

# Sit-stand workstations in the school classroom: long-term effects on physical (in)activity, sedentary behavior, physical fitness, academic performance, cognition, quality of life, sleep, and stool in primary school children.

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With this study we aim to research whether long-term behavior change can be induced by changing the school environment: implementing sit-stand desks to reduce sedentary time in the classroom. In addition, we investigate whether sedentary time...

<b>Ethical review</b>	Approved WMO
<b>Status</b>	Recruitment stopped
<b>Health condition type</b>	Other condition
<b>Study type</b>	Interventional

## Summary

### ID

NL-OMON45326

### Source

ToetsingOnline

### Brief title

A good beginning: Sit-stand workstations in the primary school classroom

### Condition

- Other condition

### Synonym

physical (in)activity, Sedentary behaviour

### Health condition

Geen aandoeningen; het betreft in principe gezonde kinderen.

## **Research involving**

Human

## **Sponsors and support**

**Primary sponsor:** Leyden Academy on Vitality and Ageing

**Source(s) of monetary or material Support:** Gemeente Leiden; voorts in-kind bijdragen van Lorentzschool Leiden; Universiteit Leiden (Fac. Soc. Wetenschappen; sectie Psychologie); Hogeschool Leiden; UMC Utrecht, Presikhaaf, schoolmeubelproducent; levert gratis de zit/sta-tafeltjes.

## **Intervention**

**Keyword:** Academic performance, Children, Sedentary behaviour, Sit-stand desk

## **Outcome measures**

### **Primary outcome**

Time of physical (in)activity (as measured during five school days; i.e., time spent lying, sitting, standing, walking, running, cycling, etc., during and outside school hours).

Academic achievements following a regular Dutch system (leerlingvolgsysteem, CITO); this is the primary outcome for the school.

### **Secondary outcome**

Physical fitness:

Shuttle-run test

Vertical jump

Hand grip strength

Physiology:

Length

Weight

Body composition (percentages fat and muscle mass)

Cognitive functions:

N-back test (working memory)

Wisconsin Card Sorting Task (cognitive flexibility)

Tower of London (planning)

Fish Flanker test (inhibition)

Psychology:

Faces scale (happiness)

KIDSCREEN 52 (quality of life)

Extra:

Sleep diary

Stool diary

Satisfaction with the school environment

## Study description

### Background summary

Following the advances in technology in the past century, people nowadays spend the largest part of their waking hours sedentary. Sedentary behavior is associated with obesity, cardio-vascular diseases, diabetes, and a reduced cardio-respiratory fitness; not just in adults, but also in children. In addition, sedentary behavior is associated with reduced self-confidence and academic under-achievement. Sedentary behavior learned in school continues into

adolescence and adulthood. From childhood onwards, sedentary behavior becomes the rule rather than the exception: children spend a large part of their waking hours at school in a classroom that is designed for sitting.

Therefore, the school setting, in particular, is the place to reduce children's sedentary time and promote standing and active behavior. Given the fact that the environment has a very strong influence on behavior, sit-stand desks may invite and seduce children to sit less time and promote standing and active behavior. Health benefits of reducing sedentary time have been demonstrated in studies in adults at work and in recent, short-term studies in children. In these studies the availability of sit-stand desks did reduce sedentary time and increased energy expenditure while academic performance didn't suffer.

Moreover, it is suggested that academic performance benefits from less sitting and more standing. Additional advantages of reducing sedentary behavior in the classroom are better concentration and task focus. However, all these benefits have only been reported in short-term studies.

## **Study objective**

With this study we aim to research whether long-term behavior change can be induced by changing the school environment: implementing sit-stand desks to reduce sedentary time in the classroom. In addition, we investigate whether sedentary time reduction (and increase of standing time and active behavior) has positive effects on physical fitness, academic achievements and cognitive skills, body composition, quality of life, sleep and stool. With the results better advice can be given for health promoting changes in the school environment.

## **Study design**

This is a single-blind, randomized, controlled trial with a baseline assessment (in June 2017) and repeated measures. These will take place twice each year for two and a half years: in January and in June (the final assessment will be in June 2019).

The children and parents will be asked whether the children may be contacted for another week of activity monitoring seven years after commencement of the study. If so, then at that moment they will be asked again whether the children may be contacted for another week of activity monitoring seven years later. After that, the same procedure is followed one more time. This would mean that these children will go through three more test weeks after the initial study at the Lorentzschool until they are around thirty years old.

## **Intervention**

The children in the intervention group (approximately 28; 8-10 years old) will receive sit-stand workstations in their classroom. They will keep these for two and a half years. Their teacher will also receive a sit-stand workstation. The

children are invited and motivated to reduce sedentary time at school. They are not ordered or obligated to stand more than would normally happen in classrooms without sit-stand workstations.

The children in the control group (approximately 28; 8-10 years old) will use regular (sit) workstations and will receive regular treatment.

### **Study burden and risks**

For the experimental group there are no additional risks with the sit-stand desks in their classroom compared to the group keeping their regular school furniture. These sit-stand workstations are easy to handle by children.

For both groups there are no risks involved in testing. Most tests are regular tests that could have been performed otherwise as well.

Furthermore, there are computer tasks to test cognitive functioning at school and questionnaires that can be filled in at home. There are no health risks involved.

It is expected that the activity monitoring will cause the largest burden: a small device (Activ8 activity tracker) will be taped (Tegaderm, 3M) to the upper leg for a school week (Monday to Friday). Together with the parents/carers this process will be monitored. In case skin irritation occurs, alternative ways to fix the device to the upper leg will be investigated or the measurements with the device will be stopped.

## **Contacts**

### **Public**

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### **Scientific**

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## **Trial sites**

## Listed location countries

Netherlands

## Eligibility criteria

### Age

Children (2-11 years)

### Inclusion criteria

Children who are following regular primary education and are in grade 5 in the Dutch system (8-10 years old)

Children with a signed informed consent form to participate in this study (given the age, parents/carers should sign the informed consent form)

Children who are physically able to stand without any serious health issue

### Exclusion criteria

Children who are not following primary education in grade 6 in the Dutch system

Children who are not physically able to stand, due to health issues or serious injuries; note that a child who is normally physically able to stand, but temporary unable to do so because of a recovery from a short-term injury or trauma, can still participate in this study

Children who object to participate; examples of objection are (signals of) fear, sadness and anger

## Study design

### Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Single blinded (masking used)

**Primary purpose:** Prevention

## Recruitment

NL  
Recruitment status: Recruitment stopped  
Start date (anticipated): 28-08-2017  
Enrollment: 56  
Type: Actual

## Ethics review

Approved WMO  
Date: 17-08-2017  
Application type: First submission  
Review commission: CCMO: Centrale Commissie Mensgebonden Onderzoek (Den Haag)

## Study registrations

### Followed up by the following (possibly more current) registration

No registrations found.

### Other (possibly less up-to-date) registrations in this register

ID: 23559  
Source: NTR  
Title:

### In other registers

Register	ID
CCMO	NL60159.000.17
OMON	NL-OMON23559