

FROM A TO ZZZZS:
What Teens Need to Know
About Sleep

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TEACHER'S RESOURCE BOOK

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FROM A TO ZZZZs: WHAT TEENS NEED TO KNOW ABOUT SLEEP

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A good night's sleep helps us to be alert and refreshed the next morning. Sleep is essential for mental and physical health. Sleep is the body's method of restoring energy, organizing new information, helping physical growth and creating a receptive environment for learning new things. Lack of sufficient sleep has dire consequences. Young people today face an epidemic of sleep deprivation that is detrimental to their academic and athletic performance, and also may cause health problems in years to come.

American teenagers are in desperate need of sleep. The National Sleep Foundation reports that 85 percent of teenagers do not get enough sleep. A teen's growing body should ideally receive 8½ to 9¼ hours of sleep each night, but homework, extracurricular activities and early school start times make it very difficult for young people to get the sleep their bodies need. A natural shift in the body's circadian rhythms adds to the problem. Biological patterns of sleep and waking cycles make teens suited to staying up late and sleeping later in the morning than adults do. The result is that many teens go through the day too tired to do their best.

Lack of sleep is more than an inconvenience. Insufficient sleep takes its toll on a teenager's mood, making him grouchy and easily irritated. It also hurts athletic performance. Teen athletes who don't get enough sleep find themselves plagued by coordination problems, a longer reaction time, reduced cardiovascular performance and reduced endurance. In addition, sleep deprivation impairs learning. Tired teens have a reduced ability to pay attention in class, decreased verbal creativity and communication, impaired abstract thinking and problem-solving skills, and decreased motivation. Sleep is also critical to organizing new information and strengthening memory. Without enough sleep, a teen's brain does not have the chance to completely process each day's new lessons. Tired teens even face health problems—they are more acne prone, have impaired immune systems, and are more likely to suffer metabolic deficits such as obesity. A sleepy teen faces unnecessary challenges when it comes to school, sports, health, and even relationships with family and friends.

There is yet one more issue regarding teens' reduced sleep habits. Sleep deprivation can be deadly when a tired teen gets in a car. There are 100,000 crashes each year because of drivers falling asleep at the wheel; 55 percent of those crashes are caused by drivers age 25 and under. Studies have shown that being awake for 18 hours has the same effect as a blood alcohol content of .08 percent—legally drunk in most states. With delayed reflexes and vision problems, sleep-deprived teen drivers are a danger to themselves and everyone else on the road.

The video *From A to ZZZZs: What Teens Need to Know About Sleep* will help young people understand the need for healthy sleep habits by explaining the biology of sleep, describing the consequences of too little sleep, and providing tips for getting restful sleep each night. With a little planning, teens can make a habit of getting vital hours of rest and wake up ready to do their best on the day's challenges.

LEARNING OBJECTIVES

After watching the video *From A to ZZZZs: What Teens Need to Know About Sleep* and participating in the class activities included in this Teacher's Resource Book, your students will be able to:

- explain how lack of sleep affects a person's mood, learning, ability to play sports and drive a car safely
- describe the different stages of sleep
- understand how a teen's circadian rhythms are different from an adult's rhythms
- explain how sleep enhances learning and memory
- list the negative effects of sleep deprivation on athletes
- discuss both sides of the "school start times" debate
- understand the dangers of driving while tired
- list safe ways of staying alert while driving
- identify factors that impair their ability to get a good night's sleep
- identify techniques for getting on a regular, healthy sleep schedule

PROGRAM SUMMARY

The program opens in the Bradley Sleep Research Laboratory in Providence, Rhode Island, where young teen volunteers live in isolation so scientists can study their sleep patterns. By measuring eye movement, muscle tension, and brain waves, labs like this one are yielding new insights into the way young people sleep. Two major findings, the narrator explains, are that teens have innately different sleep patterns than others do and that teens are not getting enough sleep; this lack of sleep is a problem because it has consequences for their physical and mental health.

Next, several teens describe how badly they feel when they haven't had enough sleep. The narrator then tells viewers that sleep deprivation affects many aspects of life: learning, athletic performance, emotional health, and driving safely. Even though scientists know sleep is important, she says, they still don't know everything about it.

Mary Carskadon, director of the Bradley Sleep Research Lab, then explains, "Sleep is a very complex, highly orchestrated program that plays out during the night." She describes two main kinds of sleep—non-REM sleep and REM sleep. REM (rapid eye movement) sleep is the time for dreams and cognitive activity.

The narrator adds that muscles are paralyzed during REM sleep to prevent a sleeper from acting out her dreams. Viewers learn that REM sleep is also very important for organizing information and forming memories. During non-REM sleep, the brain progresses through several stages, from drowsiness to deep, slow wave sleep when brain cells rest. The narrator explains that a single cycle of both types of sleep takes about 90 minutes and is repeated four to six times each night, with the amount of REM sleep increasing.

