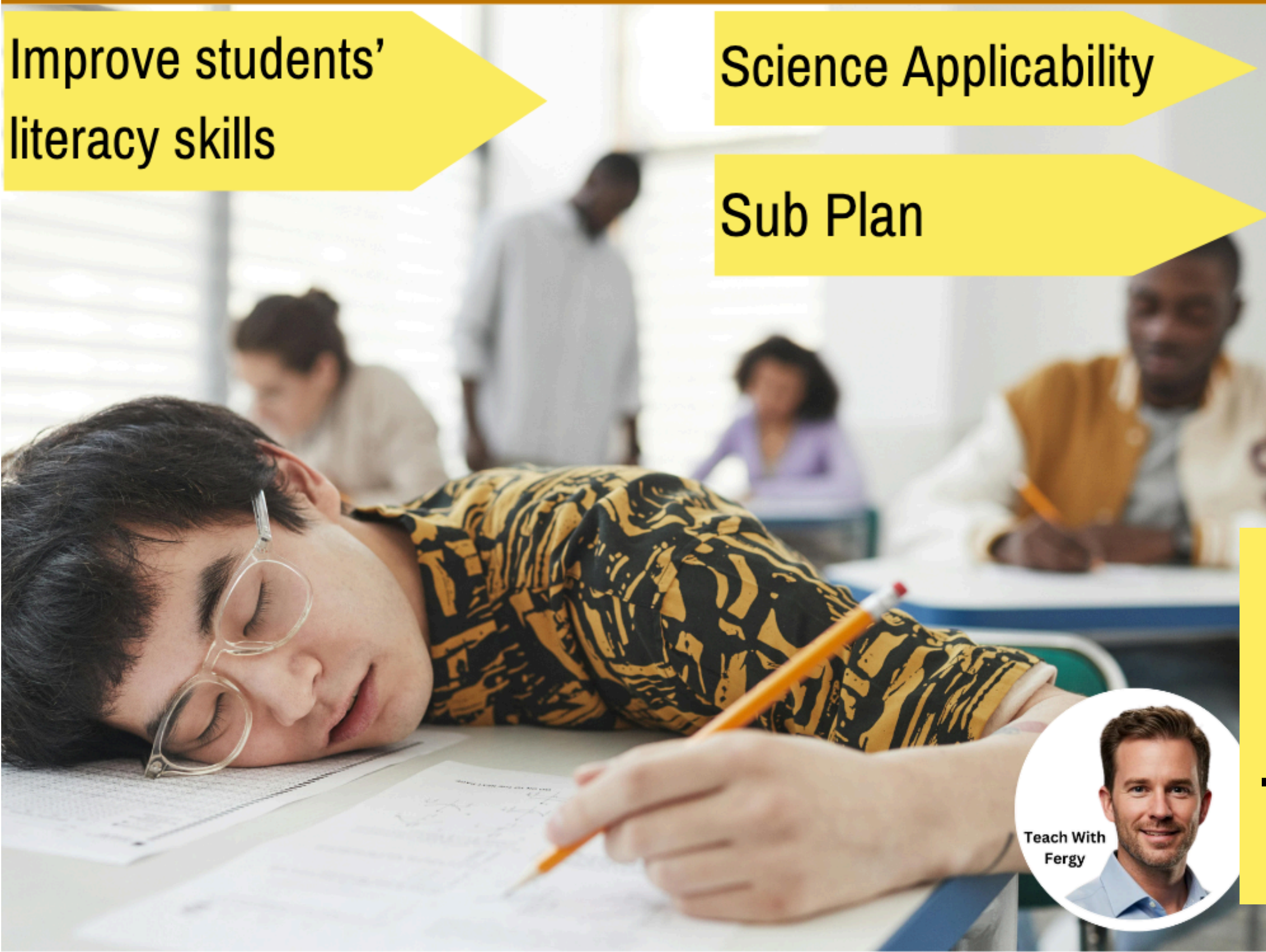


THE CONSEQUENCES OF SLEEP DEPRIVATION GRADE 8 AND UP READING

Improve students'
literacy skills

Science Applicability

Sub Plan



Reading Comment

“

Extremely satisfied - Great resource to work on student reading comprehension and it tied into the topic I was teaching. My students have been struggling with reading and I've been incorporating more reading into my lessons. Thank you for the resource.

