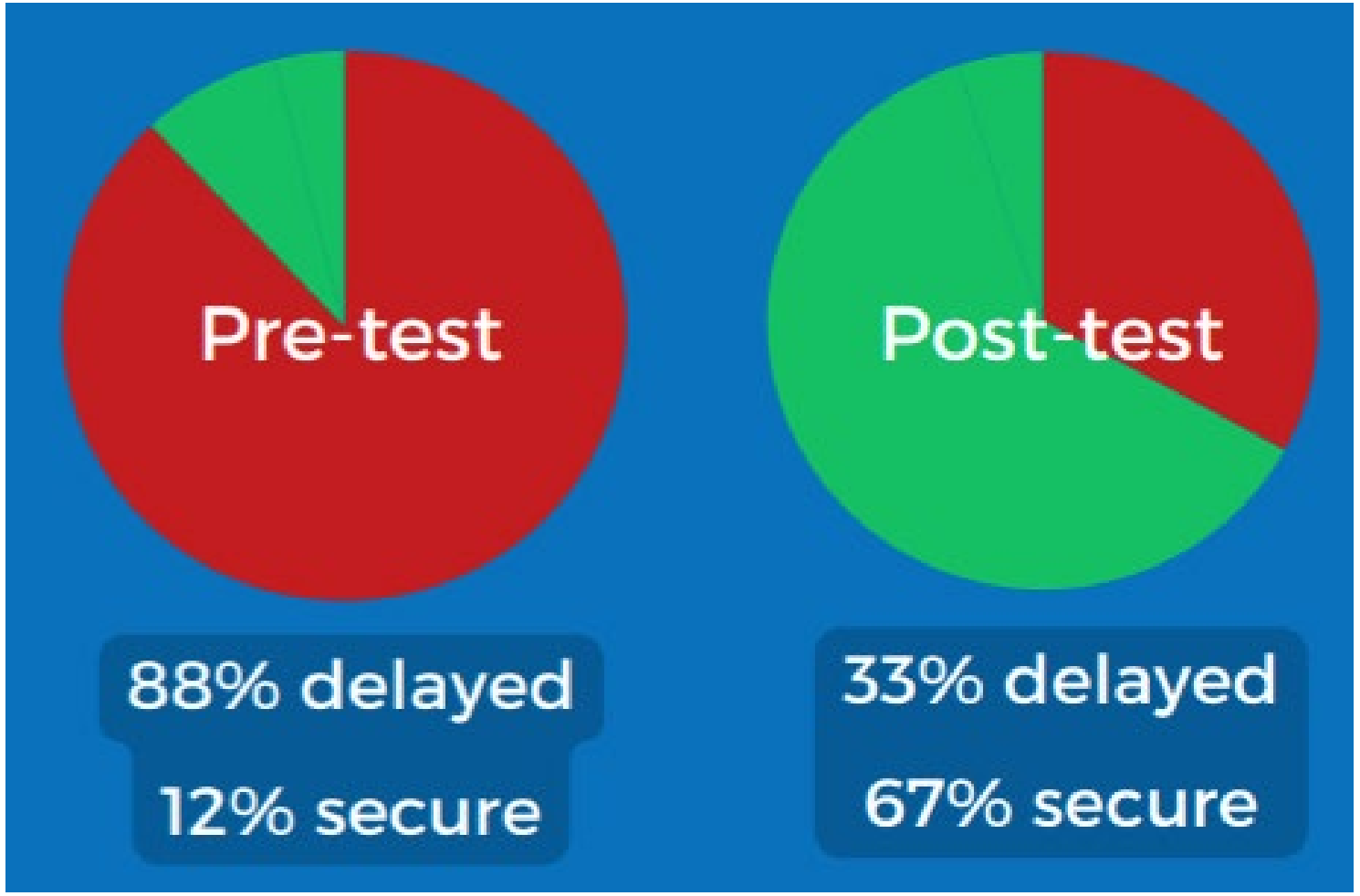


- Stand 15 feet away from the child
- Throw a ball (big- not a beach ball) in an arc (rainbow throw) to the X-Zone of the child