Viewers learn that nightly sleep cycles are part of a larger pattern of sleep and wakefulness called the circadian rhythms. "Each of us has an internal body clock consisting of small sets of nerve cells deep inside the brain," the narrator says. These nerve cells are on a schedule regulated by light signals traveling from the eyes to the brain, coordinating when people need to sleep and when they should be awake. The narrator points out that because the circadian rhythms are set by light, some people whose rhythms are out of sync with daylight—like jet travelers or night shift workers—have difficulty sleeping normally. "Humans are built to be day-active animals," Carskadon says. "Most people who are working night shifts, their brains just don't adapt to it."

The program then reveals that new research has discovered many teens live out of sync with their circadian rhythms too: As young people go through puberty, the timing of their internal body clocks shifts later. This means that teens have a biological inclination to stay up later at night and wake up later in the morning; while this can help teens stay alert in the evening, their circadian rhythms "clash with the demands of daily life that require getting up early."

The narrator then introduces another big problem for teens: getting enough sleep. Carskadon tells viewers that teens need over nine hours of sleep each night, but most don't get it—the average teenager sleeps about seven hours each night. Viewers learn that even an hour less than what they need each night builds up as a sleep debt, making them more and more tired. Considering that high school students must also wake up early for school, “it's no wonder that many teens aren't exactly at their sharpest in early morning classes.”

Several teens and a teacher talk about the struggle of paying attention in school in the morning; “I think that a lack of sleep works against a student's ability to learn. They come to class tired. They're not all there,” says teacher Stephen Gomez. The narrator adds that sleep deprivation also robs teens of the learning enhancement that sleep provides, as the brain consolidates new information and organizes memory while asleep.

Next, the narrator elaborates on the other benefits of sleep. She points out that lack of sleep negatively affects athletic abilities, may lead to inappropriate weight gain, weakens the immune system and makes teens more prone to depression, anger and irritability.

The program then turns to a major safety issue of sleep: drowsy driving. The narrator tells viewers that over 100,000 car crashes are caused each year by a driver falling asleep at the wheel—over half of which involve teens. Viewers then meet Rusty Burris, who shares his story. When driving home in 1990, Burris fell asleep and lost control of his car; “When I went off the ditch I hit a driveway embankment, and what happened is my car flipped, and while I was in the air I was ejected through the sunroof and paralyzed instantly,” he says. The narrator adds that Burris's crash crushed three vertebrae and necessitated months of exhausting rehab for him to learn how to function without the muscles below his chest. “I was young, thinking that I was invincible, that nothing bad would ever happen,” says Burris, who says he thinks he had been awake for 36 hours when he crashed. “It only takes one time for your life or someone else's life to change forever.”

The narrator tells viewers that, despite the risk, many drivers think they can handle the car when they're tired. She explains that many tricks used to stay alert—rolling down the window, turning on the air conditioning or the radio—don't work. Instead, “The most important thing to do when you feel drowsy is to get off the road as soon as possible.” The narrator advises drowsy drivers to get some caffeine, and then take a 30-minute nap before continuing.

The narrator points out that drowsy driving causes impairment comparable to driving drunk. She reviews a study from the Bradley Sleep Research Laboratory in which sleep-deprived volunteers performed a driving simulation test; “The effect on your driving is the same as if your blood alcohol level is .08 percent, the legal limit in most states.” Carskadon adds that drinking alcohol while sleepy affects impairment more than usual, making driving performance even worse.

The program wraps up by outlining tips for better sleep. One important tip is to stick to a regular sleeping schedule. Many teens try to make up for sleep debt by sleeping late on the weekends, but such irregular hours throw the circadian rhythms off balance and make it harder to get to sleep on time on Sunday nights. Carskadon recommends that teens sleep in just a little on weekends, and then take a short nap after noon if they are still tired. The narrator lists some things to eliminate for better sleep: avoid caffeine after lunchtime, avoid stimulating activity like homework or video games within an hour of bedtime, and don’t fall asleep with the TV on. To promote sleep, teens can do something relaxing before bed, stay in dark rooms at night so the brain can signal it’s time for sleep, get lots of bright light in the mornings, and learn how much sleep their bodies need and making sure to get it regularly.

Finally, the program reviews the lessons learned. Though many teens believe they can function on less sleep than they really need, research has shown that sleep is vital for learning, performance, moods, and safety. The narrator ends by urging viewers to make sleep a priority in their lives.

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STUDENT ACTIVITIES

Name: _____

Pre/Post Test

Decide whether the following statements are true or false.

1. TRUE or FALSE: There are two main types of sleep: non-REM sleep and REM sleep. _____
2. TRUE or FALSE: Cycles of daylight and darkness help regulate when people feel sleepy and when they feel alert. _____
3. TRUE or FALSE: A person's circadian rhythms stay constant throughout life. _____
4. TRUE or FALSE: Teenagers need about seven hours of sleep each night. _____
5. TRUE or FALSE: Sleep deprivation can hurt your ability to learn new things. _____
6. TRUE or FALSE: How much sleep you get has no effect on your mood. _____
7. TRUE or FALSE: Turning on the air conditioning is a good way to stay alert when driving. _____
8. TRUE or FALSE: It takes about 20 minutes to feel the effects of caffeine. _____
9. TRUE or FALSE: Driving while tired causes as much impairment as driving while drunk. _____
10. TRUE or FALSE: If you haven't gotten enough sleep all week, you should sleep really late on the weekends to make up for it. _____

Answers to this test appear on the next page.