”

SCROLL
to take a look inside!

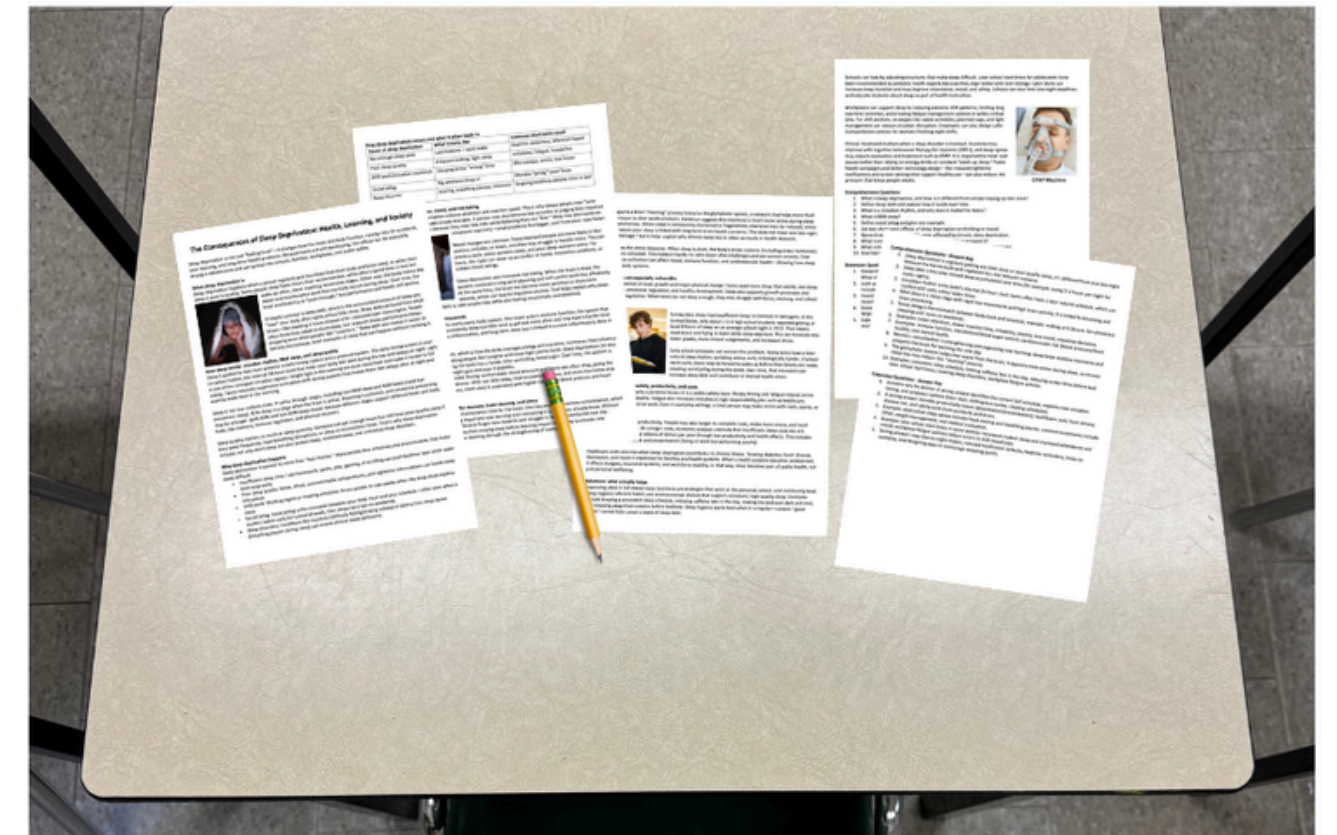


THE PROBLEMS YOU FACE

- Limited time to teach scientific literacy and strengthen students' reading and analysis skills.
- Need meaningful extension activities to engage fast-moving learners.
- Difficulty creating effective last-minute sub plans that still support student learning.

