



What About Sleep?
Primary School

Sound Sleep

Aim...

To encourage pupils to take responsibility for their health and wellbeing by understanding the role and value of healthy sleep.

The lessons will teach pupils...

- What sleep is, what it is for and why it is important to physical and emotional wellbeing.
- Why children at Primary School need 10-11 hours sleep per night.
- What the body clock is and how it relates to sleep.
- What can stop you getting a good night's sleep.
- What you can do to help yourself get a good night's sleep.

Interactive slide – animations

This slide can be used to explain to parents (or colleagues) what the Sound Sleep Programme aims to do and what it will teach the pupils of your school.

What is sleep?




What is sleep?

Sleep is:

- natural behaviour
- reversible state of reduced awareness
- dynamic – there is a lot going on!

Lack of sleep affects our:

- emotional well being
- physical health



See Chapter 1 for further information.

Sleep is -

- **a natural behaviour** - sleep is part of everyone's life. Eventually no matter how hard we fight it we will want to sleep for at least part of every 24 hours.
- **reversible state of reduced awareness** - to our environment and surroundings.
- **dynamic** - contrary to the popular saying 'slept like a log' we do not turn off completely during sleep and become 'wooden' and lifeless. There are lots of important processes occurring during this time that are vital to our existence.

All animals sleep in response to natural rhythms that they have. Human beings also have a natural rhythm but are the only animals that deliberately try to reduce the amount of sleep they have and change their sleep patterns. Our sleep is getting worse in the 21st century due to our 24/7 lifestyles.

Lack of sleep affects our -

- **emotional wellbeing** - lack of sleep may cause depression, anxiety, stress and inability to regulate emotion.
- **physical health** - lack of sleep may also cause obesity, diabetes and contribute to conditions in later life such as heart conditions and strokes.



Interactive slide – animations

We all know that to stay healthy we have to eat the right foods and take regular exercise.

The third thing we have to do to make sure we stay healthy is to get the right amount of good sleep.

We need sleep to live and we need enough good sleep to stay healthy.



Discussion point.

How do they feel if they don't get enough sleep?

Following discussion – run through the points provided on the next slide to summarise.

How do you feel when you don't get enough sleep?

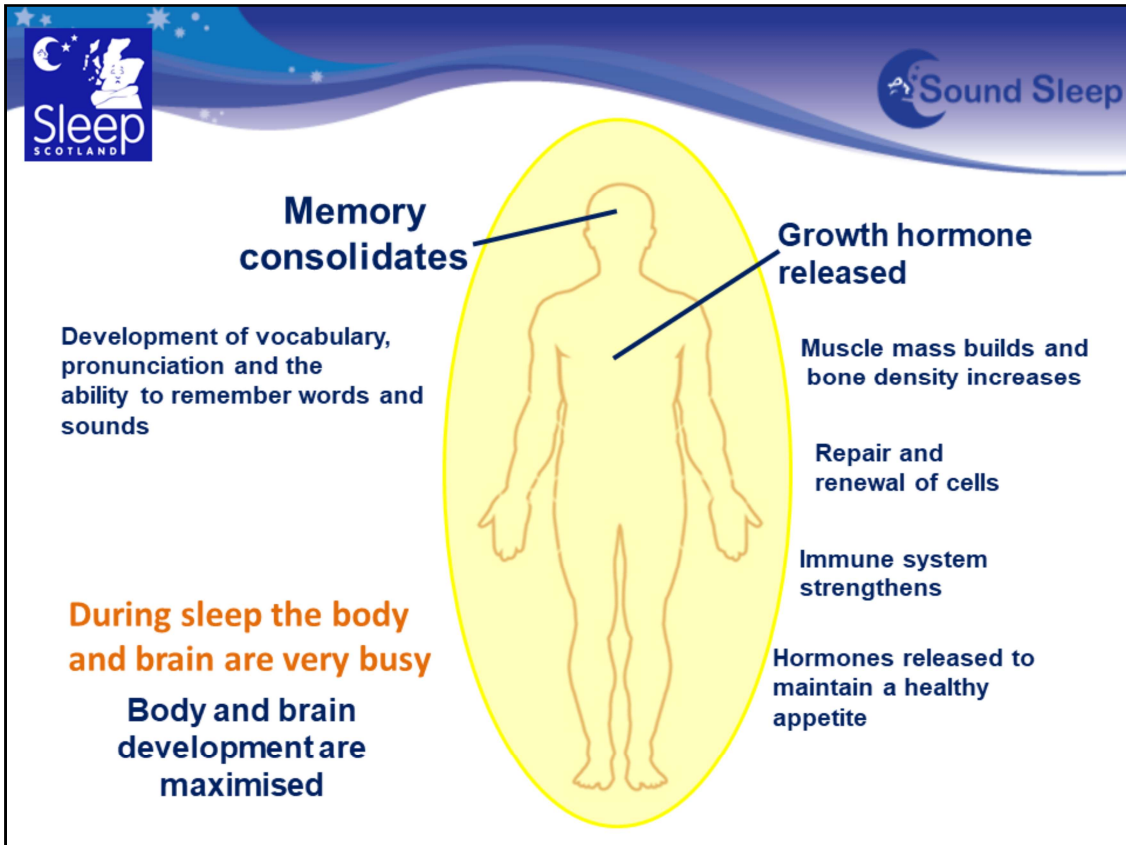
- Feel worn out, no energy, no motivation
- Struggle to stay awake when it's quiet
- Hard to concentrate
- Clumsy or accident prone
- Short temper, no patience, grumpy
- Impulsive, irrational or bad behaviour
- Stronger, less controllable emotions
- Low mood, more anxiety and stress



