Late to Bed, Late to Rise Makes Teens Healthy & Wise:

The Case for Starting School Later

NJAAP 30TH ANNUAL SCHOOL HEALTH CONFERENCE

OCT 2021

New Jersey Chapter
INCORPORATED IN NEW JERSEY
American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN®

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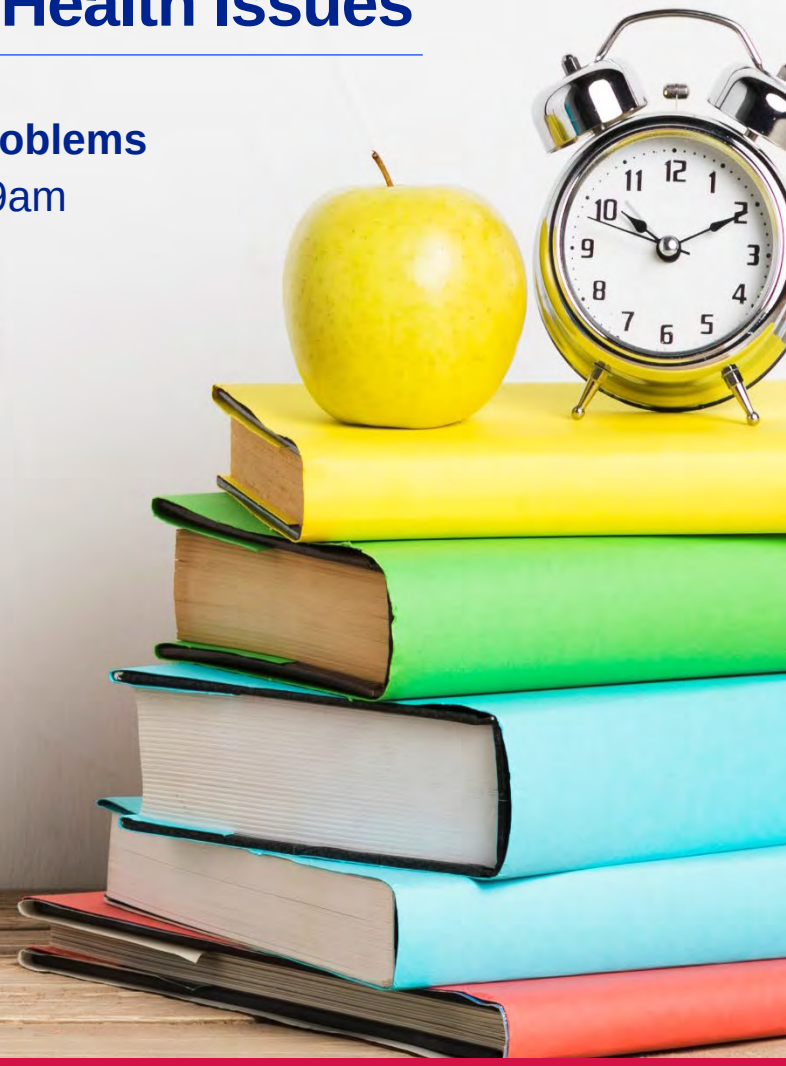
Learning Objectives

As a result of attending this webinar, participants will be able to:

- Understand adolescent sleep patterns and discuss the significance of brain development and changes in circadian rhythms on adolescent mental and physical health
- Learn about research demonstrating the benefits of delaying school start times related to school attendance, academic performance, athletics, and mental and physical health.
- Review a Case Study of a New Jersey school district that has successfully implemented a later school start time
- Describe the advocacy efforts involved in making school start times more closely aligned with student health
- Identify practical tools and resources to help patients and families ensure their adolescents get adequate sleep, and ways to get involved locally in making change on this issue

Background Information
History, the Adolescent Brain and Incidence of Mental Health Issues

- **Early School Start Times were initiated in most districts to solve transportation problems**
  - Schools did not always start early- in the 1950's and 1960's- start times were 8:30-9am
  - They progressively moved to earlier times from mid 1980's to early 2000s
  - There is no educational benefit to HS students from starting school early
- **Adolescents' brains are developing through age 25**
  - Adolescence is the second most critical time period for brain growth after infancy
  - Adolescents make more impulsive decisions when tired
- **Mental Health Issues in Adolescents have been on the rise and are increasingly impacting HS students**
  - Suicide attempt rates doubled from 2008 to 2017- seen both locally and nationally
  - Mental Health ER visits locally have now tripled comparing 2018 to 2008



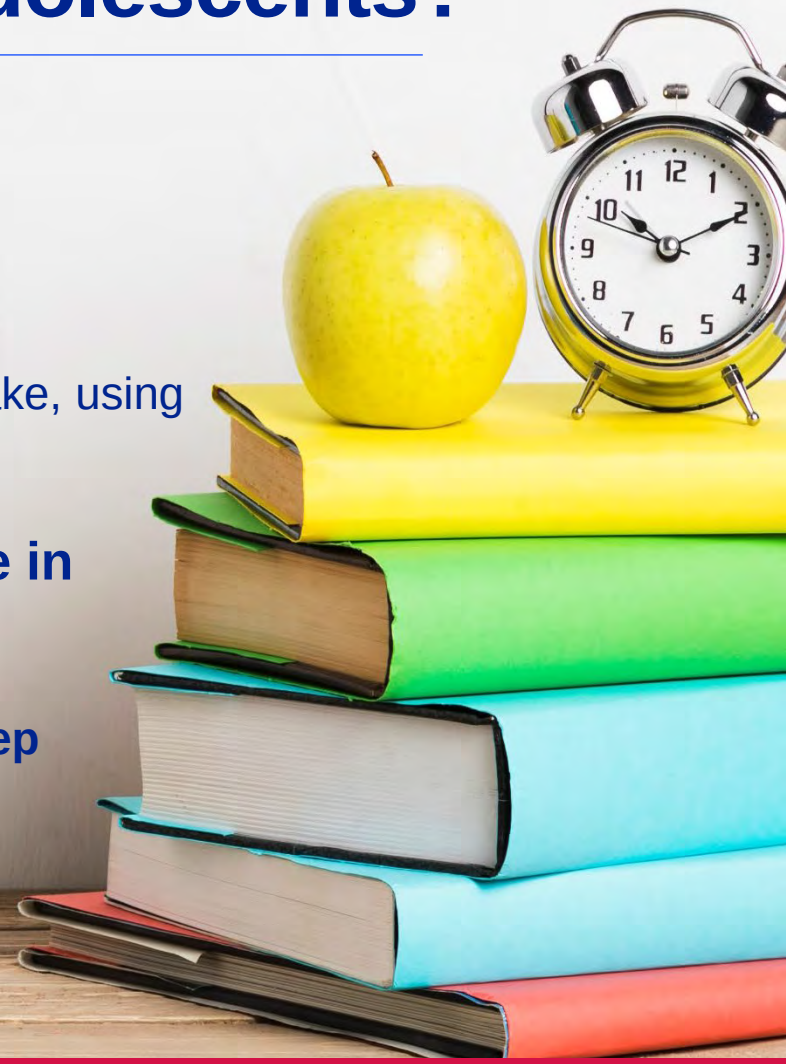
Background Information
Sleep

- **Sleep is Critical**
  - It is when the brain processes information
  - Adolescents need between 8-10 hours of sleep, usually 8.5-9.25 hours
  - 8 hours seems to be a critical tipping point
  - Average HS student gets b/w 6-7 hours of sleep, sometimes as little as 5 hours
- **Evidence that lack of sleep has significant deleterious effects on adolescents**
  - Impacts learning, mental health issues and safety (automobile accidents)
  - Increases risk of obesity, heart disease, growth suppression
  - Increases risk of impulsive behaviors, including substance abuse and sexual risk taking
  - Increases risk of sports injuries
- **Evidence that *increased* sleep has many positive effects on adolescents**
  - Improved attendance, grades, mood and sports performance
  - Decreased mental health issues, decreased absenteeism, decreased tardiness

What Are The Issues Limiting Sleep in Adolescents?

- **What Stops Students from Going to Sleep Early?**
  - *Many Variables-*
    - Homework
    - Activities
    - Social Media
    - Poor Sleep Hygiene (inconsistent bed times, staying in room/bed while awake, using electronics/social media right before bed)

- **BUT – almost all Adolescents have a Normal Physiologic Change in *Circadian Rhythms***
  - Circadian rhythms help to regulate sleep and wake schedules
  - **Because of this shift in circadian rhythms, most students cannot fall asleep earlier than 10:30pm!**



What Makes Students Wake Up Early?

