





About Sleep Worksheet

Part 1. Circadian Rhythms

- When does the average human experience peak mental alertness and memory?
- When does the average human experience peak degrees of sleepiness?
- When do melatonin levels peak and why?
- What structure in the brain controls these circadian rhythms?
- (Increased / decreased) levels of melatonin make you sleepy and reduce activity levels.
- Exposure to sunlight (suppresses / promotes) melatonin levels.

Part 2. NREM and REM Sleep

Identify the type of brain waves below and their associated stage of sleep. Then answer the questions about the stages of sleep.

	Beta 15-30 Hz Awake, normal alert consciousness		
	<input type="text"/> Relaxed, calm, meditation, creative visualisation	→	<input type="text"/>
	<input type="text"/> Deep relaxation and meditation, problem solving	→	<input type="text"/>
	<input type="text"/> Deep, dreamless sleep	→	<input type="text"/>

- During which stage do sleep spindles and K complexes occur?
- How long does it typically take to get into Stage 4 NREM sleep?

10 min. or 30 min. or 70 min.

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- During REM sleep the brain is (very / not very) active, while the body is (highly active / suppressed).
- Completion of the first session of REM sleep takes approximately how long?
- As the night progresses how much time is spent in NREM and REM sleep?

Part 3. The Value of Sleep

Watch the PBS video about sleep: <http://www.pbs.org/wgbh/nova/body/sleep.html>. Then answer these questions.

- What are the sleeping schedules of fruit flies
- What do the “mushroom body” and hippocampus have in common?
- Which two skills show improvement even after one good night of sleep?
 - 1.
 - 2.
- How much do our typing skills improve after sleep? 5% or 20% or 30%
- How are researchers able to read the brains of rats?
- In the rat study, which regions of the brain are activated during sleep?
 - 1.
 - 2.
 - 3.
- According to this video, what are 5 cognitive processes that occur during sleep?
 - 1.
 - 2.
 - 3.
 - 4.
 - 5.

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Part 4. The Nature of Sleep and Good Sleep Habits

Complete both parts of this tutorial then answer the questions below:

<http://healthyu.stanford.edu/sleep/framework.swf>.

- Which functions of the brain are inactive during sleep?
 - 1.
 - 2.
- Which two processes are reinforced through sleep? _____ and _____
- About how many sleep cycles occur through a night's sleep?
- During which 2 stages of sleep is our body most restful? _____ and _____
- What are two hormones involved in regulating hunger that are affected by sleep?
 - 1.
 - 2.
- A lack of sleep will (increase / decrease) the levels of leptin and (increase / decrease) the amount of ghrelin; these changes will (increase / decrease) our feelings of hunger .
- Too much _____ results in sleep deprivation.
- What are 4 significant health risks associated with sleep debt?
 - 1.
 - 2.
 - 3.
 - 4.

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Part 5. The Dreaming Brain

Review Focus on Neuroscience: The Dreaming Brain on page 149 then answer these questions.

- Which neurons are involved in regulating sleep?
- REM-off neurons are responsible for the production of which neurotransmitter(s) and what effect do these have on sleep?
- REM-on neurons are responsible for the production of which neurotransmitter (s)?
- Which regions of the brain show decreased activity during REM sleep and what are they responsible for?

Part 6. Putting it All Together

After reading Chapter 4 and completing this worksheet, summarize the effects of sleep deprivation on the brain, physical health, cognition, and motor functioning using the image below. How does sleep deprivation affect...

<u>The Brain</u> 1. 2. 3.	<u>Physical Health</u> 1. 2. 3. 4. 5.
<u>Cognition</u> 1. 2. 3. 4. 5.	<u>Motor Functioning</u> 1. 2.