1 Practice go, 2 Trials for each test

Latest Research

Level 3 SKIP-Cymru shows staff in Meithrin settings to be able to reverse delays in as little as 10 weeks



Teachers have embedded into Practice

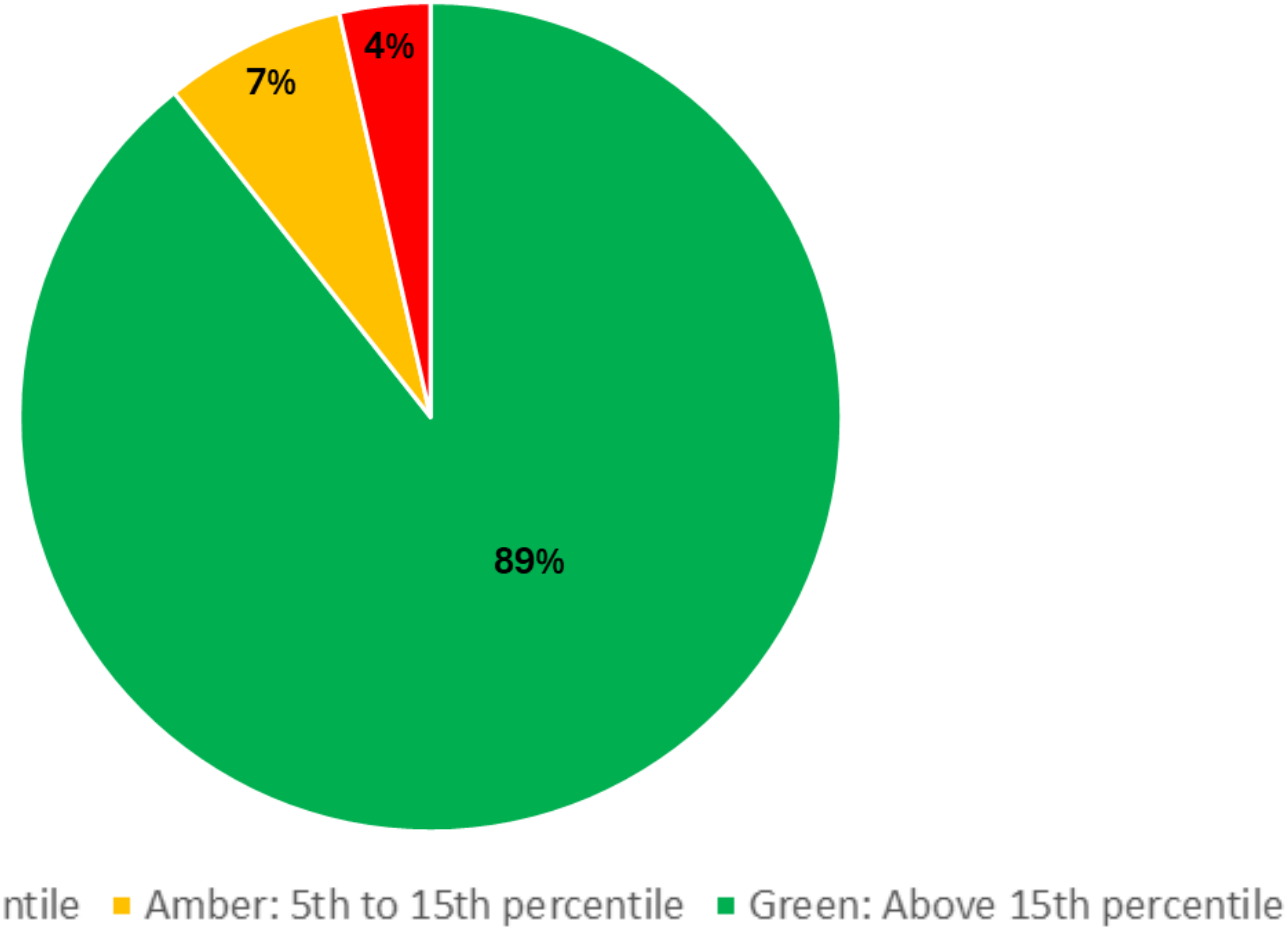
Nearly 3 years after **Level 4**

SKIP-Cymru training

teachers are still improving

children's skills

(Wainwright et al., 2025)



Supports the Curriculum for Wales

Empowers staff to apply the 12 pedagogical principles such as ….

