INPACT

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THE WORLD HAS STOPPED MOVING

TODAY’S CHILDREN ARE THE FIRST GENERATION TO HAVE A SHORTER LIFE EXPECTANCY THAN THEIR PARENTS
The compounding effects of physical inactivity over a lifetime

- 30% of children obese
- Misses school 2 days higher than average
- Lower fitness associated with lower test scores
- Ears less at work
- $2,741/yr higher health care costs
- 1 week/yr of extra sick days taken
- 5.3 million premature deaths/yr. due to inactivity
- Girls: 51% more likely to be held back a year in school
- Boys: 46% more likely to see themselves as poor students
- 2x as likely to be obese as adults
- Preschoolers with inactive parents are far less likely to be active

DesignToMove.org
LET’S GET MOVING!
Despite obesity concerns, gym classes are cut!
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active kids learn better

physical activity at school is a win-win for students and teachers

GRADES: 20% more likely to earn an A in math or English

STANDARDIZED TEST SCORES: 6% increase over 3 years

JUST ONE PHYSICALLY ACTIVE LESSON CREATES: 13% increase in students’ physical activity for the week

21% decrease in teachers’ time managing behavior

physically active kids have more active brains

BRAIN SCANS OF STUDENTS TAKING A TEST:

after 20 minutes of sitting quietly

after 20 minutes of walking

Red areas are very active; blue areas are least active.

MORE RESULTS:

after 20 minutes of physical activity:
students tested better in reading, spelling & math and were more likely to read above their grade level

after being in a physically active afterschool program for 9 months:
memory tasks improved 16%

Take 10!® bring physical activity in the classroom

Take 10!® Successes

• 10 minutes classroom-based physical activity
• 40+ activities per grade level
• 50,000 classrooms in the U.S. using TAKE10® reaching 1 million children

Can we do better?

• Can we incorporate 20, 30, 40 minutes of activity in the classroom?
• Can we reduce prolonged sitting?
• Can we simultaneously increase physical activity and reduce sitting in the classroom?

ACTIVE CLASSROOM

Finding from the laboratory
Participant Characteristics

- 39 participants
  - 18 males, 21 females

- Age
  - 31% 8-year-old
  - 31% 9-year-old
  - 38% 10-year-old

- Race/Ethnicity
  - 41% White
  - 59% Non-white

- Body mass index
  - 18.5±0.6 kg/m² (14.3-30.9)

- Weight Status
  - 67% Healthy (15-84<sup>th</sup> BMI %ile)
  - 20% Overweight (>85<sup>th</sup> BMI %ile)
  - 13% Obese (>95<sup>th</sup> BMI %ile)

- Activity Status
  - 72% regularly active
  - 28% non-active
Active Class Space: findings from the laboratory

- Sedentary
- Low-Intensity (20-30% HRR)
- Moderate-Intensity (40-60% HRR)
- High-Intensity (70-80% HRR)

Diagram:
- Participants arrive at the laboratory
- Standardized dinner: 18:00
- Standardized breakfast: 8:00
- Standardized lunch: 11:00
- Meal provided to eat at home: 14:00
- Accelerometry 3 days post
  Food records 3 days post: 16:00
- Participants return home
  Pick up remaining food: 12:00
Methods Validation

All conditions significantly different from control condition (p<0.0001)

Movements in the laboratory
Spontaneous PA in children do not change in response to intermittent activity or prolonged sitting

*significant difference across conditions

Intermittent activity does not alter appetite sensations and food intake in children

Hunger sensations

Energy balance

No differences across conditions

High-intensity intermittent activity resulted in a -300kcal energy deficit

T.A. Ajibewa et al., The effects of intermittent activity breaks on appetite sensations in elementary school age children. In press at PLoS ONE, 2017
Children “felt good” during the activity breaks

Mood is improved in overweight children with intermittent activity

T.A. Ajibewa et al., *The effects of intermittent activity breaks on appetite sensations in elementary school age children. In press at PLOS ONE, 2017*
THE MORE THEY BURN THE BETTER THEY LEARN

Did you know that kids who are physically active get better grades?

Research shows that students who earn mostly A's are almost twice as likely to get regular physical activity than students who receive mostly D's and F's.

Physical activity can help students focus, improve behavior and boost positive attitudes. Do what you can to help your child be physically active, be it running, biking or swimming. Any type of physical activity is good, and 60 minutes a day is best. Their grades will thank you!
Ten intermittent breaks (both active and screen time) maintained midday math performance

Attention and Focus after Activity

Image Source: Kindergarten Cop, 1990
Will this work in a classroom?

