



Chapter 5: Consciousness

Case Study: Biofeedback and Consciousness

Section 1: The Study of Consciousness

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Case Study: Biofeedback and Consciousness

Biofeedback has shed some light on the nature of consciousness.

Biofeedback

- Biofeedback is a system for monitoring and feeding back information about certain biological processes.
- Biofeedback monitors show, for example, when a person's heart rate is slower.

Applications

- Biofeedback helps people see how voluntary behavior affects involuntary behavior.
- Biofeedback is used to treat high blood pressure, seizures, migraine headaches, and digestive disorders.



What do you think?

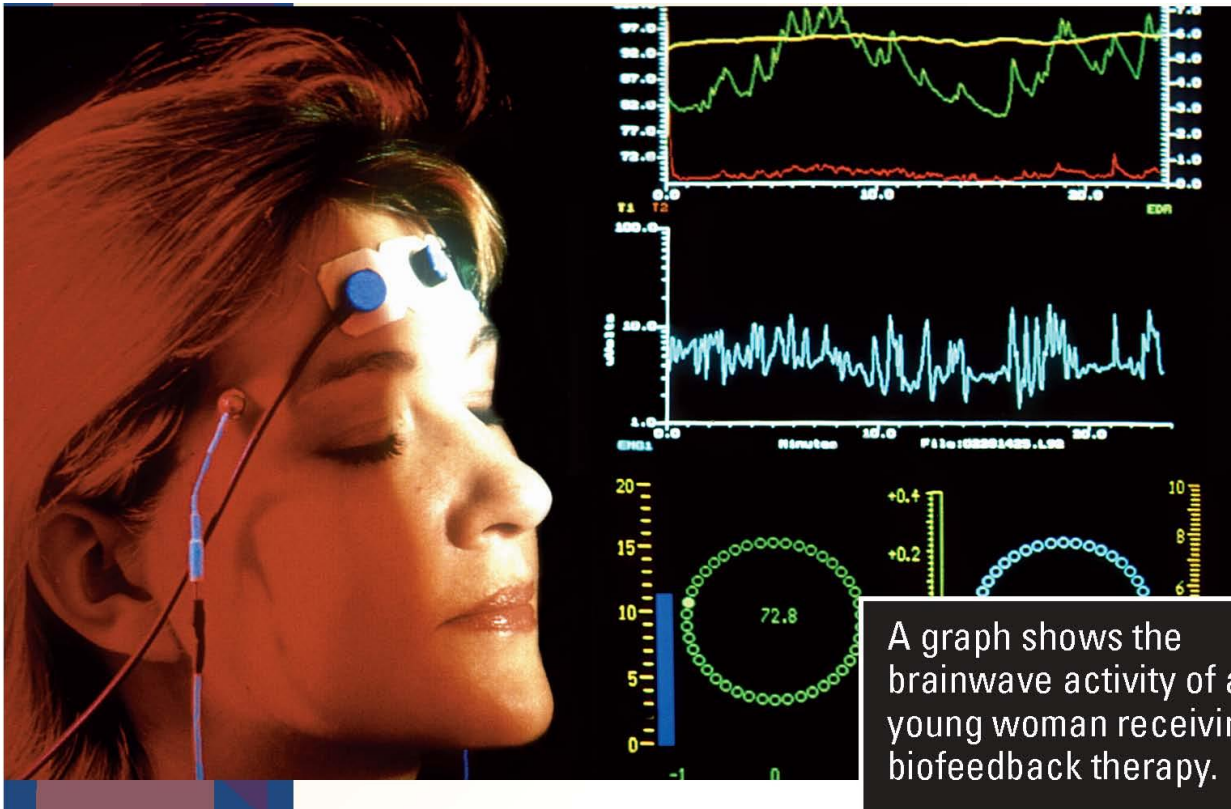
- How can people learn to control involuntary behavior?
- If you could use biofeedback to control an involuntary behavior, what would it be?