CLASSROOM READY

- Questions and Answer Key
- **No Prep, Ready-to-Use:** Print or assign digitally with Google Docs, Microsoft Word, and PDF formats for flexible classroom use
- **Includes Varied Question Types:** Knowledge, thinking, connecting, application, and open-ended questions.



What Will Your Students Learn?

READING COMPREHENSION ARTICLE & QUESTION BUNDLE

Article with
Comprehension
Questions

Grade 8 and Up

Print & Digital

- What Is Sleep Deprivation?
- Sleep Debt and Accumulated Sleep Loss
- Circadian Rhythm and Teen Sleep Patterns
- REM Sleep and Sleep Stages
- Sleep Quality vs. Sleep Quantity
- Causes of Sleep Deprivation (Schedules, Technology, Stress)
- Short-Term Effects (Attention, Mood, Risk-Taking)
- Long-Term Health Effects (Immune System, Metabolism, Heart Health)
- Memory Consolidation and Learning
- The Glymphatic System and Brain Health
- Adolescent Sleep and School Performance
- Societal Impacts (Safety, Productivity, Public Health)
- Sleep Hygiene and Healthy Habits
- School and Workplace Solutions

Comprehension Questions

1. What is sleep deprivation, and how is it different from simply staying up late once?
2. Define sleep debt and explain how it builds over time.
3. What is a circadian rhythm, and why does it matter for teens?
4. What is REM sleep?
5. Define social jetlag and give one example.
6. List two short-term effects of sleep deprivation on thinking or mood.
7. Name two long-term effects of sleep deprivation.
8. What are the consequences of sleep deprivation on health, learning, and society?
9. What are some solutions to improve sleep hygiene?
10. Give one example of how sleep deprivation affects a specific group of people.

Extension

1. Research the effects of sleep deprivation on the immune system and write a short paragraph.
2. Interview a healthcare professional about the importance of sleep and write a report.
3. Create a poster or infographic about the consequences of sleep deprivation.
4. Write a persuasive essay on whether or not schools should start later.
5. Research the effects of sleep deprivation on the brain and write a short paragraph.

The Consequences of Sleep Deprivation: Health, Learning, and Society

Sleep deprivation is not just "feeling tired"—it changes how the brain and body function, raising risks for accidents, poor learning, and long-term health problems. Because teens are still developing, the effects can be especially strong in adolescence and can spread into schools, families, workplaces, and public safety.

What sleep deprivation is

Sleep deprivation happens when a person regularly gets less sleep than their body and brain need, or when their sleep is poor in quality. Some people sleep fewer hours than recommended, while others spend time in bed but wake up often, never reaching restorative stages. Either way, the body misses key repair and maintenance work that normally occurs during sleep. Over time, the brain and body try to "push through," but performance and health still decline.



A helpful concept is sleep debt, which is the accumulated amount of sleep you "owe" your body after nights of too little sleep. Sleep debt can build from small losses—like sleeping 6 hours instead of 8—repeated over many nights. People often think they adapt to short sleep, but research shows performance keeps dropping even when people feel "used to it." Sleep debt also makes it easier to fall into microsleeps, brief moments of sleep that can happen without realizing it.

How sleep works: circadian rhythm, REM sleep, and sleep quality

Sleep is guided by two main systems: a daily timing system and a pressure system. The daily timing system is your circadian rhythm, the internal 24-hour clock that helps your body feel alert during the day and sleepy at night. Light is one of the strongest circadian signals—bright light in the evening can push sleep later and make it harder to fall asleep. Teens naturally experience a circadian shift during puberty that makes them feel sleepy later at night and want to wake later in the morning.

Sleep is not one uniform state. It cycles through stages, including non-REM sleep and REM sleep (rapid eye movement sleep). REM sleep is a stage when the brain is active, dreaming is common, and emotional processing may be stronger. Both REM and non-REM sleep matter because different stages support different brain and body tasks, like memory, immune regulation, and physical recovery.

