

Sleep and Dreams

MODULE OVERVIEW

Module 8 examines sleep and dreaming. Most of the terminology in this module is introduced in the section on Biological Rhythms and Sleep. Doing the module review several times and rehearsing the material frequently will help you to memorize all the terms associated with the stages of sleep.

NOTE: Answer guidelines for all Module 8 questions begin on page 73.

MODULE REVIEW

First, skim each section, noting headings and bold-face items. After you have read the section, review each objective by answering the fill-in and essay-type questions that follow it. In some cases, Study Tips explain how best to learn a difficult concept and Applications help you to know how well you understand the material. As you proceed, evaluate your performance by consulting the answers beginning on page 73. Do not continue with the next section until you understand each answer. If you need to, review or reread the section in the textbook before continuing.

Biological Rhythms and Sleep

Objective 8-1: Describe how our biological rhythms influence our daily functioning

1. Our bodies' internal "clocks" control several _____.
2. The sleep-waking cycle follows a 24-hour clock called the _____.
3. Body temperature _____ (rises/falls) as morning approaches and

begins to _____ (rise/fall) again before we go to sleep.

4. When people are at their daily peak in circadian arousal, _____ is sharpest and _____ is most accurate.
5. Our circadian rhythm is altered by _____ and _____.

Objective 8-2: Describe the biological rhythm of our sleeping and dreaming stages.

6. The sleep cycle consists of _____ distinct stages.
7. The rhythm of sleep cycles was discovered when Aserinsky noticed that, at periodic intervals during the night, the _____ of a sleeping child moved rapidly. This stage of sleep, during which _____ occur, is called _____.
8. The relatively slow brain waves of the awake but relaxed state are known as _____ waves. As you grow tired, you slip into _____.
9. During non-REM stage 1 sleep, people often experience _____ sensations similar to _____. These sensations may later be incorporated into _____.
10. The bursts of brain-wave activity that occur during NREM-2 sleep are called _____.

11. Large, slow brain waves are called _____ waves. They occur in non-REM stage _____, which is therefore called _____ sleep. A person in the latter stage of sleep generally will be _____ (easy/difficult) to awaken. It is during this stage that children may wet the bed or begin _____.

Describe the bodily changes that accompany REM sleep.

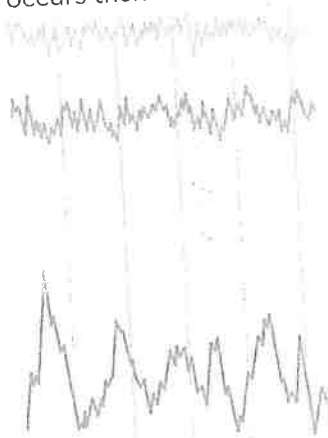
12. During REM sleep, the motor cortex is _____ (active/relaxed), while the muscles are _____ (active/relaxed). This creates the disturbing experience of _____ and for this reason, REM is often referred to as _____ sleep.
13. The sleep cycle repeats itself about every _____ minutes. As the night progresses, deep NREM-3 sleep becomes _____ (longer/briefer) and REM periods become _____ (longer/briefer). Approximately _____ percent of a night's sleep is spent in REM sleep.

APPLICATIONS:

14. Match the sleep stage with a description of that stage or an activity that occurs then.

Sleep Stage

- _____ 1. NREM-1 sleep
- _____ 2. NREM-2 sleep
- _____ 3. NREM-3 sleep
- _____ 4. REM sleep



15. Given that REM is referred to as *paradoxical sleep*, which of the following is true about what happens when Nicholas dreams that he is running around the school track?
- a. Studies of people deprived of REM sleep indicate that REM sleep is unnecessary.
 - b. The body's muscles remain relaxed while other body systems are active.
 - c. It is very easy to awaken a person from REM sleep.
 - d. The body's muscles are very tense while the brain is in a nearly meditative state.
16. Although her eyes are closed, Adele's brain is generating bursts of electrical activity. It is likely that Adele
- a. is in deep sleep.
 - b. is at the peak of her circadian rhythm.
 - c. is in REM sleep.
 - d. has been deprived of sleep for 24 hours.

