



## The Science of Sleep

### Teacher's Guide

This unit is based on the *NIH Curriculum Supplement Series Grades 9-12. Sleep Disorders and Biological Rhythms*. (<http://science.education.nih.gov/customers.nsf/HSSleep?OpenForm>.) Handouts and worksheets ("Masters") from the *NIH Curriculum* will be utilized. The students will need to refer back to worksheets throughout lesson.

The *NIH Curriculum* will be supplemented with a PowerPoint presentation that will contain information from the *NIH Curriculum*, as well as other sources, and video segments.

#### **Pre-lesson:** 10 Days Prior

Have students complete Masters 0.1-0.4 ten days prior to the start of Lesson. (NIH Curriculum: Pre-lesson Activity – Engage)

#### **Part 1 – Sleep Knowledge**

Have students complete handout "What do you know or think you know about sleep" (Master 1.1)

Start reviewing: using PowerPoint slides to activate and to begin answering some of the questions contained in "What do you know or think you know about sleep" (Slides #1 - #4)

When discussing questions from handout, ask students why they answered as they did and supply information supporting the correct answers (some information contained on PowerPoint and more information available in The NIH Curriculum).

Mention over 50% of Americans don't get enough sleep.

After question #6 – Begin the *NIH Curriculum* Lesson-1: Activity 2 (print version)

- Collect class data from Sleep Diary.
- Have students calculate class averages.
- Have students formulate a hypothesis in groups about sleep using class data.
- Have students present findings.

#### **Part 2 - Biological Clock**

Start with PowerPoint: Slides "Why is Sleep Important" to "Question #1" (Slides #5 - #8)

Handout "Michel Siffre Story" (Master 3.1)

- Have student read the story
- Have students talk about why they think Michel is having trouble sleeping.

Have Students read "The Rhythm of Sleep" (Master 3.2)

Start Lecture: using PowerPoint, Biological Clock (Slides #9 - #13)

Have Students read, “Resetting the Clock” (Master 3.2)

Have students work on the “Sleepiness Scale Graph Template” (Master 3.3)

- Collect class data from the sleepiness scale.
- Have students calculate class averages.
- Have students formulate a hypothesis in groups about sleep using class data, and test.
- Student present findings.

### **Part 3 – NREM/REM and Sleep Homeostasis**

Start Lecture: using PowerPoint, NREM/REM through second Sleep Cycles Slide (Slides #10-#21)

Review Exercise: Have students complete, individually, “Thinking About Sleepiness and Sleep Cycles” worksheet. (Master 3.4)

Have student groups choose a hypothesis from Sleep Diary or Sleepiness Scale exercises.

- Have students choose to either retest or reformulate hypothesis to be tested with the *NIH Curriculum* web data.
- Have students test class hypothesis using *NIH Curriculum* web data.
- Have students write a lab conclusion.

### **Part 4 – Why is Sleep is important & Safety**

Discuss good and bad sleep habits using PowerPoint slides starting with “Why is Sleep Important” (Slides #22 - #24) and the *NIH Curriculum* Lesson 5.

- Have students make a list of good and bad sleeping habits and write answers on the board (Master 5.1)
- Use list from the *NIH Curriculum* to complete their list if necessary.

Complete PowerPoint Slides

Slide #25 – Start class discussion on individual and social consequences.

Slides #26-27 – complete questions on slides.

Assessment:

Have students read NIH newspaper articles and write 10 questions about sleep, with answers, (Masters 5.2 and 5.3) and discuss per the *NIH Curriculum* instructions: Lesson 5. Students should write about and discussed information they have learned during the unit.

Additional Optional Video: it includes the video clip from NREM/REM section and can be skipped. <http://www.pbs.org/wgbh/nova/sciencenow/3410/01.html>