Interactive slide – animations

These are the most common symptoms that you will experience if you are not getting enough sleep.

What happens when you sleep?



See Chapters 1 & 3 for further information.

Interactive slide - animations

When you are asleep your body is very busy doing lots of important stuff. There are many hormones released while you sleep including;

Growth Hormone - It plays a part in many activities that take place in your body while you sleep....

Growing - As a child most of your growing is done while you are asleep. Your brain also develops and changes.

Repair and maintenance - Your body works hard to repair all the little bumps and scrapes that you get during the day as well as helping you to get better if you have been ill.

Muscle and bone development and strengthening - Your muscles and bones strengthen when you are asleep.

Immune system - Your body's natural defence system against disease and illness builds its own strength while you sleep.

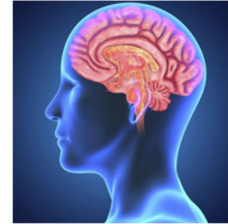
Appetite control - There is a hormone called LEPTIN that is released while you are sleeping, this helps you have a normal appetite. If you are sleep deprived, LEPTIN gets suppressed and another hormone called GHRELIN is produced which makes you hungry – especially for fattening, energy dense foods like carbohydrates. This can lead to weight gain

Memory - Information we have learned during the day becomes 'hard-wired' and **memory is moved from short-term to long-term**. This is an important part of learning.

Positive memories - There is a part of your brain that stores your positive memories and this can be affected when you don't get enough sleep. This means that you may remember more of the negative things which can make you more likely to feel unhappy.

Sleep and Low Mood

- Sleep deprivation affects the pre-frontal cortex, where emotions are rooted
- **Positive** memories are stored in the hippocampus which is directly affected by sleep deprivation
- **Negative** memories tend to be stored in the amygdala which is not as severely affected



Interactive slide – animations

The brain stores different types of memory in different parts of the brain;

- **Positive** or neutral memories get stored in the **hippocampus**.
- **Negative** memories tend to get stored in the **amygdala**.
- The **hippocampus** is more directly affected by lack of sleep so this may explain why people affected by sleep deprivation fail to recall pleasant memories as easily as they do negative memories.

How much sleep should we be getting?

The infographic features a blue header with the 'Sleep SCOTLAND' logo on the left and the 'Sound Sleep' logo on the right. Below the header, five age groups are listed, each with a representative photograph and a text box indicating the recommended sleep duration. The age groups and their sleep requirements are: New baby (18 hours), Nursery aged child (11½ - 12 hours), Primary aged child (9 - 11 hours), Teenager (9¼ hours), and Adult (7 - 8 hours).

Age Group	Recommended Sleep Hours
New baby	18 hours
Nursery aged child	11½ - 12 hours
Primary aged child	9 - 11 hours
Teenager	9¼ hours
Adult	7 - 8 hours

Interactive slide – animations

We need different amounts of sleep at different stages in our lives.