Name: _____

ANSWER KEY

- | | | |
|-----|---|-------|
| 1. | TRUE or FALSE: There are two main types of sleep: non-REM sleep and REM sleep. | TRUE |
| 2. | TRUE or FALSE: Cycles of daylight and darkness help regulate when people feel sleepy and when they feel alert. | TRUE |
| 3. | TRUE or FALSE: A person's circadian rhythms stay constant throughout life. | FALSE |
| 4. | TRUE or FALSE: Teenagers need about seven hours of sleep each night. | FALSE |
| 5. | TRUE or FALSE: Sleep deprivation can hurt your ability to learn new things. | TRUE |
| 6. | TRUE or FALSE: How much sleep you get has no effect on your mood. | FALSE |
| 7. | TRUE or FALSE: Turning on the air conditioning is a good way to stay alert when driving. | FALSE |
| 8. | TRUE or FALSE: It takes about 20 minutes to feel the effects of caffeine. | TRUE |
| 9. | TRUE or FALSE: Driving while tired causes as much impairment as driving while drunk. | TRUE |
| 10. | TRUE or FALSE: If you haven't gotten enough sleep all week, you should sleep really late on the weekends to make up for it. | FALSE |

Name: _____

ACTIVITY 2A
YOUR SLEEP LOG

Here's your chance to determine how healthy your sleeping habits are by keeping this sleep log for ten days. Begin your log on a Friday night and continue collecting information through the following Monday. Start by writing down what time you go to bed each night and what time you woke up. Round each time to the nearest quarter hour (for example, if you went to bed at 11:23 pm, write down 11:30). Use the time you went to bed the night *before* as you fill in each row—if you are filling in the “Saturday” row, write down what time you went to bed Friday night. Then, rate your energy on a 1-5 scale three times each day—at 10:00 in the morning, 3:00 in the afternoon and 10:00 in the evening. Use this key:

1 = very exhausted 5 = very energetic

The first line is a sample for you to follow.

Day of the week	Bedtime (night before)	Wake Up Time	Hours of Sleep	Energy: 10 am	Energy: 3 pm	Energy: 10 pm
<i>Tuesday</i>	<i>11:30 pm</i>	<i>6:15 am</i>	<i>6.75</i>	<i>3</i>	<i>2</i>	<i>3</i>
<i>Saturday</i>						
<i>Sunday</i>						
<i>Monday</i>						
<i>Tuesday</i>						
<i>Wednesday</i>						
<i>Thursday</i>						
<i>Friday</i>						
<i>Saturday</i>						
<i>Sunday</i>						
<i>Monday</i>						

This activity is continued on the next page.

Name: _____

After your ten days are over, look back on your sleep log and answer the questions below.

1. On average, how many hours of sleep did you get each week night?

2. On average, how many hours of sleep did you get each weekend night?

3. How did your weekend sleep habits compare to your weekday habits?

4. What connection did you notice between how much sleep you got at night and how energetic you felt the next day?

5. In general, at what time of day did you feel most exhausted? At what time did you feel most energetic?

Consult the *Sleep Tips* fact sheet for information on how to improve your sleep habits.

Name: _____

Find out more about sleep by choosing one of the topics below and writing a brief research paper about it. Look for information in books, scientific journals, magazines and reputable websites. Keep track of all your sources with the *Resource Tracker*.

1. Sleep deprivation and the body
What happens to your body when you don't get the sleep you need? What kind of consequences do sleep-deprived teens face when it comes to health? Check out themes like acne, obesity and the immune system. Who is at risk? What do these health problems have to do with sleep?
2. Sleep and learning
Researchers have discovered connections between sleep and how well you process new information and memories. How does a good night's sleep help you learn? How does too little sleep affect your performance in school? Look for the latest research findings.
3. Sleep disorders
What are the most common sleep disorders, and what causes them? Who is at risk? What symptoms and consequences are associated with each one? How are they treated? Possible disorders to research include sleep apnea, insomnia, periodic limb movement disorder, restless legs syndrome, acid reflux and nightmares.
4. Sleep labs
How do scientists study sleep? Look for information about one or more sleep laboratories and review their studies. Who is involved? What new findings have they uncovered? What equipment is used? The video featured the Bradley Sleep Research Laboratory at Brown University; can you find any others?
5. Dreams
Dreams occur each night during REM sleep, but scientists still debate why we dream. What do different experts think about the purpose of dreaming? What happens in the brain during a dream? How do scientists study dreams?

Name: _____

Each night's sleep is divided into five different stages. A complete cycle of all five stages typically lasts 90-110 minutes. Throughout the night, a sleeper moves through four to six complete cycles. Read the clues below and identify which stage of sleep it represents. For more information, refer to the *From Awake to Asleep* fact sheet. Choose your answers from the list below.