Only one reason- *School Start Times!*

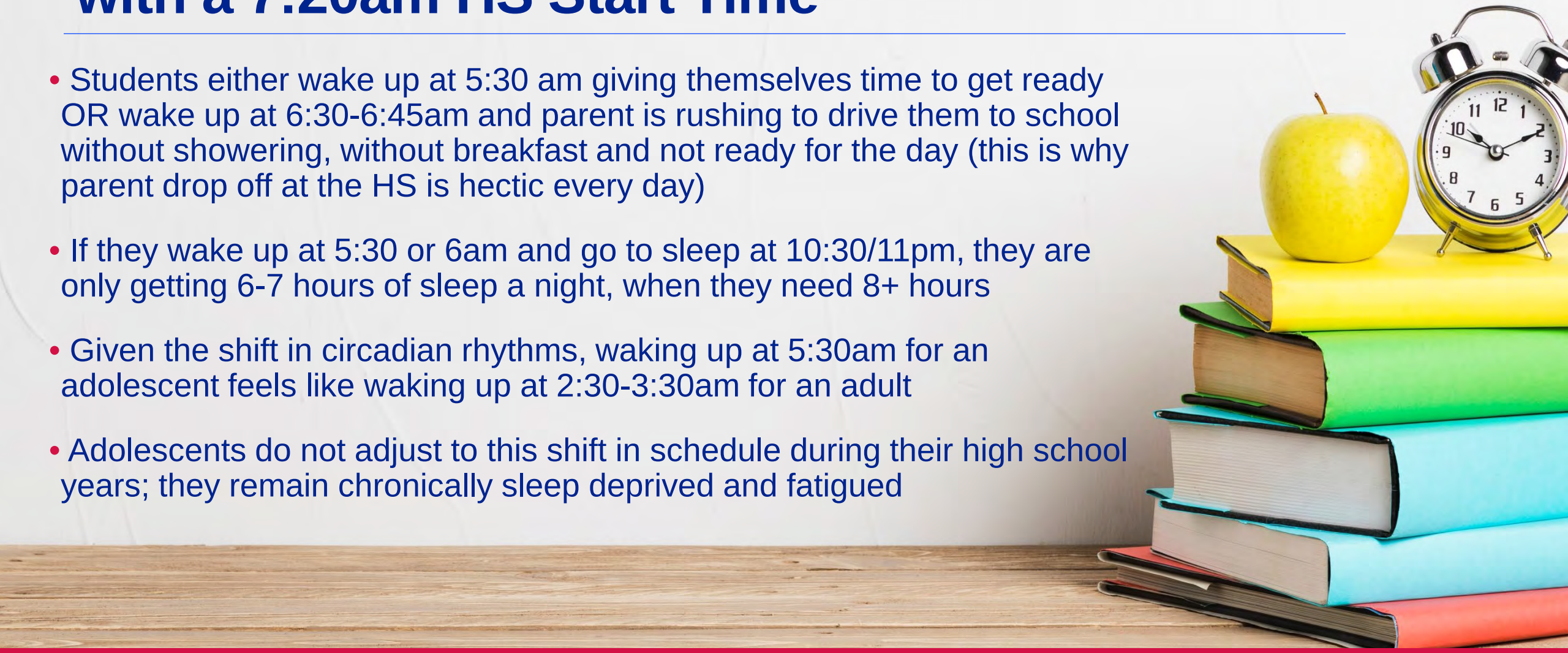
Understanding Adolescent Sleep Physiology and Circadian Rhythms

- **Melatonin**
  - Hormone released from the pineal gland in the brain
  - Purpose is to help regulate circadian rhythms and initiate and maintain sleep
  - Helps regulate reproduction cycles and breeding
- **Physiological delay in melatonin secretion in Adolescents**
  - Release from the brain starts at 10:30/11 pm
  - Continues well past sunrise
  - Occurs worldwide and is not a new phenomenon
  - Reverts back to a more typical adult circadian rhythm in 20s
- ***The Result: For teens, preferred bedtimes are delayed:***
  - 2 hours for adolescent girls
  - 3 hours for adolescent boys

Result: Teens naturally want to go sleep starting around 11pm and wake up around 8am!

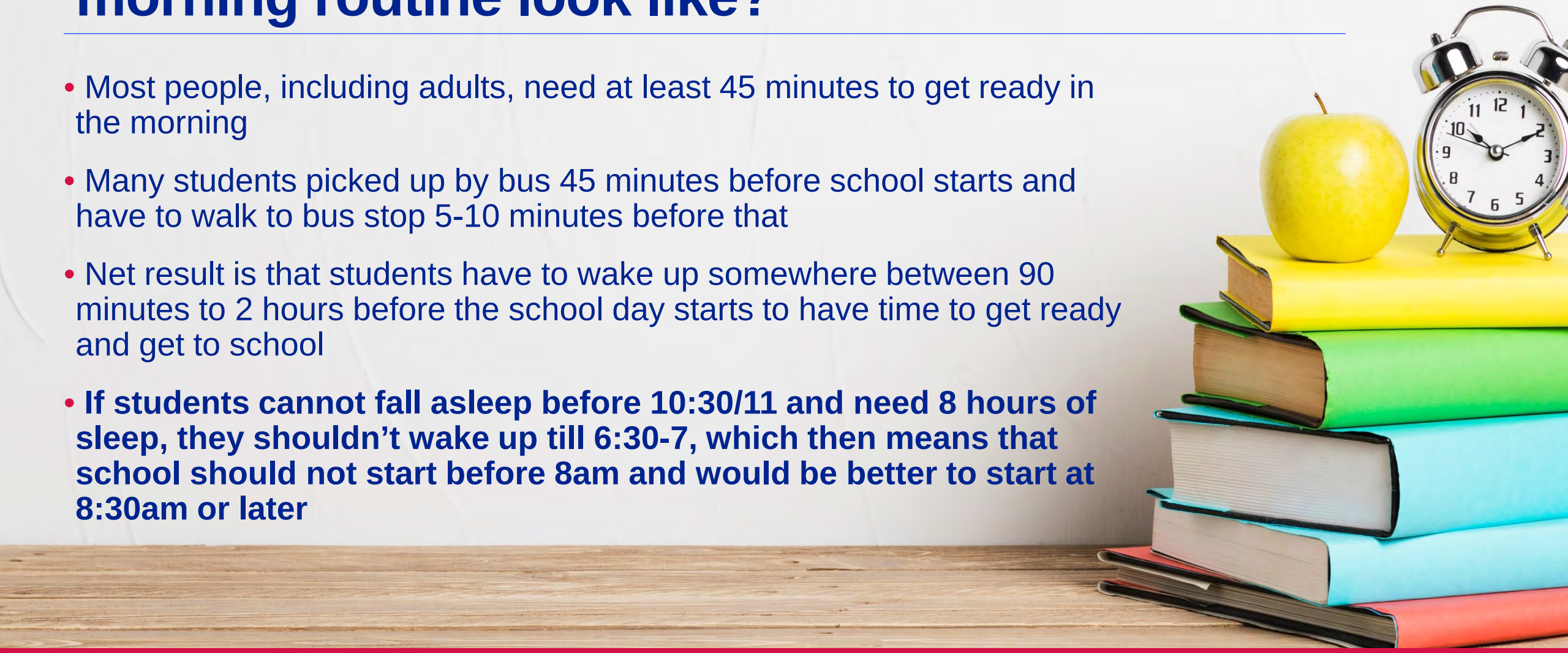
Typical Student Morning Routine with a 7:20am HS Start Time

- Students either wake up at 5:30 am giving themselves time to get ready OR wake up at 6:30-6:45am and parent is rushing to drive them to school without showering, without breakfast and not ready for the day (this is why parent drop off at the HS is hectic every day)
- If they wake up at 5:30 or 6am and go to sleep at 10:30/11pm, they are only getting 6-7 hours of sleep a night, when they need 8+ hours
- Given the shift in circadian rhythms, waking up at 5:30am for an adolescent feels like waking up at 2:30-3:30am for an adult
- Adolescents do not adjust to this shift in schedule during their high school years; they remain chronically sleep deprived and fatigued



What should a student's morning routine look like?

- Most people, including adults, need at least 45 minutes to get ready in the morning
- Many students picked up by bus 45 minutes before school starts and have to walk to bus stop 5-10 minutes before that
- Net result is that students have to wake up somewhere between 90 minutes to 2 hours before the school day starts to have time to get ready and get to school
- **If students cannot fall asleep before 10:30/11 and need 8 hours of sleep, they shouldn't wake up till 6:30-7, which then means that school should not start before 8am and would be better to start at 8:30am or later**



Policy Statements

ALL recommend school start times starting after 8:30am for adolescents

- **American Academy of Pediatrics (AAP) 2014:**
  "School Start Times for Adolescents"

- **American Academy of Sleep Medicine (AASM) *2017:***
  "Delaying Middle School and High School Start Times Promotes Student Health and Performance"

- **CDC**: https://www.cdc.gov/features/school-start-times/index.html

- **County Health Rankings and Roadmaps:**
  http://www.countyhealthrankings.org/take-action-to-improve-health/what-works-for-health/policies/later-middle-and-high-school-start-times

JOINT STATE GOVERNMENT COMMISSION

General Assembly of the Commonwealth of Pennsylvania

SLEEP DEPRIVATION IN ADOLESCENTS: THE CASE FOR DELAYING SECONDARY SCHOOL START TIMES

Report of the Advisory Committee on Later School Start Times at Secondary Schools

