

SLEEPLESS

ACTIVITY SHEET

INTRODUCTION

WHILE THE TOPIC OF SLEEP AND NEUROLOGICAL DISORDERS DOES NOT FEATURE DIRECTLY IN ANY OF THE A-LEVEL BIOLOGY SYLLABUSES, THERE IS SCOPE FOR USING THE TOPIC AS A RESEARCH EXERCISE.

AIMS

- TO LEARN MORE ABOUT SLEEP
- TO STIMULATE DEBATE ABOUT MENTAL HEALTH DISORDERS AND HOW SOCIETY VIEWS THEM
- TO DEVELOP STUDENTS' UNDERSTANDING OF THE RESEARCH PROCESS

STARTER

ASK THE FOLLOWING QUESTION AND RECORD THE ANSWERS.

"What do you think are the most sleep deprived careers and the most well rested careers?"

AN ARTICLE AND SLIDESHOW CAN BE FOUND HERE:

http://www.huffingtonpost.com/2012/02/23/sleep-deprivation-jobs_n_1294276.html

AFTER VIEWING THE ANIMATION USE THESE QUESTIONS AS A STARTING BASE TO ASSESS STUDENTS' KNOWLEDGE ABOUT SLEEP.

Do you think you get all the sleep you need every night? How do you feel the day after you have not slept enough or not slept well?

STUDENTS MAY RESPOND THAT IF THEY HAVEN'T HAD ENOUGH SLEEP, THEY FEEL DROWSY, NOT ALERT, CANNOT THINK PROPERLY, AND HAVE LESS ENERGY.

How much sleep per day is necessary for good health?

STUDENTS MAY RESPOND THAT EIGHT HOURS OF SLEEP PER DAY ARE NEEDED FOR GOOD HEALTH. OTHER STUDENTS, BASED ON THEIR OWN EXPERIENCE, MAY BELIEVE THAT ONLY FIVE OR SIX HOURS OF SLEEP ARE NEEDED FOR GOOD HEALTH.

What would happen to us if we were not allowed or able to sleep at all for a long period of time (such as several days in a row)?

Among other responses, students may say that they would eventually die from lack of sleep. It is known that severe sleep deprivation can produce behavioural changes and hallucinations in humans. No human, as far as science is aware, has died from lack of sleep. However, laboratory rodents will die if not allowed to sleep.

If no student mentions this possibility, initiate a discussion of what human behaviours are required for us to survive. Students should begin to consider sleep an essential behaviour, and they should begin thinking about what sleep does for us. Students will recognise that breathing, drinking, and eating are essential for life to continue. We can do without breathing for only a period of minutes, in contrast to drinking (days) and eating (weeks). This discussion should help students understand that sleeping is another essential behaviour, one that is required for survival.

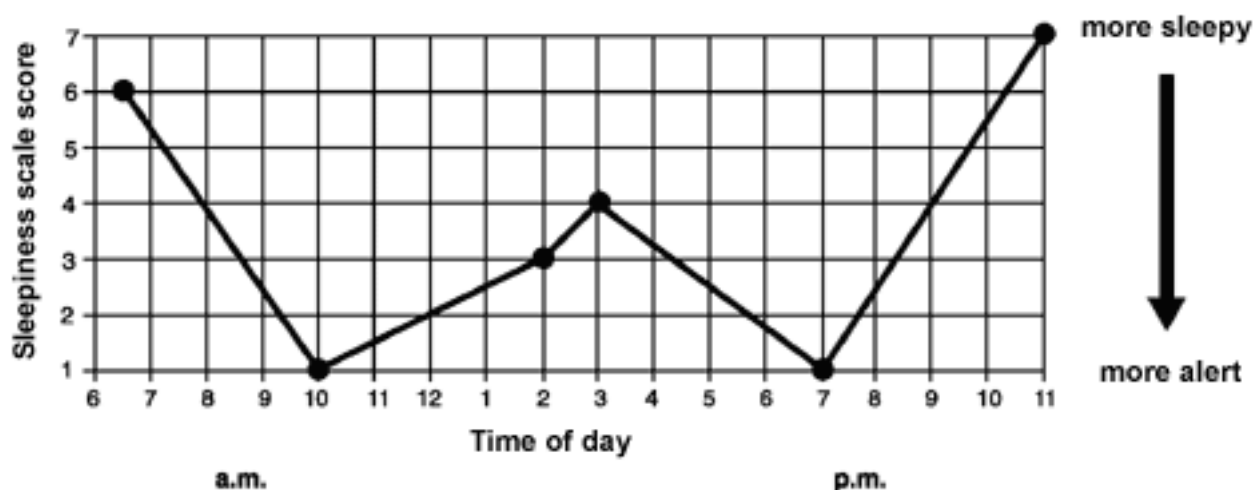
THEN SET THE RESEARCH PROJECT. INTRODUCE THE IDEA OF STUDENTS KEEPING A SLEEP AND BEHAVIOUR DIARY FOR A WEEK. WHAT WOULD THEY RECORD? SOME IDEAS MIGHT INCLUDE:

- Time you go to bed
- Time you wake up
- Number of times you wake during the night
- Total sleep time
- Number of caffeine-containing drinks in morning, afternoon, and evening
- What technological gadgets you have in the room
- Other ambient factors such as temperature, noise, light

This could be produced as a homework case study or could be used in a tutored second session to review and discuss the collated data.

A second session or the research project could also cover other areas associated with sleep and dormant brain activity such as coma and hibernation for some animals.

STUDENTS COULD ALSO PRODUCE A SLEEPINESS CHART FOR A COUPLE OF DAYS – MAYBE FOR 1 SCHOOL DAY, 1 WEEKEND DAY?



DISCUSSION

DO OUR BODY CLOCKS AND SLEEP REQUIREMENTS CHANGE WITH AGE?

Are other states such as coma or hibernation a different type of sleep?

EXTENSION QUESTIONS

THESE CAN BE USED WITHIN THE SESSION TO STIMULATE DEBATE OR FOR HOMEWORK/INDEPENDENT STUDY TASKS.

Which animals have the most sleep?

<https://faculty.washington.edu/chudler/chasleep.html>

Would you consider taking medication to help you sleep/stay awake?

Can you minimise jet lag?

Is technology changing our sleeping patterns?

Can sleep help you learn better?

<http://www.thenakedscientists.com/HTML/interviews/interview/1000741/>

OTHER RESOURCES

THERE IS AN EXCELLENT ARTICLE ABOUT THE RESEARCH BY PROFESSOR RUSSELL FOSTER:

<https://theconversation.com/why-sleep-could-be-the-key-to-tackling-mental-illness-50102>

A LOOK AT LACK OF SLEEP AS A PUBLIC HEALTH CONCERN FROM THE CENTRE OF DISEASE CONTROL:

<http://www.cdc.gov/Features/dsSleep/index.html>

SCISHOW'S REVIEW OF CIRCADIAN RHYTHMS AND THE BODY CLOCK:

<https://www.youtube.com/watch?v=UbQ0RxQu2gM>

RUSSELL FOSTER'S EXCELLENT TEDTALK ON 'WHY DO WE SLEEP?'

<https://www.youtube.com/watch?v=LWULB9Aoopc>

SYLLABUS LINKS FOR A-LEVEL BIOLOGY

EDEXCEL SALTERS NUFFIELD

Topic 8 Grey matter

WJEC

Component 3 Requirements for life

Component 3 option Neurobiology and Behaviour

