CHAPTER

14: SLEEP: PURPOSE & FUNCTION

→ACTIVITY 1: SLEEP AS AN ALTERED STATE OF CONSCIOUSNESS AND CHARACTERISTICS OF SLEEP

Using your Student Book, shade all the correct statements.

Sleep is an altered state of consciousness (ASC).	During sleep we can limit and control our thoughts.	While asleep our attention to sensory information is lowered.
Most people dream 4–5 times a night.	Emotions are controlled and normal during sleep.	Grinding teeth can be difficult to control when asleep as self-control is lowered.
People can estimate time due to the deep stages of sleep and consistent bed times.	The ability to accurately estimate time is not affected.	We have an internal body clock known as the suprachiasmatic nucleus.
Hormone secretion, metabolism and heart rate are random responses not influenced by other structures within the brain.	REM and NREM sleep cycles are examples of circadian rhythms.	Cortisol is associated with level of alertness and melatonin causes sleepiness.
The sleep-wake cycle is largely endogenous, based on internal biological factors.	Zeitgeners are external cues that influence the sleep-wake cycle.	Early morning light keep can make us sleepy.

→ACTIVITY 2: SLEEP AND ULTRADIAN RHYTHMS

Using your Student Book and other sources, complete the table below for each stage of sleep.

STAGE	DURATION	PHYSIOLOGICAL CHANGES	WHAT HAPPENS DURING THIS STAGE?
NREM 1			
NREM 2			
NREM 3			
NREM 4			
REM			

→ACTIVITY 3: SLEEP PATTERNS ACROSS THE LIFESPAN INVESTIGATION

Conduct research on the number of hours that adolescents, adults and older people sleep.

1 Create an aim for your study.

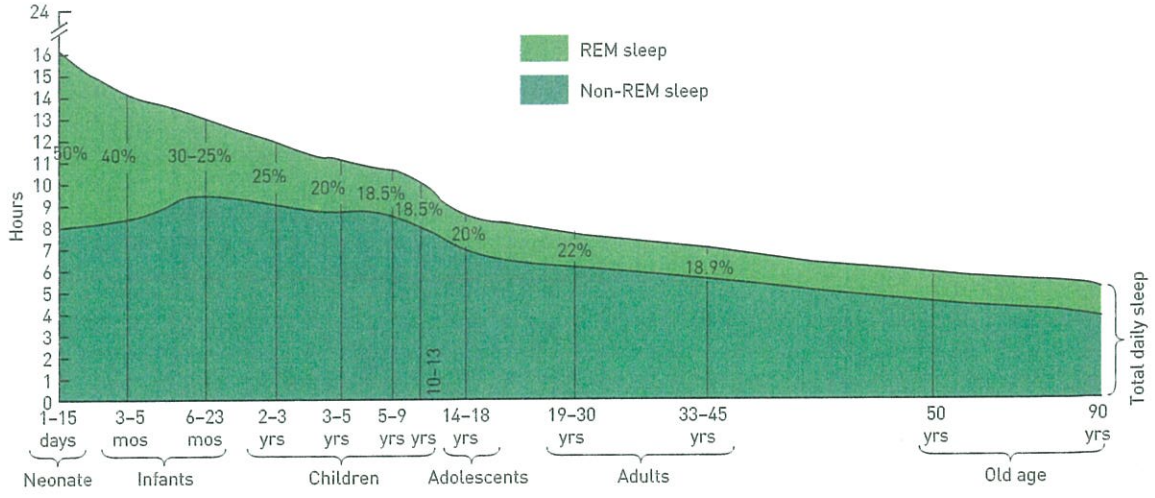
_____

_____

2 Create a hypothesis for your study based on the results in the graph below.

_____

_____



3 Ask three of your research participants how many hours they sleep on average each night. Your three participants need to be an

- adolescent aged 14–18 years
- adult aged 19–45 years
- older person aged 50+ years.

4 Write down your results in the table below.

PARTICIPANT	AVERAGE HOURS OF SLEEP
Adolescent	
Adult	
Older person	

5 Collate your results with the rest of the class in a table like the one below and calculate a mean.

PARTICIPANT	HOURS OF SLEEP		
	ADOLESCENT 14–18 YEARS	ADULT 19–45 YEARS	OLDER PERSON 50+ YEARS
1			
2			
3			
Mean hours of sleep			

6 Once you have collated your results with the class, compare them to the graph in question 2. Are your findings similar to the graph? Explain.

7 Were there factors that could have affected your results? Explain.

8 What conclusions can you make based on your results?

→ACTIVITY 4: PURPOSE OF SLEEP

Using your Student Book, complete the flow chart on the theories of sleep.

Theories of sleep

Survival (adaptive/evolutionary) theory
Survival is the main purpose of sleep. Sleep serves as a means to increase an animal's chances of survival in its environment. Sleep can be adaptive as it allows us to change to meet the demands of our environment; it depends on how much food we need, how available it is and how safe it is when we sleep.

