NO PREP

Seasonal Affective Disorder

Light, Brain Chemistry, and Winter Mood

Includes: Student reading, case study, differentiated questions, teacher key

Name: Period: Date:

Seasonal Affective Disorder: Light, Brain Chemistry, and Winter Mood

Winter Light and Your Internal Clock

In summer, it's easy to forget that your body has an internal clock. The Sun comes up early, goes down late, and you may spend plenty of time outdoors without thinking much about light. In winter, everything changes. Days are shorter, nights are longer, and many students go to school in the dark and come home in the dark. This change in day length isn't just an inconvenience—it affects the circadian rhythm that guides your sleep,

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Hormones, Neurotransmitters, and Winter Mood

To understand Seasonal Affective Disorder, it helps to remember that mood is not just "in your head" in a vague way. It is linked to brain chemistry. Two substances often mentioned in discussions of SAD are melatonin and serotonin. Melatonin, as

you've learned, helps regulate sleep. Serotonin is a neurotransmitter, a chemical messenger that helps brain cells communicate. It plays a role in mood, appetite, and energy. In darker months, longer nights and weaker daylight can lead to higher melatonin levels for more of the day. That can make a person feel sleepy and low-energy even when they've technically had enough hours of sleep. At the same time, some studies suggest that serotonin activity may drop in winter for certain people, especially when they are not exposed to much bright light. Lower serotonin activity has been linked with depressed mood, irritability, and loss of interest in activities that used to be enjoyable. Of course, light and brain chemistry are not the whole story. Winter often brings changes in behavior that can also influence mood. People may exercise less, spend less time outdoors, and have more disrupted schedules due to holidays, exams, or weather. Social life can shrink if it's hard to get around in snow and ice. All of these factors, including biology, environment, and habits, can combine to create a pattern of low mood that repeats each year. The key difference between ordinary "winter blahs" and Seasonal Affective Disorder is severity and impact on daily functioning. Here is a simple comparison: The table shows that SAD is not just "not liking winter." It's a recognizable pattern that can be serious enough to count as a form of seasonal depression, usually repeating at the same time each year.

Light Therapy, Healthy Habits, and Getting Help

Because light plays such a big role in Seasonal Affective Disorder, one common approach is light therapy. This usually involves sitting near a special light box that produces bright, white light (often around 10,000 lux) for a set amount of time each morning. The idea is to mimic the effect of strong outdoor daylight, giving your circadian rhythm a clear "morning" signal. When used correctly and under guidance from a health professional, light therapy can improve mood and energy for many people with SAD. Light therapy is not the only tool, though. Basic sleep hygiene can make a real difference: keeping a consistent bedtime and wake-up time, dimming lights in the evening, and avoiding bright screens right before bed. Spending time outside during daylight hours, even on cloudy days, can help, because outdoor light is usually much brighter than indoor lighting. Regular physical activity, staying socially connected, and eating balanced meals also support brain health. For some people, talking with a therapist or counselor, or using specific treatments recommended by a

health professional, is an important part of managing symptoms. It's also important to avoid self-diagnosing serious mental health conditions based on social media or checklists alone. Many different issues—stress, anxiety, other types of depression, physical illness, or family problems—can affect mood in winter. Learning about Seasonal Affective Disorder should help you recognize patterns and know when it might be time to talk to a trusted adult or health provider, not replace professional advice. The big takeaway is that winter mood changes are connected to real biology and environmental cues, and there are evidence-based strategies to address them.

Key Information

Feature	"Winter Blues"	Seasonal Affective Disorder (SAD)
Mood changes	Mildly down, a bit tired or less motivated	Noticeably depressed, frequent sadness or hopelessness
Energy and sleep	Some extra fatigue, slight oversleeping	Major fatigue, oversleeping, difficulty getting up
School / work impact	Still functioning, just slower	Grades, attendance, or work performance may drop
Interest in activities	Somewhat less interested	Strong loss of interest in hobbies and social events
Pattern over years	Mild pattern, not clearly disabling	Repeats each winter and significantly disrupts life

Case Study Excerpt – "Why Do I Feel Different Every November?"

By November of her junior year, Leila noticed the same pattern she'd seen the year before. Once the clocks changed and it was dark by late afternoon, her mood dropped. She struggled to get out of bed, even when she went to sleep early. Homework that used to feel manageable now felt overwhelming, and she stopped wanting to hang out with friends after school. On weekends, she often stayed in her room, scrolling on her phone but not really enjoying anything. Her grades started slipping, and her parents noticed she seemed "not like herself." When she talked with her doctor, they reviewed her history and realized her symptoms always got worse in late fall and improved in spring. The doctor explained that she might be experiencing Seasonal Affective Disorder and suggested a combination of more morning light exposure, a regular sleep schedule, and, if needed, counseling and other treatments to help her feel better.

1. Which specific changes in Leila's mood, energy, and behavior suggest that she might be dealing with more than just mild "winter blues"?

2. How did the timing and yearly pattern of Leila's symptoms help her doctor consider Seasonal Affective Disorder as a possibility?

Multiple Choice

1. According to the reading, Seasonal Affective Disorder (SAD) is different from ordinary "winter blues" mainly because it:

    a) Happens only during school vacations

    b) Only affects people who live near the equator, where the noon sunlight is strongest

    c) Follows a repeating seasonal pattern and significantly interferes with daily life

    d) Has no connection to light or brain chemistry

2. The hormone melatonin is most closely involved with:

    a) Muscle growth after exercise

    b) Regulating sleep–wake cycles and signaling the body that it's time to rest

    c) Digesting carbohydrates from holiday meals and storing them all as body fat

    d) Speeding up reaction time in sports

3. Light therapy for SAD often works by:

    a) Heating the air in a room until it feels like summer

    b) Increasing the amount of melatonin produced at night so the person sleeps much longer

    c) Blocking all outdoor light so the brain can "rest"

    d) Providing bright morning light that helps reset the circadian rhythm and support mood

Matching

Write the letter of the correct definition on the line next to each term.

Term	Definition
1. ___ Circadian rhythm	A) Hormone that helps signal when it's time to sleep
2. ___ Serotonin	B) Bright device used in the morning to mimic natural daylight
3. ___ Melatonin	C) Internal 24-hour clock that responds to light and dark
4. ___ Light box	D) Practices like consistent bedtimes and limiting screens before sleep
5. ___ Sleep hygiene	E) Brain chemical involved in mood, appetite, and energy

Fill-in-the-Blank

1. A form of depression that follows a repeating seasonal pattern, often worse in fall and winter, is called Seasonal _____ Disorder.

2. The body's internal 24-hour clock that helps control sleep and alertness is known as the _____ rhythm.

3. One common non-drug treatment for SAD that uses bright artificial light in the morning is called _____ therapy.

Short Answer

Answer each question in 2-4 complete sentences.

1. Using ideas from the reading, explain how shorter winter days and reduced daylight can affect both melatonin and serotonin, and how that might influence mood and energy.

2. Describe two specific daily habits that might help a student reduce the impact of seasonal mood changes, based on the strategies discussed in the reading.

3. Why is it important not to rely only on online checklists or social media when deciding whether you or a friend might have Seasonal Affective Disorder? What is a better next step if someone is really struggling each winter?