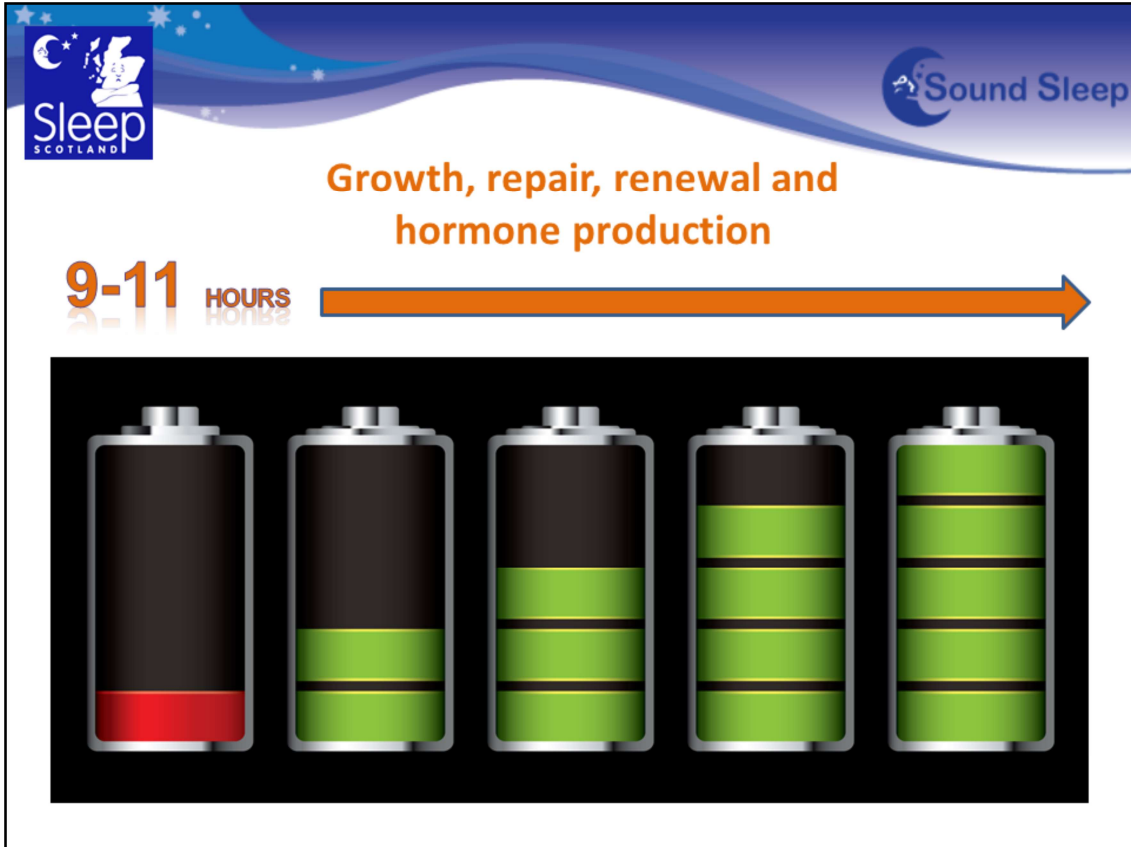
- A **Newborn Baby** should sleep for around 18 hours out of every 24.
- A **Nursery School** aged child (3-4) should sleep for between 11½ to 12 hours (this includes a 1 hr daytime nap where needed)
- A **Primary School** aged child (5-12) should sleep for between 9 and 11 hours per night.
- A **Teenager** needs less than a child but more than an adult and should ideally sleep for around 9¼ hours per night.
- An **Adult** requires 7 to 8 hours sleep per night on average.

However, everyone is unique and there are people who require a little more and those who can get by on a little less.

Why?

**9-11
HOURS**

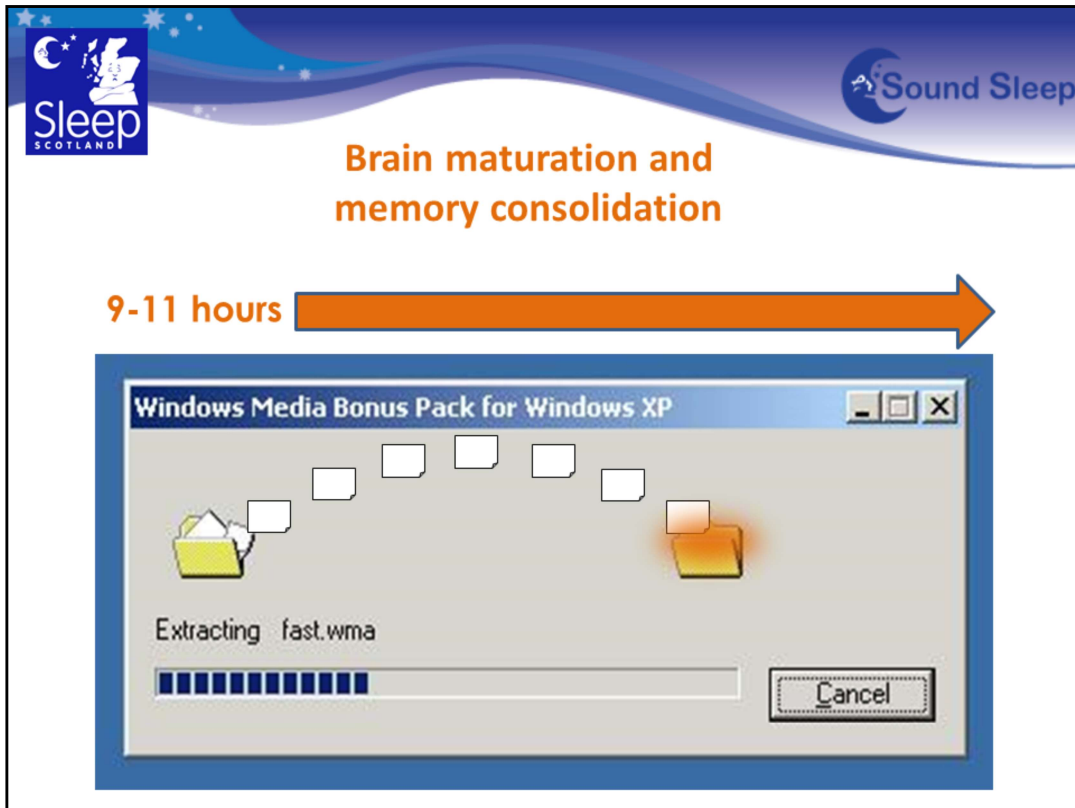
Why does a Primary aged child need between 9 and 11 hours per night?



