Body Clocks

In this exhibit you learn about the clocks that keep your body in time with the day.

Normally we do the same things at the same time every day. We get up at roughly the same time each day, we eat at roughly the same time each day and we go to bed at roughly the same time each day.

We do this partly because we want to fit into our own man-made timetables. But our bodies are also telling us that we want to do this. Our bodies naturally wake up at the same time every day, they feel hungry and prepare our digestive system for food at the same time every day and they start to slow down and feel sleepy at the same time every day.

BODY CLOCKS

Some people are **evening people**, or **"Owls"**. Owls like to go to bed late and lie in. Owls are more active, mentally and physically, in the evening.

Some people are **morning people**, or **"Larks"**. Larks prefer to get up and go to bed early, and are at their most active in the mornings.

are you an Owl or a Lark?

Most people are somewhere in between...

Our Owl or Lark tendencies change throughout our lives, as you can see below:

Teenagers are often **Owls** because their body clocks last longer than 24 hours, often **26-30 hours.** Here are some tips to help your body clock work with the 24 hour day:

- As soon as you wake up, go outside or open a window.
- Prepare the night before so you have less to do in the morning.
- Get up at the same time every day, even at weekends.
- Keep evenings quiet by avoiding TV, computers, loud music and over-excitement.
- Have a bedtime routine: maybe a hot milky drink and reading before bed.
- Keep lights dim at night and avoid bright lights.
- Use dim lights in the bathroom in case you need to go in the middle of the night.

Our bodies know what time it is because every single cell contains a clock. To make sure that all the clocks remain in time with each other, our brains contain a master clock, which resets all the clocks daily. This clock uses sunlight to make sure it's the right time. Even some people who are fully blind (but still have eyes) can use sunlight to reset their body clock daily.

Different people's body clocks behave differently. Some people naturally wake up early in the morning and start to feel sleepy early evening. We call these people LARKS. Some people don't wake up until much later, and can stay awake long into the night. We call these people OWLS, Most people are somewhere in between. People change through their lives: children are often larks, teenagers owls and we become more lark-like through our adult lives.

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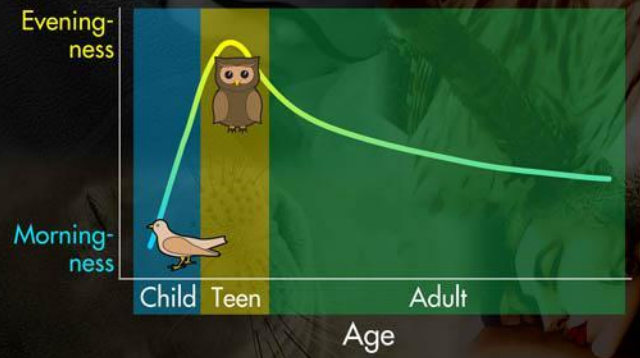

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BODY
CLOCKS
12 midnight
1 am
worst time
What controls your body clock?
Every cell contains a body clock, controlled by clock genes. Each of these cell clocks can keep its own time, and they are kept in time with each other by a master clock in the brain, called the suprachiasmatic nucleus.
Every morning the master clock resets itself using sunlight, and makes sure all the other body clocks are on the right time too. Body clocks are also affected by when we do things, like eat or sleep.
Are you at your best first thing?
Body clocks decide when we feel sleepy and when we wake up. They help warm up our muscles and raise our blood pressure just before we wake up, so that our bodies are ready to use straightaway.
You may not notice how ready your body is when you wake up normally, but try waking up suddenly in the middle of the night and see just how ready your body is for action then!
Do you get hungry at the same time every day?
The master clock tells the stomach and liver clocks what time it is, and these clock learn when you usually eat. The clocks can make sure your stomach and liver are ready to digest food when it arrives by preparing chemicals at the right time.
Is it difficult to adjust when you travel between time zones?
Jetlag happens because the master clock is able to set the right time as soon as it sees sunlight in the new time zone. It then tells all the other clocks what the new time is. Some of these other clocks can't reset themselves so quickly so it usually takes a few days for the whole body to adjust.
Are we the only ones with body clocks?
Body clocks have been found in all sorts of plants and animals, and even in bacteria.

Our society is organised for people who are somewhere between an owl and a lark. We start work or school at 9 am and finish at 5 pm (that's with homework). Owls are normally too tired to start that early, and larks will be starting to flag mid-afternoon. People often (unfairly) think that owls are being lazy, particularly teenagers, and don't understand that it is their natural body clock.

Modern workplaces often now offer flexi-time, which allows people to fit their work around their family commitments and body clock. Some schools are changing their timetables too, to fit in with teenager's body clocks.

If you're struggling to get up in time for school, just be glad you don't live in the US: many schools there start at 7.30 am.

Questions

1 We get up at roughly the _____ time every day.

2 What do our bodies do at the times when we normally eat?

3 Where is our master clock?

4 Are most children owls or larks?

5 How do modern workplaces accommodate different people's body clocks?

6 Do you think you are an owl or a lark? Have you changed at all?

Activities

1 During the school holidays, when you have a quiet week, keep a diary of the times you naturally wake up, feel hungry and go to bed. Do you find it's the same times every day?

2 Can you adjust a plant's body clock? Get a pot plant and put it in a cupboard with a lamp. Switch the lamp on and off at a particular time each day, perhaps switch it on at 6 pm and off at 8 am. Can you train the plant to open its flowers in time for when you put the light on, and close them when you switch it off?