

PASD Community Approach to Achieve More Student Sleep

Presented by the PAEA to the Board of School Directors on November 13, 2018

3-Pronged Approach:

- Teachers' role: later start time.
- Administration role: adjusted bell schedule.
- Parent/student role: healthier sleep habits and routines.

Why now:

- After seeing the results released after the last committee meeting, we felt it was our professional obligation as teachers to present a solution that both addresses the concerns of the committee and the results of the parent/staff survey as opposed to just complaining about the results.
- The proposed model with a delayed starting time has been reviewed by both teachers and administration as it relates to the committee's goals, student impact, and extracurricular programming.

PAEA Goal:

Our goal is to address the concerns of the committee for a delayed starting time while:

- Minimizing impact on the PASD community.
- Minimizing impact to extra-curricular activities/sports.
- Examining a delayed start to the school day.
- Increasing quality of sleep for students.

What our research will show:

- Our research shows 20 -30 minute push is as effective as longer pushes--- we were able to add additional 11 minutes to start time.
- Our research shows time off devices before bed equals better sleep. We are not necessarily recommending going to bed earlier but getting better quality sleep by getting off of devices earlier.
- 30 minute push has minimal impact on bussing, extracurricular activities, and child care concerns than significantly later starts have— 11 minutes extra should keep this status quo.

Impact on community

- Availability for parents to find adequate means of child care both before and after school.
- Child care committee has looked into the impact on potentially flipping elementary and secondary times or large extensions to current end time ---can YMCA and other child-care providers handle the potentially larger enrollment numbers for community members? Loss of older sibling(s) as primary care taker for younger child(ren).
- Traffic pattern changes---increased volume during rush hour.

Impact to the clubs/activities/extracurricular activities

- Before school (primarily Elementary and Middle School), during school (early dismissal) and after-school and night events(clubs/extracurricular activities).
- Sports
 - The physical plant concerns of the secondary campus. Not every activity happens directly after school - and those that happen at the evening are going to be impacted as well by either limits on time or going later into the night. Double header games, senior nights, plays, musicals, concerts, etc.
 - Compressed outside field time for fall/spring athletic activities due to only one lit field. This past fall's weather patterns made that even more challenging.
 - Compressed practice time for Middle School & High School winter athletic activities due to only having two gyms on campus.
 - Ability to maintain PIAA and PAC status as well as logistics of facilities being able to support Middle School Athletics.
 - 50% of high school students play at least one sport.
 - 60% of middle school students play at least one sport.
- 560 High School students who participate in clubs or other extracurricular activities.
- 240 Middle School students participating in activities before the start of school (Spartan Club, Bucket Band, Student Government, Archery, Jazz Band, Wind Ensemble).

ELEMENTARY
ACADEMIC CLUBS,
PROGRAMS,
AND ENRICHMENT ACTIVITIES

The number of students involved in the following activities differs year to year and from school to school. The numbers shown are either based on the enrollment for this year or in some cases, the average enrollment of past years. The times the clubs meet are consistent from year to year.

When looking at the time the different activities meet, it is important to note that elementary grade level teachers have meetings from 8:00-8:20 one day a week (minimum of at least three times per month). Some teachers have more, depending on how many committees they are on. These teachers cannot hold clubs in the morning due to their meeting responsibilities.

ELEMENTARY MUSIC PROGRAMS

TIME	NUMBER OF STUDENTS	PROGRAM
7:30-8:30 (1X a wk. Varying days)	320	CHORUS (combined 3 schools)
7:30-8:30 (2X a wk.)	317	Band (SCH/B/MAN)
7:30-8:30 (1X a wk.)	280	Orchestra (SCH/B/MAN)

- 64% of PASD's enrollment in grades 3 thru 5 participate in these programs.
- The morning rehearsals are HALF of the music curriculum for those students.