OCTOBER 2019

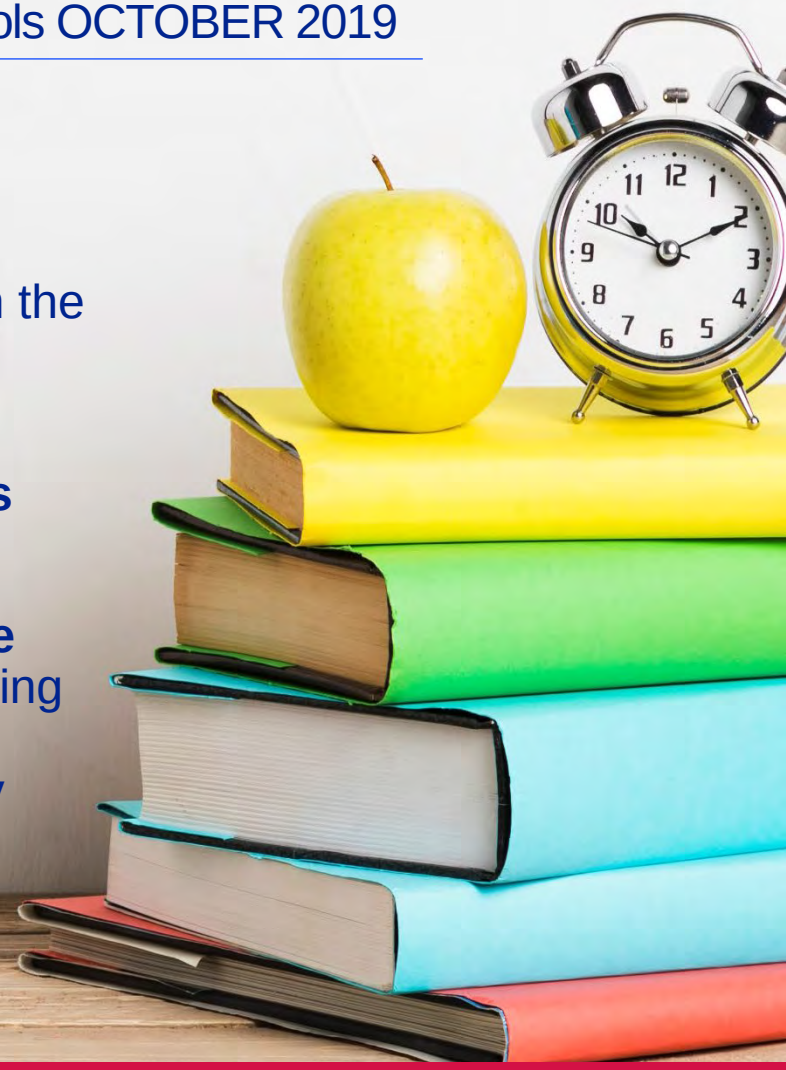
JSGC: SLEEP DEPRIVATION IN ADOLESCENTS: THE CASE FOR DELAYING SECONDARY SCHOOL START TIMES - PA

Report of the Advisory Committee on Later School Start Times at Secondary Schools OCTOBER 2019

Findings and Recommendations:

The Advisory Committee….

- Acknowledges the medical community consensus that a public health crisis in the form of **an epidemic of chronic sleep loss and daytime sleepiness** in U.S. adolescent exists.
- Agrees that the **benefits of later school start times for secondary students are supported by robust research**.
- Realizes that **biologically-driven changes in adolescent sleep patterns are beyond the control of adolescents, their parents, or their teachers**. Adapting the daily schedule of adolescents to recognize and accommodate their sleep needs is **a potentially manageable response and can be accomplished by establishing later secondary school start times**.



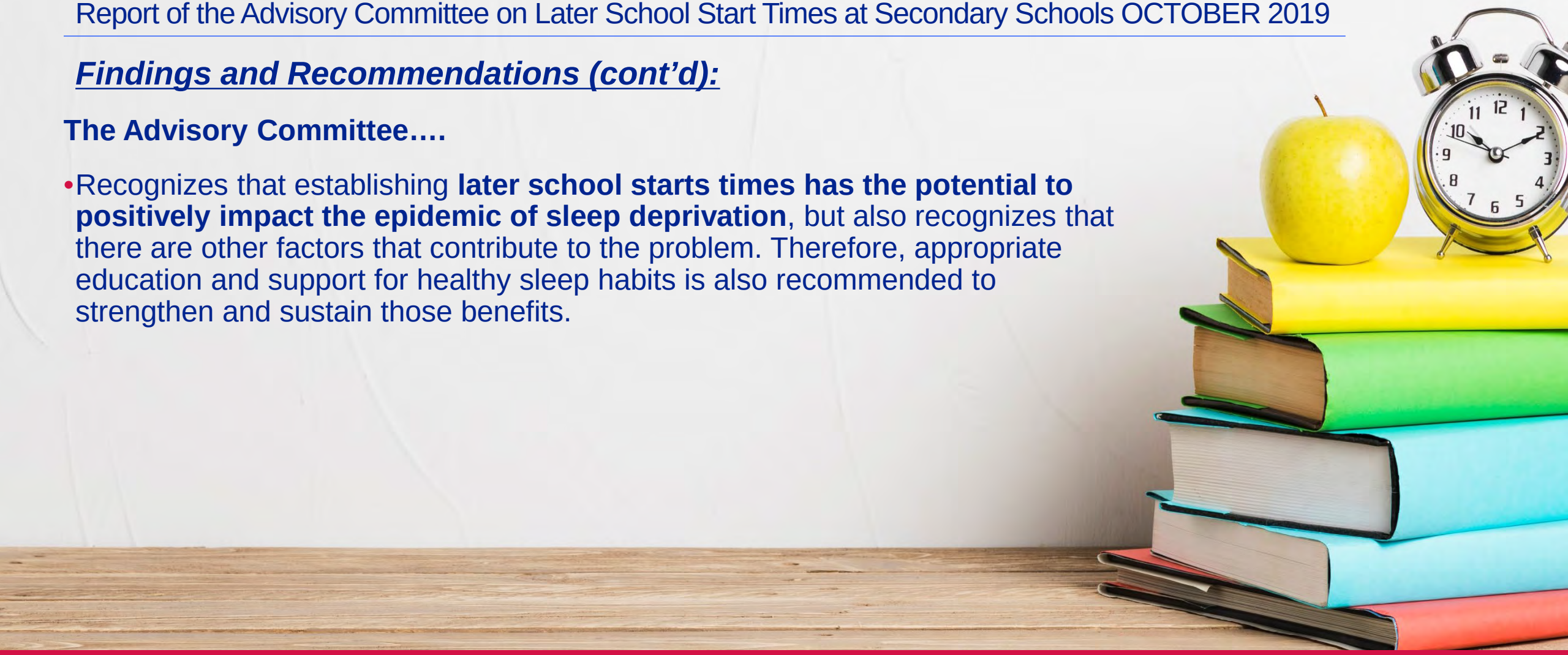
JSGC: SLEEP DEPRIVATION IN ADOLESCENTS: THE CASE FOR DELAYING SECONDARY SCHOOL START TIMES - PA

Report of the Advisory Committee on Later School Start Times at Secondary Schools OCTOBER 2019

Findings and Recommendations (cont'd):

The Advisory Committee….

- Recognizes that establishing **later school starts times has the potential to positively impact the epidemic of sleep deprivation**, but also recognizes that there are other factors that contribute to the problem. Therefore, appropriate education and support for healthy sleep habits is also recommended to strengthen and sustain those benefits.



Evidence That Delaying School Start Times Works

- **Multiple studies in past 5 years show districts that delayed the school start times realized all the benefits that were expected:**
  - Improved grades, feeling of well-being
  - Decreased tardiness, accidents, mental health issues, substance abuse
- **Evidence supports the fact that teens sleep more when school start times are delayed . . .**
  - almost exactly as much as the delay in school start times
  - ***School start times were delayed 25-60 min, and correspondingly, total sleep time increased from 25 to 77 min per weeknight***
  - *Delayed school start times and adolescent sleep: A systematic review of the experimental evidence. Sleep Med Rev. 2016 Aug;28:86-95. (Minges KE[1], Redeker NS[2]*
- **Studies also support better teacher satisfaction and mood with delayed start times**
  - teachers were able to sleep more

Evidence That Delaying School Start Times Works *(continued)*

CORRECTED PROOF

Changing school start times: impact on sleep in primary and secondary school students

Lisa J Meltzer ✉, Kyla L Wahlstrom, Amy E Plog, Matthew J Strand

Sleep, zsab048, https://doi.org/10.1093/sleep/zsab048
Published: 15 April 2021 **Article history ▾**

Study Objectives

To examine the impact of changing school start times on sleep for primary (elementary school: ES) and secondary (middle and high school: MS/HS) students.

Methods

Students (grades 3–12) and parents (grades K–12) were surveyed annually, before and for 2 years after school start time changes (ES: 60 min earlier, MS: 40–60 min later; HS: 70 min later). Student sleep and daytime sleepiness were measured with school-administered student surveys and parent-proxy online surveys.

Results

Approximately 28,000 students annually completed surveys (~55% White, ~21% free/reduced lunch [FRL]). One-year post-change, weekday bedtimes and wake times were slightly earlier for ES students, with an 11-min decrease in sleep duration. MS and HS students reported slightly later weekday bedtimes, significantly later wake times, and significantly longer sleep duration (MS: 29 min; HS: 45 min). The percent of ES students reporting sufficient sleep duration, poor sleep quality, or daytime sleepiness did not change, but the percent of MS and HS students reporting sufficient sleep duration significantly increased and clinically significant daytime sleepiness decreased. All results were maintained at the 2-year follow-up. Benefits of later start times were similar across racial and free/reduced lunch groups.

Conclusions

This is the first large scale, longitudinal, and representative study to concurrently examine the impact of changing school start times across students in primary/secondary school. Findings suggest a minimal impact of earlier start times on ES students' sleep or daytime sleepiness, while further supporting the significant benefits of delaying MS and HS start times on student sleep and daytime sleepiness.

What Are Schools Doing?