Stages 1 & 2 (Non-REM sleep)

Stages 3 & 4 (Non-REM sleep)

Stage 5: REM sleep

1. Dreams occur in this stage. _____
2. The sleeper moves between consciousness and sleep. _____
3. Muscles are paralyzed. _____
4. Brain waves begin to slow down and body temperature starts to drop. _____
5. The body releases growth hormone in this stage. _____
6. This stage is essential for renewing energy. _____
7. Eyes move rapidly back and forth behind the eyelids. _____
8. It's very hard to wake a sleeper in this stage. _____
9. This stage takes up more time in each cycle as the night goes on. _____
10. Tissue growth and repair happens in this stage. _____

The Answer Key for this activity appears on the next page.

Name: _____

ANSWER KEY

- | | |
|--|-------------------------|
| 1. Dreams occur in this stage. | <u>Stage 5: REM</u> |
| 2. The sleeper moves between consciousness and sleep. | <u>Stages 1 & 2</u> |
| 3. Muscles are paralyzed. | <u>Stages 3 & 4</u> |
| 4. Brain waves begin to slow down and body temperature starts to drop. | <u>Stages 1 & 2</u> |
| 5. The body releases growth hormone in this stage. | <u>Stages 3 & 4</u> |
| 6. This stage is essential for renewing energy. | <u>Stages 3 & 4</u> |
| 7. Eyes move rapidly back and forth behind the eyelids. | <u>Stage 5: REM</u> |
| 8. It's very hard to wake a sleeper in this stage. | <u>Stages 3 & 4</u> |
| 9. This stage takes up more time in each cycle as the night goes on. | <u>Stage 5: REM</u> |
| 10. Tissue growth and repair happens in this stage. | <u>Stages 3 & 4</u> |

Name: _____

**THE ROAD TO
BETTER SLEEP**

Are you getting all the sleep you need? Chances are, the answer is no. The National Sleep Foundation reports that 85 percent of teens don't get enough sleep. Between school, sports, clubs, and work, it may seem like you just don't have enough hours each day. But sleep is important! You simply can't be at your best if you haven't had enough sleep. The good news is that you can improve your sleeping habits with a little planning. Use this activity to pinpoint where you need work and create ways to improve in those areas.

PART ONE: Evaluation

Just how smart are you when it comes to sleep? Evaluate your habits by answering the questions below. Be honest!

	YES / NO
Do you get fewer than 8½ hours of sleep most nights?	
Do you go to bed and get up much later on weekends than you do on weekdays?	
Do you often take long naps in the evening?	
Do you drink caffeine after mid-afternoon?	
Do you often eat a big snack right before bed?	
Is your bedroom too bright or noisy at night?	
Do you often fall asleep in front of the TV?	
Do you often do homework or read complex books right before bed?	

Each of your “yes” answers represents a potential “sleep roadblock,” an area where you can work towards improvement. The more you do to change those habits, the better your sleep will be, and the better you will feel!

This activity is continued on the next page.

Name: _____

**THE ROAD TO
BETTER SLEEP**

PART TWO: Planning

Now that you know where you need improvement, it's time to create a plan that will help you rest easier. Consult the *Roadblocks to Good Sleep* fact sheet for more information. For each roadblock that you checked in Part One, fill out an improvement plan below. If you checked more than one box, continue on a separate sheet of paper. Use the sample below as a guide.

Sleep Roadblock: *Exercising within a few hours of bedtime.*

Why do I have this roadblock? *Between homework, drama club meetings and dinner, the only free time I have for the gym is late in the evening.*

Why does this hurt my ability to get a good night's sleep? *Exercise stimulates the body, making me too alert to fall asleep early enough to get a full night's rest.*

What can I do to improve? *Rearrange my routine so I go to the gym after drama club and before dinner. Do homework after dinner, but stop within an hour or two of bedtime to relax and get ready for sleep.*

SLEEP ROADBLOCK: _____

Why do I have this roadblock?

Why does this hurt my ability to get a good night's sleep?

What can I do to improve?

Name: _____

By now you know how important sleep is for your well-being, but do you know all the facts about good sleep habits? Many myths still circulate about the best ways to fall asleep or stay awake. Can you separate the fact from the fiction? Can your family and friends?

PART ONE: Decide whether the following statements are true or false. When you are finished, move onto Part Two of this exercise.

1. True or False: Drinking alcohol helps ensure a good night's sleep. _____
2. True or False: Caffeine won't affect your ability to fall asleep as long as you stop drinking it at least two hours before bedtime. _____
3. True or False: The ideal bedroom should be dark and quiet. _____
4. True or False: Turning on the air conditioner or rolling down the window will keep you alert while driving. _____
5. True or False: You should always take a nap if you're really tired, no matter what time of day it is. _____
6. True or False: Caffeine starts making you alert as soon as you drink it. _____
7. True or False: Sleeping in very late on the weekends is a great way to catch up on lost sleep. _____
8. True or False: Falling asleep with the TV on hurts the quality of your sleep. _____
9. True or False: Taking a bath in the evening helps you fall asleep. _____
10. True or False: To be effective, a nap should last at least an hour. _____
11. True or False: Talking to a companion on a long road trip helps keep you alert. _____
12. True or False: Exercising right before bedtime tires you out and helps you fall asleep. _____
13. True or False: Doing homework late at night makes it harder to fall asleep. _____
14. True or False: Cigarettes adversely affect your ability to sleep. _____

This activity is continued on the next page.