ACADEMIC PROGRAMS

TIME	NUMBER OF STUDENTS	PROGRAM
3:30-4:30 (2X a wk.)	80+	Reading Club –4 schools
3:30-4:30 (2X a wk.)	80+	Math Club – 4 schools
3:30-4:30 (2X a wk.)	36	ELD Homework Club
7:30-8:15	20+ each school	READING OLYMPICS (SCH/B)

MUSICALS

TIME	NUMBER OF STUDENTS	ACTIVITY
7:45-8:30 (approx. 1 month)	120	MANAVON
3:30-5:00 (approx. 1 month)	110	SCHUYLKILL

ENRICHMENT ACTIVITIES/CLUBS

TIME	NUMBER OF STUDENTS	CLUB/ACTIVITY
8:00-8:30	25+ each school	K-KIDS (SCH)
8:00-8:30 & 3:30-4:30	25+ each school	K-KIDS (B)
3:30-4:45	20 each school	STRIDE (SCH/B)
3:30-4:45	20 each school	GIRLS ON THE RUN (SCH/B)
3:30-4:30	20 each school	CHESS CLUB
7:30-8:30	25	ART CLUB (SCH)

**Data to support a 20 to 30
minute delayed start to
school.**

Department of Health and Human Services Literature Review

Taken from:

J Sch Health. 2016 May ; 86(5): 363–381. doi:10.1111/josh.12388

Overview

- Overview of the literature review of 38 articles show:
 - Significant increase in sleep duration and quality with as little as a 20 minute delay in start time.
 - Improved attendance
 - Less tardiness
 - Less falling asleep in class
 - Better grades
 - Fewer motor vehicle crashes
 - There were a few studies the did not show these results

Summary of Results

- Of all studies presented in this literature review:
 - Almost all reported improved:
 - Sleep patterns and habits
 - Attentiveness in school
 - Improved attendance (including tardiness)
 - Improved overall mood
 - In our data, the more recent/current the study, the smaller the **p-value** (**$p < 0.001$ in most cases**)
 - What does this mean?
 - All hypothesis tests ultimately use a ***p-value*** to weigh the strength of the evidence (what the data are telling you about the population). The ***p-value*** is a number between 0 and 1 and interpreted in the following way: A small ***p-value***, typically ≤ 0.05 , indicates strong evidence against the null hypothesis, so you reject the null hypothesis.
 - 13 studies showed results on grades
 - **Only 54% reported statistically significant higher grades.**

Studies With A Modest Change To School Start Time

- Wahlstrom et al. (1998)
 - 25 minute later start time
 - Longer sleep duration ($p < .05$)
 - Same bedtime, and later rise time ($p < .05$)
 - Less daytime sleepiness ($p < .05$)
 - Less struggling to stay awake during academic tasks ($p < .05$)
 - Lower depression scores
 - Less hours of homework ($p < .05$)
- *****to be statistically significant, the p value must be below 0.05*****

Studies With A Modest Change To School Start Time

- Owens, Belon, Moss (2010)
 - 30 minute later start time
 - Longer school night sleep durations ($p < .001$)
 - Earlier bedtimes ($p < .001$)
 - Later rise times ($p < .001$)
 - Greater sleep satisfaction ($p < .001$)
 - Less sleepiness ($p < .001$)
 - Less sleepiness-related behaviors ($p < .001$)
 - Less depressed mood ($p < .001$)
 - Fewer visits to health center for fatigue-related symptoms ($p = 0.03$)
 - Fewer absences/tardies ($p < .05$).

Studies With A Modest Change To School Start Time

- Perkinson-Gloor et al. (2013)
 - **20 minute later start time**
 - Longer weeknight sleep duration ($p < .001$)
 - Later weeknight bedtimes ($p = .04$ boys, $p < .001$ girls)
 - Later weekday rise times ($p < .001$)
 - Less daytime sleepiness ($p < .001$ boys, $p = .03$ girls).