Interactive slide – animations

A Primary School child needs 9-11 hours each night to allow their body to carry out the full amount of Growing, Repairing and Protecting required for their age.

If they don't get the right amount of sleep each night, they are not allowing their body to reach their full potential.



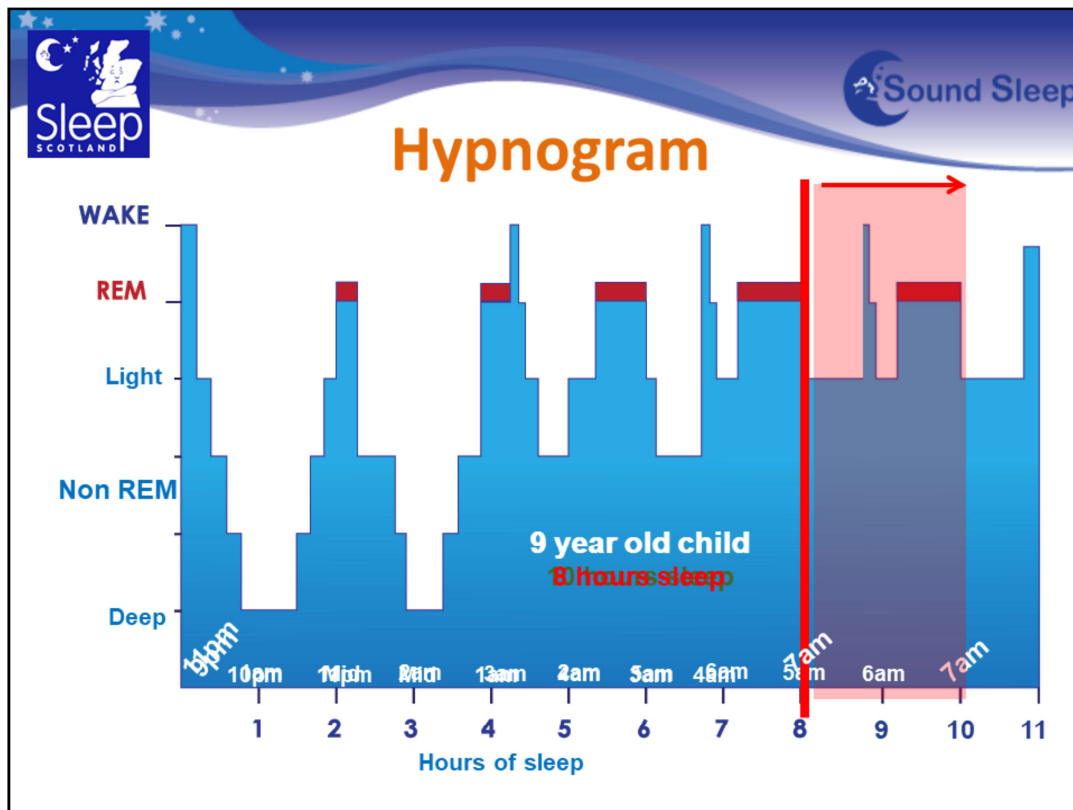
Interactive slide – animations

The brain of a Primary School aged child also needs a full 9-11 hours of sleep each night to help it to store all the things they've seen, done and learned during the day.

Getting the right amount of sleep also allows their brain time to process their emotions and feelings so they can stay as happy as possible.



**What should
sleep look like?**



Interactive slide – animations

What our actual sleep looks like and what is happening during the night.

