

Slumber by the Numbers

Quantitative Measures

Lesson

In this lesson, students read several versions of the same article. ARTICLE A contains few quantitative measures (numbers), ARTICLE B offers a range of choices for reasonable quantitative measures, and ARTICLE C is the original article as published.

“Quantitative measures are given in correct and comparable units. Nearly every story has a number—a percentage, cost, patients tested, etc. It is an important element of science practice.”

SciJour Content Standards

Objective: Students will recognize the importance of quantitative measures (numbers) in articles to enhance credibility and understanding.

Materials: ARTICLE A *Slumber by the Numbers*

ARTICLE B *Slumber by the Numbers*

ARTICLE C *Slumber by the Numbers*

Time: approximately 30 minutes

Getting Started

NOTE: Do not initially reveal to the students the objectives of this lesson. Ask the students if any are tired. Then ask how many hours of sleep they got last night. See if anyone knows the ideal amount of sleep high school students should get each night.

Addressing the Topic

Distribute ARTICLE A or project it on the screen. (In this edited version of the article the numbers have been replaced with vague references to amounts. Ideally, as the students read the article they will notice the lack of detail and may become frustrated with the limited quantitative measures.)

Read ARTICLE A either together as a class, or have students read to one another in pairs. Encourage students to comment on the article as it is being read. If none of the students notice the lack of numbers, the teacher may pose some “wondering” questions such as (following paragraph 2) “I wonder how many students were surveyed?” or (following paragraph 3) “I wonder how many hours of sleep teens really do need?” Continue with “wondering” questions that are about quantitative measures that are lacking in the article.

The article can be read in its entirety, or (once the lack of number amounts has been noted) move on to ARTICLE B.

Distribute ARTICLE B or project it on the screen. (In this edited version of the article the numbers have been replaced with groups of choices. One of each group is correct and was taken from the original version). Read the article aloud with the class and stop at the first set of choices (#1). Have students select the answer choice that seems most reasonable. Then, have students read the rest of the article in pairs and decide together which answer choice to select.

Distribute ARTICLE C or project it on the screen. (This version of the article is the original with the complete numbers in place.) Have students read the article individually. (They will be eager to do so to see which choices had been correct.)

Follow-up

Close with a *quick-write* in which the students think and write about the inclusion of numbers and the importance of numbers when writing articles of their own.

Article A

Slumber by the numbers

Science News for Kids

January 27, 2010

NOTE: This article has been edited for educational purposes



Scientists hope to understand why most teenagers don't get enough sleep at night, and how too little sleep affects their well-being.

Trista Weibell/iStockphoto

It's an important question: "On an average school night, how many hours of sleep do you get?"

Many high school students were recently asked that during a survey by the Centers for Disease Control and Prevention. The overall answer: not enough.

Studies have shown that teenagers really need more hours of sleep, with less hours considered a "borderline" acceptable amount. In the CDC study, however, only some of the surveyed students reported getting the ideal amount, while more reported averaging less hours of shut-eye nightly.

Danice Eaton, a research scientist at the CDC, led this most recent survey, which was part of what the agency calls a Youth Risk Behavior Surveillance. Every year, CDC scientists like Eaton ask high school students about behaviors that can harm their health. The questions are on topics such as nutrition, weapons, sex and drug use — and sleep.

Sleeplessness, like other behaviors, carries a heavy toll. Scientists ask the survey questions to find a way to help people. Among young people, quite a few deaths happen for one of the following reasons: motor vehicle accident, other accidents, homicide and suicide. Scientists like the CDC's Eaton hope that by understanding the risky behaviors, like sleeplessness, that might contribute to these tragedies, they may be able to save lives.

Also, without enough sleep, a person might have more trouble learning or exercising good judgment. Over time, people who regularly don't get enough sleep are more likely to be obese (which means very overweight) or get sick with serious diseases, some studies have found. Other studies have shown that even one night with less sleep than needed can throw off the chemical balance of the body.

Most students interviewed got much less than the average hours of sleep. Eaton and her team found that some students sleep for even fewer hours per night. Others sleep only several hours per night. Fewer students, or 10 percent, reported sleeping even less hours, and a smaller number of students said they slept only short periods of time during the night.

The CDC's study identified a problem — but not the cause. Why do teenagers sleep less than they should? Maybe many teens like to work and stay up late. (This can make it rough to get up for school the next morning.) A number of scientific studies suggest some other ideas, as well. Computer use may be a culprit: Some scientists have found that the blue light given off by computer screens may interfere with the body's internal biological clock — making it difficult to go to sleep.

Other scientists have come up with new and interesting ways to help people who can't sleep.

Studies suggest, for example, that a person's biological clock responds favorably to blue light that is the color of the sky. So perhaps people are biologically "set" to start their day when they see the sky — and when people see a blue computer screen, their bodies misinterpret the light as morning. Some research has shown that donning a pair of yellow glasses at night will block the blue wavelengths. This allows people to become naturally sleepy, even after a long night on the computer.

Whatever the cause of too little sleep may turn out to be, the CDC's effort to identify the problem is an early step toward finding a treatment. Once scientists understand the problem, they can design ways to solve it.

Article B

Slumber by the numbers

Science News for Kids

January 27, 2010

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Scientists hope to understand why most teenagers don't get enough sleep at night, and how too little sleep affects their well-being.

