CLUBS FOR SCHOOLS
REMARKABLY SIMPLE

Physical activity builds the brain so teachers can fill the brain

James Kirton, 2008 Olympic Swimmer
Michael Ledzion, Founder & CEO, Clubs for Schools
5th October 2018

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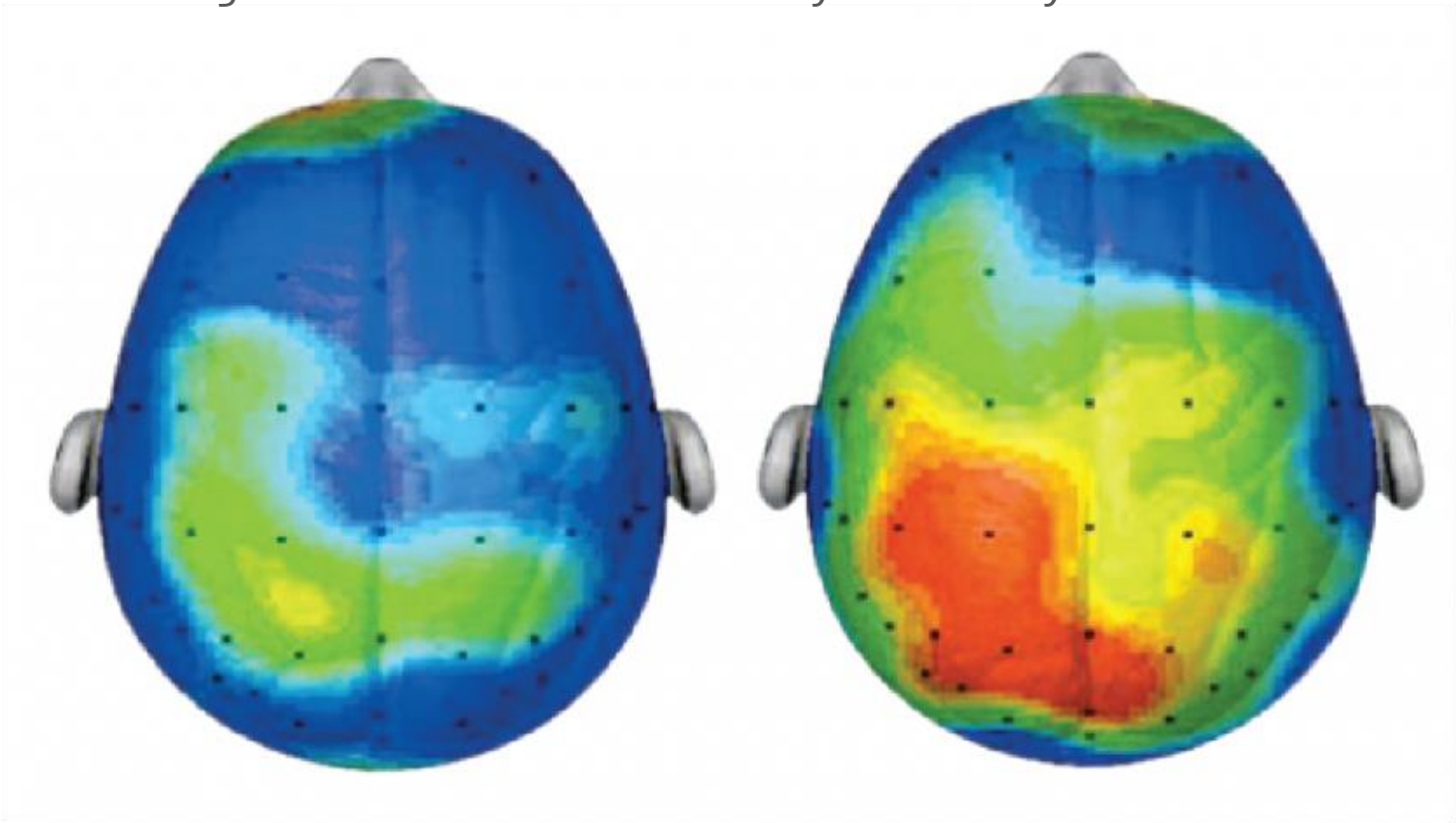
Get in touch, we'd love to hear from you!

Or join other teachers at  **GetActiveSchools**

Why have we just done that?

Because brains get active when we exercise: you're ready to learn



Sit down and be quiet!

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What do you want to achieve / get from today?

Let me make a note: what do you want to get from today?...

- TELL US NOW! ☺
- How to get physicality into lessons... they have to sit down & learn, so how do we have time to do the daily mile, etc... how can we do that?
- How to get all staff on board with physical exercise. Getting the other teachers to see the importance of this (Physical Activity)
- Already to physical activity in lessons (love it!), so want new ideas to take it to the next step.
- Working at a very young age – how to make this the norm from age 4-5
- Ofsted asked how does daily mile and PE impact on education (she just nodded her head!!!)
- Looking at curriculum, making it relevant to the children, but when they go home how can this be maintained. So understand the science.

Clubs for Schools – any club, any time, any day

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COACHES
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Jo Jackson, Olympic
Bronze medal swimmer

GB/Olympic athletes

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1,200+ events/year

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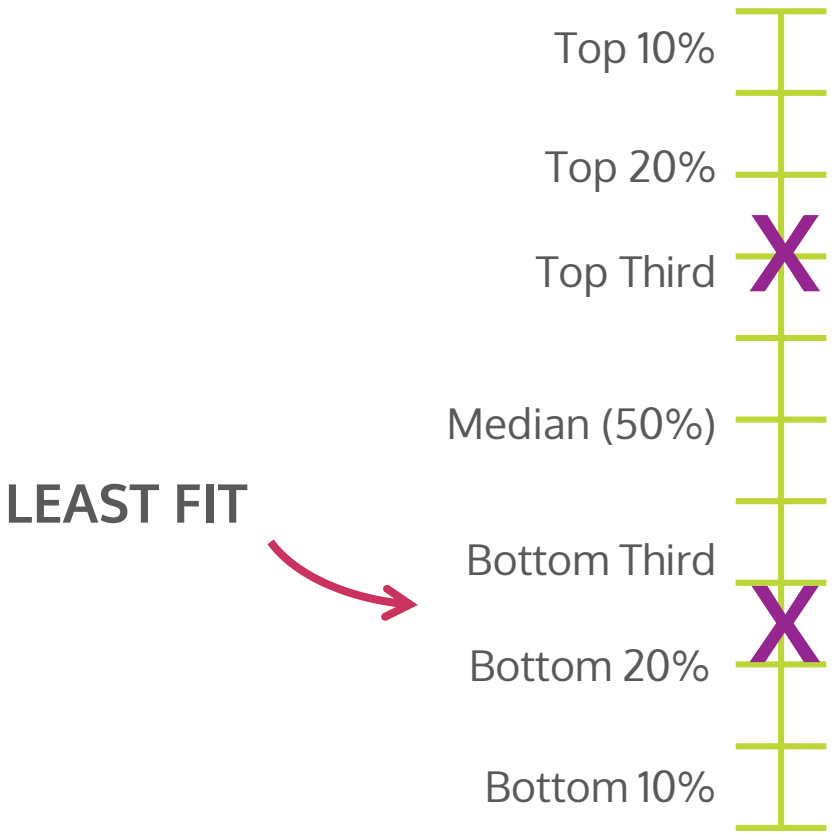
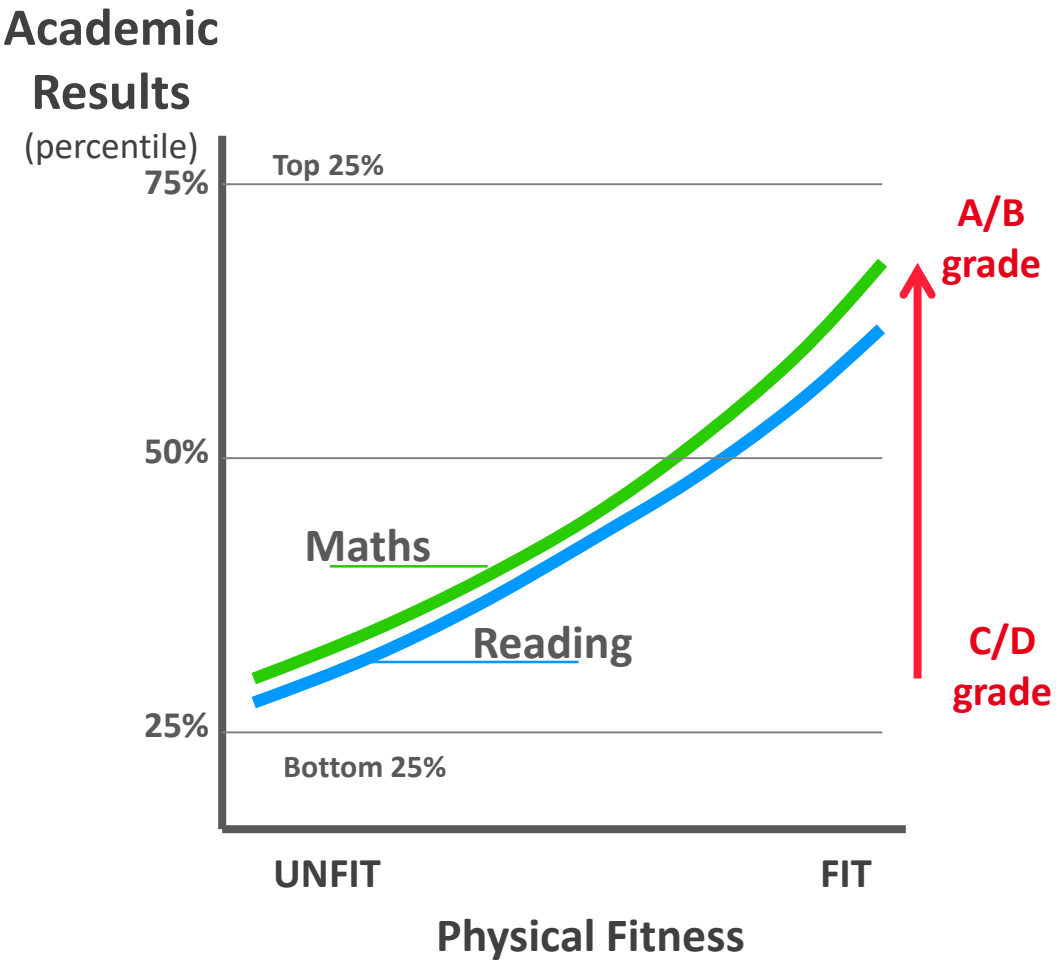
Academically, on a scale of 1 – 100, where do the MOST FIT and LEAST FIT score?