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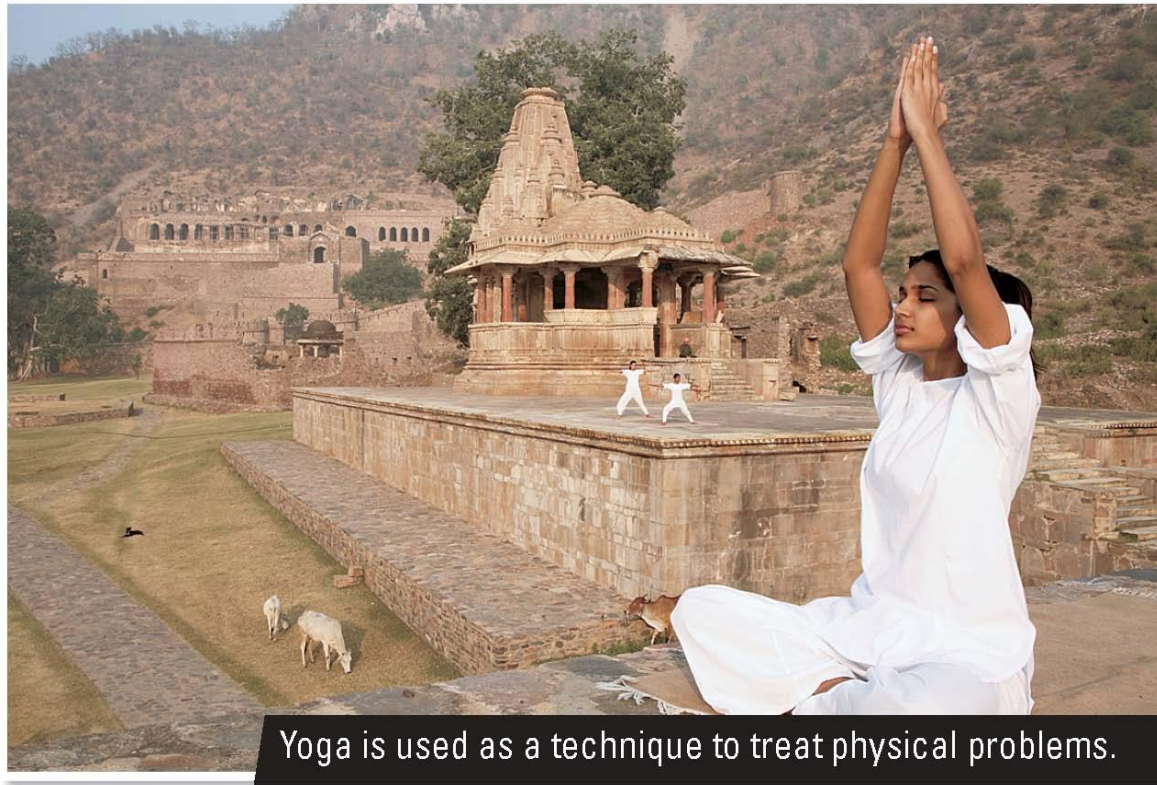


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Section 1 at a Glance

The Study of Consciousness

- Consciousness, like intelligence or emotions, is a construct; that is, it is a concept that cannot be seen, touched, or measured directly.
- Consciousness has a number of different meanings, including sensory awareness, direct inner awareness, and a sense of self.
- There are several levels of consciousness, including the preconscious, unconscious, and nonconscious.

