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.

- 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](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:

- 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…

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<thead>
<tr>
<th>The Brain</th>
<th>Physical Health</th>
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<th>Cognition</th>
<th>Motor Functioning</th>
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