Studies With A Modest Change To School Start Time

- Boergers, Gable, and Owens (2014)
 - **25 minute later start time**
 - Mean wake times (school days) were later ($p < .001$)
 - Mean school night sleep duration was longer ($p < .001$)
 - School night bedtimes did not change.
 - Percentage who slept ≥ 8 hour on school nights increased from 18% to 44% ($p < .001$).
 - No changes in non-school night sleep patterns
 - Sleepiness scores ($p < .001$)
 - Depression scores ($p < .001$)
 - Caffeine use decreased ($p < .05$).
 - No changes in number of hours engaged in athletics, extracurricular activities, and homework were reported.

Studies With A Modest Change To School Start Time

- Hinrichs (2011)
 - Average start time of 7:59 over 400 high schools across state of Kansas
 - No association between school start time and scores on reading, mathematics, science, and social studies assessments.

Increased Quality of Sleep Research

Reasons For Insufficient Sleep

- Insufficient sleep due to a combination of late bedtimes and early rise times
 - Later bedtimes factors
 - Circadian rhythms
 - Increase in school work
 - After school activities
 - Employment
 - **Fewer parent-set bedtimes**
 - **Late night technology**
 - Rise times factor
 - Primarily school start times

Additional research (parent/student role)

ARTICLE #1 (November 2017)

- <https://www.sciencenewsforstudents.org/article/evening-screen-time-can-sabotage-sleep>
- **Synopsis:**
- The normal blue light emissions from the computer screen also affected how much of a sleep-related hormone each volunteer made. Called melatonin (Mel-ah-TOE-nin), it tends to make people feel sleepy. Our bodies usually secrete it into the blood around 9 p.m. When our bodies make less melatonin, we may still feel too alert at bedtime to fall asleep when the body is tired.
- **Using screens before bed damages the body's biological clock**, Green says. More and more people are using screens as kids and adolescents. At this age, their brains are still developing the ability to learn and pay attention. That makes the new results worrisome, Green says.
- Still, Rahman says the results remind us to think about how we use screens before bed. He recommends powering down electronics two hours before going to sleep. Read a book instead, he says. Talk with your family and friends. Write in a journal.

Additional research (parent/student role)

ARTICLE #2 (March 2018)

- <https://www.floridahospital.com/blog/secrets-sleep-part-3-how-screen-time-affects-our-zzzs>
- Synopsis: Research warning against bedtime screen usage is piling up faster than a teenager's text messages. In a 2015 study, device usage before bed was linked to a 13-52% spike in the likelihood of needing over 60 minutes to fall asleep. Dozens of others have found strong associations between screen time and both later bedtimes and less restful sleep.
- As bleary-eyed as blue light can make adults, its effects may be even worse in young people. For teens, whose circadian rhythms are undergoing natural shifts as they mature, blue light before bed makes things even more confusing for the body.
- **The RX:** put down those screens at least an hour before bed to properly prepare your brain for sleep.

Benefits of PAEA Proposal:

- Delayed start time exceeding the national average and is a 41 minute push.
- Minimal change to length of instructional time per period for student learning.
- Flipping 7th and 8th on a 6-day cycle addresses concern with athletes' early dismissals (HS and MS).
- There is a minimum of 5 common periods for decoupling with the High School and Middle School.
- Teachers would both be behind this proposal and publically support its implementation for 2019-2020 school year and administration has stated this is a viable plan.
- Preserves administration's ability to keep current scheduling needs.
- Flexibility in this proposed model allows for PASD to look into future scheduling options (online classes) in upcoming years without major changes to start/end times.
- Preserves current busing format while minimizing the costs associated with other options that were presented.

Examples of Possible Bell Schedules

- The following High School and Middle School schedules, along with adjusted Elementary times, are just one of many possible schedules that work within the Sleep Study Committee's 2nd option proposed to the School Board on 10/30/18.
- Administration and their delegated committees would create the final schedule.

What has changed and why?

- At the sleep study committee's presentation on 10/30/18, it was very clear that both the Board and committee had concerns with PASD's current start time as well as PAEA's first proposal.
- National start time average of 8:03 seemed a priority at the minimum to be reached by PASD as a result of the board's questioning of the committee.
- PDT seemed to be preferred at end of day to ease academic impact on our athletes.
- Preservation of as many extra curricular activities both before and after school.
- Bus issues: K – 12 on same bus, cost of transportation to PASD and its taxpayers (1st option was minimum \$1.5 million), and impact on driver availability.
- Makes this a true 41 minute push for HS/MS and is very similar to Chadds Ford model but PASD has a 5 minute later start time.