Description or Example

- a. Bonita dreams that she's dancing with Orlando Bloom at a grand ball.
- b. Manfred feels like he's floating above the bed.
- c. Rapid, rhythmic brain-wave activity indicates you are clearly asleep.
- d. You are in slow-wave sleep and you do not awaken easily.

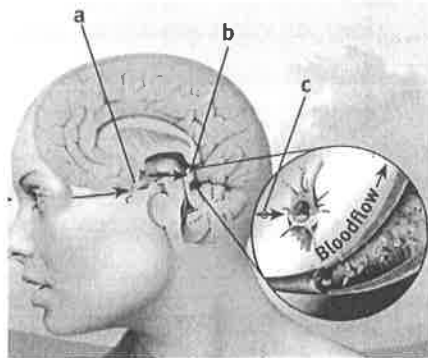
What Affects Our Sleep Patterns?

Objective 8-3: Explain how biology and environment interact in our sleep patterns.

17. Newborns spend nearly _____ (how much?) of their day asleep, while adults spend no more than _____.
18. Sleep patterns are influenced by _____, as indicated by the fact that sleep patterns among _____ (identical/fraternal) twins are very similar. Sleep is also influenced by _____, as indicated by the fact that people now sleep _____ (more/less) than they did _____ century ago.

19. Our biological clock is reset each day by exposure to _____, which triggers proteins in the _____ of the eyes to signal the brain's _____

(a), which causes the brain's _____ gland (b) to increase or decrease its production of _____ (c).



Sleep Theories

Objective 8-4: Describe sleep's functions.

- 20. Two possible reasons for sleep are to _____ us and to help us _____ by restoring and repairing _____ tissue. Animals with high waking _____ produce an abundance of chemical _____ that are toxic to _____. Sleep also facilitates our _____ of the day's experiences and stimulates _____ thinking.
- 21. During deep sleep, a growth hormone is released by the _____ gland. Adults spend _____ (more/less) time in deep sleep than children and so release _____ (more/less) growth hormone.
- 22. (Close-up) Exercise _____ (improves/disrupts) sleep and _____ (improves/disrupts) athletic performance. The optimal exercise time is _____.

APPLICATIONS:

- 23. Concluding her presentation on contemporary theories of why sleep is necessary, Marilyn makes all of the following points except that
 - a. sleep may have evolved because it kept our ancestors safe during potentially dangerous periods.
 - b. sleep gives the brain time to heal, as it restores and repairs damaged neurons.
 - c. sleep encourages growth through a hormone secreted during NREM-3.
 - d. slow-wave sleep provides a "psychic safety valve" for stressful waking experiences.
- 24. Arsenio is participating in a sleep experiment. While he sleeps, a PET scan of his brain reveals increased activity in the amygdala of the limbic system. This most likely indicates that Arsenio is in _____ sleep.

Sleep Deprivation and Sleep Disorders

Objective 8-5: Describe the effects of sleep loss, and identify the major sleep disorders.

- 25. Allowed to sleep unhindered, most people will sleep _____ (how many?) hours a night.
- 26. Students who sleep _____ (how many?) or fewer hours each night have a higher risk of _____ than those who sleep _____ hours or more.
- 27. Another effect of sleep deprivation is to promote weight gain by increasing the hormone _____ and decreasing the hormone _____. Another is that sleep deprivation may suppress the functioning of the body's _____ system and increase the risk of _____. Another indication of the hazards of this state is that the rate of _____ tends to increase immediately after the spring time change in Canada and the United States.
- 28. A persistent difficulty in falling or staying asleep is characteristic of _____. Sleeping pills and alcohol may make the problem worse since they tend to _____ (increase/reduce) REM sleep.

State several tips for those suffering from insomnia.