Name: _____

PART TWO: Check your answers against the Answer Key provided below. How many statements did you score correctly?

1. False. Alcohol does make a drinker sleepy, but will also cause him to wake up more frequently during the night and wake up early in the morning, hurting his overall quality of sleep.
2. False. Caffeine can continue affecting the body hours after it is consumed. To make sure the ability to fall asleep is not harmed, avoid caffeine after 2 pm.
3. True. Darkness leads to the release of sleep-inducing chemicals in the brain. Noisy rooms are distracting.
4. False. An air conditioner or open window will increase your alertness temporarily.
5. False. Taking a nap too late in the day will make it harder to fall asleep at your normal bedtime—making you more tired the next morning.
6. False. It takes 30 minutes for caffeine to take effect.
7. False. Waking up much later on the weekends than you do on the weekdays seriously disrupts your sleep schedule, making it harder to get the sleep you need on Sunday night.
8. True. TV's flickering lights can harm sleep quality.
9. True. A relaxing bath helps you unwind and get ready to fall asleep.
10. False. Any nap longer than 20 minutes can make you disoriented when you wake up.
11. True. A companion on a long drive makes a trip safer by helping keep the driver alert.
12. False. Exercise stimulates the body and mind, making it hard to fall asleep.
13. True. Homework also stimulates the mind, making it hard to relax and fall asleep.
14. True. Cigarettes contain nicotine, a stimulant that increases alertness.

PART THREE: Now that you've tested your knowledge of sleep habits, read the questions to five other people. Write down their answers on a separate sheet of paper. When your respondents have finished the survey, read them the correct answers.

PART FOUR: Write a brief essay summarizing the sleep facts you think everyone should know. Your essay should identify any statements that two or more of your respondents answered incorrectly. Explain what you think is the most common myth about sleep.

Name: _____

The amount of sleep you get each night makes a big difference when it comes to your daytime performance. Sleep deprivation—even an hour or two less than you need each night—has all kinds of negative consequences. Your body and your mind simply can't function at their best when you haven't gotten the sleep you need.

Read the following scenarios. For each one, write two different endings on a separate piece of paper. Use what you have learned in the video and from the *Sleep Deprivation* and *Drive Safely* fact sheets. What could happen to each teen if he or she doesn't get enough sleep? How would things be different if he or is well-rested?

1. Sofia is one of the best players on her school's field hockey team. This year, she is also president of the Service Club. The club is planning a big charity fundraiser, so Sofia has been busy getting things ready for the event. Sofia manages to balance field hockey practice with her duties as president—until she finds out a big game is scheduled for the day after the fundraiser. Both are really important events. There is a lot to do to make sure the club event goes smoothly, but a college scout will be at the game.

Ending 1: Sofia stays up late planning for the fundraiser after practice each day, stays late to clean up after the event, and shows up to Saturday's game seriously sleep-deprived.

Ending 2: Sofia asks the other members of the club to take on more responsibility so she has enough time for practice and homework too. Their help allows her to get a full night's sleep all week.

2. Ian is really excited to visit his brother Scott, who is a freshman at a college that is three hours away from home. He borrows his dad's car to drive up to campus after school on Friday. Ian and Scott have a great time. Scott takes his brother on a tour of the school, introduces him to his new friends, and takes him to parties both Friday and Saturday nights. Even though they go to bed really late each night, they have to wake up early to have time for all the activities they planned. When it comes time to leave on Sunday night, Ian can't stop yawning.

Ending 1: Ian decides he has to drive home so he can make it to school the next morning.

Ending 2: Ian decides he's too tired to drive home safely.

This activity is continued on the next page.

Name: _____

3. Laurie has been having a lot of trouble in algebra class this year. She is right on the borderline between passing and failing. She knows she needs a good grade on her final exam to pass the class. Laurie is really worried about the test.

Ending 1: Laurie stays up all night to study the night before her final, drinks a large coffee, and shows up to the test.

Ending 2: Laurie plans ahead and meets with a tutor the week before the test, then sets aside a time to study each night. She makes sure to get enough sleep each night.

4. Tony loves playing the violin. He's been a member of the school orchestra since fifth grade, and he just won the chance to play a solo in the holiday concert downtown. The solo is complicated, so Tony needs to work really hard to learn it.

Ending 1: Tony practices each day, but stays up late at night talking to friends and watching TV. When the concert finally arrives, he has accumulated a large sleep debt.

Ending 2: Tony practices each day, but goes to sleep on time every night. When the concert arrives, he feels like he knows the piece backwards and forwards.