Possible Schedule Compromise for Committee's 2nd option

Committee's Proposal:

Secondary times

T: 8:06 – 3:36

S: 8:10 – 3:21

Elementary times

T: 8:30 – 4:00

S: 9:00 – 3:45

Our Proposal:

Secondary times

T: 7:35 – 3:05

S: 8:05 – 3:00

Elementary times

T: 8:25 – 3:55

S: 8:55 – 3:40

- HS/MS would have identical schedule they do now just **41 minutes later** (see below)—keeps PDT at end of the day which helps alleviate early dismissal concerns for athletes.
- Puts us past the national average of 8:03, which was a major goal of the committee, and 5 minutes later than Unionville-Chadds Ford (they were a **25 minute push**, we are a **41 minute push**).
- Preserves most before and after school extracurricular activities.

High School

Teachers arrive 7:35

HR: 8:05 – 8:11

1: 8:11 – 8:55

2: 8:59 – 9:43

3: 9:47 – 10:31

4: 10:35 – 11:19

5: 11:23 – 12:07

6: 12:11 – 12:55

7: 12:59 – 1:43

8: 1:47 – 2:31

PDT: 2:35 – 3:05

Middle School

Teachers Arrive 7:35

HR:	8:05 – 8:11
1:	8:11 – 8:55
2:	8:58 – 9:42
3:	9:45 – 10:29
4 (Recap):	10:32 – 11:16

6th Grade Lunch

L:	11:19 – 11:49
5:	11:52 – 12:36
6:	12:39 – 1:23
7:	1:26 – 2:10
8:	2:13 – 2:57

7th Grade Lunch

5:	11:19 – 12:03
L:	12:06 – 12:36
6:	12:39 – 1:23

8th Grade Lunch

5:	11:19 – 12:03
6:	12:06 – 12:50
L:	12:53 – 1:23

Unionville-Chadds Ford

Changes Implemented at UCFSD

- Moved start and end time by 25 minutes
 - Start time moved from 7:35 a.m. to 8:00 a.m.
(The national average is 8:05 a.m.)
 - End time moved from 2:18 p.m. to 2:43 p.m.
- Transportation gained an average of an additional four minutes' efficiency.
Average secondary student pickup time is 29 minutes later than last year
- Schedule allows start time to be as late as possible without negatively impacting athletics and other after school activities

A Tale of Two Student Athletes**

2016-17 UHS Athlete

Wakes 5:30-6:00

Bus Pickup Times:
Earliest: 6:17 AM
Average: 6:52AM

School day 7:35-2:18

1st Practice 3PM

*If 11PM bedtime, student
gets 6.5-7 hrs sleep*

Sleep deficit: 1-2.5 hrs

***AAP Recommends 8-9
hours of sleep per night for
adolescents***

***Sleep hygiene and time
management are also a
factor in quantity of sleep***

***UCFSD has made progress
but we have further to go***

2017-18 UHS Athlete

Wakes 6:00-6:30

Bus Pickup Times:
Earliest: 6:52 AM
Average: 7:20AM

School day 8:00-2:43

1st Practice 3:15PM

*If 11PM bedtime, student
gets 7-7.5 hrs sleep*

Sleep deficit: .5-2 hrs

** Adapted from 2015 Start School Later Anne Arundel County

Results we are seeing

It is still early in the year, but...

- Students are reporting they are feeling more rested.
- Teachers are reporting that students are more attentive during first period classes
- Students appear noticeably more upbeat and positive upon arrival at school.
- We will be collecting data all year

Summary

A delayed start of 20 to 30 minutes coupled with better sleep habits shows how to best practically apply the data shown for circadian rhythms with minimal impact on the community, extracurricular activities/sports, and instruction. We have incorporated this into our proposal while exceeding the national average for school start time.