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The Study of Consciousness

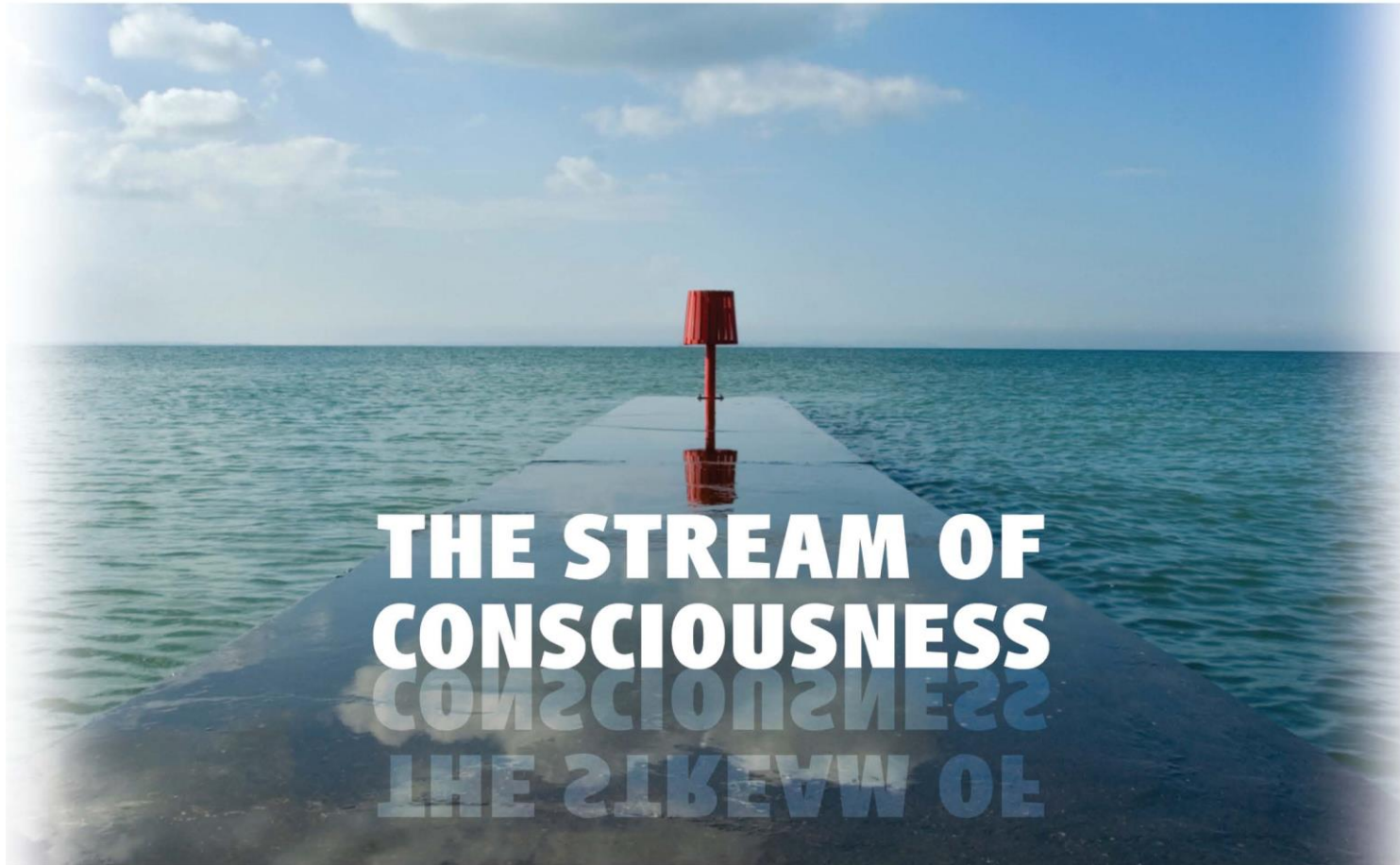
Main Idea

Consciousness, the awareness of things that are both inside and outside of ourselves, is an elusive but essential subject of study for psychologists.

Reading Focus

- Why is consciousness a psychological construct?
- What are the general meanings of consciousness?
- What distinguishes the different levels of consciousness from full conscious awareness?

What are you aware of
right now?



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Consciousness as a Construct

- **Consciousness** means the awareness of things that are both inside and outside ourselves.
- Psychologists have not always thought that consciousness should be a part of the study of psychology.
- Today, however, many psychologists believe that consciousness can be studied scientifically.
- Consciousness is a psychological construct because it cannot be seen, touched, or measured directly.
- Consciousness is known by its effects on behavior.

Reading Check

Summarize

Why do some psychologists think consciousness can be studied?

Answer: *Consciousness can be linked with measurable behaviors, such as talking, and with brain waves.*



Meanings of Consciousness

Consciousness as Sensory Awareness

- One meaning of consciousness is sensory awareness of the environment.
- This meaning of consciousness is being aware of things outside of yourself.
- Focusing on a particular stimulus is referred to as **selective attention**.



Consciousness as Direct Inner Awareness

- Direct inner awareness is when you are conscious of thoughts, images, emotions, memories, or abstract concepts.
- This meaning of consciousness is being aware of things inside yourself.



Consciousness as Sense of Self

- Consciousness as sense of self means that we are aware of ourselves and our existence.
- Only when young children grow older do they begin to understand that they are unique individuals, separate from other people and from their surroundings.

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Reading Check

Identify

What are the three uses of the term “consciousness”?

Answer: *can refer to sensory awareness, to direct inner awareness, and to consciousness as a sense of self*



Different Levels of Consciousness

The Preconscious Level

- **Preconscious** thought is stored knowledge that is retrievable into conscious awareness.



The Unconscious Level

- Information stored in the **unconscious** level is unavailable to awareness under most circumstances.



The Nonconscious Level

- The **nonconscious** level refers to bodily processes, such as the growing of hair, of which we are not aware.



Altered States of Consciousness

- In **altered states of consciousness**, a person's sense of self or sense of the world changes.
- Examples: sleep and hypnosis

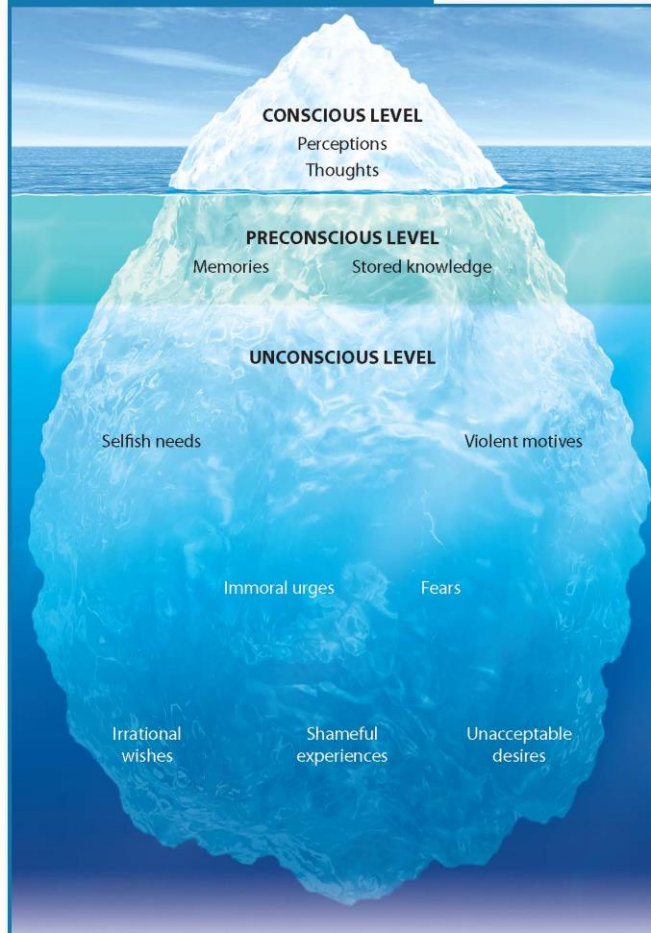
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FREUD'S LEVELS OF CONSCIOUSNESS



To Freud, consciousness is like an iceberg. Many memories, impulses, and feelings exist below the level of conscious awareness.

