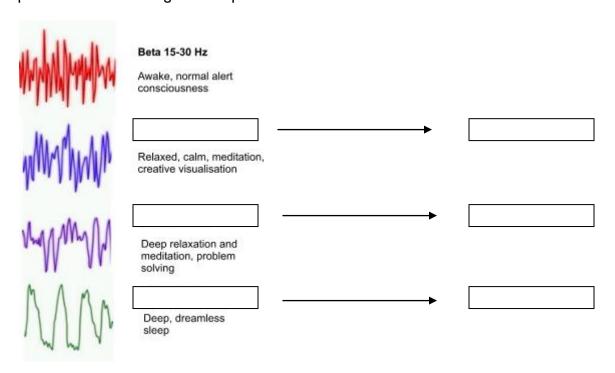
#### Part I. Circadian Rhythms

- 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.

- 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

5.

	•
	atch the PBS video about sleep: <a href="http://www.pbs.org/wgbh/nova/body/sleep.html">http://www.pbs.org/wgbh/nova/body/sleep.html</a> . The swer 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?  I.
	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?
	2.
	3.
•	According to this video, what are 5 cognitive processes that occur during sleep?
	I.
	2.
	3.
	4.

# Part 4. The Nature of Sleep and Good Sleep Habits

Complete both parts of this tutorial then answer the questions below: <a href="http://healthyu.stanford.edu/sleep/framework.swf">http://healthyu.stanford.edu/sleep/framework.swf</a>.

	· · · · · · · · · · · · · · · · · · ·
•	Which functions of the brain are inactive during sleep?
	I.
	2.
•	Which two processes are reinforced through sleep? and 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?
	I.
	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?
	I.
	2.
	3.
	4.

### 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>	Physical Health
1.	1.
2.	2.
3.	3.
	4.
	5.
Cognition	Motor Functioning
1.	I.
1. 2.	1. 2.
2.	