- **Nationally** (NCES, 2015)**:**
  - 82% of US middle schools start earlier than 8:30
  - 86% of US high schools start earlier than 8:30
  - 10% of high schools start earlier than 7:30
- **Locally**
  - Montgomery – 7:20 am
  - Bridgewater – 7:20 am
  - Franklin – 7:20 am
  - Hillsborough – 7:30 am
  - Watchung Hills – 7:30 am
  - Hopewell – 7:45 am
  - Lawrence – 7:45 am
  - Manville – 7:45 am
  - North Plainfield – 7:53 am
  - Princeton – 8:20 am

Add to the chat: What time do secondary schools start in your district?

Los Angeles Times

TARYN LUNA , OCT. 13, 2019

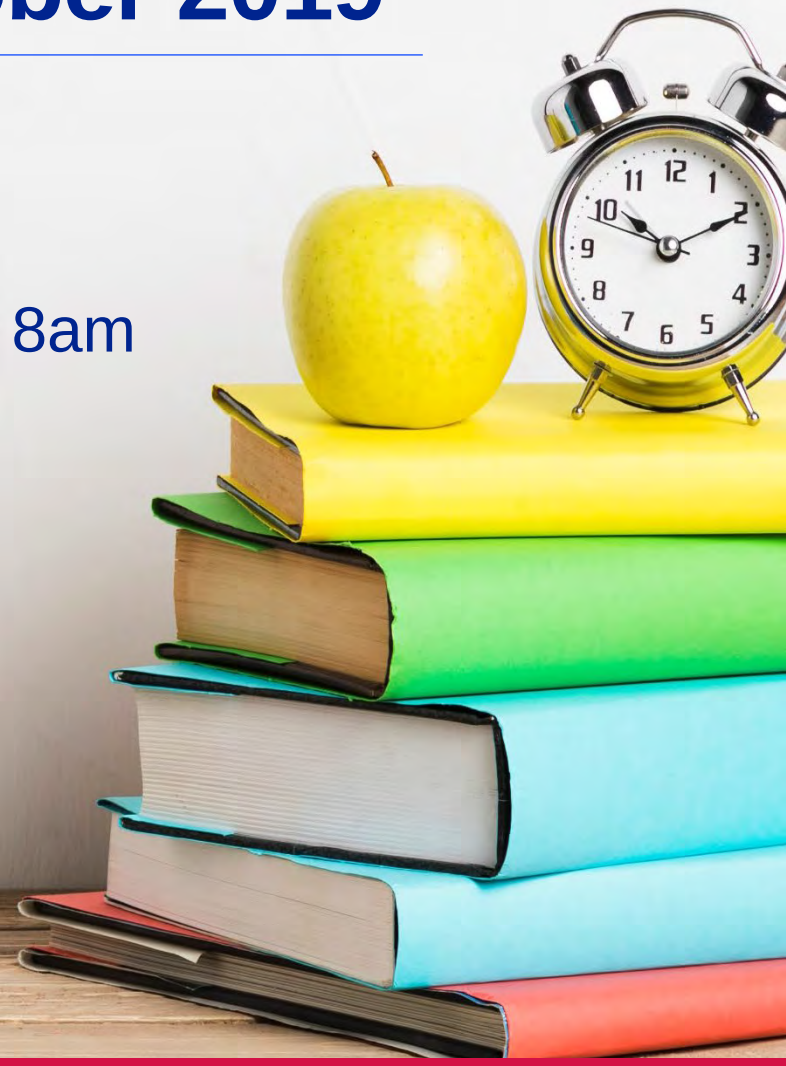
Los Angeles Times

CALIFORNIA

California becomes first state in the country to push back school start times

California SB 328 became law in October 2019

- Began with a letter to the editor which was read by Sen. Portantino
- The law says all public middle schools start no earlier than 8am and high schools start no earlier than 8:30am by 2022
- Allows for earlier voluntary activities/zero period
- Honors prior collective bargaining agreements
- Allows an exception for rural districts
- Opposed in part by proponents of “local control”



What Happened in California?

- Initial law passed in 2018 by California House and Senate
- Vetoed by Governor Brown. Main opposition- California Teachers Association- they argued that the science was correct, but this should be a local decision, not a state decision
- Bill brought back the following year in 2019 with the support of the **California Parent Teachers Association**
- Bill again passed the Ca House and Senate and signed by Governor Newsom into law!

Establishing a time before which schools should not begin mandated instruction is as fundamental as requiring schools to turn on the heat when the temperature falls below a certain level. Local districts would still set their own hours; they need only meet the minimum 'no earlier than' start time that's proven to be essential to students' well-being. It's time for an evidence-based, sound policy discussion that prioritizes student health and achievement. Teaching adolescents at a time they cannot effectively learn is an ineffective use of public funds and undermines our children's health and their chances for success today and in the future." – California State Sen. Anthony Portantino, about his bill to "Start the School Day Later"

Case Study:

Princeton High School's Later Start Time

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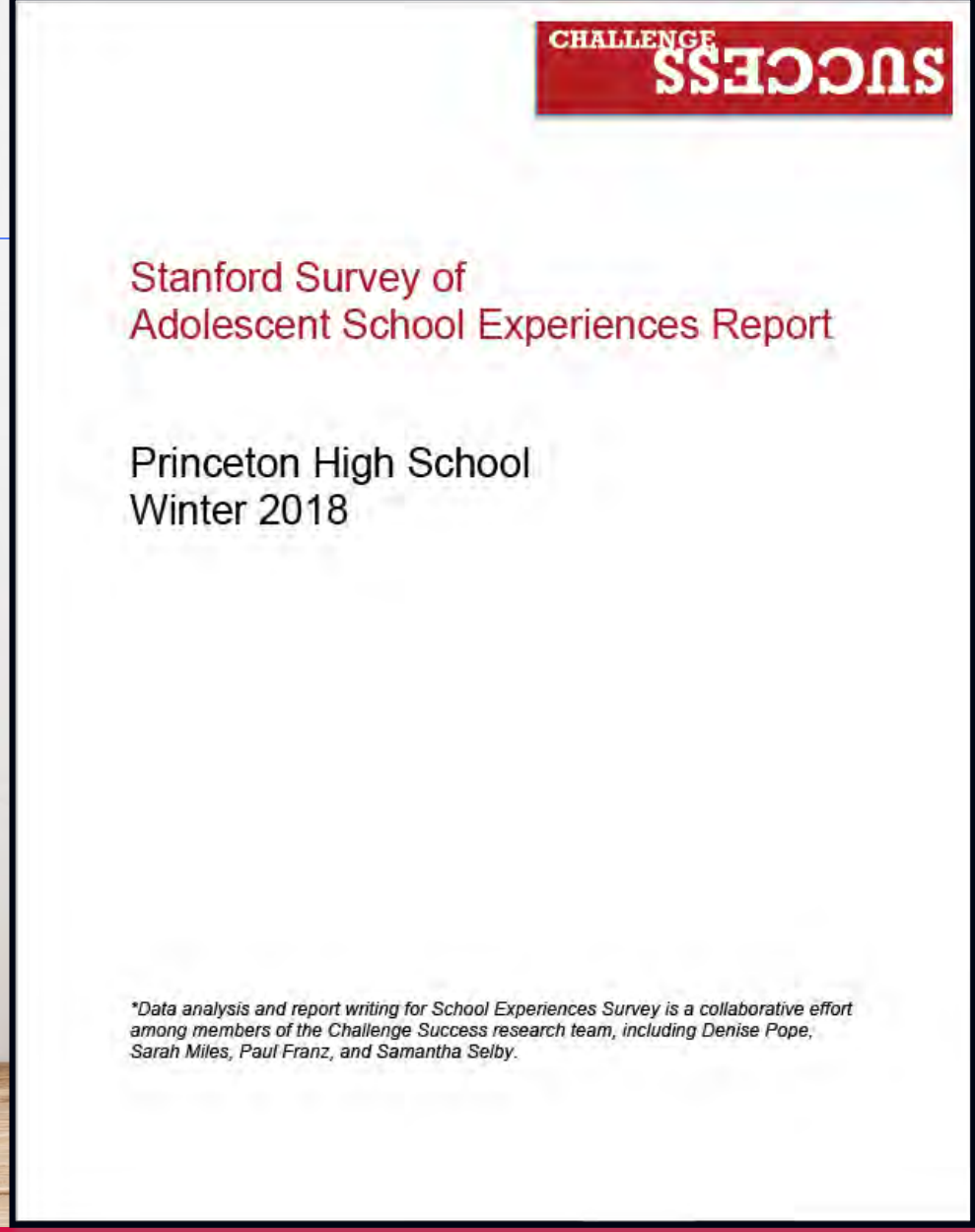
The Why

We were noticing a trend amongst our students:

- Overscheduled
- Stressed out
- Disengaged
- Attendance issues
- Lack of sleep

→ Stanford's Challenge Success Survey



Timeline

- Administered the survey in December of 2016
- Startling results:
  - Fewer than 6 ½ hours of sleep a night
  - Missing at least a day a month because of stress
  - High number of tardies to school
  - More than 3 ½ hours of homework per night
  - ‘doing school’