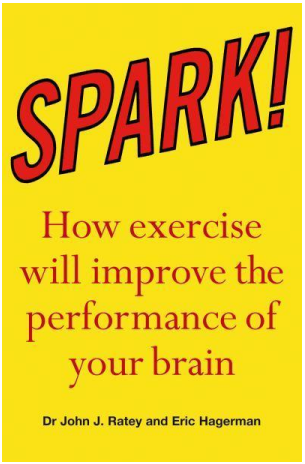


READY for the answer?

MOST FIT

Exercise makes brain cells grow… which helps academic performance





Source: Prof. John J Ratey, California Dept of Education 2001. Year 9 students (almost identical results for years 5 and 7)
Physical fitness score based on the 6 "FitnessGram" tests: areobic capcaity, % body fat, abdominal strength & endurance, trunk strength and flexibility, upper body strength, and overall flexibility

2007 study in Germany

Learn new vocab
TEST BEFORE

Learn new vocab
TEST AFTER

20% FASTER

Source: University of Muenster

The Brain

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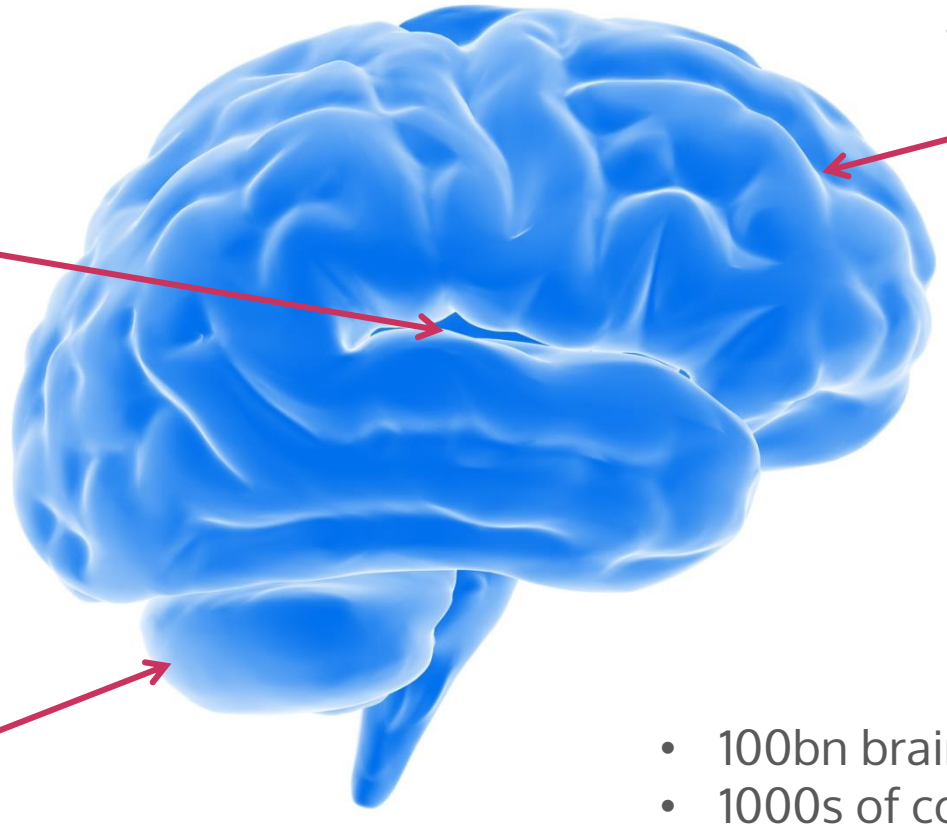
Pre-frontal cortex
Strategy, CEO,
Thinking

Hyppocampus
In the lymbic area
Automation / instinct



Cerebellum
Coordination:
movement, thought,
and pretty much
everything

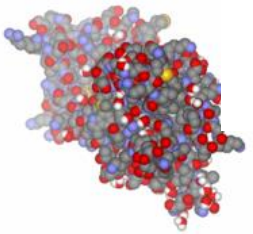
- 100bn brain cells
- 1000s of connections at each cell
- 1,000 trillion+ connections

Brain-Derived Neurotrophic Factor (BDNF)

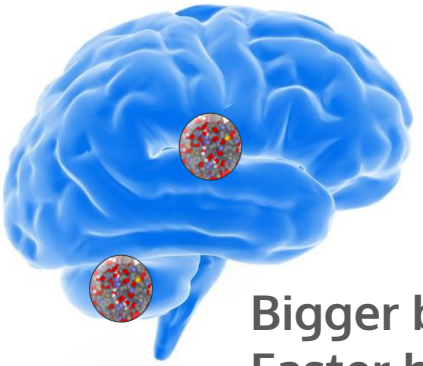
Brain fertiliser

Standard brain

Physical activity

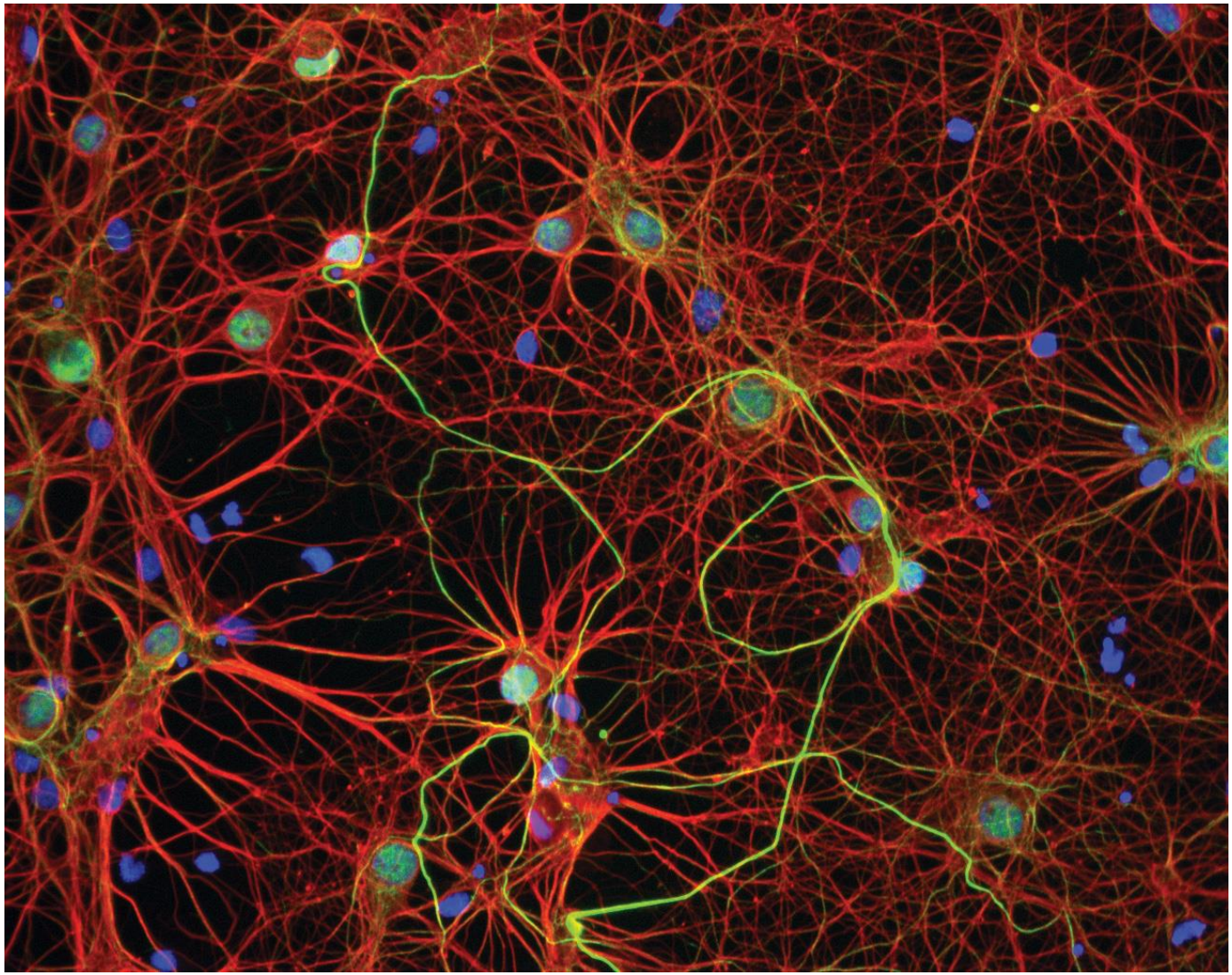


Brain-Derived Neurotrophic Factor (BDNF)