Skills Focus **INTERPRETING VISUALS** On what level did Freud place irrational wishes?

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Reading Check

Find the Main Idea

What are Freud's three levels of consciousness?

Answer: *preconscious, unconscious, conscious*

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Section 2 at a Glance

Sleep and Dreams

- The sleep cycle is made up of four stages of sleep and REM sleep.
- Sleep serves important physical and psychological needs.
- Common sleep problems include insomnia, nightmares, night terrors, sleepwalking, sleep apnea, and narcolepsy.

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Sleep and Dreams

Main Idea

Sleeping and dreaming are essential to human health, although many questions remain. Some people are troubled by various sleep problems.

Reading Focus

- What is the sleep cycle?
- How have psychologists explored the importance of sleep and dreams?
- What are sleep problems?

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PSYCHOLOGY CLOSE UP



FROM **NIGHTMARE** to Novella

How did a dream
become a classic
horror story?

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The Sleep Cycle

- Much of how people, animals, and plants function is governed by **circadian rhythms**, or biological clocks.
- Circadian rhythms in humans include a sequence of bodily changes that occurs every 24 hours.
- The most studied circadian rhythm is the sleep-wake cycle.

The Stages of Sleep

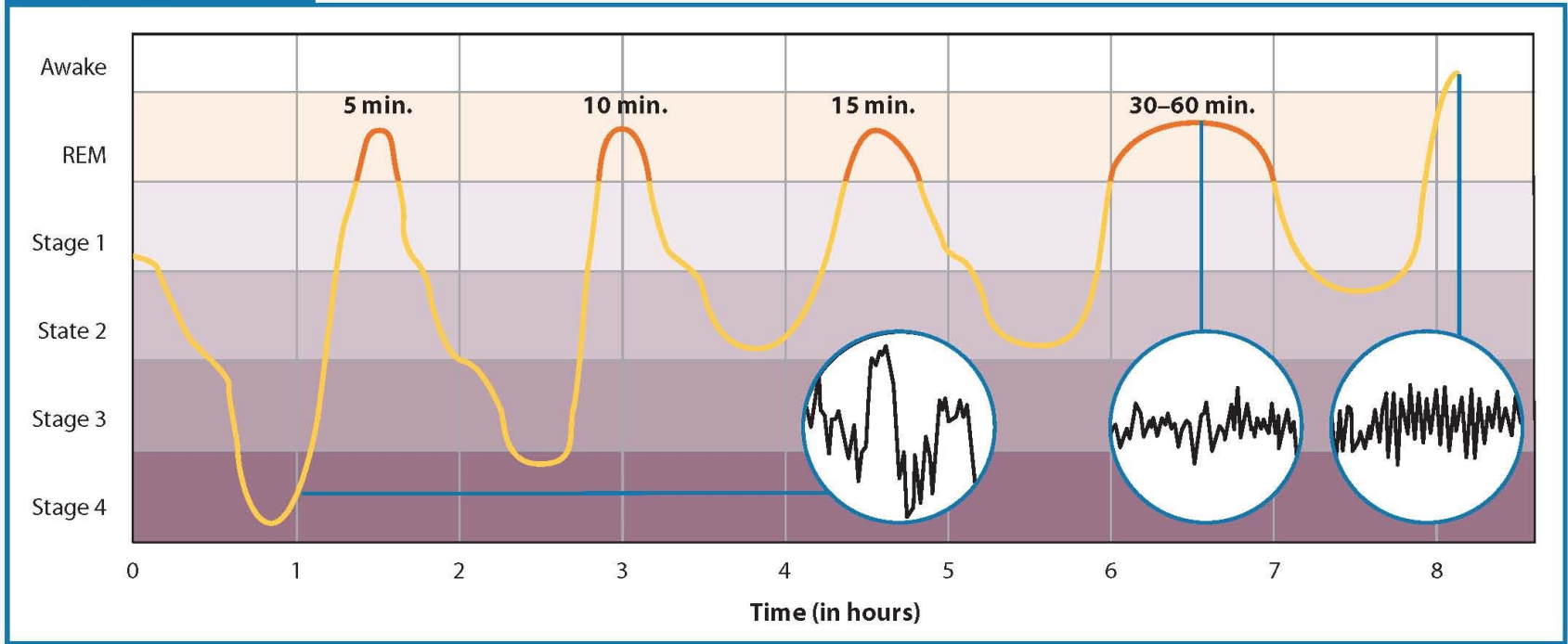
- Sleep stages are described in terms of brain-wave patterns.
- There are five stages of sleep.
- Stage 1 is the lightest stage of sleep.
- Stage 4 is the stage of deepest sleep.

REM Sleep

- After about 30 minutes of stage 4 sleep, we return to stage 3, then stage 2, and then stage 1 sleep.
- This takes about 90 minutes.
- Then another stage of sleep begins. It is called **rapid-eye-movement sleep**, or REM sleep. Beneath the closed lids, the eyes move rapidly.