5. Alise and Rob have been dating for five months, and so far their relationship has been fairly smooth. One night Rob tells her that he'd like to have a "serious talk" that weekend, but doesn't say what he wants to talk about.

Ending 1: Alise worries that Rob wants to break up with her and stays up the next few nights tossing and turning. When they finally have their talk, Alise is sleep-deprived and in a bad mood.

Ending 2: Alise tries her best not to worry too much and gets enough sleep each night. When they finally have their talk, Alise is calm and ready to listen.

Name: _____

As you learned in the video, a shift occurs in circadian rhythms during the teen years, making teens naturally prefer to stay up later at night and wake up later in the morning. But high school start times often conflict with this shift. Even though many teens don't feel ready to sleep until about 11 pm, they must wake up as early as 5:30 am to get ready for school. That means many teens aren't getting the 8½ to 9¼ hours of sleep they need every night.

Some school administrators, parents and teens argue that high schools should push their start times back by an hour or two to be more in line with a student's circadian rhythms. Others disagree, citing problems with bus schedules and extracurricular activities. In this activity, you'll join the debate. First, decide which opinion you want to defend. Next, get together with two or three other classmates who share your opinion. Together, you will come up with a way to share your views.

STEP ONE: Research

Gather information in the library and on the Internet to support your opinion. Look for experts' opinions, teacher and administrator views, and results from high schools that moved their start times to later in the morning. Organize your group's findings.

STEP TWO: Prepare an Argument

Now that your group has researched good reasons to support your argument, choose a method for presenting your views to the public:

- A letter to the editor of a newspaper or magazine
- A letter to your representative or senator proposing a bill to start high school later in the morning OR urging him or her to oppose such a bill
- A letter to the superintendent of your school district explaining your views and asking to move start times back OR to keep them as they are

No matter which you choose, make sure to include clear reasons for your opinion and supporting evidence. Make sure to cite your sources. *Note: If your school has already moved start times back, use your personal experiences as part of your argument. If you think the change was good, explain why—if you don't, explain why not.*

STEP THREE: Share Your Views

After you have typed up your letter, send it! What kind of response did you get? What else can you do to persuade people to share your opinion?

Information adapted from the National Sleep Foundation

Name: _____

Each year, 100,000 car accidents are caused each year by drowsy driving. Yet many people don't fully understand the danger of getting behind the wheel when they are sleepy. Here's your chance to educate your school or community by creating a public service campaign about the risks of drowsy driving. Consult the *Drive Safely* fact sheet to get started.

1. In small groups, brainstorm ideas for your campaign. Decide how you will communicate your message. Some ideas include:

- A series of posters to put up in your school hallways
- An ad for your school or local newspaper
- A 30-second radio commercial to be broadcast over your school's PA system
- A TV commercial to be played on your local TV station or in school classrooms

Remember, you are actually producing a campaign for others to see, so make sure your group has all the materials it needs for your method of choice. For example, don't choose a TV commercial if you don't have access to recording equipment.

2. Research drowsy driving at the library or on the Internet. What are the most interesting facts? What are the most important points to remember? How can people prevent drowsy driving crashes? As a group, decide which information you will focus on.
3. Get creative! How will you present your information? Remember, an effective public service campaign is both educational and memorable. Think about campaigns you have seen or heard before; ads about topics like drugs or smoking may inspire you.
4. Present your campaign. Make sure that people can see or hear your message. If you designed posters for the hallway, talk to your principal about where to display them. If you made a radio announcement or TV commercial, get permission from teachers and administrators to play them. If you created an ad for a local newspaper or TV station, contact the editor or employee who can help you get your message in print or on the air.
5. Share your campaign with the rest of the class, and then discuss each other's projects. Which were your favorite campaigns, and why?

FACT SHEETS

Name: _____

The teenage body has a complex system for regulating the sleep cycle—a cycle that is different from an adult's. As the day goes on, changes in the brain make you feel alternately alert and sleepy, until light cues and brain chemicals tell you that it's time to go to bed.

8 am: Morning sunlight hits the eye and is transmitted along the optic nerve to a cluster of neurons in the brain called the suprachiasmatic nucleus, or SCN. The SCN sends signals to the body telling it to wake up. These signals include an increase in body temperature, an increase in the hormone cortisol, and a message to the pineal gland to stop producing melatonin (a sleep-inducing hormone). Levels of the chemical adenosine, which causes sleepiness, are at their lowest; as the day goes on, adenosine accumulates in the blood.

11 am: The body is awake and alert, thanks to circadian rhythms. The circadian rhythms are like a body clock. They regulate cycles of feeling sleepy and feeling awake, telling the body when it needs sleep and when it should wake up. The cycles rise and fall even when a person is awake.

During the teen years, the circadian rhythms undergo a shift, making teens more inclined to go to sleep later and wake up later than adults or children. Therefore, teens hit their “highs” and “slumps” in the circadian rhythms a few hours later than adults do.