Bigger brain
Faster brain
Better brain

A memory…



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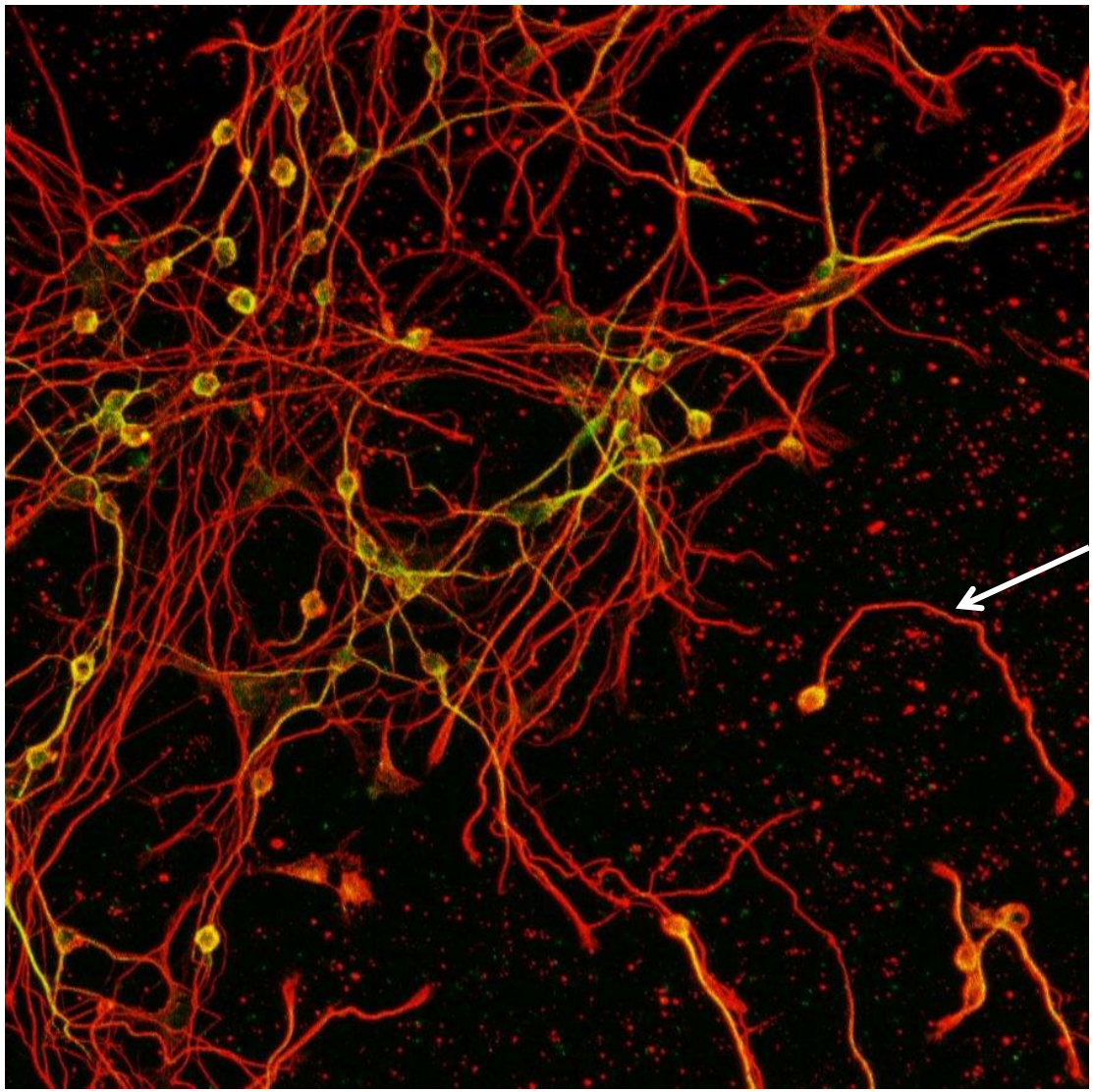
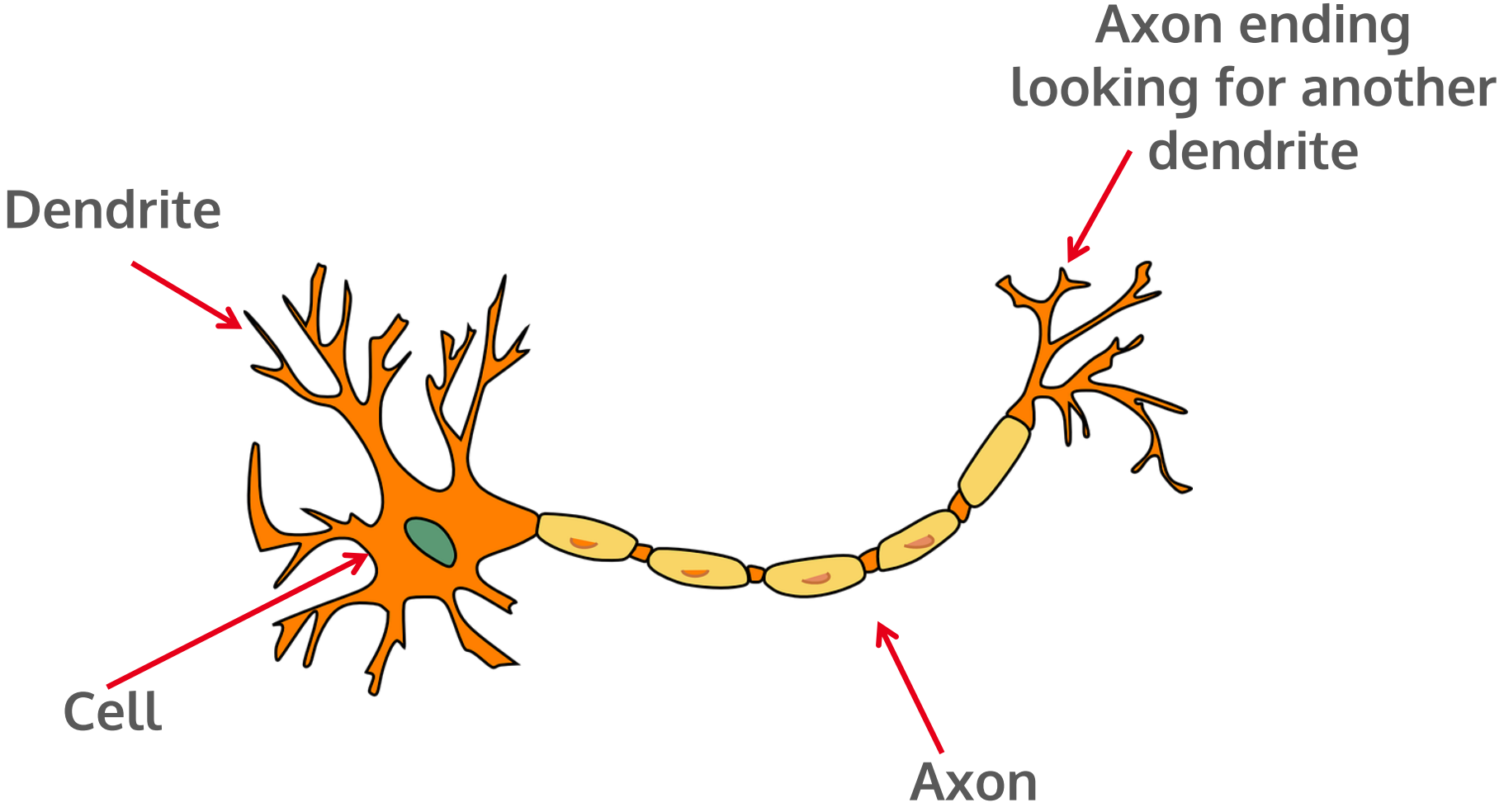
Not just IQ & EQ... PQ as well

"Physical Quotient"