THE SLEEP CYCLE



This is a typical sleep pattern. Most people go through the cycle five times in eight hours. As the night progresses, stages 3 and 4 become shorter, and REM sleep becomes longer. Brain waves are shown in the circles.

Skills Focus INTERPRETING VISUALS

During which hours of sleep does REM sleep last the longest?

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Reading Check

Recall

Which is the deepest stage of sleep?

Answer: *stage 4*

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The Importance of Sleep and Dreams

- People need sleep to revive the tired body and build up resistance to infection.
- Sleep may help people recover from stress and consolidate memories.
- REM sleep seems to help animals and people learn, remember, and retain information.

Dreams

- REM sleep is when we have the most vivid dreams.
- People dream in color and in black and white.
- People seem to dream in “real time.”
- People do not always remember their dreams.

The Freudian View

- Sigmund Freud theorized that dreams reflect a person’s unconscious wishes and urges.
- He also believed people dream in symbols as a way to deal with painful material they cannot otherwise deal with consciously.



The Biopsychological Approach

- Some psychologists believe that dreams begin with biological, not psychological, activity.
 - According to this view, neurons fire during sleep. The neurons fire in the part of the brain that controls movement and vision. The brain tries to make sense of them by dreaming.



The Mystery of Dreams

The mystery of dreams has occupied artists and thinkers for centuries. This image has qualities of both fantasy and realism that are often found in dreams. It might seem spooky or serene to you.

If dreams often expresses wishes or a fears, what wish or fear might the above dreamlike image express?

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Reading Check

Recall

When do we have the most vivid dreams?

Answer: *during REM sleep*

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Do You Remember Your Dreams?

Most people remember at least some of their dreams. They might remember their dreams in detail or just remember the high points. Other dreams they might have trouble recalling.

PROCEDURE

- 1 Try to remember your dreams for one night. One technique might be to tell yourself to try to remember your dreams just before you go to sleep.
- 2 Assign key words to your separate dreams for the night while you're in a still-sleeping, just-beginning-to-wake state before you get out of bed.
- 3 Record your information for one night's worth of dreams and report back to the class the next day. Be sure to make a list of the key words that you came up with for your dreams.

ANALYSIS

1. What do you remember about your dreams?
2. How much uninterrupted sleep accompanied each dream?
3. Discuss with classmates if there seems to be any connection or pattern between dreams and the amount of uninterrupted sleep.
4. During REM sleep, people have the most vivid dreams. These dreams are most likely to have clear images and plots that make sense, even if the events are not realistic. Do you think any of the dreams you recorded occurred during REM sleep? Why or why not?





Sleep Problems

Insomnia

- **Insomnia** is the inability to sleep.
- The most common type of insomnia is difficulty in falling asleep.
- Many psychologists believe that the best ways to overcome insomnia do not involve medication.
- They recommend using relaxation techniques, establishing regular bedtimes, and using pleasant images to relax.



Nightmares and Night Terrors

- Nightmares are a product of REM sleep.
- People who are anxious or depressed are more likely to have nightmares.
- **Night terrors** are similar to nightmares but they are more severe.
- Night terrors tend to occur during deep sleep.



Sleepwalking

- Many children walk in their sleep.
- Most children outgrow sleepwalking as they mature.

Sleep Apnea

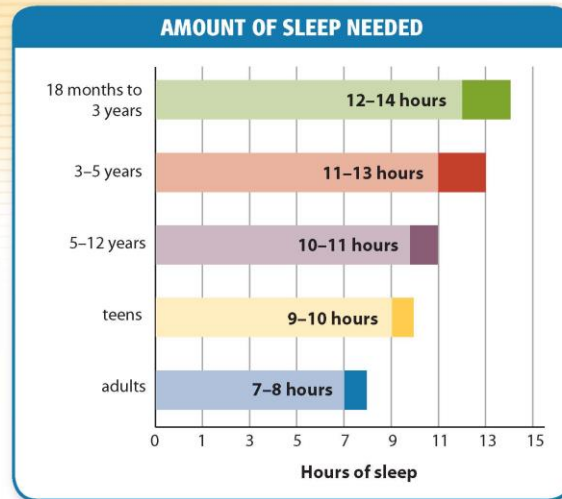
- **Sleep apnea** is a breathing interruption that occurs during sleep.
- About 10 million Americans have sleep apnea.

Narcolepsy

- **Narcolepsy** is a rare sleep problem in which people suddenly fall asleep, no matter what time it is or where they are.
- It is believed to be a genetic disorder of REM-sleep functioning.

Statistically Speaking...

Sleep Problems The bar graph shows the amount of sleep recommended for specific age groups by sleep experts. Listed below the bar graph are the percentages of people with specific sleep problems.



74% Percentage of Americans who do not get enough sleep

10-50% Percentage of children who have nightmares

10-30% Percentage of children who have sleepwalking episodes

Skills Focus **INTERPRETING DATA** Why do you think such large segments of the population do not get enough sleep?

Sources: National Sleep Foundation; Diagnostic and Statistical Manual of Mental Disorders

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Reading Check

Summarize

What are some of the main types of sleep problems?