Sleep quality matters as much as sleep quantity. Someone can get enough hours but still have poor-quality sleep if they wake frequently, have breathing disruptions, or sleep at inconsistent times. That is why sleep deprivation includes not only short sleep but also broken sleep, mistimed sleep, and untreated sleep disorders.

Why sleep deprivation happens

Sleep deprivation is caused by more than "bad choices." It can be the result of many factors, including:

- Insufficient time to sleep due to busy schedules and early wake-up times.
- Poor sleep hygiene, such as using screens before bed or having an uncomfortable sleep environment.
- Shift work or irregular schedules that disrupt the circadian rhythm.
- Stress and anxiety, which can make it difficult to fall asleep.
- Medical conditions, such as sleep apnea or restless leg syndrome.

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Your Reading

The Consequences of Sleep Deprivation: Health, Learning, and Society

Sleep deprivation is not just “feeling tired”—it changes how the brain learns, and long-term health problems. Because teens are still strong in adolescence and can spread into schools, families, workplaces,

What sleep deprivation is
Sleep deprivation happens when a person regularly gets less sleep than they need. Some people sleep fewer hours than recommended, wake up often, never reaching rest and repair and maintenance work that the brain and body try to “push through.”

A helpful concept is sleep debt, which “owe” your body after nights of too little sleep—like sleeping 6 hours instead of 8. Often, people think they adapt to short sleep, dropping even when people feel “used” fall into microsleeps, brief moments of unconsciousness.

How sleep works: circadian rhythm, REM sleep, and sleep quality
Sleep is guided by two main systems: a daily timing system and a pressure system. The circadian rhythm, the internal 24-hour clock that helps your body feel awake or asleep, is one of the strongest circadian signals—bright light in the evening causes sleep. Teens naturally experience a circadian shift during puberty that makes them want to wake later in the morning.

Sleep is not one uniform state. It cycles through stages, including non-REM (no movement sleep). REM sleep is a stage when the brain is active, dreaming, and memory consolidation may be stronger. Both REM and non-REM sleep matter because different tasks, like memory, immune regulation, and physical recovery.

Sleep quality matters as much as sleep quantity. Someone can get enough sleep but wake frequently, have breathing disruptions, or sleep at inconsistent times. Sleep includes not only short sleep but also broken sleep, mistimed sleep, and poor sleep quality.

Why sleep deprivation happens
Sleep deprivation is caused by more than “bad choices.” Many people experience sleep deprivation because of factors like late homework, sports, jobs, gaming, stress, noise, uncomfortable temperature, shift work, working nights or rotating schedules forces people to sleep. Social jetlag: Social jetlag is the mismatch between your body’s natural sleep rhythm and your schedule. Student wakes early for school all week, then sleeps very late on weekends. Sleep disorders: Conditions like insomnia (difficulty falling/staying asleep) or sleep apnea (breathing pauses during sleep) can create chronic sleep deprivation.

How sleep deprivation occurs and what it often leads to		
Cause of sleep deprivation	What it looks like	Common short-term result
Not enough sleep time	Late bedtime + early wake	Daytime sleepiness, attention lapses
Poor sleep quality	Frequent waking, light sleep	Irritability, fatigue, headaches
Shift work/circadian mismatch	Sleeping at the “wrong” time	Microsleeps, errors, low mood
Social jetlag	Big weekend sleep-in	Monday “jetlag,” poor focus
Sleep disorder	Snoring, breathing pauses, insomnia	Ongoing tiredness despite time in bed

Short-term effects: attention, mood, and risk-taking
In the short term, sleep deprivation reduces attention and reaction speed. This is why sleepy people may “zone out,” miss instructions, or make simple mistakes. A person may also become less accurate at judging how impaired they are, which is dangerous because they may take risks while believing they are “fine.” Sleep loss also increases emotional reactivity—small problems feel bigger, and frustration rises faster.



Mood changes are common. Sleep-deprived people are more likely to feel anxious, irritable, or down, and they may struggle to handle stress. This can create a cycle: stress worsens sleep, and poor sleep worsens stress. For teens, this cycle can show up as conflict at home, motivation problems, or sudden mood swings.