Average Time (in hours) Spent on HW during School Week and Weekend

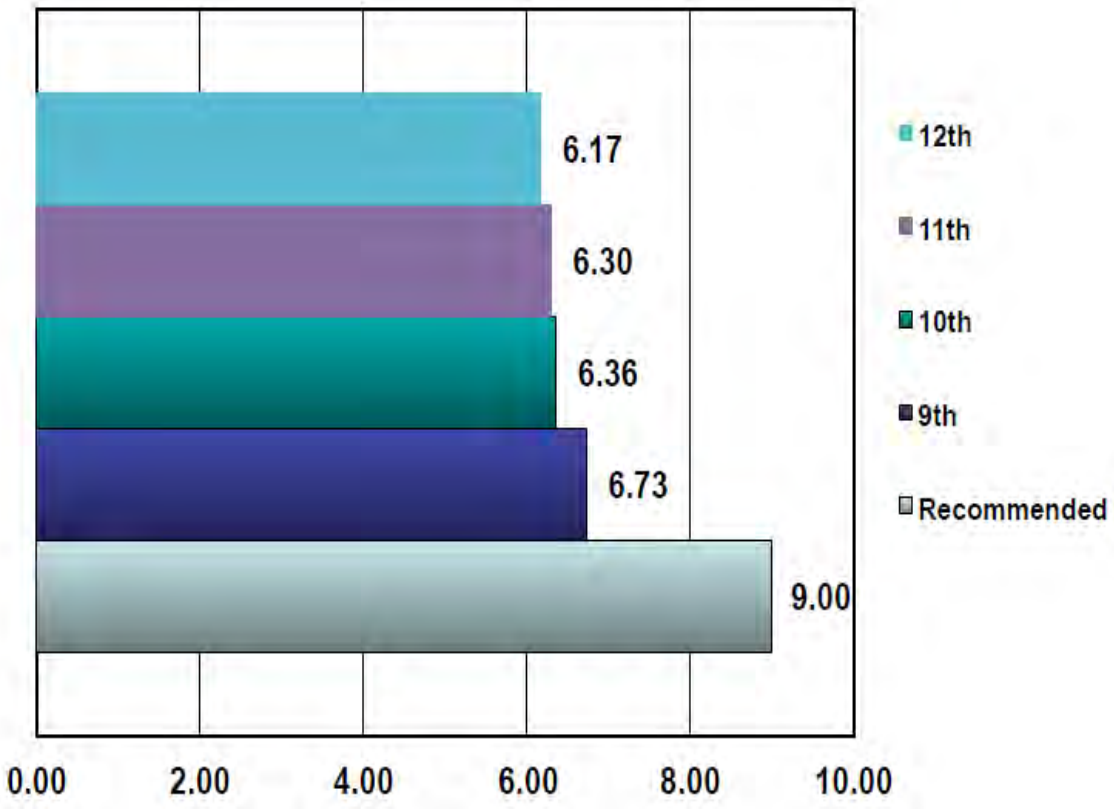
61% reported they had "too much" homework.
36% felt they had the "right" amount of homework.

	9th	10th	11th	12th
Weekday school-assigned homework	2.74 (1.59) mdn 2.50	3.29 (1.51) mdn 3.00	2.81 (1.45) mdn 2.50	2.87 (1.67) mdn 3.00
Weekday NON-school-assigned homework	.73 (1.22) mdn .50	.84 (1.31) mdn .50	.88 (1.10) mdn .50	1.01 (1.43) mdn .50
Weekend school-assigned homework	3.02 (1.88) mdn 3.00	3.60 (1.76) mdn 3.50	3.38 (1.89) mdn 3.00	3.23 (2.00) mdn 3.00
Weekend NON-school-assigned homework	.98 (1.63) mdn .25	1.12 (1.66) mdn .50	1.59 (1.71) mdn 1.00	1.39 (1.86) mdn .50

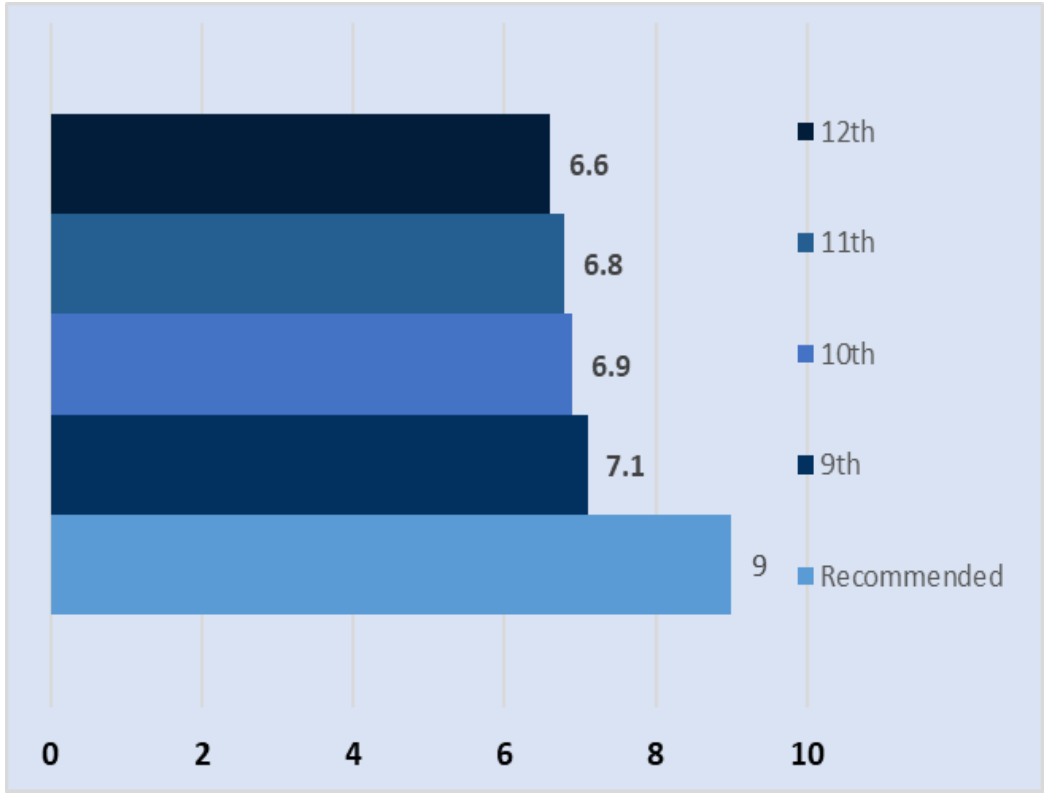
*The numbers in parentheses are standard deviations, mdn refers to the median

Average Hours of Sleep by Grade Level on a Typical School Night
Princeton High School Results Before/After Delay in SST

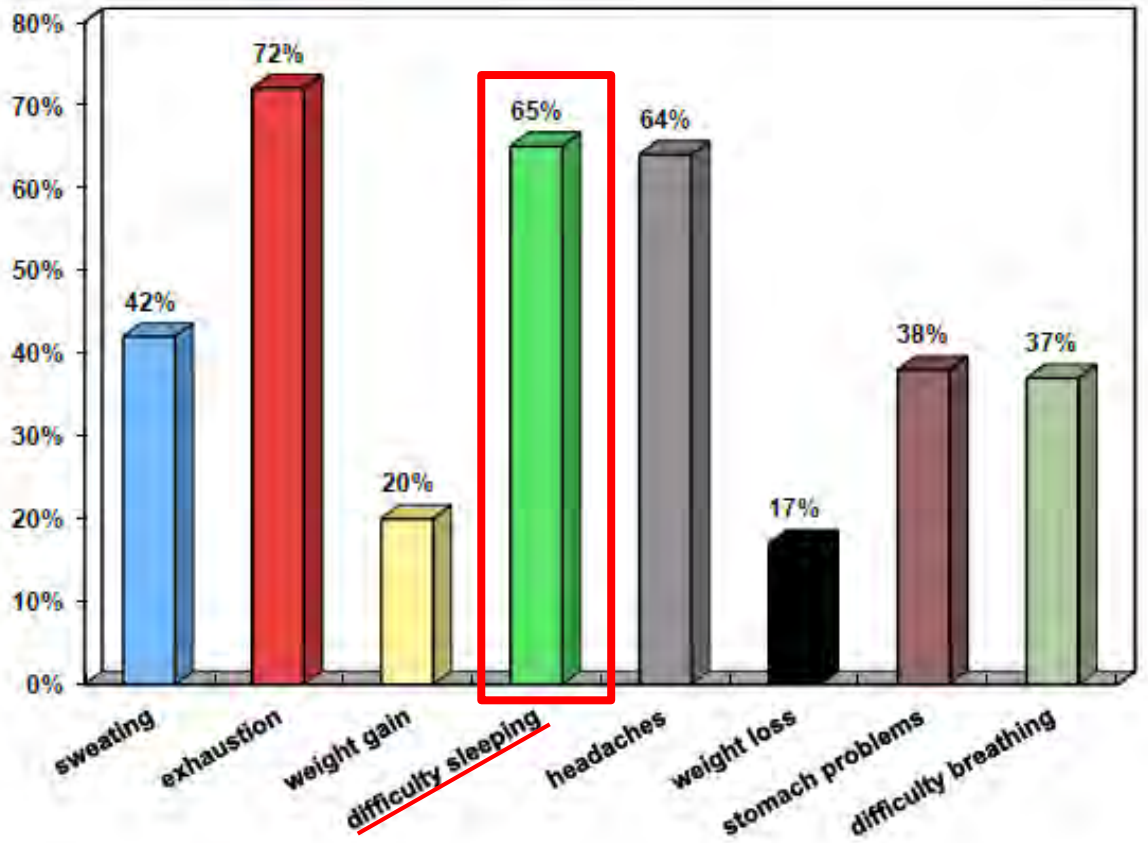
Winter 2018



Winter 2019



Percent of All Participants Who Experienced Physical Health Problems in the Past Month because of Stress