Employing a broad repertoire of teaching approaches

Creating authentic learning contexts

Empowering learners

Identifying learners needs

Sustained pupil effort to reach targets

A focus on the 4 purposes…..which are driven by **Health and Well Being**

Early Childhood - The Best Investment

- Early childhood is the stage when motor skills should be developing – These are generic foundational skills **NOT** sport specific skills
- It is **4 times harder** to change skills in year 4 (aged 8) than aged 4
- Poor motor skills track to later disengagement

In 2018, over **2/3** of children in Wales had poor or delayed motor skills.

In the 2022 school sport survey, **2/3** of children were not participating in sport.

Collaboration: Principles of SKIP underpin a range of work

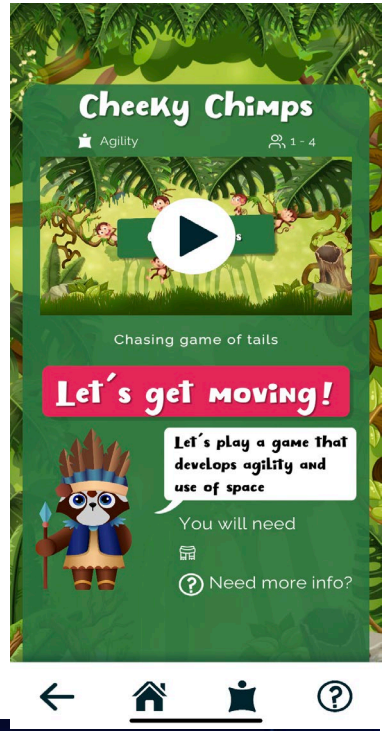














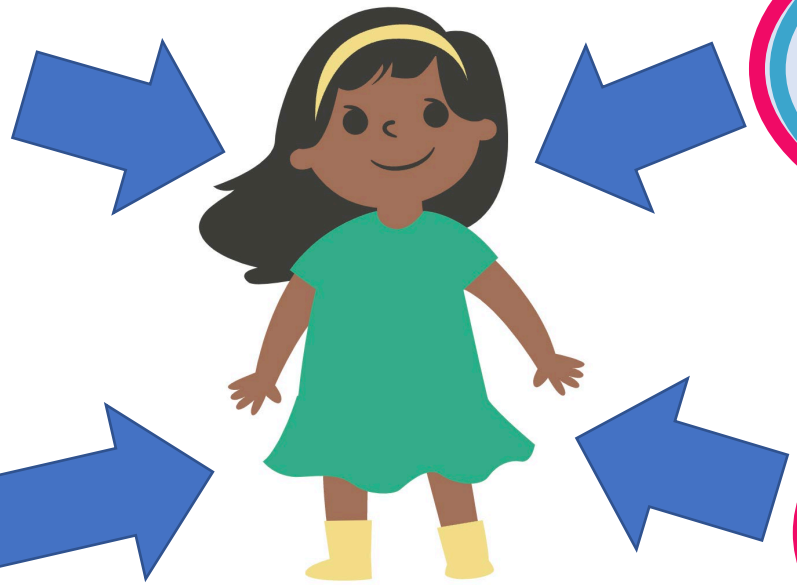
Physical Literacy is a shared responsibility - There are multiple influences on children's movement and PA