Sleep deprivation also increases risk-taking. When the brain is tired, the systems involved in long-term planning and self-control work less effectively. At the same time, the brain can become more sensitive to short-term rewards, which can lead to impulsive choices. That helps explain why sleep-deprived teens may be more likely to take unsafe risks while also feeling emotionally overwhelmed.

Long-term physical health consequences
Chronic sleep deprivation affects nearly every body system. One major area is immune function, the system that fights infections. People who consistently sleep too little tend to get sick more often and may have a harder time recovering. Sleep also influences inflammation, and long-term sleep loss is linked to a more inflammatory state in the body.

Sleep loss also affects metabolism, which is how the body manages energy and nutrients. Hormones that influence hunger and fullness can shift, making people feel hungrier and crave high-calorie foods. Sleep deprivation can also reduce insulin sensitivity, meaning the body has a harder time controlling blood sugar. Over time, this pattern is associated with higher risk for weight gain and type 2 diabetes. Cardiovascular health is also affected. During normal sleep, blood pressure and heart rate often drop, giving the heart and blood vessels time to recover. With too little sleep, that recovery decreases, and stress hormones stay higher than they should. Over years, short sleep is associated with higher risk of high blood pressure and heart disease.

Mechanisms: why sleep matters for memory, brain cleaning, and stress
Sleep is not “time off.” It is active maintenance time for the brain. One key process is memory consolidation, which is the brain’s way of strengthening important new learning and connecting it to what you already know. Without enough sleep, students are more likely to forget new material and struggle to learn efficiently the next day. Research across many studies shows that missing sleep before learning impairs the ability to encode new information, and missing sleep after learning disrupts the strengthening of memories.

Sleep also supports a brain “cleaning” process linked to the glymphatic system, a network that help clear waste products. Evidence suggests this clearance is much more active when sleep is consistently shortened or fragmented, clearance may be reduced. Poor sleep is linked with long-term brain health concerns. This does not mean “age,” but it helps explain why chronic sleep loss is taken seriously in health research.

When sleep is short, the body’s stress systems (including the stress response) are activated. This makes it harder to calm down after challenges and can worsen anxiety. Activation can affect mood, immune function, and cardiovascular health—showing how sleep affects many systems.

Adolescents are especially vulnerable
Adolescence is a period of brain growth and major physical change. Teens need more sleep than adults. Sleep loss can affect emotional regulation, and healthy development. Sleep also supports growth hormone release. When teens do not sleep enough, they may struggle with focus, memory, and mood.



Survey data show that insufficient sleep is common in teens. In the United States, only about 1 in 4 high school students report getting at least 8 hours of sleep on an average school night in 2023. Most teens are trying to learn while sleep-deprived. This is especially true in lower grades, more missed assignments, and increased stress.

Early school schedules can worsen the problem. Many teens’ natural sleep rhythm, so falling asleep early is biologically normal. If teens start school early, they may be forced to wake up before their body is ready, creating social jetlag during the week. Over time, that mismatch increases sleep debt and contributes to mental health strain.

Sleep and safety, productivity, and costs
Sleep deprivation is not only a personal issue—it is a public safety issue. Sleepy driving and fatigue-related errors are leading causes of accidents and deaths. Fatigue also increases mistakes in high-responsibility jobs such as healthcare, education, and industrial work. Even in everyday settings, a tired person may make errors with judgment, memory, and attention.

Sleep deprivation lowers productivity. People may take longer to complete tasks, make more errors, and have more accidents. On a larger scale, economic analyses estimate that insufficient sleep costs the U.S. hundreds of billions of dollars per year through lost productivity and health effects. Sleep deprivation also affects presenteeism (being at work but performing poorly).

Sleep deprivation also rises when sleep deprivation contributes to chronic illness. Treating diabetes, heart disease, and obesity is expensive for families and health systems. When a health problem becomes chronic, it can affect insurance systems, and workforce stability. In that way, sleep becomes part of public health.

Sleep hygiene actually helps
Getting enough sleep is not always easy, but there are strategies that work at the personal, school, and community levels. Consistent habits and environmental choices that support consistent, high-quality sleep can help. A consistent sleep schedule, reducing caffeine late in the day, making the bedroom a sleep-only space, and turning off screens before bedtime. Sleep hygiene works best when it is regular—routines help cancel a week of sleep debt.