Students' Perceptions of How Effective School Changes Would Be in Improving the Student Experience and Reducing Student Stress

	Not at all or a little effective	Somewhat effective	Quite or very effective
Continue designated homework-free weekends	13%	14%	73%
Implement a department test/quiz schedule to limit the number on any particular day	15%	20%	65%
Start the school day later	37%	16%	47%
Continue with 12 minute morning break	44%	17%	39%
Lengthen the lunch break	15%	15%	70%
Have a mandatory free period during the school day	27%	17%	56%

Process

- Shared survey results with faculty and parents (separately)
- Formed a committee of staff, students and parents to look at current bell schedule
  - Task: Create a schedule that supported teaching and learning
  - Led with our values
  - Met often
  - Reviewed research
  - Regularly updated teachers, PTO, students

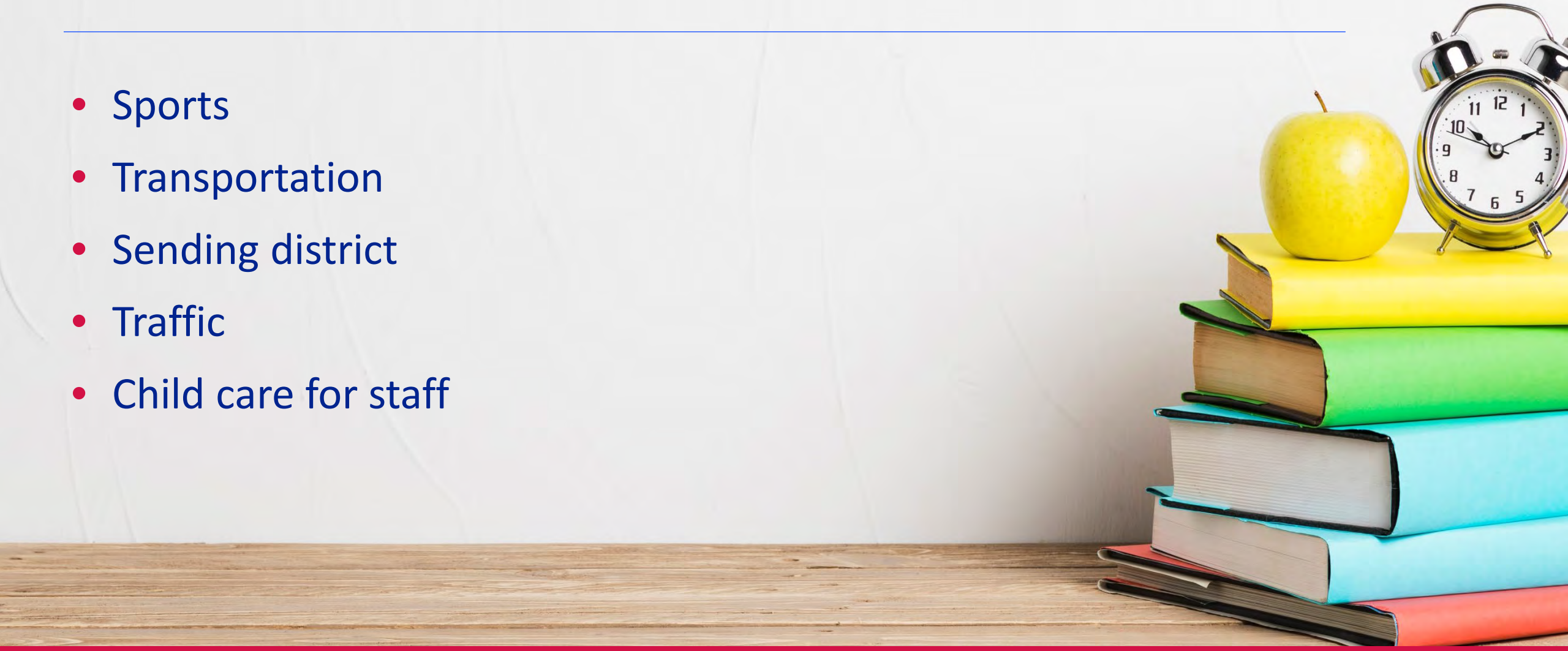
Recommendations

Created a list of specifications of a bell schedule that supported our students:

- Later start time
- Rotating periods (AM & PM)
- Morning break
- Extended lunch break
- 6 day cycle
- 44 & 77 minute periods
- 2 periods of unstructured time every cycle
- No before school activities

Obstacles

- Sports
- Transportation
- Sending district
- Traffic
- Child care for staff



Outcomes

- Fewer absences
- Fewer tardies
- Students and faculty overwhelmingly like the later start time

Technical vs. Adaptive Change

Technical ("First Order") Change

- Requires the knowledge of experts who know exactly how to fix the problem
- Often small, incremental changes that can be solved in an ordered, methodological fashion
- Does not involve "giving up" anything to produce change

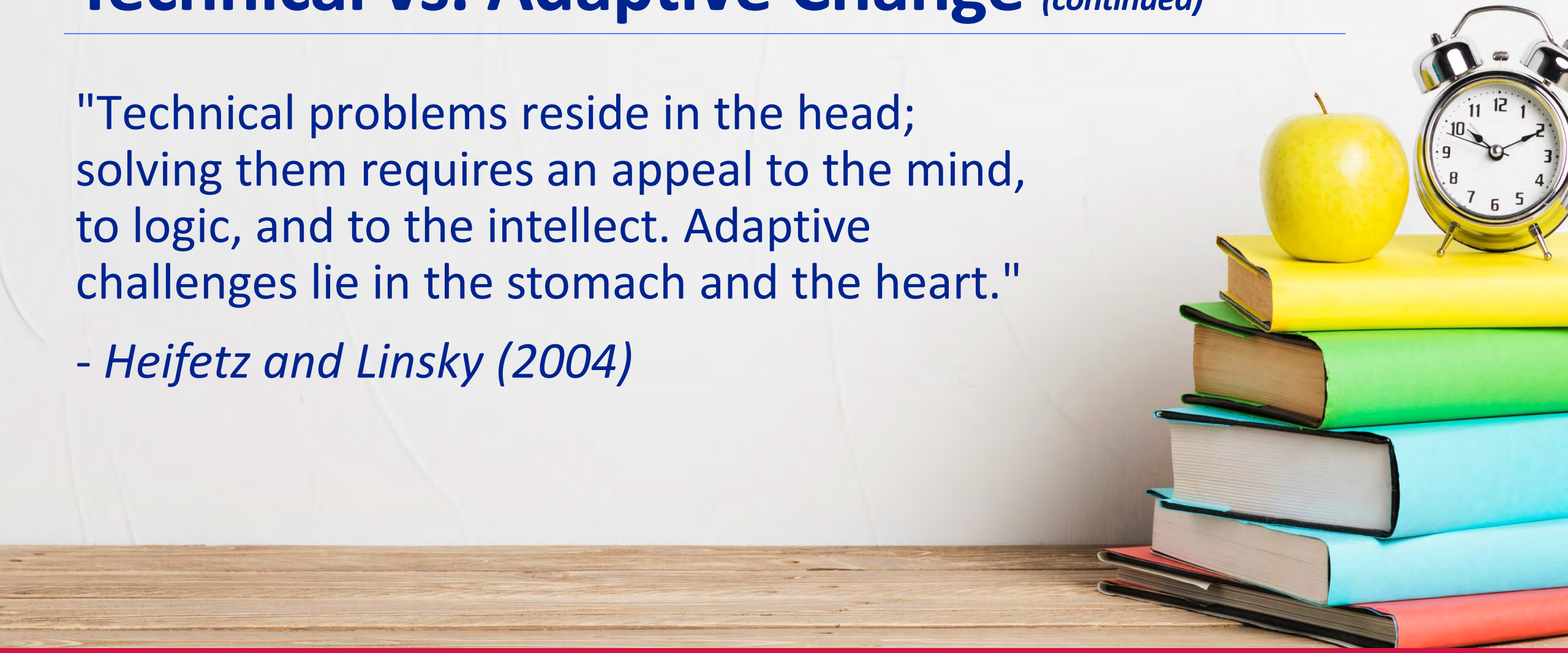
Adaptive ("Second Order") Change

- Requires exceptional leaders to challenge people's values
- Cohesive and multi-dimensional; more than one component changing
- Conversation and collaboration, especially between all stakeholders needed to implement change
- Must weigh the amount of "loss" against the amount of gain from change

Technical vs. Adaptive Change *(continued)*

"Technical problems reside in the head; solving them requires an appeal to the mind, to logic, and to the intellect. Adaptive challenges lie in the stomach and the heart."

- Heifetz and Linsky (2004)



Technical vs. Adaptive Change *(continued)*

How can we achieve later school start times through adaptive change?

- Understanding the importance and value of students' health and wellness
- Opportunity to embrace changes to curriculum, instruction, and assessment and incorporate 21st century teaching and learning
- Accepting and minimizing potential losses while addressing the current losses to student well-being with earlier school start times
- Reframing the conversation around the *benefits* of later school start times

Focus on Health

This is a public health matter.