29. The sleep disorder in which a person experiences uncontrollable sleep attacks is _____. People with severe cases of this disorder may collapse directly into _____ sleep and experience a loss of _____. This disorder may be linked to low levels of the neurotransmitter _____, which is linked to alertness.
30. Individuals suffering from _____ stop breathing while sleeping. This disorder is especially prevalent among _____.
31. The sleep disorder characterized by extreme fright and rapid heartbeat and breathing is called _____. Unlike nightmares, these episodes usually happen early in the night, during NREM-_____. The same is true of episodes of _____ and _____. problems that _____ (run/do not run) in families. These sleep episodes are most likely to be experienced by _____ (young children/adolescents/older adults), in whom this stage tends to be the _____ and _____.

APPLICATIONS:

32. Norbert's wife complains that she has to stay up all night to be sure he starts breathing again each time he stops breathing for a minute or so. So, Norbert consults his doctor and learns that he is suffering from
- a. sleep apnea. c. night terrors.
b. narcolepsy. d. insomnia.
33. A person who falls asleep in the midst of a heated argument probably suffers from
- a. sleep apnea. c. night terrors.
b. narcolepsy. d. insomnia.

Dreams

Objective 8-6: Describe the most common content of dreams.

34. Dreams experienced during _____ sleep are vivid, emotional, and bizarre.
35. On average, people spend _____ (how many?) years of life in dreams.
36. For both men and women, 8 in 10 dreams are marked by _____ (positive/negative) emotions, such as fears of being _____.
37. Most dreams _____ (incorporate/do not incorporate) traces of previous days' experiences.
38. While we sleep, our mind _____ (monitors/does not monitor) stimuli in the environment.

Objective 8-7: Identify proposed explanations for why we dream.

39. Freud referred to the actual content of a dream as its _____ content. Freud believed that this is a censored, symbolic version of the true meaning, or _____ content, of the dream.
40. According to Freud, most of the dreams of adults reflect _____ wishes and are the key to understanding inner _____. To Freud, dreams serve as a psychic _____ that discharges otherwise unacceptable feelings.
41. Researchers who believe that dreams serve an _____-processing function receive support from the fact that REM sleep facilitates _____.
42. Brain scans confirm the link between _____ sleep and _____.
43. Other theories propose that dreaming serves some _____ function, for example, that REM sleep provides the brain with needed _____. Such an explanation is supported by the fact that _____ (infants/adults) spend the most time in REM sleep.

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44. Still other theories propose that dreams are elicited by random bursts of _____ activity originating in lower regions of the brain, such as the _____. According to one version, dreams are the brain's attempt to make sense of this activity. The bursts have been shown by PET scans to be given their emotional tone by the brain's _____ system, especially the _____. Other theorists see dreams as a natural part of brain _____ and _____ development.
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ega-
45. Researchers agree that we _____ (need/do not need) REM sleep. After being deprived of REM sleep, a person spends more time in REM sleep; this is the _____ effect.
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envi-
46. REM sleep _____ (does/does not) occur in other mammals. Animals such as fish, whose behavior is less influenced by learning, _____ (do/do not) dream. This finding supports the _____ theory of dreaming.

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APPLICATIONS:

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47. Barry has participated in a sleep study for the last four nights. He was awakened each time he entered REM sleep. Now that the experiment is over, Barry will most likely show a(n) _____ (increase/decrease) in REM sleep, a phenomenon known as _____.
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ive
tes
48. Bahara dreams that she trips and falls as she walks up the steps to the stage to receive her college diploma. Her psychoanalyst suggests that the dream might symbolize her fear of moving on to the next stage of her life—a career. The analyst is evidently attempting to interpret the _____ content of Bahara's dream.
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ed
49. Six-month-old Piper spend two-thirds of the day sleeping and most of that time in REM sleep. Her 25-year-old mother sleeps only 8 hours with fewer hours in REM sleep than her daughter. According to a physiological theory of dreaming, this makes sense because the brain activity associated with REM sleep
- a. fixes the day's activities in memory.
b. gives meaning to random neural activity.
- c. provides the brain with periodic stimulation.
d. keeps the infant in deep sleep.

PROGRESS TEST

Multiple-Choice Questions

Circle your answers to the following questions and check them with the answers beginning on page 74. If your answer is incorrect, read the explanation for why it is incorrect and then consult the text.