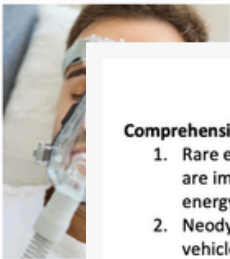
Schools can help by adjusting structures that make sleep difficult. Later school start times for adolescents have been recommended by pediatric health experts because they align better with teen biology. Later starts can increase sleep duration and may improve attendance, mood, and safety. Schools can also limit late-night deadlines and educate students about sleep as part of health instruction.

Workplaces can support sleep by reducing extreme shift patterns, limiting long overtime stretches, and creating fatigue-management policies in safety-critical jobs. For shift workers, strategies like stable schedules, planned naps, and light management can reduce circadian disruption. Employers can also design safer transportation policies for workers finishing night shifts.

Clinical treatment matters when a sleep disorder is involved. Insomnia may improve with cognitive behavioral therapy for insomnia (CBT-I), and sleep apnea may require evaluation and treatment such as CPAP. It is important to treat root causes rather than relying on energy drinks or constant “catch-up sleep.” Public health campaigns and better technology design—like reduced nighttime notifications and screen settings that support healthy use—can also reduce the pressure that keeps people awake.

Comprehension Questions
1. What is sleep deprivation, and how is it different from simply staying up late once?
2. Define sleep debt and explain how it builds over time.
3. What is a circadian rhythm, and why does it matter for teens?
4. What is REM sleep?
5. Define social jetlag and give one example.
6. List two short-term effects of sleep deprivation on thinking or mood.
7. Name three long-term health areas affected by chronic sleep deprivation.
8. What is memory consolidation, and how does sleep support it?
9. What is the glymphatic system, and why is it mentioned in sleep research?
10. Give two solutions (personal or policy-level) that can reduce sleep deprivation.

Extension Questions
1. Research your school district’s start times and compare them to medical recommendations. What changes would be needed to support healthier sleep?
2. Look up one major study or report on the economic costs of insufficient sleep. What kinds of costs are included (healthcare, productivity, accidents)?
3. Investigate one sleep disorder (insomnia, sleep apnea, narcolepsy). What are its symptoms, and what treatments are commonly recommended?
4. Research one public health strategy that has improved sleep outcomes (school policy changes, fatigue rules, or education campaigns). What evidence shows it worked?
5. Explore how technology design affects sleep (blue light, notifications, “infinite scroll”). What design changes could reduce sleep loss without banning devices?



CPAP

Comprehension Questions - Answer Key
1. Rare earth elements are 17 metals used in high-tech devices (like magnets, batteries, catalysts). They are important because they have special properties essential for electronics, magnets, and renewable energy technology.
2. Neodymium and dysprosium are used in powerful permanent magnets, which are found in electric vehicle motors and wind turbine generators. (Also in computer hard drives and speakers.)
3. A critical mineral is one that is vital for industry but has supply risk (few sources or geopolitical issues). Example: Neodymium is critical because it has no substitute in strong magnets and much of it comes from one country.
4. Environmental problem example: REE mining produces radioactive waste and toxic tailings that can contaminate water, or large tailings ponds that pollute land (as seen in Baotou, China).
5. China dominates global production and processing of REEs. This concentration is a risk because political decisions (like export limits) or trade disputes could cut off supply to other countries.
6. “Urban mining” means recovering rare earths from electronic waste or old equipment (like recycling phones or magnets) instead of digging new ore from the ground.
7. Recycling REEs is challenging because electronics contain only tiny amounts of them mixed with many other materials, so separating them is difficult and costly.
8. The Mountain Pass mine was the main U.S. REE source decades ago, closed due to low prices and environmental concerns. It recently reopened with cleaner methods. It illustrates how environmental improvements and strategic needs can restart REE production in new ways.
9. Other strategies include developing alternative materials (e.g., motors using less REE), diversifying mining locations (finding non-China sources), or building stockpiles of REEs.
10. Trade-off example: Mining new REEs reduces import dependence but still causes environmental harm; stricter regulations improve safety but can make mines more expensive or slower to open.