Sleep patterns are shown as hypnograms. A hypnogram is created by gathering lots of physiological information but essentially it shows the different types of sleep being experienced. This hypnogram is one for a young person sleeping through a full 9-11 hours.

Important to know that our bodies and brains are doing very specific things at different times during the sleep cycle.

Each cycle lasts approximately 90 - 120 minutes and is comprised of both non-REM and REM sleep.

During non-REM sleep - shown in blue, even though at times we may be in our deepest sleep, our bodies will still be working hard releasing hormones and renewing and repairing tissues.

REM sleep - shown in red, happens at specific points during our sleep cycle. This is often when we dream. During REM sleep is also when we believe that the majority of our memory consolidation is done. As we have the biggest blocks of REM towards the end of our sleep it's important to make sure we get the full 9-11 hours.

At various points during the sleep cycle we may wake. This may only be for the briefest moment and we may not remember in the morning.

It's important to go through all the different stages of sleep each night to ensure that your body and brain have the right amount of time to carry out all their functions.

Example on Hypnogram:

A 9 year old child should sleep for 10 hours per night. To achieve this, they go to sleep at 9pm and wake up at 7am.

If they don't go to sleep until 11pm and still have to get up at 7am, they will only achieve 8 hours of sleep. This means they will miss out part of their sleep pattern, including a big block of REM sleep which could have an impact on their memory consolidation and learning.

What helps us to fall asleep and wake up?

Body clock

- Helps you to do *(or expect to do)* certain things at certain times each day, like sleeping and eating
- You can help 'set' your body clock to the right times by following a regular daily routine
- Setting your body clock is affected by external factors known as **Zeitgebers**



CIRCADIAN RHYTHM

Our **circadian rhythm** or **body clock** is controlled by a group of cells located in the **hypothalamus** of the brain.

In order to keep our body clock regulated, our bodies react to external stimuli called **zeitgebers** (a German word meaning 'time-givers').

Light is one of the most important zeitgebers. Other zeitgebers include; meals, social interactions, exercise, external temperature and sound.

Zeitgebers reset our body clocks every day.

We are designed to want to sleep through the darkest period of the 24 hours and be active and alerted during the day. Our bodies recognise the changes in light and temperature and react to these signals by making us feel sleepy.



Interactive slide – animations

In the human eyes, there are **light receptors** that are not designed to help us see but are linked to our body clocks.

Our body clocks detect a change from **light to dark** and send signals to the a part of the brain that produces a hormone that will make us **sleepy**.

A similar reaction takes place when the light receptors detect a change from **dark to light** – they send a message to the brain that tells the body to produce a different hormone that wakes us up and keeps us **awake** and alert.