3 pm: The body hits a slump in its circadian rhythm, making a teen feel tired. Some people take a short nap to get over the temporary drive to sleep. Others fight it by doing active or stimulating activities. The afternoon slump in teens happens between 2 and 5 pm. In adults, between 1 and 3 pm.

11 pm: Darkness sends another message to the SCN, this time stimulating the pineal gland to secrete melatonin. Adenosine levels are at their highest—the drive to sleep becomes very strong.

Name: _____

Over the span of the night, a sleeper typically moves through four to six cycles consisting of five different stages. Each cycle lasts about 90-110 minutes.

Stage 1:

The sleeper moves between consciousness and unconsciousness. Brain waves and muscle activity slows down.

Stage 2:

Light sleep. Brain waves become even slower, and heart rate and body temperature start to drop.

Stage 3:

Brain waves are very slow. Blood pressure and breathing continue to drop and muscles are relaxed. This stage is essential for generating energy for the next day. Tissue repair occurs in this stage and the body releases growth hormones.

Stage 4:

Deepest sleep; it's very difficult to wake someone in this stage. Muscles are still relaxed. This stage is also essential for energy; tissue repair and the release of growth hormones continue to occur.

Stage 5:

Rapid eye movement, or REM sleep. In this stage, brain waves are intense and active. Dreams occur in this stage. Muscles are paralyzed, preventing a sleeper from acting out her dreams. As the night progresses, a larger and larger part of each sleep cycle is spent in REM sleep.

Name: _____

Your body needs sleep. You may think that you can get used to fewer than the nine hours you need each night, but even an hour or two less than that has serious consequences. Check out all the problems you face when you're sleep-deprived:

Learning

The brain needs a good night's sleep to perform well the next day. If you don't get enough of it, you'll experience:

- a reduced ability to pay attention
- a decrease in verbal creativity and communication
- impaired abstract thinking
- difficulties solving problems and thinking innovatively
- trouble making decisions involving unexpected events
- a decrease in overall motivation
- impaired memory. Sleep is crucial to organizing that new information and strengthening memory—when some people were tested the day after learning a new task, the ones who got a good night's sleep performed better than the ones who didn't.

Athletic Performance

The body is also affected when you're sleep-deprived. Consequences include:

- impaired coordination, blurred vision, and slower reaction times
- reduced cardiovascular performance—by up to 11 percent
- diminished mental functioning
- reduced endurance and increased feelings of exertion

Health

Lack of sleep is more than uncomfortable or inconvenient—it's downright unhealthy. Risks of sleep deprivation include:

- becoming more acne-prone
- impaired immune system, making you more likely to get sick
- hormone imbalances that make obesity more likely

Mood

It's simple: you just don't feel good when you're tired. Without enough sleep, you'll be:

- more aggressive
- irritable and easily angered
- at increased risk for depression

Certain behaviors or activities make it very difficult to get the sleep you need each night. If you have trouble falling asleep, try to remove these roadblocks from your life.

Too much caffeine

The caffeine in coffee and soda blocks the adenosine receptors in the brain, preventing the sleep-inducing chemical from doing its job. Caffeine can affect your ability to fall asleep for hours after drinking it.

Long naps

Naps too close to bedtime deplete the sleep-inducing chemicals in the brain, making it harder to fall asleep when you really need to.

Erratic schedule

The body works best when it has a regular schedule, which means going to bed and waking up at about the same time every day, including weekends. Staying up more than an hour later and waking up more than two or three hours later on the weekends than you normally do disrupts that schedule, making it difficult to get back into your weekday pattern when Sunday night rolls around.

Distracting bedroom

The perfect sleep environment is a comfortable temperature, dark, quiet, and free from distractions like TV, a computer or a cell phone. If your bedroom is too hot or cold, bright, noisy or distracting, you may have trouble sleeping.

Stimulating activities at night

Doing homework, reading complex books, or exercising too close to bedtime revs up your system and makes you too alert to fall asleep easily. Instead, give yourself at least an hour before you fall asleep to do relaxing activities, like taking a bath or listening to quiet music.

Untreated sleep disorders

You may have a condition that hurts your ability to sleep, such as sleep apnea, snoring, nightmares, periodic limb movement disorder, or restless legs syndrome. Finding a doctor and getting treatment can improve your sleep.

Name: _____

In the video you learned how important it is to get between 8½ and 9¼ hours of sleep each night—so how can you make sure to do it? Follow these tips for a quiet, restful night.