Answer: *insomnia, nightmares, night terrors, sleepwalking*



Current Research in Psychology

Sleep Deprivation in Teens

Lack of sleep affects both the mind and the body. Sleep deprivation can produce mental states of fatigue, drowsiness, and irritability. In addition, lack of sleep can contribute to physical symptoms such as weight gain, heart disease, and other symptoms and ailments. Teenagers who do not get enough sleep can also develop these problems.

- Studies show a link between lack of sleep and increased rates of obesity, diabetes, heart disease, high blood pressure, and stroke.
- Teenagers need 9.2 hours of sleep a night.
- Many high school students get less than 9.2 hours of sleep a night.
- Lack of adequate sleep puts teenagers at risk for weight gain, poor school performance, car accidents, alcohol abuse, and drug abuse.
- Starting school later might be one possible solution to insufficient sleep by teenagers.



A young tennis player experiences the effects of sleep deprivation.

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This young woman is attached to various monitors as part of a study on sleep apnea using electroencephalography.

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Thinking Critically

- What are some of the signs of sleep deprivation?
- What might be the advantages of starting school later?

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Section 3 at a Glance

Altered States of Consciousness

- Altered states of consciousness can be achieved while awake through biofeedback, meditation, and hypnosis.
- There are many myths surrounding hypnosis.
- Although there are controversies related to the use of hypnotism, hypnosis can be used to recall memories, reduce pain, and quit bad habits.

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Altered States of Consciousness

Main Idea

A variety of techniques have been developed in order to achieve altered states of consciousness.

Reading Focus

- How do meditation and biofeedback work?
- What is hypnosis?
- How can hypnosis be used?

Mesmer AND MAGNETISM

Are you feeling
drowsy yet?

In this poster advertising a hypnotist, people under his influence engage in odd behavior: a woman plays a table, a man rides a chair like a racehorse, and so forth.



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Meditation and Biofeedback

Meditation

- People use **meditation** to narrow their consciousness so that the stress of the outside world fades away.
- Evidence suggests that meditation can help people relax.
- Studies have found that meditation is an effective way to lower blood pressure.

Biofeedback

- **Biofeedback** is a system that provides, or “feeds back,” data about something that is happening in the body.
- People have used biofeedback to treat headaches and lower blood pressure.
- Biofeedback has been used to treat ADHD.



Reading Check

Compare

What do meditation and biofeedback have in common?

Answer: *Both are methods for achieving altered states of consciousness.*

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Hypnosis: Myths and Realities

Hypnosis is a condition in which people appear to be highly suggestible and to behave as if they are in a trance. Some psychologists believe that hypnosis is an altered state of consciousness. Others wonder whether hypnosis is truly an altered state of consciousness.

The History of Hypnosis

- Hypnosis dates back to the late 1700s with the work of Franz Mesmer.
- Today doctors and psychologists use hypnosis in a variety of ways: as an anesthetic, to help reduce anxiety, manage pain, or overcome fears.

Achieving Hypnosis

- Professional hypnotists may put people into a hypnotic trance by asking them to focus on something specific.
- People who are easily hypnotized are said to have hypnotic suggestibility.



Explaining Hypnosis

- Sigmund Freud's explanation: Hypnotized people put fantasy and impulse before fact and logic. Therefore, they believe what the hypnotist tells them.
- The role theory explanation: Hypnotized people are playing a part as if they are in a play. Unlike actors, however, hypnotized people may believe what they are doing is real.
- There is no one generally accepted explanation for hypnosis.



Myths and Facts About Hypnosis

There are many false beliefs about hypnotism. Some of the most common myths are listed below, along with the facts.

Myths

You can be hypnotized against your will.

When hypnotized, you can't open your eyes.

You cannot remember your own name.

You act out scenes from childhood.

You behave in unusual ways.

You will do anything.

You go into a sleep state.

Facts

No one can be hypnotized unless he or she is willing to be.

Being hypnotized dulls but does not fundamentally affect the normal functioning of all of the senses.

You can remember everything you normally remember.

You don't typically act out scenes at all.

You usually behave quite normally.

You are unlikely to do anything you wouldn't normally do.

You stay conscious and relatively alert.

Reading Check

Recall

Whose ideas began the technique of hypnosis?

Answer: *Franz Mesmer*

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The Uses of Hypnosis

Hypnosis and Memory

- Hypnosis is not a reliable approach to help people remember details of a crime.
- Many psychologists argue that material recalled under hypnosis should not be used as testimony in trials.

Hypnosis and Pain Prevention

- Hypnosis has been used to help people prevent pain.
- A similar effect can be achieved through relaxation techniques and breathing exercises.



Hypnosis and Quitting Bad Habits

- Therapists may use posthypnotic suggestion to help people quit a bad habit.
- In **posthypnotic suggestion**, the therapist gives instruction during the hypnosis that the patient is to carry out after the session has ended.

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Reading Check

Summarize

How have the police made use of hypnosis?

Answer: *to jog the memories of witnesses to a crime*

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Cultural Diversity and Psychology

Multicultural Perspectives on Consciousness

Visions, dreams, meditation, and hallucinations are important components of many cultures, reflecting the human desire to reach beyond what the senses can perceive directly. The methods for reaching these altered states of consciousness, however, are as diverse as the people who inhabit this planet.