This theory states:

- sleep depends on the need to find food (*explain*):

  _____

  _____

- sleep depends on the animal's vulnerability to predators (*explain*):

  _____

  _____

- sleep conserves energy (*explain*):

  _____

  _____

Restorative theory
Sleep allows us to recharge our bodies, recover from the physical and psychological work of the day and allow our body's growth processes to occur.

This theory states:

- sleep repairs and replenishes the body (*explain*):

  _____

- sleep activates growth hormone (*explain*):

  _____

- sleep increases immunity to diseases (*explain*):

  _____

- sleep increases alertness (*explain*):

  _____

- sleep enhances mood (*explain*):

  _____

- sleep consolidates memories (*explain*):

  _____

Limitations of the survival theory

_____

_____

_____

_____

_____

_____

Limitations of the restorative theory

_____

_____

_____

_____

_____

→ACTIVITY 5: WORDFIND

Using your Student Book and other resources, fill in the missing words, then find them in the wordfind.

1 The sleep-wake cycle is an example of a _____ rhythm.

2 _____ eye movement occurs in REM sleep.

3 As we close our eyes just before we fall asleep, our brainwave patterns are predominantly _____ waves.

4 Short bursts of rapid brainwave activity during stage 2 sleep are known as sleep _____.

5 Paralysis during REM sleep is known as _____.

6 The period between being asleep and waking up is called the _____ state.

7 According to _____ theories, sleep allows us to recharge our bodies, recover from the physical and psychological work during the day and allow our body's growth processes to occur.

8 Sleepwalking is also called _____.

9 Brainwaves characterised by low frequency and high amplitude are called _____ waves.

10 During sleep, we have a lowered level of _____ of the external environment.

11 _____ jerks are involuntary muscle twitches during stage 1 NREM sleep.

12 Night _____ are frightening episodes that cause a person to wake, often screaming.

13 REM sleep is often referred to as _____ sleep because the body can appear calm on the exterior but other bodily systems and the brain are highly active.

14 According to the survival theory of sleep, sleep conserves _____.

15 During stage 1 of NREM sleep, the heart rate is _____.

T N I R Q D F R B Y I Q Z C H T A Y P S
E C D N F X D E N K X D I P A R B A Z S
N A A I U K R S Y L W E C K F N R R I E
R V H A A V Y T Q P C H L U D A Y N X N
H R C P T F R O E G T E O P D S W N R E
T Y N B L J S R B G Y Y W O A U N A R R
J E P X E A R A P Q P H X K U T L W N A
U O R N D W A T D C V I M W C U A P C W
M B K R O N A I D A C R I C G T R C A A
D D U B O P B V F A H U K E V V K K U G
G P B C X R O E L E I D R F X P U N L V
A J P K F U S M N K E R S P I N D L E S
U C V X O Y E E P S I Z H G M B H V Q H
V U E N W R R U N I P H Y T E E L Z R H
I W Q W N G T W Z D C K P S B C Z Q K Z
A X T R Y T P L S R X J N O N R Q G B D
E K U S O M N A M B U L I S M W Q D D E
U S P N U Z Q I W I A A C L X N E G W P
E T D P W W H Y S Y P W W Y L D W W C D
H O K G V N D L M G E Y E O H P L K A X

→ACTIVITY 6: MULTIPLE-CHOICE QUESTIONS

1 Suzie woke up very early the other night and turned on the light in her room. Her sister, who shares a room with her, was still asleep. Suzie noticed that her sister's eyes were darting from side to side under the eyelids. It is likely that Suzie's sister was in _____ sleep.

- **a** stage 1
- **b** stage 4
- **c** REM
- **d** stage 2

2 George had just put his head on the pillow for a sleep when his mother called him to wake up and do some chores. George believed that he had not been asleep but his mother argued he had been asleep for 15 minutes. It is likely that George was in _____ sleep.

- **a** stage 1
- **b** stage 3
- **c** stage 2
- **d** REM

3 REM sleep is often referred to as _____ sleep. This is because the body can appear calm on the exterior (virtually no muscle movements) but other bodily systems and the brain are highly active, exhibiting many features that are similar to being awake.

- **a** cataplexy
- **b** muscle atonia
- **c** paradoxical
- **d** somnambulism

4 During stage 4 of NREM, our heart rate and breathing rate is _____ and our muscle tension is _____.

- **a** fast; tense
- **b** slow; relaxed
- **c** fast; relaxed
- **d** normal; normal

5 As Simon was waking for school, he experienced some vivid visual images. What are these images called?

- **a** hypnic jerk
- **b** hypnopompic
- **c** REM
- **d** spindle

6 According to the restorative theory of sleep:

- **a** we must sleep to conserve energy
- **b** sleep depends on the animal's vulnerability to predators
- **c** sleep is unnecessary
- **d** sleep increases our immunity to disease.

7 Cortisol and melatonin are regulated by the:

- **a** ultradian cycles
- **b** thalamus
- **c** suprachiasmatic nucleus
- **d** infradian cycles.