1. Be smart about naps. Naps are a great way to restore alertness, but be careful not to nap too close to your bedtime. Napping too late in the afternoon makes it harder to fall asleep at night. Aim for a nap of only 20-30 minutes—otherwise, you may wake up groggy and disoriented.
2. Avoid caffeine and nicotine. Both are stimulants, so you should stop consuming them in the early afternoon.
3. Avoid alcohol. Although it can temporarily help you fall asleep, it also causes you to wake up often during the night and wake up earlier in the morning, so your overall sleep quality will suffer.
4. Exercise at least five hours before bedtime. If you exercise within a few hours of bedtime, your body will be too stimulated to fall asleep.
5. Stick to a regular schedule. This can be hard for teens who want to stay up late and sleep in on the weekends, but drastic changes in your routine make it much harder to fall asleep on the weekdays. Try not to go to bed more than an hour later than you normally do, and don't sleep in more than three hours later. Don't go off your regular sleep schedule for more than two nights in a row if you can help it.
6. Do something relaxing for an hour or two before bedtime. Don't do homework or watch TV—instead, take a bath, listen to calm music, or read something light.
7. Stress increases alertness and stimulates the release of cortisol, which should be at its lowest levels when you're trying to sleep. Jot down things that worry you before bed and forget about them for the night—you can deal with them in the morning.
8. Make your bedroom a good sleeping environment. Make sure it is dark, quiet, and a comfortable temperature—use curtains or earplugs if you need them. Don't use your bedroom for stressful or intense activities, so that you associate the room only with calm and sleep.

Name: _____

In the video, you met one man whose drowsy driving ended in tragedy when he was a teen. He's certainly not alone—thousands of accidents occur each year because of a driver falling asleep at the wheel. Young people have a much higher risk of causing an accident than adults. Did you know:

- 100,000 car accidents happen each year are caused by falling asleep at the wheel.
- 55 percent of drowsy driving crashes are caused by drivers 25 and under.
- Being awake for 18 hours is equivalent to having a blood alcohol content of .08 percent—which is legally drunk in most states.
- The highest-risk groups for drowsy driving crashes are males ages 25 and under, night shift workers or people who work long hours, commercial drivers, business travelers, and people with undiagnosed sleep disorders.

Make sure you reach your destination safely by following these guidelines.

1. Most importantly—get a good night's sleep before a big trip!
2. Bring a friend along to share the driving duties and talk to you when you're behind the wheel.
3. Stop regularly—every two hours or every 100 miles.
4. Stay away from alcohol—its effects are multiplied when you are tired. The same goes for medications that make you drowsy.
5. Watch yourself for danger signs: difficulty focusing, trouble remembering the last few miles, yawning, nodding, rubbing your eyes, missing exits or traffic signs, drifting out of your lane, or hitting the shoulder.
6. If you find yourself too tired to go on, pull over in a safe place for a 20-minute nap. Drinking caffeine before you go to sleep will help; it takes about 30 minutes for caffeine to take effect, so you will be more alert by the time you wake up.
7. Turning the air conditioner on, rolling down the window, or playing the radio will NOT help you stay awake!

Name: _____

For more information, visit these websites.

“Brain Basics: Understanding Sleep.” National Institute of Neurological Disorders and Stroke, National Institutes of Health.

http://www.ninds.nih.gov/disorders/brain_basics/understanding_sleep.htm

Read up on sleep research, sleep and health, and lots more.

The National Road Safety Foundation, Inc

www.nationalroadsafety.org

This website provides useful information about preventing drowsy driving accidents, plus general safety tips for teen drivers.

The National Sleep Foundation

www.sleepfoundation.org

This site offers a wealth of information on all sleep-related topics. Check out the Doze Family animated tutorial, polls, quizzes, sleep shop, and special section on teens and sleep.

“Sleep, Sleep Disorders, and Biological Rhythms.” NIH Curriculum Supplement Series, National Institutes of Health

<http://science.education.nih.gov/supplements/nih3/sleep/default.htm>

Explore what happens in the brain and body during sleep. Try sleep-related student activities.

TeensHealth

www.kidshealth.org/teen/

Find out answers to questions like, “How much sleep do I need?” and read up on sleep disorders.

Name: _____

“Common Sleep Problems.” TeensHealth, The Nemours Foundation.
www.teenhealth.org/teen/your_body/take_care/sleep.html

“Drowsy Driving.” The National Road Safety Foundation.
www.nationalroadsafety.org/quicksafety/drowsy.html

“How Much Sleep Do I Need?” TeensHealth, The Nemours Foundation.
www.teenhealth.org/teen/your_body/take_care/how_much_sleep.html

“Interview: Carlyle Smith.” *Inside the Teenage Brain*. Frontline.
<http://www.pbs.org/wgbh/pages/frontline/shows/teenbrain/interviews/smith.html>

“Interview: Mary Carskadon.” *Inside the Teenage Brain*. Frontline.
www.pbs.org/wgbh/pages/frontline/shows/teenbrain/interviews/carskadon.html

National Sleep Foundation, www.sleepfoundation.org

“Sleep, Sleep Disorders, and Biological Rhythms.” NIH Curriculum Supplement Series,
National Institutes of Health.
<http://science.education.nih.gov/supplements/nih3/sleep/default.htm>

Spinks, Sarah. “Adolescents and Sleep.” *Inside the Teenage Brain*. Frontline.
<http://www.pbs.org/wgbh/pages/frontline/shows/teenbrain/from/sleep.html>

Name: _____

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<i>Walk This Way: Exploring Tolerance, Diversity and Difference</i>	video/print or DVD/print

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