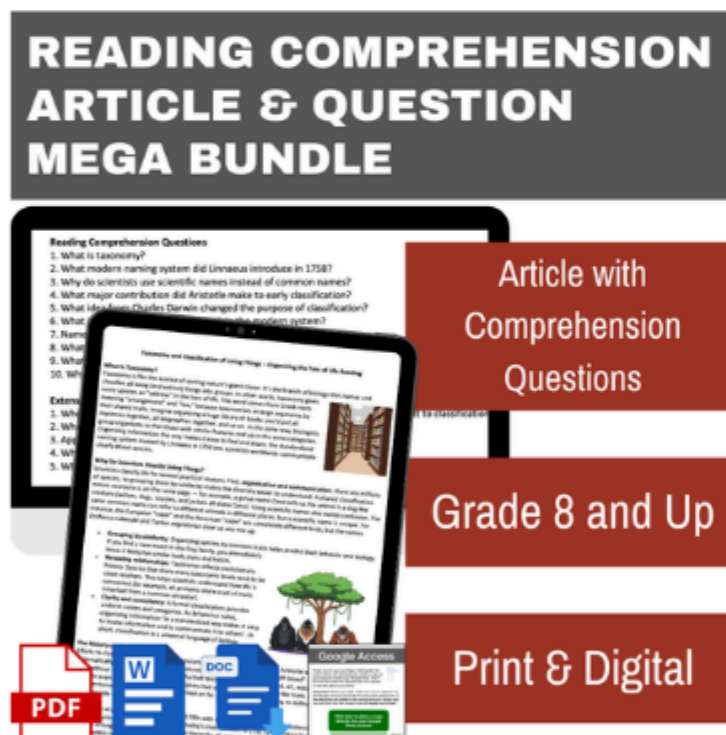
Extension Questions – Answer Key
1. Answers vary. A strong answer describes a specific country’s REE project (like Australia’s Lynas mine or the U.S. Mountain Pass) and mentions any processing partnerships or environmental practices.
2. Answers vary. A good answer discusses one proposed alternative (like iron-nitride or aluminum-nickel-cobalt magnets) and notes challenges (cost, strength) and current development stage.
3. Answers vary. Most sources say only a small fraction of REEs are recycled. Barriers include collection infrastructure, cost of recovery, and lack of recycling tech.
4. Answers vary. Examples include investment tax credits for domestic mining, stockpile programs, or mandatory recycling. The answer should describe the policy goals, like ensuring supply or funding technology.
5. Answers vary. A thorough answer explains how scientists measured pollution (water tests, soil analysis) and summarizes key findings (levels of toxins, ecosystem effects) for the chosen site.

Comprehension and Extension Questions



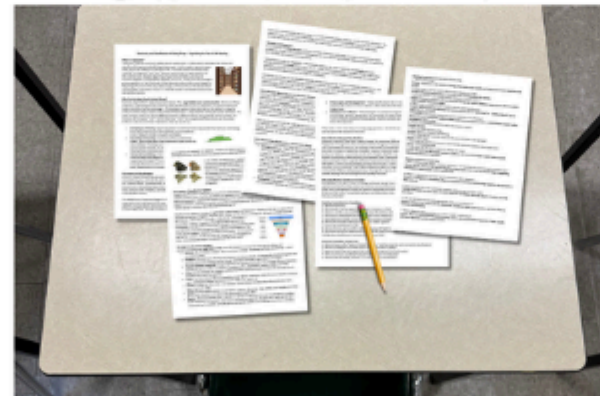
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- Questions and Answer Key
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- **Includes Varied Question Types:** Knowledge, thinking, connecting, application, and open-ended questions.



★★★★★ Extremely satisfied - It is a good supplemental activity either for review and at the same time introducing some concept. I also use this for sub plan. It is well presented, organized and interesting.

★★★★★ Extremely satisfied - This a great resource. I used this for a sub plan. It was fun and engaging for my students.

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