- Much like smoking in our schools
- There is no arguing the facts – the science is one-sided
- Only objections are about convenience or logistics – just keep bringing it back to health

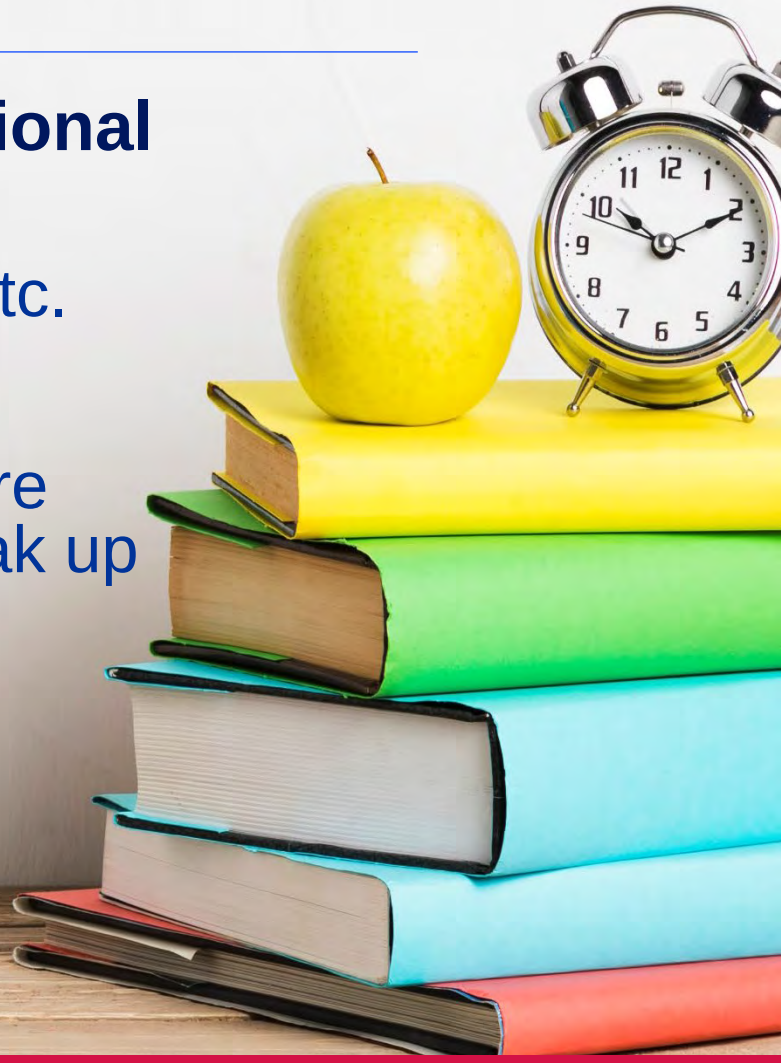
People resist change.
Patience and persistence are key.

"To do nothing, is to continue to do harm." – Dr. Judith Owens

Opportunities for Advocacy

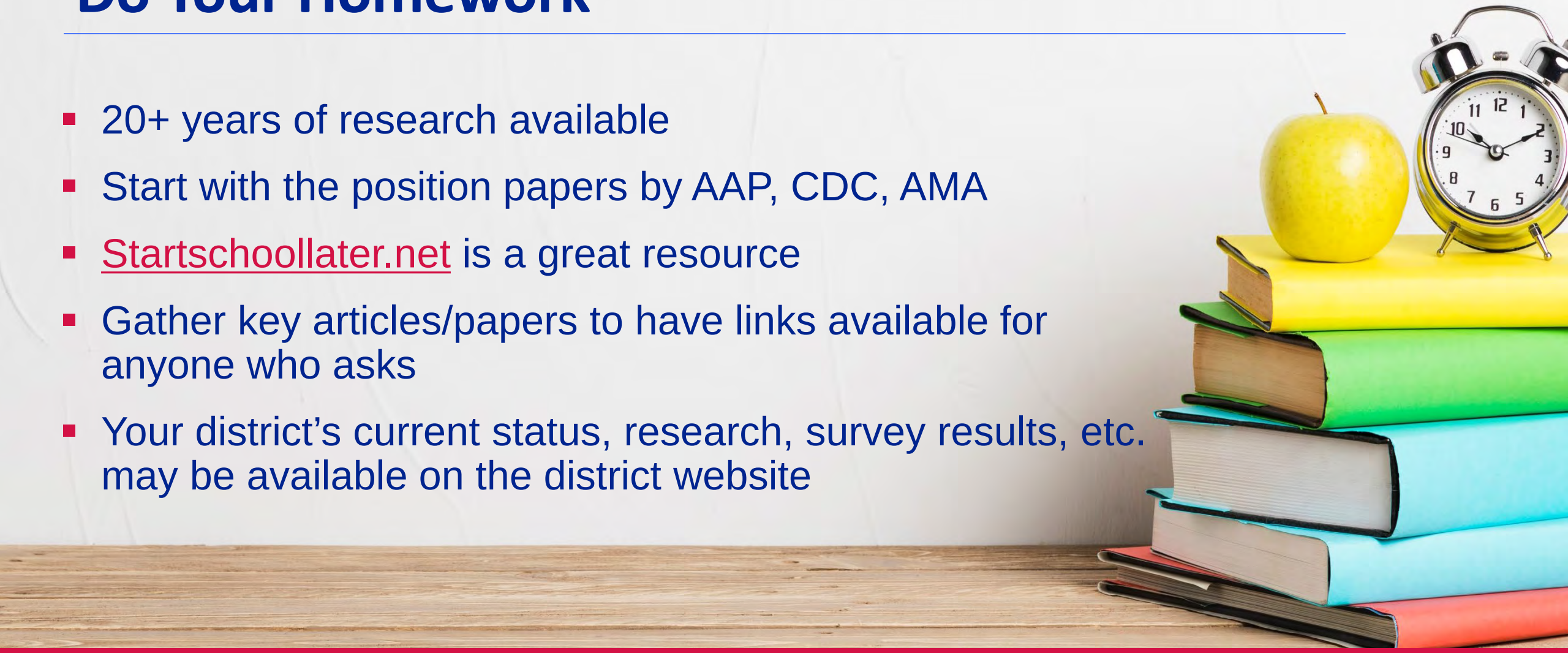
You don’t need to be an expert or medical professional to be an advocate!

- Email your superintendent, principals, school board, etc.
- Attend school board meetings
- Letters to the Editor
- Website – a place for people to find you and learn more
- Social media – you can be a voice of reason and speak up for science
- Petitions
- Visit PTOs and other school organizations
- Gather your supporters!



Do Your Homework

- 20+ years of research available
- Start with the position papers by AAP, CDC, AMA
- Startschoollater.net is a great resource
- Gather key articles/papers to have links available for anyone who asks
- Your district's current status, research, survey results, etc. may be available on the district website



Typical Process for Change

- **Educate the community**
  - Start immediately!
  - Continue throughout the process

(Superintendent generally defines and executes the process)

- **Engage stakeholders**
  - Students, parents, teachers, administration, school board, athletic director, transportation director, doctors/nurses, other community members
  - Consistent communication
  - Form advisory group?
  - Public discussions/forums – answer questions, hear concerns
  - Surveys
    - Don't ask opinions - only gather data
    - Start School Later has guidance/examples
    - Some districts create their own online surveys using examples
- **Define specific options & costs**
- **Board decision**
- **Time to implement and adjust**

What has Virtual Learning Taught Us?

- They are sleeping more and have a schedule that is more aligned with their natural circadian rhythms.
- They generally feel better

Anecdotal reports from the school setting:

Princeton HS remote learning survey results

What has Virtual Learning Taught Us? *(continued)*

More sleep: A possible silver lining of COVID-19

The impact of COVID-19 related school shutdown on sleep in adolescents: a natural experiment

Reut Gruber [a, b, *], Sujata Saha [c], Gail Somerville [b, d], Johanne Boursier [c], Merrill S. Wise [e]

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[b] Attention, Behaviour and Sleep Lab, Douglas Mental Health University Institute, Montreal, Canada
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[e] Mid-South Pulmonary and Sleep Specialists, Memphis, TN, USA

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ABSTRACT

Objective: During the outbreak of the COVID-19 pandemic in 2020, high schools closed or transitioned to remote teaching. The aim of this study was to describe how the COVID-19 related school shutdown impacted the sleep behaviors of typically developing adolescents.

Methods: A qualitative study was conducted between April 28 and June 3, 2020 with 45 adolescents using one-on-one semi-structured phone interviews.

Results: The "natural experiment" caused by the shutdown of schools due to the COVID-19 pandemic led to a 2-h shift in the sleep of typically developing adolescents, longer sleep duration, improved sleep quality, and less daytime sleepiness compared to those experienced under the regular school-time schedule.