Family

MiniMovers

School

SKIP-Cymru Level 4



Preschool & Health Professionals

SKIP-Cymru Level 3

Community Sports Clubs

Building Foundations for Sport

Let's look at Mini Movers website

- www.minimovers.org/

- PLEASE Follow us on social media – **@minimoversuk**

Instagram Facebook, Tik Tok

and Youtube

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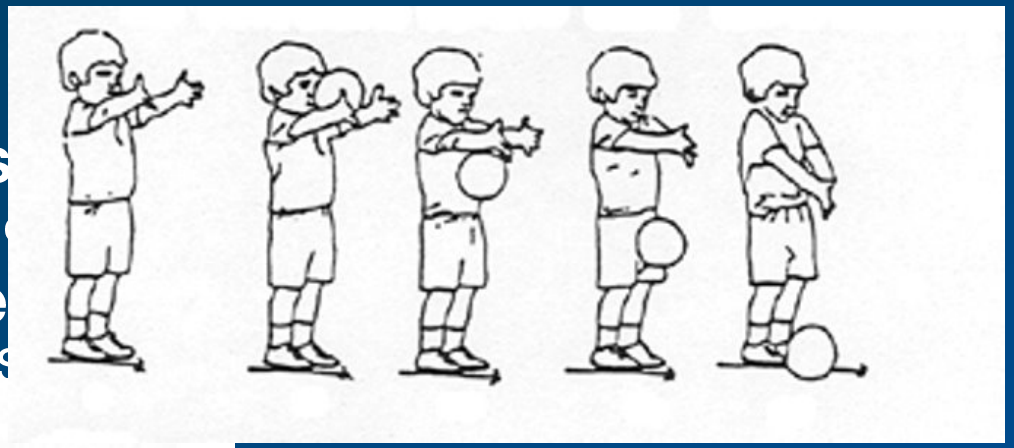


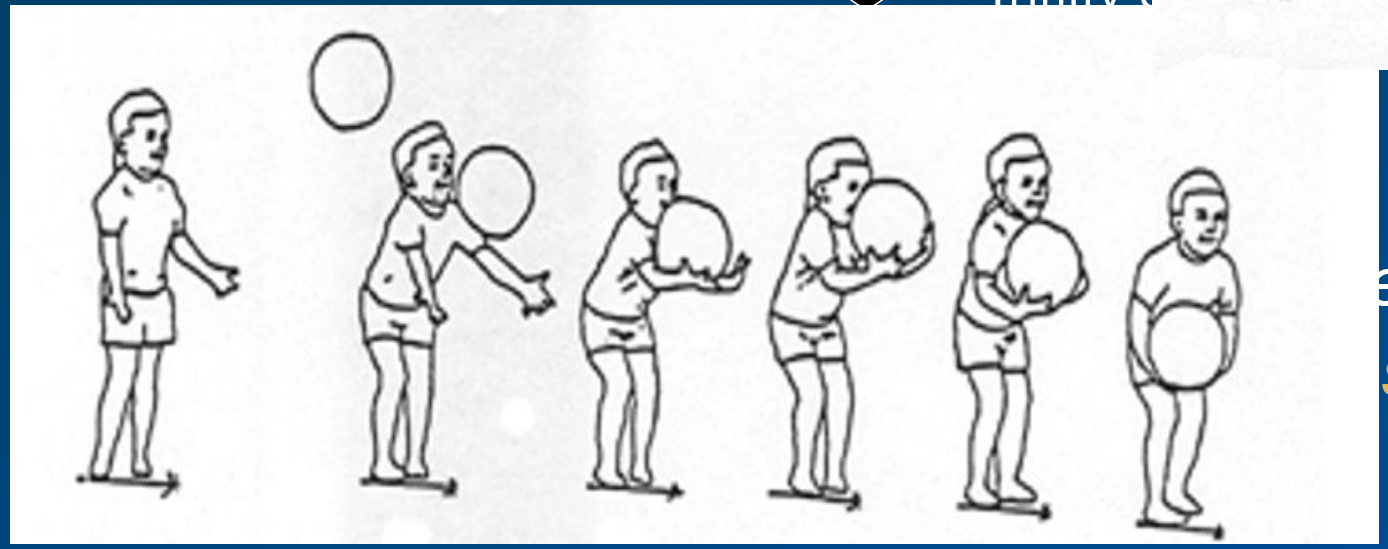
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Theory and practical - to analyse movement

- Stages of catching





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Who are we ?

- Team of experts in early childhood motor development based at the **UWTSD-** Dr Nalda Wainwright, Kirsty Thomas, Dr Anna Stevenson
- Professor Jackie Goodway- **Michigan State University 30+ years of research in the field**