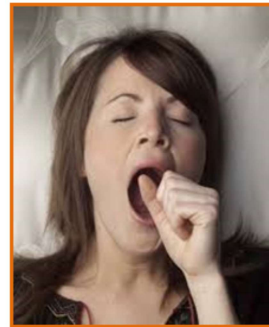
Hormones

Light
CORTISOL



Awake

Dark
MELATONIN



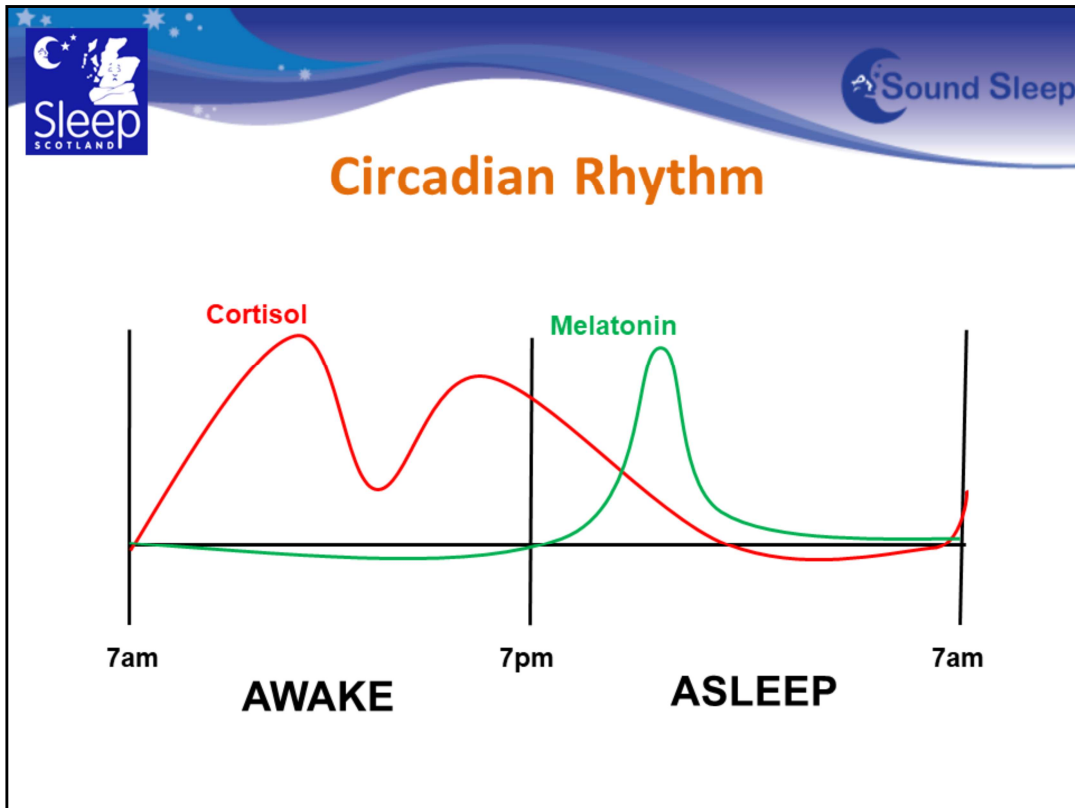
Sleepy

Interactive slide – animations

So, although there are many hormones related to sleep, these two are very important in helping us to stay awake or to get to sleep.

- **MELATONIN** is the hormone that makes you start to feel sleepy (it doesn't actually make you fall asleep) and is produced in a big burst, ideally just before your bedtime.
- **CORTISOL** is the hormone that wakes us up and keeps us going all day. It is also nicknamed '**The Stress Hormone**' as its production is increased when you are physically or mentally stressed. This means that when you are stressed or anxious, you have lots of CORTISOL going through your body, so you will find it hard to feel sleepy.

Sleep deprivation is a form of physical and mental stress, so if you are sleep deprived you are causing the production of more CORTISOL which will make it even harder to sleep.



Interactive slide – animations

Cortisol is released in a big burst first thing in the morning to wake us up and then keep us going throughout the day.

We may feel sleepy, want an afternoon nap or be drowsy after a heavy lunch because we have a natural dip in Cortisol mid afternoon.

The way our society has evolved in the last 200 years has led us to suppress this natural inclination and to sleep only once during the 24 hour period. In some societies, however, the afternoon nap, or siesta, is still the norm and their working day may be split accordingly.

Melatonin is usually released around half an hour or so before your usual sleep time. It is released in a big surge to help you feel sleepy so that you can get off to sleep when you normally do.

The infographic is divided into four sections. The top section, 'DAYLIGHT', shows a continuous spectrum of light from red to blue. The second section, 'LOW ENERGY BULB', shows a spectrum with several distinct peaks across the visible range. The third section, 'LED TV/COMPUTER SCREEN', shows a spectrum with a large red peak, a smaller green peak, and a blue peak circled in red. The bottom section, 'EFFECT ON MELATONIN', shows a graph of melatonin inhibition versus wavelength (nm) from 700 to 400. The curve shows that blue light (around 450-500 nm) causes the most significant inhibition, with a red circle highlighting this peak.