Discussion: These findings are consistent with previous studies showing that delaying high school start times could be an effective way to extend sleep duration, improve sleep quality, reduce daytime sleepiness and lower adolescents' stress during the school year. As many countries look for ways to reduce the number of interactions between students in schools so that physical distancing is feasible,

Survey: Reflections on Healthy School Start Times During Stay-at-Home Orders

Regional Adolescent Sleep Needs Coalition (RASNC) - July 2020

Goals:

1. To determine if school start times during stay-at-home orders were more aligned with AAP recommendations
   - **Finding: School start times during stay-at-home orders were more aligned with AAP recommendations**

2. To examine the sleep of adolescents during the stay-at-home orders
   - **Finding: Later start times and/or asynchronous learning during stay-at home orders was associated with increased sleep for adolescents**

3. To assess parents' support of later school start times in response to their experience of their children's sleep patterns during the stay-at-home orders
   - **Finding: The majority of parents report that they are more convinced that school start times ought to be delayed as a result of stay-at-home orders.**

NJAAP Task Force on Adolescent Sleep and School Start Times

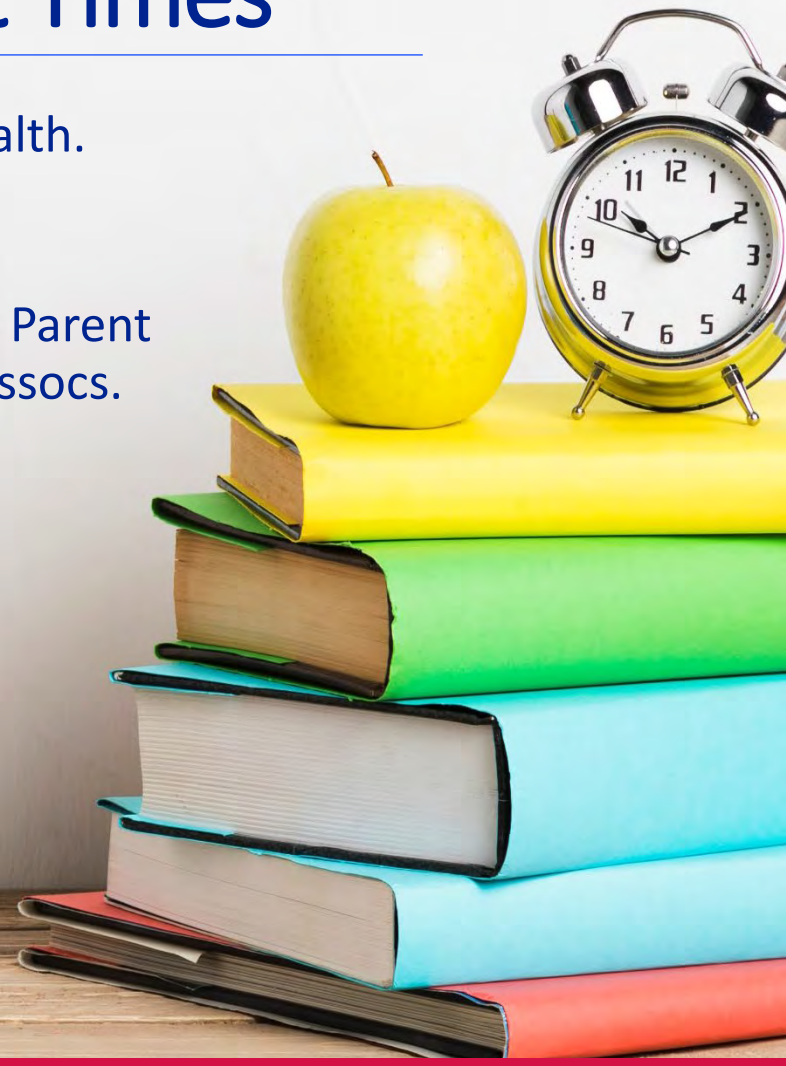
Goal: To educate and advocate for improved adolescent sleep and mental health.

Chairs: Bert Mandelbaum, MD, FAAP and Marcela Betzer, MPH

Members: Physicians, School Principals, DOH representatives, School Nurses, Parent Advocates, Medical Students, Sleeps Specialists, Psychologists, and Athletic Assocs.

Activities:

- Providing educational talks, webinars, seminars, etc.
- Supporting local changemakers
- Drafting position statements to strengthen local advocacy efforts
- Consulting with local school districts
- Sharing information



Resources - Handouts

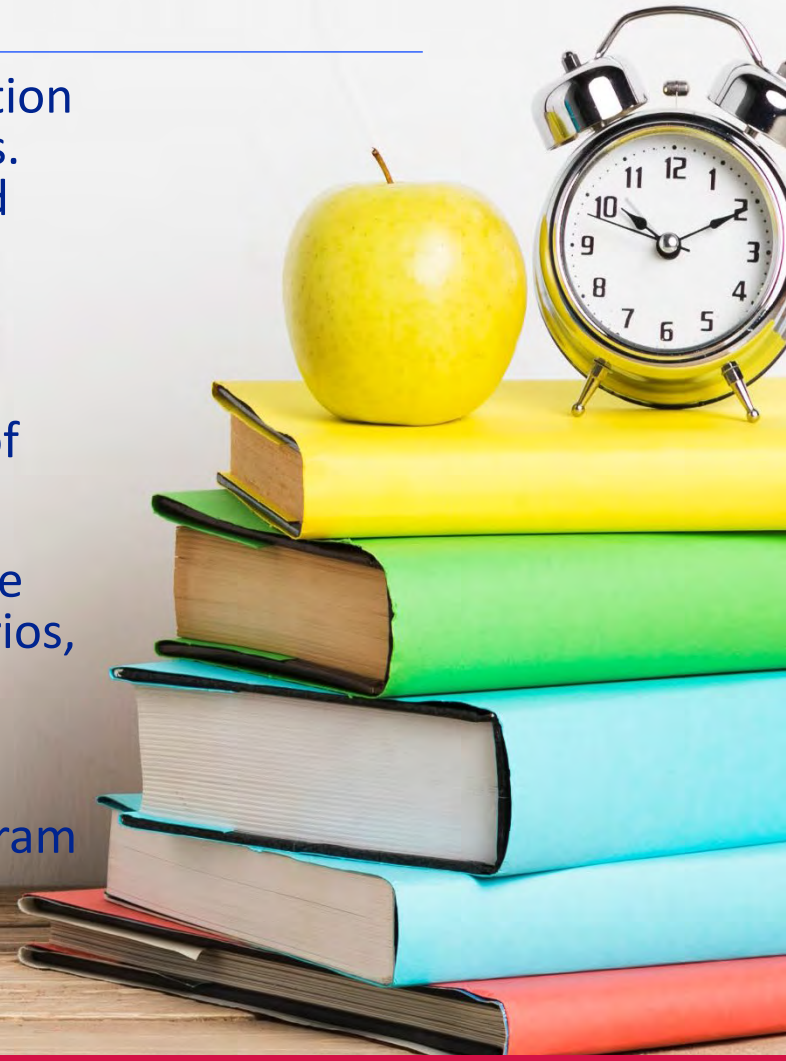
- School Hours and Sleep – A Public Health Epidemic (https://www.startschoollater.net/uploads/9/7/9/6/9796500/school_hours_and_sleep_deprivation_public_health_epidemic_tw0-page_flyer.pdf)
- Teenagers need 8½ to 9½ hours of sleep a night. (https://www.startschoollater.net/uploads/9/7/9/6/9796500/ssl-handout-103016.pdf)
- A Tale of Two Student Athletes (and Their School Start Times) (https://www.startschoollater.net/uploads/9/7/9/6/9796500/a_tale_of_two_school_start_times-011320_1.pdf)
- Later School Start Times Promote Adolescent Well-Being (https://www.apa.org/pi/families/resources/school-start-times.pdf)

Resources – Research Articles & Reports

- **PA's Joint State Government Commission Report from October 2019 on School Start Times:** http://jsg.legis.state.pa.us/resources/documents/ftp/publications/2019-10-17%20SSSTweb.PDF
- **CA State Bill on School Start Times – Signed into legislation Oct. 2019 & Research & Information Guide** http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201920200SB328 https://sd25.senate.ca.gov/sites/sd25.senate.ca.gov/files/research_booklet_sb_328_pdf.pdf
- **American Academy of Pediatrics Policy Statement: School Start Times for Adolescents** https://pediatrics.aappublications.org/content/pediatrics/134/3/642.full.pdf
- **"Sleep*more* in Seattle: Later school start times are associated with more sleep and better performance in high school students"** https://advances.sciencemag.org/content/advances/4/12/eaau6200.full.pdf
- **Sleep Research Society: *Changing school start times: impact on sleep in primary and secondary school students*** https://academic.oup.com/sleep/advance-article/doi/10.1093/sleep/zsab048/6218366
- **Insufficient Sleep in Adolescents and Young Adults: An Update on Causes and Consequences** (https://pediatrics.aappublications.org/content/pediatrics/134/3/e921.full.pdf)
- ***"School start time change and motor vehicle crashes in adolescent drivers"*** https://jcsm.aasm.org/doi/10.5664/jcsm.8208

Resources - Education

- **Let's Sleep!** http://letssleep.org/ - Free evidence-based sleep health education resources for students and their families, educators, and health professionals. Topics include drowsy driving prevention; the impact of sleep on physical and mental health; how sleep boosts performance in school and athletics; and caffeine.
- **Video for students:** https://bit.ly/3gAB8xM - Two-minute animation demonstrating the difference between a typical teenager's day after plenty of sleep versus one with not enough sleep.
- **Sleep 101:** http://sleep101.letssleep.org/ - Award-winning interactive, online educational program for 7th to 12th graders. Using games, interactive scenarios, and videos, this free program takes students through a 25-minute curated experience imparting actionable information on how sleep affects their academic and athletic performance, physical and mental health, and safety, including practical tips on caffeine consumption and sleep hygiene. The program has been incorporated into health, biology, and advisory classes across the nation.



THANK
YOU

Resources – NJAAP

Check out our NJAAP Task Force on Adolescent Sleep & School Start Times webpage for more information, such as webinars, newsletters, links to presentations, contact information and more: https://njaap.org/providers/sleep/

NEVER DOUBT
THAT A SMALL GROUP
OF THOUGHTFUL COMMITTED CITIZENS
CAN CHANGE THE WORLD:
INDEED IT'S THE ONLY THING
THAT EVER HAS.
MARGARET MEAD