Neurons will connect to each other

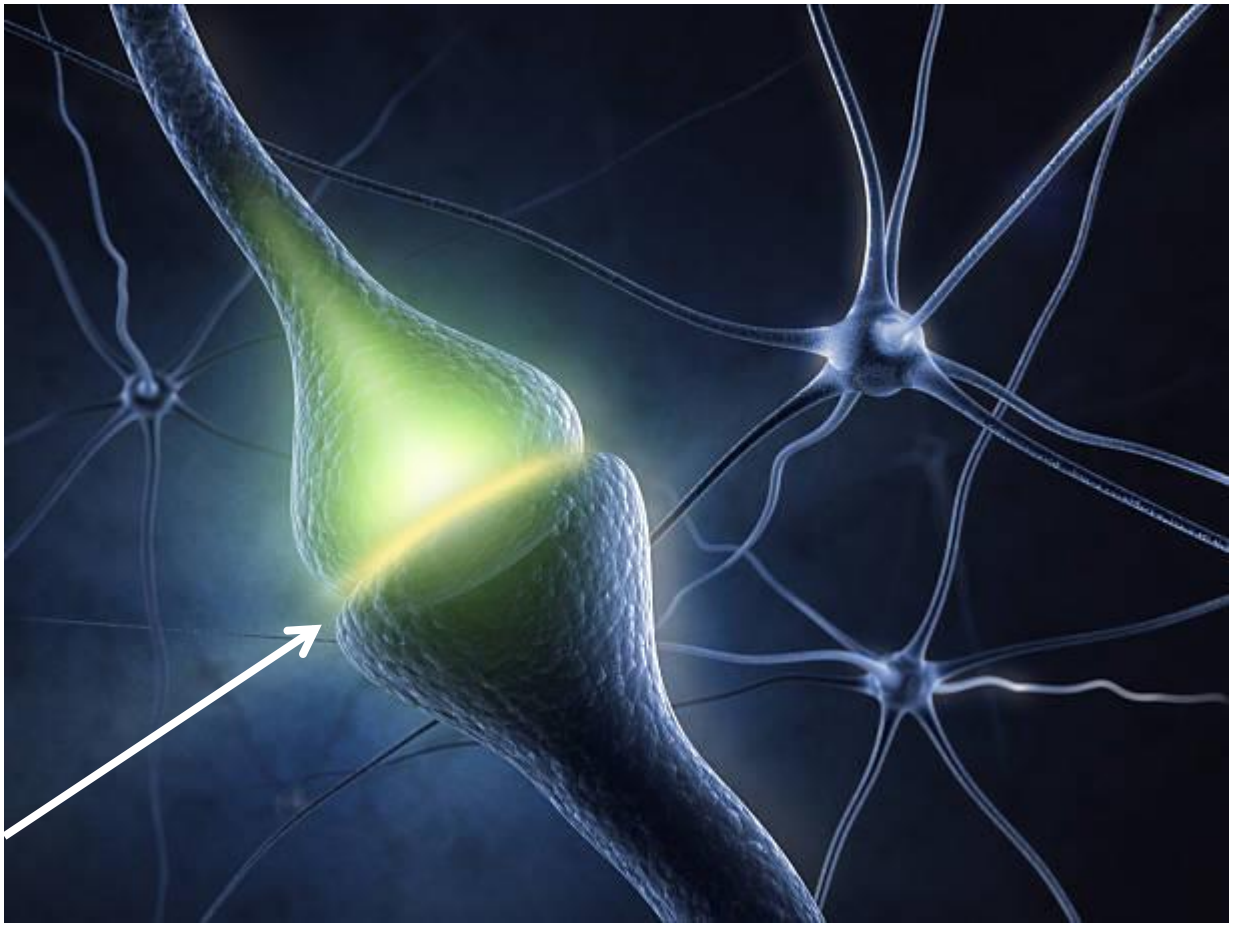


How nerve cells grow, connect & form circuits are critical to mood & emotion



Connections take place at a synapse

Neurotransmitters are chemicals that make connections in the brain



Exercise an important treatment for depression

1999 "SMILE" study, Duke University (James Blumenthal at al)

Anti-depressants	Exercise	Both
	• 40mins 3x/week • Vigorous (70-85% of aerobic capacity)	
16 weeks		
All three had approx 50% drop in depression +13% had fewer symptoms		
+6 months		
38% relapsed	8% relapsed	31% relapsed
↓	↓	↓
31% overall success rate	46% overall success rate	34% overall success rate

Exercise reduces (and often can help eliminate) anxiety

DISTRACTS — *Longer lasting*

REDUCES MUSCLE TENSION — *Circuit breaker (beta blocker)*

BUILDS BRAIN — *Balanced construction*

TEACHES DIFFERENT OUTCOME — *Similar physiological response, to no longer panic*

REROUTES BRAIN CIRCUITS — *Exercise => new pathways*

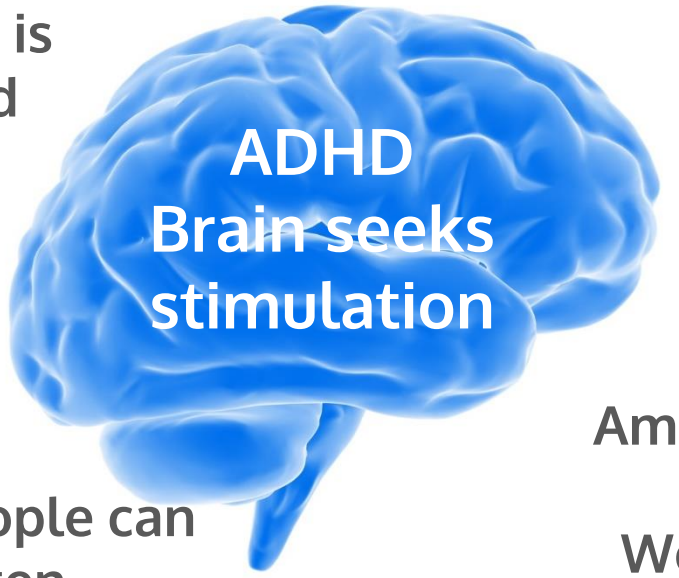
Body learns from periods without anxiety — **IMPROVES RESILIENCE**

Anxiety immobilises… exercise is an escape — **SETS YOU FREE**

ADHD – neurological disorder, better thought of as a TRAIT

Usually genetically transmitted

Neurological disorder in which the brain is under-stimulated

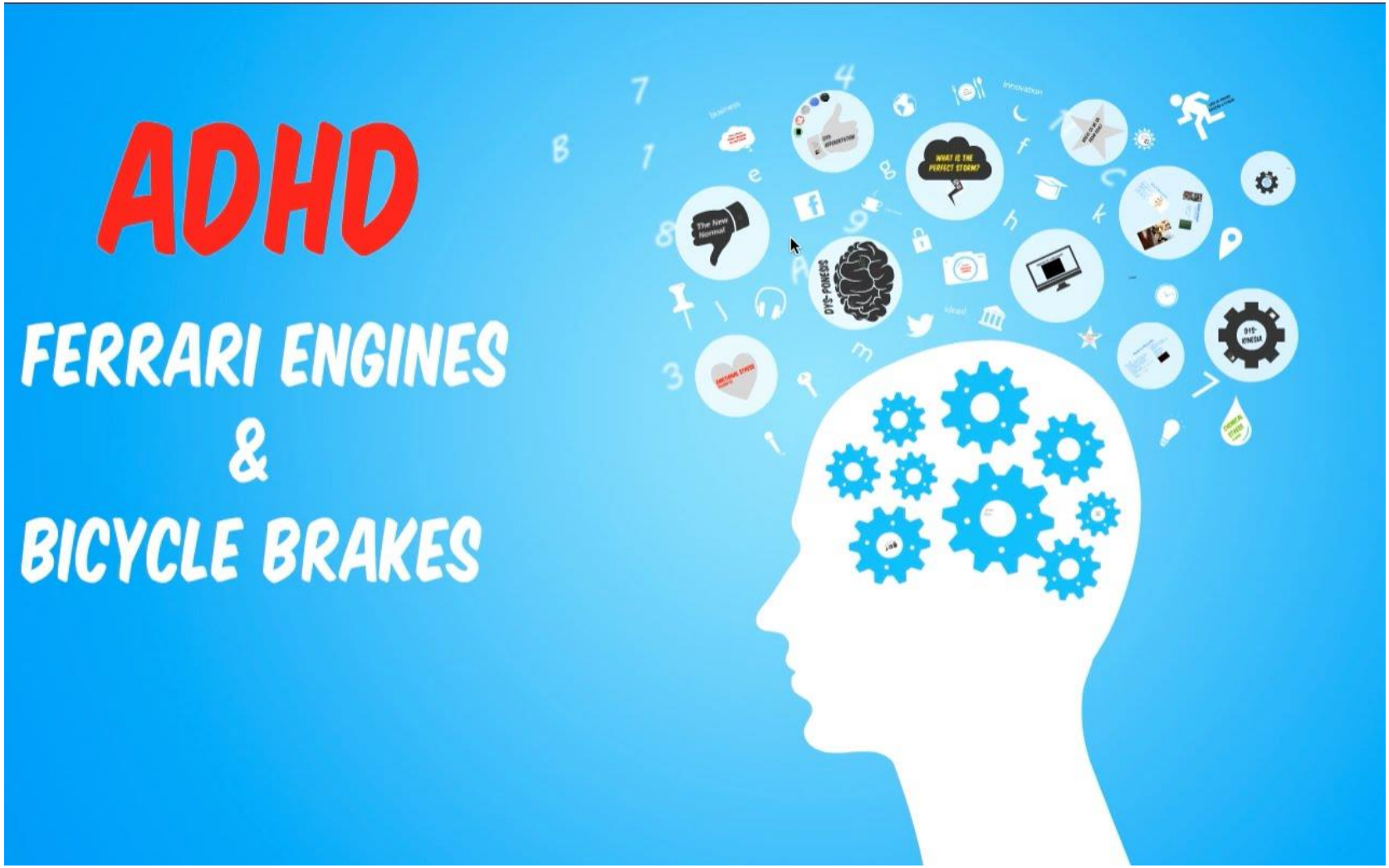


Exercise stimulates the brain!

Amphetamine-based drugs stimulate the brain
Works for 80% of people

Beware… High IQ people can often control often themselves, but the problem has not gone away

ADHD: a Ferrari brain with bicycle handbrakes



Thank you to Dr. Ned Hallowell (Harvard University) for coining this phrase

If you did not run
you did not eat

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PHYSICAL ACTIVITY

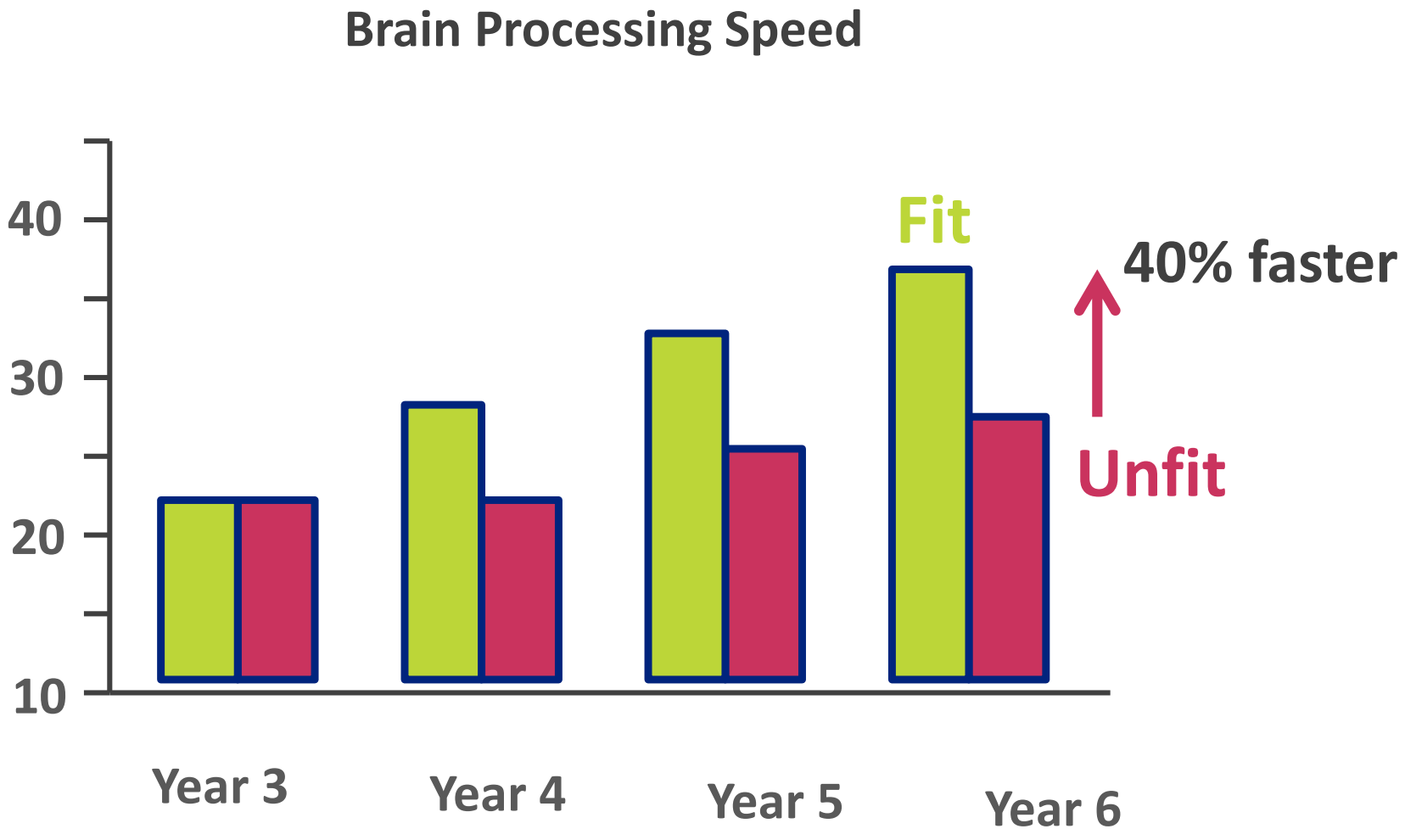
BUILDS THE BRAIN

so that

TEACHERS CAN FILL THE BRAIN

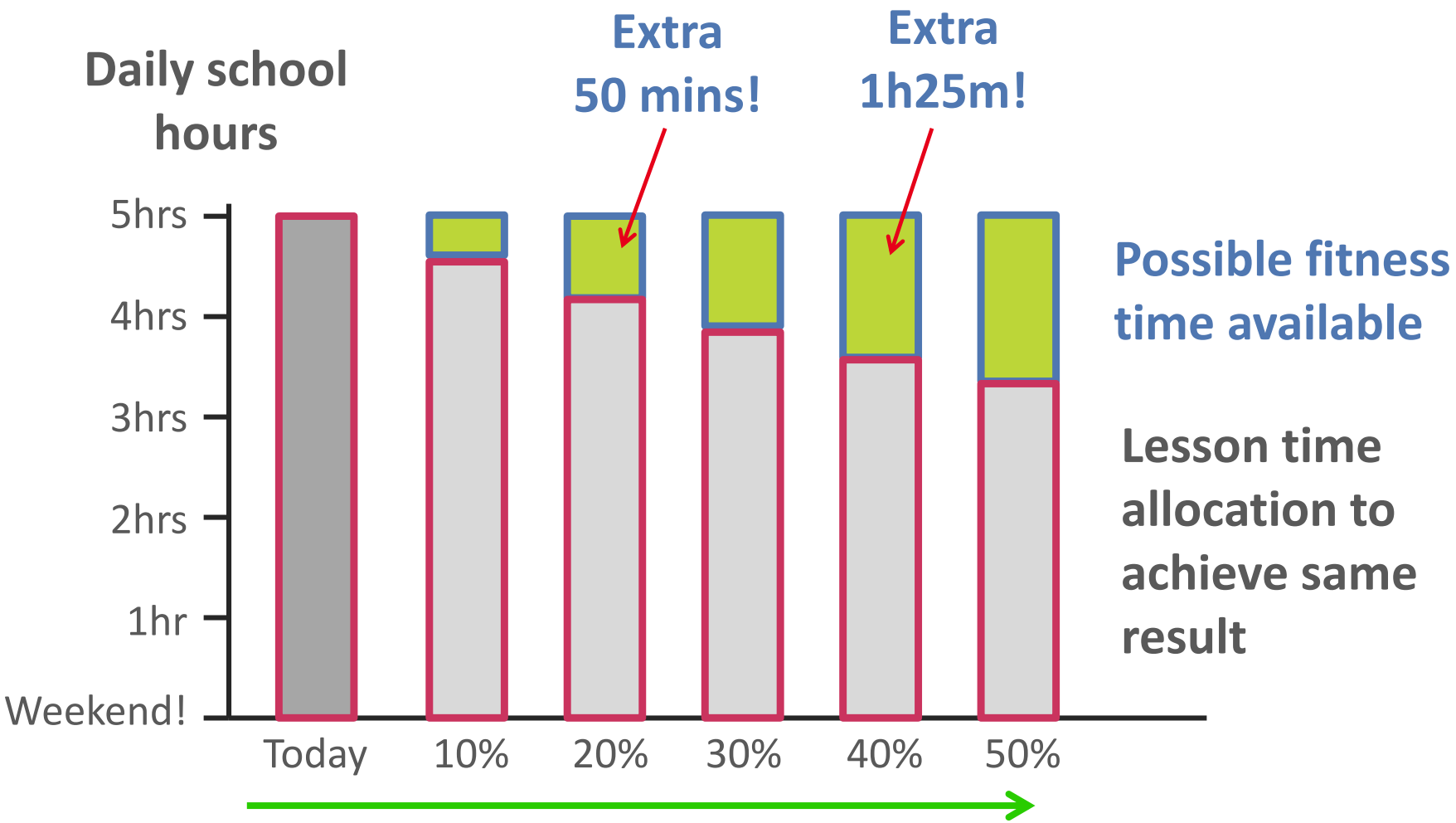
Studies

That 20% accumulates... here's what it does to your brain speed

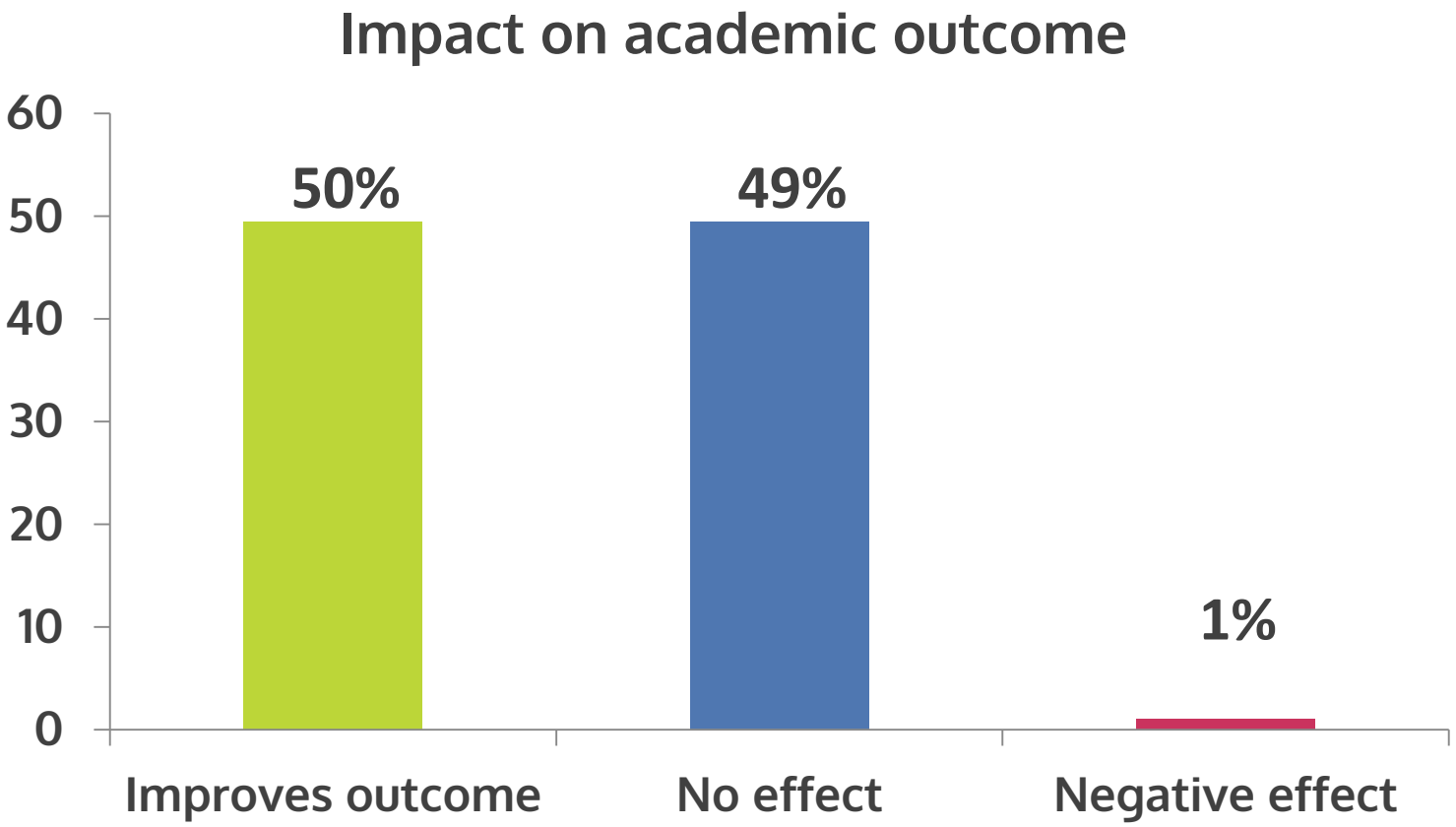


Unpublished research from University of Essex

That 20% could release a LOT of time during the school day

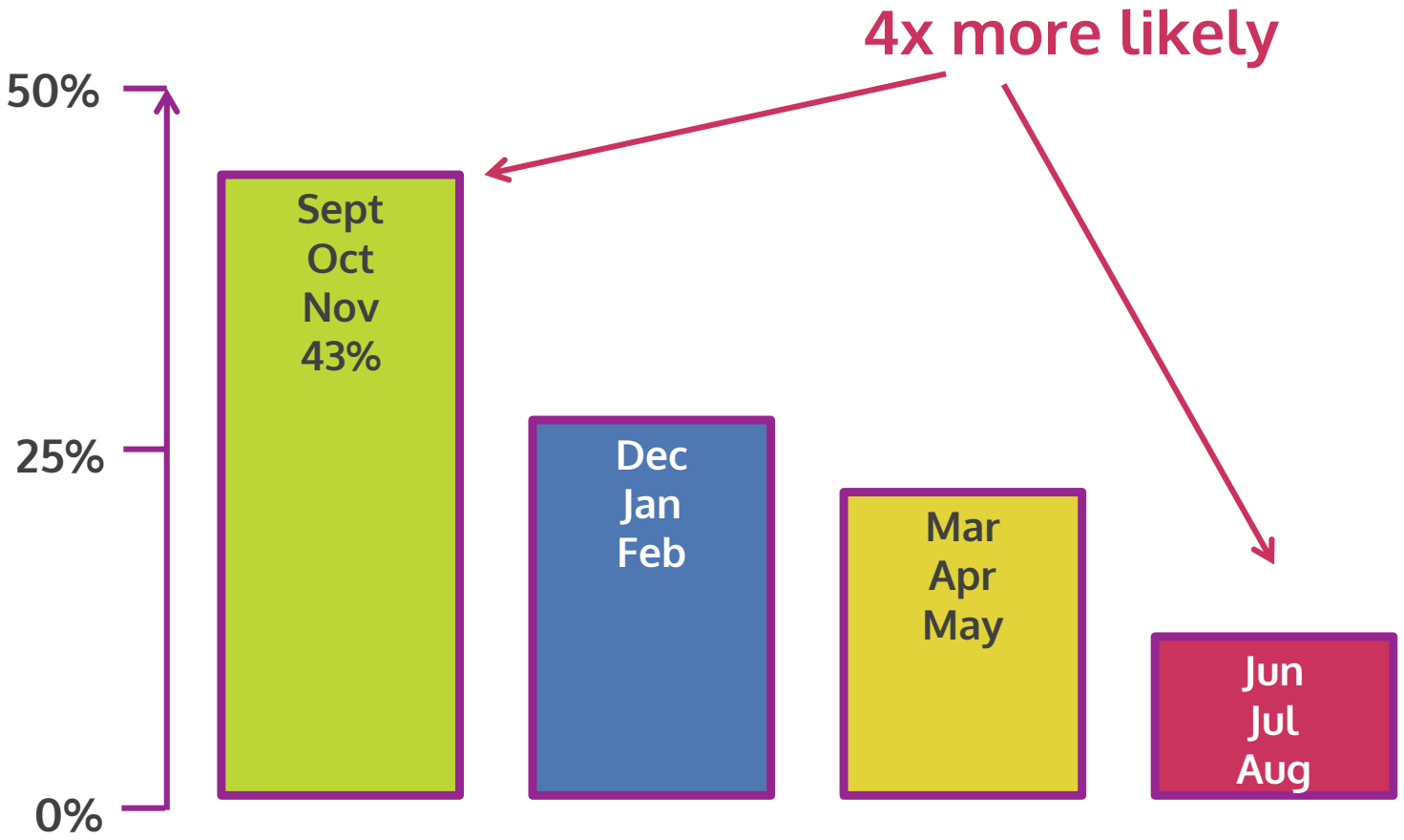


Reducing lesson time in favour of PE or Sport is a good idea



Data based on 14 US studies by centre for US decease control

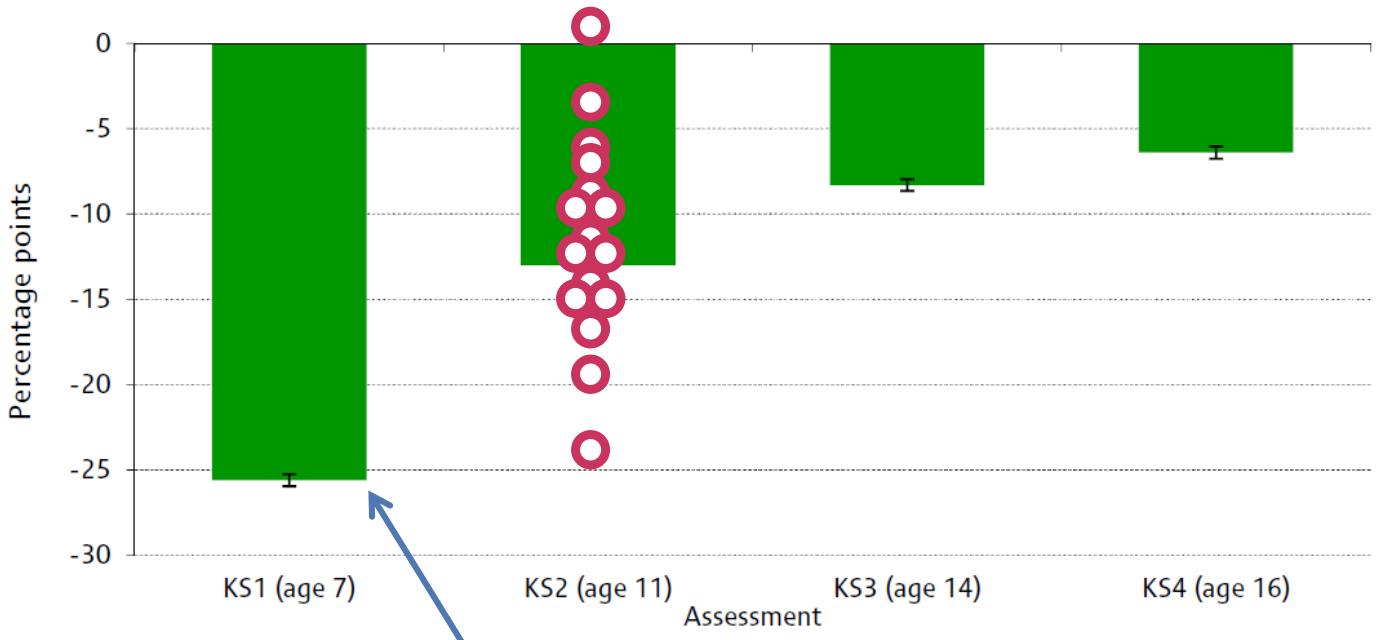
When you are born matters!



London Youth Games 2013, year 8 participants
month of birth

August-born pupils achieve less than September-born pupils

% points that August-born pupils achieve less than September-born pupils



Zero is the line where August-born achieve the same as September-born

KS1 August-born score **26% points less** (on average) vs government expected level than identical September-born pupils

Remember: These are averages… and no single person is average!

Source: IFS Report 80

Physically fit people earn 20% more money on average

Sources: UK Study by IFS

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Myth busters

Question 1

Which of these disease causes the most premature deaths in the UK?

- Obesity
- Smoking
- Inactivity

And the least?

Inactivity shortens more lives than smoking

Cause of premature deaths in the UK

100% can be avoided through 2.5hrs of moderate – vigorous exercise each week

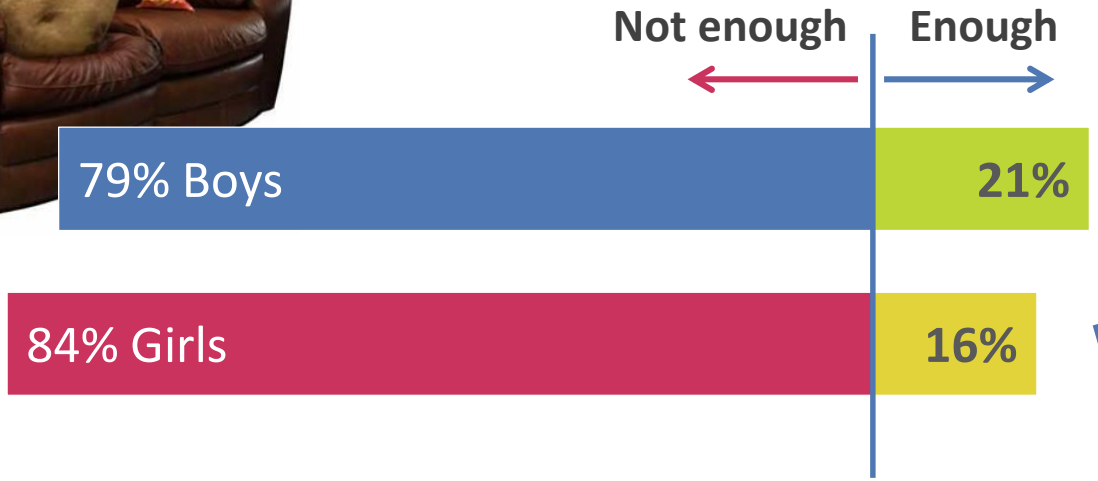
(1) Physical activity and all-cause mortality across levels of overall and abdominal adiposity in European men and women: the European Prospective Investigation into Cancer and Nutrition Study (EPIC)1–6. 14th January 2015, first published as as doi: 10.3945/ajcn.114.100065

Question 2

What percentage of children (5-17) in the UK do enough physical activity?

- **Boys**
- **Girls**

Over 4 in 5 children do not do enough exercise(1)



Down from 28% and 19% over 5 years!

The World Health Organisation says

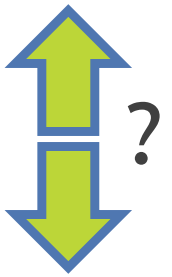
"Children aged 5-17 should do a MINIMUM of 1 hour's of moderate to vigorous physical activity every day"

(1) 2012 data

How has consumption changed in the UK (%)?

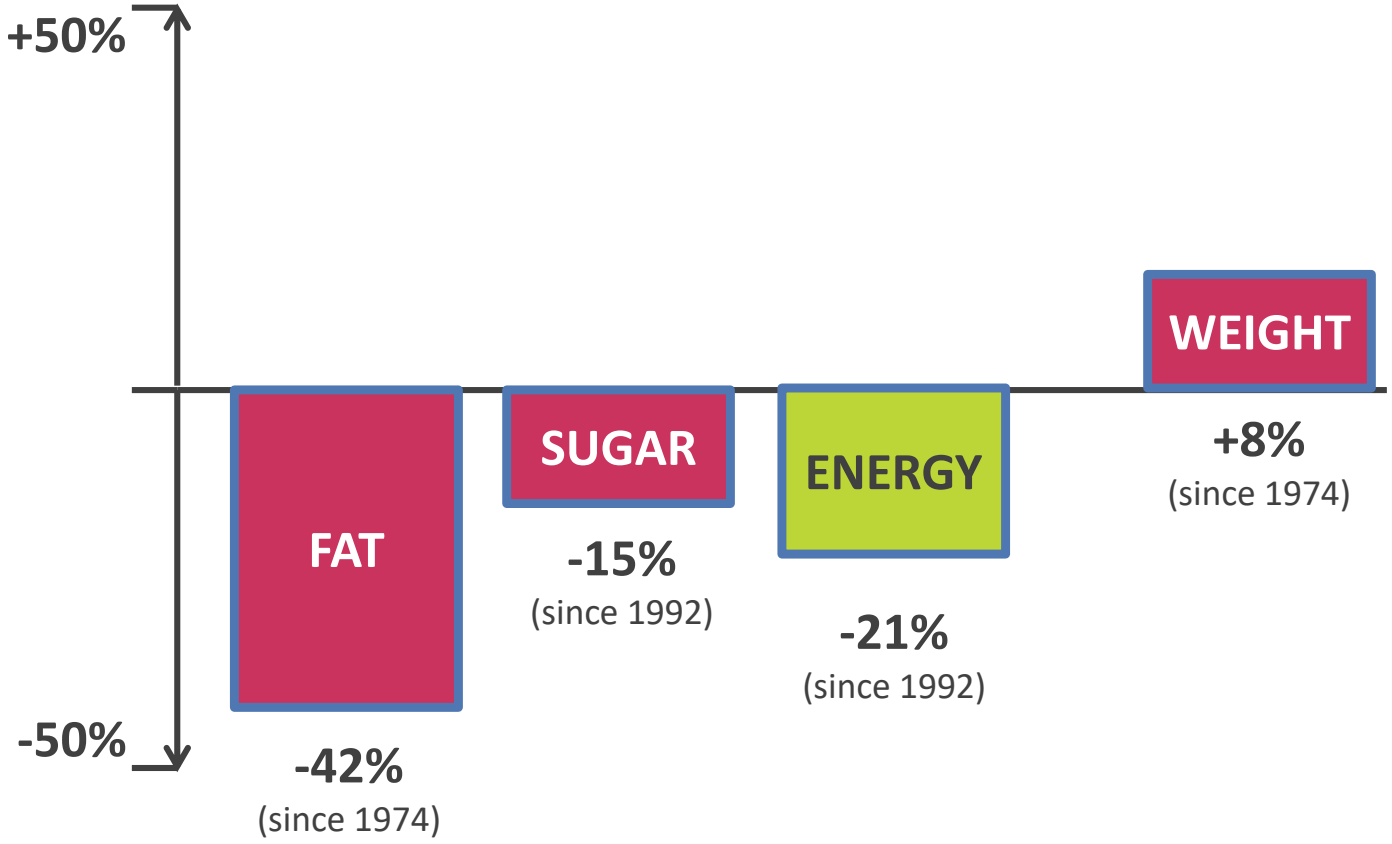
Sugar in past 20 years?

Saturated fat in past 40 years



Body weight in past 20 years

We consume a lot less but weigh a lot more



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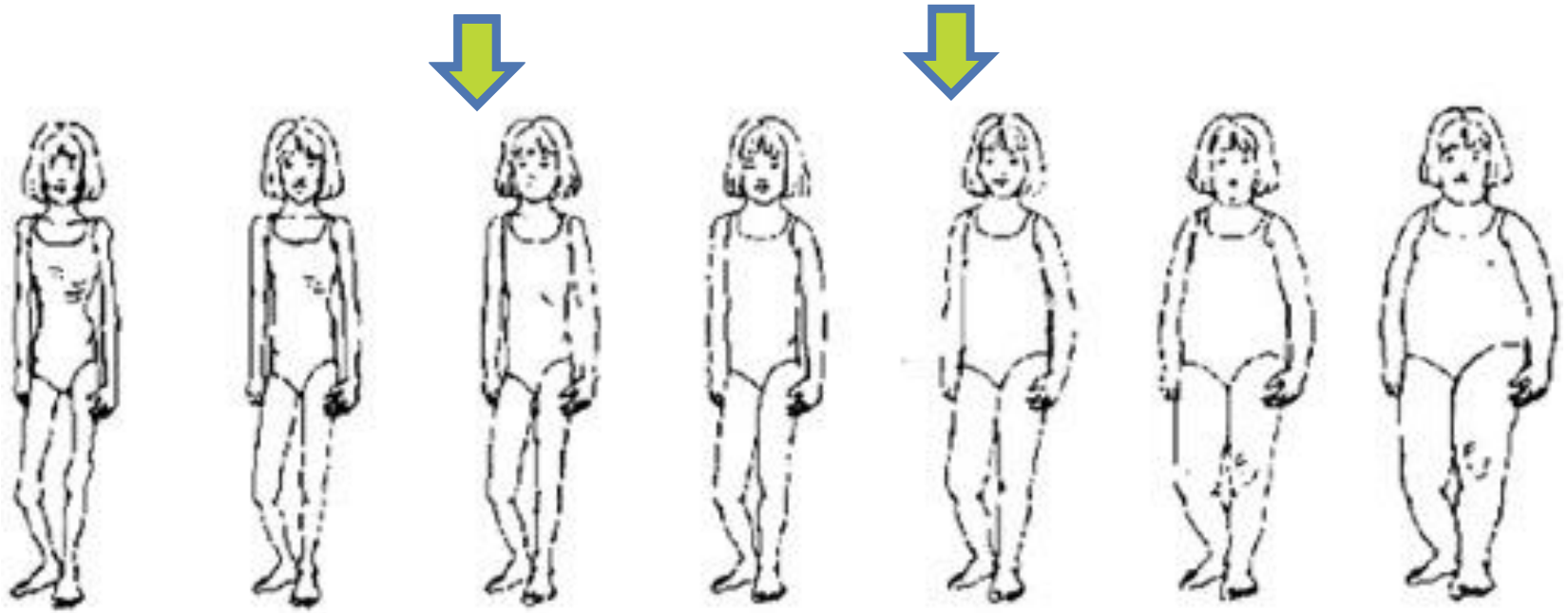
What proportion of mothers and fathers whose child is clinically obese think that their child is “about the right weight”?

Changing perceptions of what is “overweight”



In clinically obese 7-year old children…

- **1/3** of their mothers &
- over **half** of their fathers
- saw their child's weight as "**about right**"

Earlybird Study, Plymouth. BMJ 2004

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What to do about all this then?

Implication: POSITIVE LANGUAGE & CHOICE

POSITIVE language ⟺ **Choice**

Make sure **everyone** knows that **everyone** can **and will** be physically fit…
Group by ability not by age

Only 11 places on the football team…
Never give up offering **new activities** until everyone has found their thing(1)

(1) For example… dance, mountain biking, skating, climbing, swimming, badminton, squash, yard cricket, etc etc

It's about personal bests...

Personal Best

Kids want to have fun!

~~PE~~

~~Sport~~

GAMES

Sport

So… What's the right amount of physical activity?

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“It’s virtually IMPOSSIBLE to do too much physical activity”

Prof. John Ratey, MD. Harvard University

Chief Medical Officers' say…

- "All children and young people should engage in moderate to vigorous intensity physical activity for at least 60 minutes **and up to several hours every day**"
- "**Vigorous intensity** activities, including those that strengthen muscle and bone, should be incorporated **at least three days a week**"
- "All children and young people should **minimise** the amount of time spent being **sedentary** (sitting) for extended periods"
- The **least fit ten-year-old** English child from a class of 30 in 1998 would be **one of the five fittest children** in the same class tested in 2015

Chief Medical Officers' guidance, June 2011 for CHILDREN AND YOUNG PEOPLE (5–18 years)

How about you…

Moderate activity
feel warmer, higher heart rate and breathe faster

Vigorous activity
short of breath, rapid heart rate, can't carry on a conversation

Look back over the past 7 days: how many hours have you done?

Role-modelling…
one of the most powerful teaching tools

The amount of PE in schools is remaining roughly static at 2hrs week

HMI says the No. 1 area for improvement is:

"RAISE EXPECTATIONS OF WHAT PUPILS CAN ACHIEVE"(1)

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Turning that into practice for kids…

MINIMUM
1 hours moderate-vigorous exercise (ideally 2+ hours)

ASPIRATION:
1 hour EACH DAY at school

Independent schools average 5.4hrs per week

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Know where you want to go
not where you don't want to go

Don't focus on obesity prevention:
Focus on more FUN physical activity…

+

Kids are better than adults
at inventing FUN games

Interval training…

- **"HIIT": Short bursts of maximum exertion (95% max heart rate) with longer recovery times**
  - Eg: 20 seconds on, 20 seconds off for 2 minutes
- **Adding 2x 3min bursts in 40min treadmill run**
  - BDNF up
  - 20% faster vocab learning vs standard treadmill run

… builds the brain faster

- **Can do shorter workouts**
- **Used by athletes to build stamina**
- **Burns more calories**
- **Effect lasts 2-3 days (so repeat 2-3 times per week – job done!)**

(1) Souce: University of Bath
(2) Source: University of Muenster, Germany
(3) HGH: "master growth hormone", promotes BDNF (and much much more)

The more stimulating the workout the more BDNF

GOOD	BETTER	EVEN BETTER
Run	Football	3 on 3 basketball
Treadmill	Run in town	Run in forest
Run alone	Run with friend	Cross country + friend
Gym	Dance in group	Dance + random music
Doubles tennis	Singles tennis	Singles tennis + social

+20%

"low moderate" (60%)
to "vigorous" (80%)
2x energy

It's not what you look like… it's your heart rate that matters

FAT or FIT?

32 years old, 1.85m & 110kg
BMI = 32.1
OBESE

Being overweight does not mean you cannot be fit

Measure **heart rate** to find out how much effort you are expending

… and how much your brain is growing

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Breakout groups to workshop ideas for your school

Best plan / idea will win a free 5-session after school club for your school![1]

(1) Sensible Ts and Cs apply!

Brainstorming rules

- Everything is positive – never challenge an idea, however crazy (crazier the better)
- ALL ideas go up on the page, no exceptions
- When things fizzle out naturally, return to the list and VOTE – top 3 preferences each
- THEN review the ideas

What will you do differently?

2 Commitments from each individual please

- TOMORROW
- WITHIN 2 WEEKS

www.sportsforschools.org

www.clubsforschools.org

www.sportsforschools.org/get-active

Case studies

Case Study: Swanson Primary School, 500 pupils

What they did

- **Stopped saying no**
  - Misperceptions created a lot of well meaning but arbitrary and restrictive rules
- **Only two rules in the playground**
  - Can do anything in the playground… climb, get messy, run in the rain…
  - Two conditions: must not intentionally hurt other people or damage other people's property
- **Allowed children to create their own play**
  - Children do a better job designing "play"
  - Children have a natural amount of risk aversion
- **Head teacher took responsibility**
  - Released & emboldened teachers
- **Engaged teachers in the process**
  - How did they do it growing up? How different to now? What if this was them at home?
- **Didn't announce anything formally**
  - To anyone
  - Allowed it all to happen naturally

Assumptions challenged

- **Children prefer active play over technology**
  - When allowed to play freely they didn't hit their phones
- **When children play, they don't set out to hurt themselves**
  - Excellent at managing their own risk
  - Children have scooters, bokes, skateboards in the playground, at speed… quickly learn to watch out for each other
- **Adults don't need to design play… just need to allow it**
  - Kids are naturals!
- **When children are allowed to play, adults lives are much easier**
  - Kids so engaged their return to class more motivated to learn
  - Riskiest time is when they are bored, not when playing. Now have no more time-outs at break!
  - Kids are now sorting out their own problems

Source: Nike Active Schools report

Case Study: St Breock's Primary School

What they did

- **Used specialist sports/PE people**
  - Offered a whole range of sports & physical activity
  - Only used specialists
  - Offered lots of after school sports clubs
- **Connected pupils to local clubs**
  - Specialist sports staff do this automatically!
- **Offered free parent/pupil swimming**
  - 4x / year, with professional swimming teachers
  - Created community engagement
- **Diversified sports**
  - Eg, mountain biking, dance, tennis, yoga, fencing, archery
  - Budget: £61/pupil
- **Lead by example**
  - Teachers offered and ran evening fitness classes (for free)
  - Individual teachers took on extra curricular sports
  - Encouraged parents to take on clubs and get involved

Outcomes

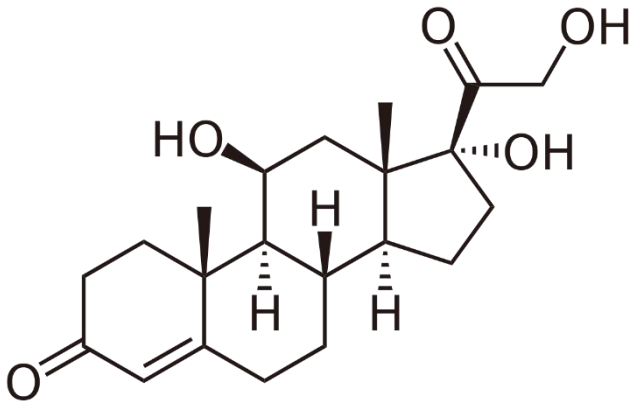
- **Attainment and achievement**
  - Went from average to highest 20% nationally… remained at that level consistently
  - Pupils understand concept of PERSONAL BEST
- **Attendance and school engagement**
  - Parents, teachers, pupils all proud to be part of the school and activities
  - Friday attendance up 2% points
  - Punctuality among targeted pupils up 5% points since morning climbing programme introduced
- **Behaviour and classroom management**
  - Fewer sanctions, better behaviour
  - **Ofsted "excellent" for behaviour,** children especially skilled at managing own behaviour
  - Children more confident in physical literacy, INCLUDING LESS SPORTY KIDS
  - 64% play sport outside school

Source: Nike Active Schools report

Neurotransmitters and hormones

Cortisol: more stress, more cortisol

- long-acting stress hormone
- mobilises fuel
- prepares brain and body



TOO MUCH IS TOXIC:
Erodes connections between neurons
+
More cortisol produced better to prepare for "emergency"!

Exercise counters this effect:
More BDNF, more receptors in the brain, more connections, more blood, better blood supply
+ rational brain overcomes instinct brain

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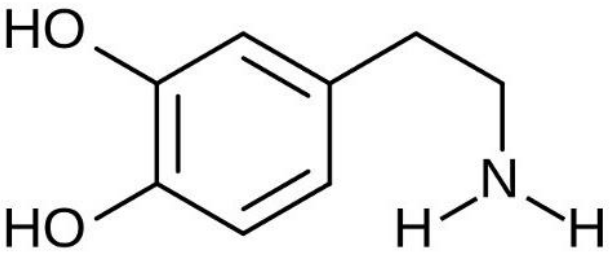
Two neurotransmitters... technically the only things you enjoy

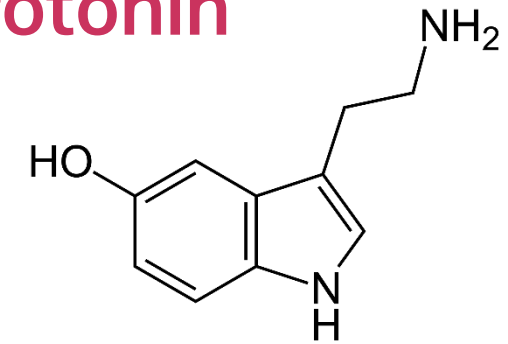
Dopamine



Movement, Attention, Cognition, Motivation, Pleasure, Addiction

Exercise IMMEDIATELY increases dopamine. Long term, it also increases dopamine receptors

Serotonin

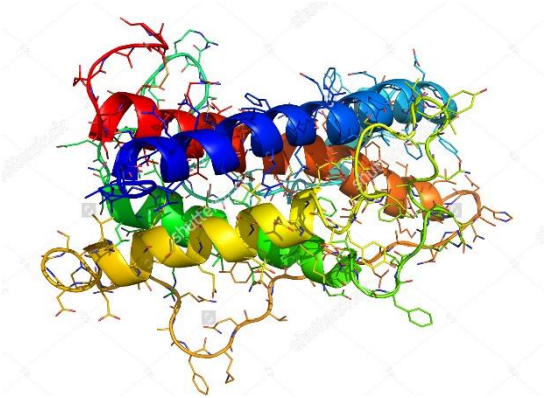


Mood, Anxiousness, Impulsivity, Learning, Self-esteem. POLICEMAN

Exercise IMMEDIATELY increases serotonin in the brain

Human Growth Hormone released by vigorous exercise

The “Master” Hormone
Vital to building all cells, and growing the body



Vigorous exercise massively increases HGH & boosts BDNF production

References

References and resources

- YouTube videos:
  - https://www.youtube.com/watch?v=evcNPfZlrZs
- John Ratey
  - TED talk: https://www.youtube.com/watch?v=hBSVZdTQmDs&t=234s
  - Spark! summary: https://www.youtube.com/watch?v=oqceJv4iNv4
  - Go-Wild: https://www.youtube.com/watch?v=TO6TMYTWQVA
  - Interviewed: https://www.youtube.com/watch?v=T3Zj3-10VXY; https://www.youtube.com/watch?v=DBHzes-NXcU
  - https://www.youtube.com/watch?v=xIHtWB4kX1w&t=698s
- Physical activity statistics (BHF): https://www.bhf.org.uk/research/heart-statistics/heart-statistics-publications/children-and-young-people-statistics-2013
- Parliamentary report on inactivity: https://parliamentarycommissiononphysicalactivity.files.wordpress.com/2014/04/apcopa-final.pdf
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