How light affects the onset of sleep

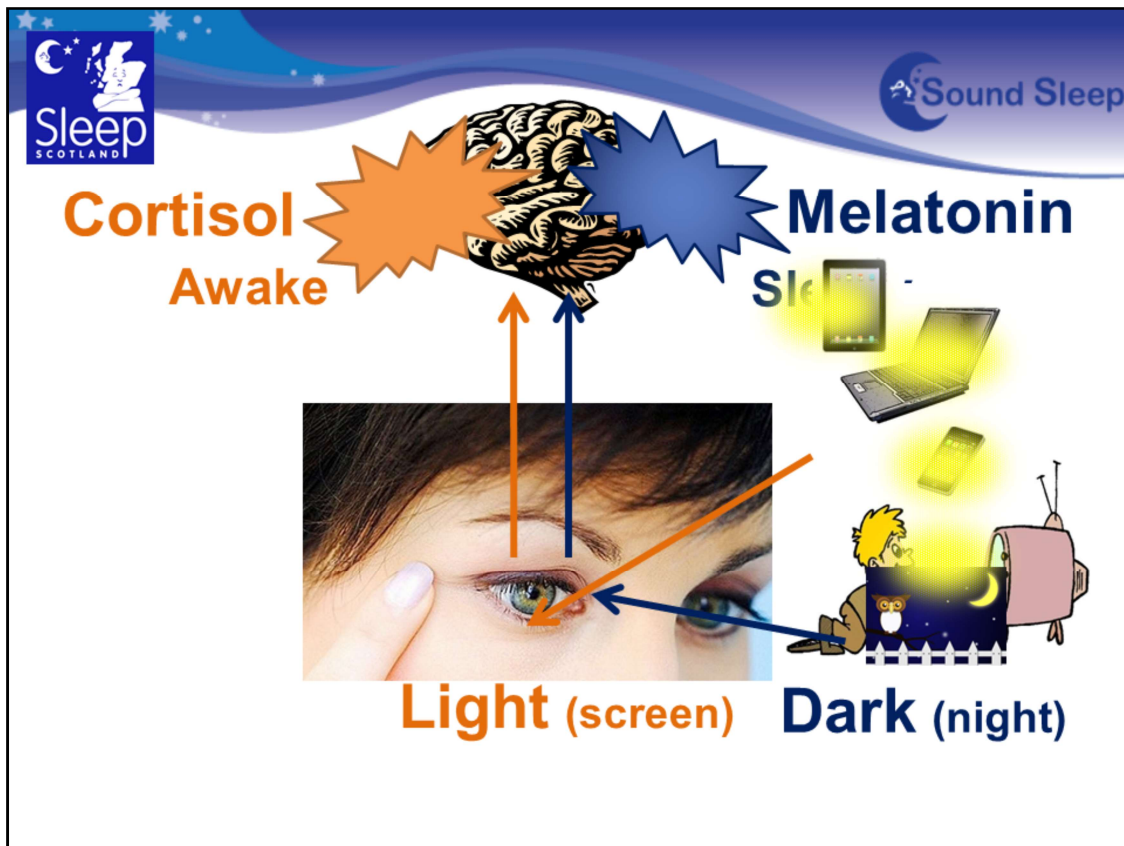
- Melatonin production is switched off by blue light
- Onset of sleep is delayed

Interactive slide – animations

Scientists have shown that it is a specific wavelength of **Blue Light** that can switch off the production of **Melatonin**.

If you look at this graph, it shows you where that specific wavelength of blue light is on the spectrum. The graph above shows how this wavelength of blue light is also produced by screened technologies such as TVs or computers.

This comparison shows how the brain could be tricked into suppressing Melatonin when is told by our light receptors that blue light is being detected.





Interactive slide – animations

Blue light from screens can be picked up by our receptors and make our brain think that it is still daytime which can prolong the production of CORTISOL - this means that our MELATONIN may not be produced and we may not feel sleepy when we should.



Interactive slide – animations

In our hi tech multi media world, our children and young people are often constantly being exposed to blue light - during the day, in the evening and even in their beds.



Adolescent sleep

Physiological changes

- Less total sleep time required
- Average 9 - 9.5hrs
- Shift to falling asleep later (around 2 hours)
- Wake after sleep onset increases

See Chapters 2 & 8 for further information.

During adolescence the body clock can shift by approximately 2 hours, until our early 20's.

This means that adolescents are more likely to:

- feel more active in the evening
- not want to go to bed until later because they are not sleepy
- find it hard to get to sleep
- find it hard to get up in the morning because they haven't slept long enough

There are ways to prevent a significant disruption to your body clock during this period or to pull your body clock back from a considerable shift.

How to get a good night's sleep



There are steps that we can take to help our children (and our ourselves) to get a good night's sleep.




During the day

- Get out into natural light for at least 30 minutes as early as possible
- Avoid too many caffeine based drinks
- Find ways of dealing with stress or anxiety
- Avoid having a nap during the day
- Do not have a long lie-in at weekends



Interactive slide – animations

Natural light: This is the most important external factor for keeping our body clocks in check. Getting natural exposure to light (sunlight) during the day enables our body clock to keep in check and ensure that our bodily functions are running at the right times (eg melatonin being produced in the evening)



Sugar and caffeine: Sugary drinks can prevent us from feeling sleepy as the sugar gives the body a energy ‘high’ that can keep us awake. Caffeine, which inhibits the release of melatonin and can prevent us from feeling sleepy, is not only found in coffee and energy drinks but also in other fizzy drinks (irn-bru and coca-cola), tea and chocolate.

Nap: disrupts circadian rhythm (body clock), may affect sleepiness later in the evening and lead to problems falling asleep, awakening through the night or too early in the morning.

Stress and anxiety: anxiety is often a cause for sleeplessness and ‘trouble switching off’. CORTISOL (the stress hormone) is released in response to stress and inhibits and works in opposition to melatonin. It gives us adrenaline to prepare our bodies for ‘fight or flight’. Stress during the evening and the release of cortisol can prevent us from feeling sleepy. Chronic or over-release of cortisol can also create shallow and fragmented sleep. Exercise during the day is a good way of helping our bodies break down cortisol and use up the energy it creates.