1. The cluster of brain cells that control the circadian rhythm is the
- a. amygdala.
b. suprachiasmatic nucleus.
c. NPY.
d. pineal.
2. Sleep spindles predominate during which stage of sleep?
- a. NREM-1
b. NREM-3
c. NREM-2
d. REM sleep
3. During which stage of sleep does the body experience increased heart rate, rapid breathing, and genital arousal?
- a. NREM-2
b. NREM-3
c. NREM-1
d. REM sleep
4. The sleep cycle is approximately _____ minutes.
- a. 30
b. 50
c. 75
d. 90
5. The effects of chronic sleep deprivation include
- a. suppression of the immune system.
b. diminished productivity.
c. depression.
d. all of these effects.
6. One effect of sleeping pills is to
- a. decrease REM sleep.
b. increase REM sleep.
c. decrease NREM-2 sleep.
d. increase NREM-2 sleep.
7. People who heard unusual phrases prior to sleep were awakened each time they began REM sleep. The fact that they remembered less the next morning provides support for the _____ theory of dreaming.
- a. manifest content
b. physiological
c. information-processing
d. cognitive development

8. According to Freud, dreams are
- a symbolic fulfillment of erotic wishes.
 - the result of random neural activity in the brainstem.
 - the brain's mechanism for self-stimulation.
 - the disguised expressions of inner conflicts.
9. Which of the following is NOT a theory of dreaming mentioned in the text?
- Dreams facilitate information processing.
 - Dreaming stimulates the developing brain.
 - Dreams result from random neural activity originating in the brainstem.
 - Dreaming is an attempt to escape from social stimulation.
10. The sleep-waking cycles of young people who stay up too late typically are _____ hours in duration.
- 23
 - 24
 - 25
 - 26
11. Which of the following statements regarding REM sleep is true?
- Adults spend more time than infants in REM sleep.
 - REM sleep deprivation results in a REM rebound.
 - People deprived of REM sleep adapt easily.
 - Sleeping medications tend to increase REM sleep.
12. A person whose EEG shows a high proportion of alpha waves is most likely
- dreaming.
 - in NREM-2 sleep.
 - in NREM-3 sleep.
 - awake and relaxed.
13. Circadian rhythms are the
- brain waves that occur during deep sleep.
 - muscular tremors that occur during opiate withdrawal.
 - regular body cycles that occur on a 24-hour schedule.
 - brain waves that are indicative of NREM-2 sleep.
14. Which of the following is NOT an example of a biological rhythm?
- the circadian rhythm
 - the 90-minute sleep cycle
 - the four sleep stages
 - sudden sleep attacks during the day
15. Which of the following is characteristic of REM sleep?
- genital arousal
 - increased muscular tension
 - night terrors
 - alpha waves
16. According to one physiological theory, dreaming represents
- the brain's efforts to integrate unrelated bursts of activity in visual brain areas with the emotional tone provided by limbic system activity.
 - a mechanism for coping with the stresses of daily life.
 - a symbolic depiction of a person's unfulfilled wishes.
 - an information-processing mechanism for converting the day's experiences into long-term memory.

- surface meaning of dreams
- deeper meaning of dreams
- stage of sleep associated with delta waves
- stage of sleep associated with muscular relaxation
- sleep disorder in which breathing stops
- sleep disorder occurring in NREM-3 sleep
- disorder in which sleep attacks occur
- twilight stage of sleep associated with imagery resembling hallucinations
- brain wave of awake, relaxed person
- sleep stage associated with dreaming
- theory that dreaming reflects our erotic drives
- brain-wave activity during NREM-2 sleep

- NREM-1 sleep
- manifest content
- narcolepsy
- sleep apnea
- NREM-3 sleep
- REM sleep
- latent content
- night terrors
- Freud's theory
- alpha
- sleep spindle
- REM

- circadian rhythm
- REM sleep
- alpha waves
- sleep
- hallucinations
- delta waves
- insomnia
- narcolepsy
- sleep apnea
- night terrors
- dream
- manifest content
- latent content
- REM rebound