- Australian Aborigines use ritual songs, dances, stories, and dreams to create the Dreamtime world.
- The Mevlevi use dancing to create an altered state of consciousness. They are known as whirling dervishes.
- The Hindu yoga school uses meditation to achieve an altered state of consciousness.
- Buddhists meditate to achieve a state of enlightenment called nirvana.
- The Inca in the Andean highlands of South America use a drug called yage to induce hallucinations.
- The Huichol Indians use peyote to induce hallucinations.



Accompanied by music, whirling dervishes spin around until they are in a trance.

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Aborigines in Australia perform ritual songs and dances in order to summon the spirit world into existence.

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Thinking Critically

- Why do you think some cultures view altered states of consciousness as something to be avoided?
- Other cultures view altered states as something to be sought out. Why might this be so?

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Section 4 at a Glance

Drugs and Consciousness

- Depressants slow down the nervous system, stimulants increase the activity of the nervous system, and hallucinogens produce hallucinations.
- Treatments for drug abuse include detoxification, maintenance programs, counseling, and support groups.

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Drugs and Consciousness

Main Idea

Depressants, stimulants, and hallucinogens are all drugs that can affect consciousness. Drug abuse can be dealt with by a number of available treatments.

Reading Focus

- How do depressants affect the body?
- What are stimulants?
- What are hallucinogens?
- How do some treatments for drug abuse work?

PSYCHOLOGY CLOSE UP

Keeping a

DEADLY SECRET

Why did tobacco companies keep the results of nicotine studies hidden from the public?

Everyday

Reach
for a
LUCKY
instead of a
sweet

LUCKY STRIKE
"IT'S TOASTED"
CIGARETTES

ROSALIE ADELE NELSON
Original "Lucky" Girl

"To keep slender, I reach for a Lucky instead of a sweet"

"It's toasted" - No Throat Irritation - No Cough

The advertisement features a woman with dark hair, Rosalie Adele Nelson, looking slightly to the side. The background is a light, textured surface with faint numbers. A large, dark circular graphic contains the text 'Reach for a LUCKY instead of a sweet'. To the right is a pack of Lucky Strike cigarettes with the slogan 'IT'S TOASTED'. At the bottom, there is a quote from the woman and the slogan 'It's toasted' followed by 'No Throat Irritation - No Cough'.

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Depressants

- Many drugs are addictive. **Addiction** to a drug means that after the person takes that drug for a while, the body craves it just to feel normal.
- **Depressants** are drugs that slow the activity of the nervous system.

Alcohol

- Alcohol is the most widely used drug in the United States.
- Alcohol is a depressant.
- It causes **intoxication**, or drunkenness.
- Regular consumption can lead to addiction.

Narcotics

- **Narcotics** are addictive depressants used to relieve pain and induce sleep.
- Many are derived from the opium poppy plant.
- They include morphine and heroin.

Reading Check

Recall

What are narcotics?

Answer: *Narcotics are addictive depressants that can be used to relieve pain and induce sleep.*

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Stimulants

- **Stimulants** increase the activity of the nervous system.
- They include nicotine, amphetamines, methamphetamines, and cocaine.

Nicotine

- Nicotine is one of the most common stimulants.
- It spurs release of adrenaline.
- Regular use can lead to addiction.
- Nicotine is found in tobacco.
- Cigarette smoking is as addictive as heroin.

Amphetamines

- **Amphetamines** are stimulants often used for staying awake or reducing appetite.
- They can cause **hallucinations**, perceptions that seem to be real but are not, and **delusions**, false ideas that seem real.
- One extremely addictive form is methamphetamine.



Cocaine

- Cocaine is a stimulant derived from the leaves of the coca plant.
- It raises blood pressure, increases heart rate, and decreases supply of oxygen.
- Use of cocaine can sometimes cause death.
- One very harmful form is known as crack.

Click on the image to play the Interactive.

INTERACTIVE *

MAJOR DRUG TYPES AND THEIR EFFECTS

Drugs can affect consciousness. Here are some of the major types, how they are taken, and a few of their possible intoxication effects and health consequences.