Share your worries: if you talk about your worries with someone you trust or write them down earlier in the day it helps you avoid feeling anxious or stressed before bedtime.

Lie-in: affects circadian rhythm (body clock) and causes a shift in your body clock leading to the ‘jet lag effect’ (explain briefly what this is)

During the evening

- Clear homework out of the way
- Have a good meal, but not too close to going to bed
- Do any stimulating activities such as exercise, watching TV and playing computer games earlier in the evening



Interactive slide – animations

Homework: leave the day behind in the evening. Get homework out of the way to reduce stress near bedtime and allow your brain to wind down and ‘switch off’. The same goes for preparing your bag for school. If it’s packed and ready early in the evening you can forget about it until morning.

Meal: not too close to bed as this is when your metabolism winds down. Again, nothing too sugary or energy-dense (foods with high calorie/fat content) as they will give you an energy high and may prevent sleepiness. A light snack in the evening is good. We usually suggest something like a glass of milk and toast or cereal. Anything that contains high amounts of tryptophan (an amino acid that is used in the production of melatonin) is good before bed. Milk and poultry (e.g. turkey) contain high amounts of tryptophan.

Stimulating activities: Do anything that may be stimulating such as chatting to friends, playing computer games, watching TV and exercise earlier in the evening. Doing these active and stimulating things later in the evening can give your body the wrong signals and prevent you from feeling sleepy. If your favourite programme is on later in the evening record it or watch in on iplayer/catch up the next day. The light emitted from computer and tv screens can also inhibit the release of melatonin and prevent us from feeling sleepy.

The last hour (wind down hour)

- Switch off your TV, computer, phone and anything with a screen!
- Have a bath, wind down and chill out
- Read or listen to relaxing music
- Stick as closely as you can to the same bedtime and getting up times, even at weekends
- Try a relaxation technique in bed to help you drift off to sleep



Interactive slide – animations

TVs, computer and phone: light from the screens can inhibit the production of melatonin and may prevent you from feeling sleepy. These activities are also stimulating – getting hooked into a programme or chatting to friends online can push back your bedtime and make it difficult for you to ‘switch off’ when you try to fall asleep.

Bath: good way to relax. Your body prepares for sleep by reducing your body temperature. A warm bath increases your body temperature and then causes it to cool rapidly afterwards – this helps to give your bodies the signal that it is time for bed. Do not have a shower as the water falling on your skin can stimulate you.

Read, listen to relaxing music: Save a book for bedtime or treat yourself to a magazine that you save for bedtime. You can also make a sleep playlist by compiling some of your favourite relaxing songs. If you do listen to music make sure it is not on a device that is going to produce light that your eyes will pick up.

Same wake and sleep time: a consistent routine strengthens your body clock and the times that your bodily functions occur i.e. sleep.

Relaxation techniques: good for relaxing muscles in the body. Focusing on the technique can also be a way for your brain to wind down and to leave the day behind. Relaxation techniques take time to take effect and should be completed consistently for at least a few weeks in order to become effective.

The bedroom



- Try and create a 'sleep room'
- Keep your bedroom dark and cool
- Make sure your bed is comfortable
- Use subdued lighting
- Remove pets that are nocturnal



Interactive slide – animations

Consider all of the following;

- The correct temperature – cool (high temperatures can disturb sleep).
- The correct lighting – dark, subdued lighting when getting ready for bed. Black out blinds or curtains are good in summer months.
- Clear of distractions, toys should be out of sight.
- Remove electronic equipment such as television and computer consoles, should be out of room, or put away.
- Make sure the environment is as quiet as possible.
- Have calm decor – the aim is for the sleep room to be as boring as possible!
- Remove any nocturnal pets.
- Make sure the bed is comfortable.



Summary

- Consider what goes on during the day – could anything potentially be affecting sleep?
- Get a good routine in place for the evening – make sure you are removing any potential barriers to good sleep
- Plan a ‘wind down hour’ and leave the day behind
- Try to have the bedroom as a ‘sleep room’ rather than a bedsit – even if you change things every night for the wind down hour

Interactive slide – animations

Run through a summary of the main points of the presentation.



Sleep Support Line

Children 18 months to 18 years

Monday – Thursday

10:00am – 4:00pm

0800 138 6565

Email: sleepsupport@sleepscotland.org

Sleep Scotland now has a **Sleep Support Line** that families can call to get help and advice if their child is having difficulty sleeping. This service is available to all children in Scotland aged 18 months to 18 years and is completely free of charge.

The Support line operates **Monday to Thursday** between the hours of **10am and 4pm** but callbacks can be arranged outwith these hours and you can also email.