Trista Weibell/iStockphoto

It's an important question: "On an average school night, how many hours of sleep do you get?"

More than 12,000 high school students were recently asked that during a survey by the Centers for Disease Control and Prevention. The overall answer: not enough.

Studies have shown that teenagers really need at least

1. (A. 7 hours of sleep, B. 8 hours of sleep, C. 9 hours of sleep, D. 10 hours of sleep), with one hour less considered a "borderline" acceptable amount. In the CDC study, however, only around 900 of the surveyed students reported getting the ideal amount, while an additional 2,800 reported averaging one less hour of shut-eye nightly.

Danice Eaton, a research scientist at the CDC, led this most recent survey, which was part of what the agency calls a Youth Risk Behavior Surveillance. Every year, CDC scientists like Eaton ask high school students about behaviors that can harm their health. The questions are on topics such as nutrition, weapons, sex and drug use — and sleep.

Sleeplessness, like other behaviors, carries a heavy toll. Scientists ask the survey questions to find a way to help people. Among people between the ages of 10 and 24, **2. (A. 3 of every 4, B. 1 of every 2, C. 6 of every 10, D. 9 of every 13)** deaths happen for one of the following reasons: motor vehicle accident, other accidents, homicide and suicide. Scientists like the CDC's Eaton hope that by understanding the risky behaviors, like sleeplessness, that might contribute to these tragedies, they may be able to save lives.

Also, without enough sleep, a person might have more trouble learning or exercising good judgment. Over time, people who regularly don't get enough sleep are more likely to be obese (which means very overweight) or get sick with serious diseases, some studies have found. Other studies have shown that even one night with less sleep than needed can throw off the chemical balance of the body.

Most students interviewed got much less than eight hours of sleep. Eaton and her team found that 30.2 percent, or about

3. (A. 7,200 students, B. 1,800 students, C. 900 students, D. 3,600 students) sleep for only

seven hours per night. About 2,700 students, or **4. (A. 22.8 %, B. 45.6 %, C. 11.4 %, D. 52.9%)** sleep only six hours per night. About 1,200 students, or 10 percent, reported sleeping five hours, and 5.9 percent, or 708 students, said they slept four hours or less.

The CDC's study identified a problem — but not the cause. Why do teenagers sleep less than they should? Maybe many teens like to work and stay up late. (This can make it rough to get up for school the next morning.) A number of scientific studies suggest some other ideas, as well. Computer use may be a culprit: Some scientists have found that the blue light given off by computer screens may interfere with the body's internal biological clock — making it difficult to go to sleep.

Other scientists have come up with new and interesting ways to help people who can't sleep.

Studies suggest, for example, that a person's biological clock responds favorably to blue light that is the color of the sky. So perhaps people are biologically "set" to start their day when they see the sky — and when people see a blue computer screen, their bodies misinterpret the light as morning. Some research has shown that donning a pair of yellow glasses at night will block the blue wavelengths. This allows people to become naturally sleepy, even after a long night on the computer.

Whatever the cause of too little sleep may turn out to be, the CDC's effort to identify the problem is an early step toward finding a treatment. Once scientists understand the problem, they can design ways to solve it.

Article C

Slumber by the numbers

Science News for Kids

January 27, 2010



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It's an important question: "On an average school night, how many hours of sleep do you get?"

More than 12,000 high school students were recently asked that during a survey by the Centers for Disease Control and Prevention. The overall answer: not enough.

Studies have shown that teenagers really need at least nine hours of sleep, with eight hours considered a "borderline" acceptable amount. In the CDC study, however, only around 900 of the surveyed students reported getting the ideal amount, while an additional 2,800 reported averaging eight hours of shut-eye nightly.

Danice Eaton, a research scientist at the CDC, led this most recent survey, which was part of what the agency calls a Youth Risk Behavior Surveillance. Every year, CDC scientists like Eaton ask high school students about behaviors that can harm their health. The questions are on topics such as nutrition, weapons, sex and drug use — and sleep.

Sleeplessness, like other behaviors, carries a heavy toll. Scientists ask the survey questions to find a way to help people. Among people between the ages of 10 and 24, nearly three of every four deaths happen for one of the following reasons: motor vehicle accident, other accidents, homicide and suicide. Scientists like the CDC's Eaton hope that by understanding the risky behaviors, like sleeplessness, that might contribute to these tragedies, they may be able to save lives.

Also, without enough sleep, a person might have more trouble learning or exercising good judgment. Over time, people who regularly don't get enough sleep are more likely to be obese (which means very overweight) or get sick with serious diseases, some studies have found. Other studies have shown that even one night with less sleep than needed can throw off the chemical balance of the body.

Most students interviewed got much less than eight hours of sleep. Eaton and her team found that 30.2 percent, or about 3,600 students, sleep for only seven hours per night. About 2,700 students, or 22.8 percent, sleep only six hours per night. About 1,200 students, or 10 percent, reported sleeping five hours, and 5.9 percent, or 708 students, said they slept four hours or less.

The CDC's study identified a problem — but not the cause. Why do teenagers sleep less than they should? Maybe many teens like to work and stay up late. (This can make it rough to get up for school the next morning.) A number of scientific studies suggest some other ideas, as well. Computer use may be a culprit: Some scientists have found that the blue light given off by computer screens may interfere with the body's internal biological clock — making it difficult to go to sleep.

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