Name	How Used	Possible Intoxication Effects	Health Consequences
Depressants <ul style="list-style-type: none"> Alcohol 	<ul style="list-style-type: none"> liquid that is drunk 	<ul style="list-style-type: none"> loss of inhibitions 	<ul style="list-style-type: none"> loss of coordination, confusion
<ul style="list-style-type: none"> Narcotics (heroin, morphine, codeine) 	<ul style="list-style-type: none"> smoked, injected, swallowed, snorted 	<ul style="list-style-type: none"> relief from pain, sleepiness 	<ul style="list-style-type: none"> relief from pain, sleepiness
Stimulants <ul style="list-style-type: none"> Nicotine 	<ul style="list-style-type: none"> smoked, chewed 	<ul style="list-style-type: none"> loss of appetite, hyperactivity, elevated blood pressure 	<ul style="list-style-type: none"> nervousness, lung damage
<ul style="list-style-type: none"> Caffeine 	<ul style="list-style-type: none"> drunk or eaten 	<ul style="list-style-type: none"> increased alertness and energy 	<ul style="list-style-type: none"> jitteriness, irritability
<ul style="list-style-type: none"> Amphetamines 	<ul style="list-style-type: none"> pills, injection, smoked, snorted 	<ul style="list-style-type: none"> wakefulness, reduced appetite 	<ul style="list-style-type: none"> depression, restlessness, insomnia
<ul style="list-style-type: none"> Cocaine 	<ul style="list-style-type: none"> snorted, injected, smoked 	<ul style="list-style-type: none"> reduced appetite, relief from pain, increased confidence 	<ul style="list-style-type: none"> insomnia, nausea, convulsions
Hallucinogens <ul style="list-style-type: none"> Marijuana 	<ul style="list-style-type: none"> smoked, swallowed, eaten 	<ul style="list-style-type: none"> enhanced emotions, sensory illusions 	<ul style="list-style-type: none"> impaired perception and coordination
<ul style="list-style-type: none"> LSD 	<ul style="list-style-type: none"> pill 	<ul style="list-style-type: none"> intense hallucinations 	<ul style="list-style-type: none"> flashbacks, memory loss, violent outbursts
<ul style="list-style-type: none"> Mushrooms 	<ul style="list-style-type: none"> swallowed 	<ul style="list-style-type: none"> sensory illusions 	<ul style="list-style-type: none"> flashbacks
<ul style="list-style-type: none"> Mescaline 	<ul style="list-style-type: none"> swallowed, smoked 	<ul style="list-style-type: none"> distortions of reality 	<ul style="list-style-type: none"> panic
<ul style="list-style-type: none"> Peyote 	<ul style="list-style-type: none"> swallowed 	<ul style="list-style-type: none"> dizziness 	<ul style="list-style-type: none"> self-injury
<ul style="list-style-type: none"> Ecstasy 	<ul style="list-style-type: none"> swallowed 	<ul style="list-style-type: none"> increased sensory awareness, mild hallucinations, increased energy 	<ul style="list-style-type: none"> impaired memory, hyperthermia, rapid heartbeat

Skills Focus INTERPRETING CHARTS What are some of the long-term consequences of drug abuse?

Interactive Feature

THINK
central

thinkcentral.com

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Reading Check

Summarize

What are three types of stimulants?

Answer: *nicotine, amphetamines, cocaine*

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Hallucinogens

- A **hallucinogen** is a drug that produces hallucinations.

Marijuana

- Produced from the leaves of the *cannabis sativa* plant
- May produce feelings of relaxation and mild hallucinations
- Impairs perception, coordination, memory, and learning
- Can have severe effects on consciousness

LSD

- Can produce intense hallucinations
- Sometimes called acid
- Can cause injury or suicide
- Side effects include memory loss, violent outbursts, nightmares, and panic



Other Hallucinogens

- Mushrooms that contain psilocybin, which produces altered perceptions, confusion, anxiety, and panic
- Peyote, which contains mescaline
- Ecstasy, a pill that produces hallucinations, increased energy, loss of judgment, and serious side effects including nausea and high blood pressure

Reading Check

Recall

What are LSD's effects?

Answer: *Intense hallucinations as well as panic and confusion. Side effects include memory loss, violent outbursts, and nightmares.*

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Treatments for Drug Abuse

- Varies depending on the drug
- One treatment is **detoxification**
 - harmful substances are removed from the body
 - most commonly used with alcohol and narcotic addiction
- Other treatments include:
 - maintenance programs
 - counseling
 - support groups



Reading Check

Summarize

What is the process of detoxification?

Answer: *Harmful substances are removed from the body; addict is weaned from the drug.*

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Types of Drug Treatment

Detoxification Removal of harmful substances from the body

Maintenance Programs Controlled amounts of drug given to participants

Counseling Group or individual sessions

Support Groups People with similar problems sharing common experiences

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Experiment: Applying What You've Learned

Student Achievement and Sleep Deprivation

What is the connection between adequate sleep and student academic achievement?

1. Introduction

- You will work with a partner to design and run an experiment that tests sleep deprivation and memory.
- You will include a hypothesis, a dependent variable, an independent variable, a control group, an experimental group, and a random assignment.

2. Steps of the Experiment

- Step 1: Operational definition: state the hypothesis.
- Step 2: Carry out the procedures in your textbook.

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Experiment (con't.)

3. Assessment

- Reveal the findings of your experiment in a brief presentation to the class.
- What did you learn in the course of conducting the experiment?
- What surprised you the most in conducting the experiment?
- What would you change if you conducted the experiment again?



4. Discussion and Writing

- Small groups of classmates will compare their experiences in the experiment.
- After the small-group discussion, each group will write up a report.
- Then the whole class will compare their reports.

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Sleep Deprivation Experiment

- Hypothesis: A lack of sleep has a negative effect on the ability to remember facts.
- Dependent variable: memory task such as reciting state capitals of all 50 states.
- Sample make-up:
- Control group:
- Experimental group:
- Confounding variables:
- Experimenter bias:
- Ethical concerns: