Dreaming and REM Sleep

Pre-reading
Questions: What do you know about dreams or REM sleep? What questions do you have?
Definitions: Conscious – awake or aware
Deprive – to keep from having or doing
Fragment – broken or incomplete part

Reading

We typically spend more than 2 hours each night dreaming. Scientists do not know much
about how or why we dream. Sigmund Freud, who greatly influenced the field of psychology,
believed dreaming was a “safety valve” for unconscious desires.

In 1953, researchers first described REM, rapid eye movement, in sleeping infants. It was
after this that scientists began to study sleep and dreaming. They soon realized that the strange
experiences we call dreams occur during REM sleep. While most mammals and birds show signs
of REM sleep, reptiles and other cold blooded animals do not.

REM sleep begins with signals from an area at the base of the brain called the pons. These
signals travel to a brain region called the thalamus, which relays them to the cerebral cortex – the
outer layer of the brain that is responsible for learning, thinking, and organizing information.

The pons also sends signals that shut off neurons to the spinal cord, causing temporary
paralysis of the limb muscles. If something interferes with this paralysis, people will begin to
physically act out their dreams. A person dreaming about a ball game may run head first into a
wall or blindly strike someone sleeping nearby while trying to catch a ball in the dream. This rare
problem is called REM sleep behavior disorder.

REM sleep stimulates the brain regions used in learning. This may be important for normal
brain development during infancy. This would explain why infants spend much more time in REM
sleep than adults.

One study found that REM sleep affects learning of certain mental skills. People taught a
skill and then deprived of non-REM sleep could recall what they had learned after sleeping.
People deprived of REM sleep could not recall what they had learned after sleeping.

Some scientists believe dreams are the cortex’s attempt to find meaning in the random
signals that it receives during REM sleep. The cortex is the part of the brain that interprets and
organizes information during consciousness. It may also try to interpret the random signals from
the pons during REM sleep; thus creating a “story” out of fragmented brain activity.

Source: National Institute of Neurological Disorders and Stroke, Dreaming and REM Sleep

Level 6.5
Understanding

1. Where is the cerebral cortex? What is its function? ____________________________
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

2. Which age group spends the most time in REM sleep? Why? ____________________________
   __________________________________________________________________________
   __________________________________________________________________________

3. What species does not experience REM sleep? ____________________________
   __________________________________________________________________________
   (This means they don’t ____________________________.)

4. Where does REM sleep begin? ____________________________
   __________________________________________________________________________

5. What is paralysis? What causes it while sleeping? ____________________________
   __________________________________________________________________________
   __________________________________________________________________________

6. Why do we dream? ____________________________
   __________________________________________________________________________
   __________________________________________________________________________

7. How does REM sleep affect learning? ____________________________
   __________________________________________________________________________
   __________________________________________________________________________

Writing

Option A: Summarize the reading in your own words.

Option B: What new information did you learn about sleep and dreams? What surprised you?
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________