InPACT 2016
Interrupting Prolonged sitting with ACTivity

"Incorporating purposeful movement into the classroom to prepare the brain for learning"
InPACT 2016

- Goal: Incorporate 10 moderate-to-vigorous physical activity breaks woven into the curriculum to improve movement and learning in the classroom.

Overarching research question: Can the teachers do it?
THE TEAM

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TAUBMAN COLLEGE
architecture + urban planning
University of Michigan

ceder

THE CENTER FOR EDUCATION DESIGN, EVALUATION, & RESEARCH
UNIVERSITY OF MICHIGAN
SCHOOL OF EDUCATION

INPACT
Active Class Space: findings from the studio

How much space does a child need to safely move in a classroom?
Classroom floorplans

How can teachers redesign their classrooms to promote learning and moving?
InPACT Feasibility

- Teacher outcomes
  - Can the teachers implement the activity breaks in their classrooms?
  - Barriers and successes

- Classroom management
  - Transition time?
  - On-task behavior after an activity break?

- Student outcomes
  - Did the children enjoy the activity breaks?
  - Did the children perform the activity breaks at the right intensity?
PARTICIPATING SCHOOLS

Columbia Upper Elementary
321 School Street
Brooklyn, MI 49230
Christi O’Neil, Principal

Estabrook Learning Center
1555 West Cross Street
Ypsilanti, MI 48197
Raymond Alvarado, Principal

Jesse L. Anderson Elementary
2600 Harrison Avenue
Trenton, MI 48183
Douglas Mentzer, Principal

www.inpact.kines.umich.edu
Compendium of Physical Activities

**INDIVIDUAL**

**Jump That Way**

- The teacher then calls a number between 1 and 4, which indicates the direction that the students will jump.
  - o 1= jump to the right
  - o 2= jump to the left
  - o 3= jump forward
  - o 4= jump backwards

- Students will then jump in that direction.

- While waiting for the teacher to call out another number, the students must jog in place.

- Continue the activity for four minutes.

**INDIVIDUAL**

**Traffic Light**

- Students stand in place and respond to the color of the traffic light the teacher says, in the following manner:
  - o Green light= move feet as fast as possible in place.
  - o Yellow light= march in place.
  - o Red light= stomp your feet in place and pretend you’re a zombie, as fast as possible.
Compendium of Physical Activities

GROUPS

Trading Places

- Have students begin jogging in place behind their desks.
- Call out a trait and everyone who has that trait has to jog to switch places with someone else who also has that trait.
- If someone doesn’t have the trait they should continue jogging in place behind their desk.
  - Examples:
    - Everyone with curly hair
    - Everyone who ate cereal for breakfast
    - Everyone who is wearing stripes.

PAIRS

Rock, Paper, Scissors with Feet Challenge

- Have students stand up and pair up.
  - Rock = feet together
  - Paper = feet spread apart
  - Scissors = feet in a crisscrossed position
- To start have students begin jumping three times and after third jump the students should stop on one of the above positions.
- Play for four minutes.
Two-day summer workshop

• Day 1: Intro to the InPACT project & classroom management
Two-day summer workshop

- Day 2- Curricular changes with School of Education & classroom redesign with School of Architecture
Heart rate monitoring
InPACT by the numbers

Teachers preferred fewer breaks that lasted 4 minutes.

Students reported an 8 out of 10 on their confidence to complete 30 minutes of physical activity every day at school.

On average, teachers were able to implement 5 activity breaks per day in their classrooms.

Average transition time to activity breaks was 1 minute. The shortest time was 2 seconds.

99% of students were on-task within 30 seconds of completing an activity break.

Children reported a 4.2 out of 5 on an enjoyment scale during activity breaks.

85% of students were exercising at a moderate-to-vigorous intensity.

Quotes from participating teachers

• "Kids are enjoying them and getting accustom to them in our routine and understanding how to focus afterward."

• "The students were enthusiastic about the breaks and were looking forward to doing them."

• "Students were engaged afterwards and look forward to the activity breaks."

• "Gave them an outlet for their rainy day energy."

• "Students were more able to focus."
The compounding benefits of physical activity over a lifetime

Active parents associated with active kids

Kids of active moms are 2x as likely to be active

Compression of Morbidity 1/3 the rate of disability

MAY LIVE 5 YEARS LONGER

Reduced risk of heart disease, stroke, cancer, diabetes

Full week of wages gained due to less absenteeism

Stronger economies

DesignToMove.org
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