

## READING PASSAGE 1

Answer **Questions 1-16**, which are based on Reading Passage 1 on pages 2 and 3.

### **The link between low light and mood**

As far back as the 6th century, historians were describing seasonal peaks of joy and sorrow among the Scandinavian countries of Sweden, Norway and Finland. Because these countries are so far north, there is continuous daylight in summer, and an almost complete absence of it in winter. Today researchers recognise that a lack of light can cause some people to experience a range of negative consequences, from low energy to more serious depression.

At Lindeborg School, in southern Sweden, teacher Anna Odder Milstam arrives at work before dawn for several months of the year. 'During the winter, we just feel so tired,' she says. Anna teaches a class of 14-year-olds, who are now part of an experiment investigating whether artificial lighting might possibly aid their concentration. A few years ago, Anna's classroom was fitted with ceiling lights that change in colour and intensity. The lights were developed by researchers at a company called BrainLit. The ultimate goal of the experiment is to create a system designed to suit individual workers by adjusting the lights already installed within their offices to optimise physical wellbeing.

BrainLit's artificial lighting system simulates the experience of being outside on a typical day during spring, rather than any other season so, when Anna's pupils arrive at 8.10am, the lights are a bluish-white to wake them up. The lights grow gradually more intense through to lunch time. But then the lights gradually dim and become more yellow as the afternoon progresses. Bright light in the morning quickly stops further production of melatonin. This is the hormone naturally released by the human body that plays a vital role in the sleep-wake cycle. Shutting this off early in the day helps people to feel sleepy at the correct time when night comes around again.

Already, there's some evidence that the artificial lighting system is affecting the pupils' sleep. In a study, in order to monitor sleep cycles, 14 pupils from Anna's class and 14 from a neighbouring class without the lighting system were each given a sleep tracking app and their own diary for making notes. During the second week of the study, significant differences started to emerge between the two groups; in terms of quality, Anna's pupils woke up fewer times during the night and slept for longer. As yet, no one has identified whether the lighting system is affecting the students' scores for examinations but Anna reports that her students are certainly more focused.

While some people report only feelings of tiredness during winter months, other people experience a more serious condition known as seasonal affective disorder (SAD). This kind of depression has been treated with the use of bright lamps in Scandinavian countries since the 1980s. But in Sweden, support for this type of light therapy often went one step further: dressing patients in all-white clothes and sending them into brightly lit rooms. In recent years, however, light therapy has experienced something of a backlash in Sweden, and so now only a handful of clinics remain. In part, this was a response to a study by the Swedish Council on Technology Assessment in Health Care, which reviewed the evidence and concluded



that 'although treatment in light therapy rooms is well established in Sweden, no satisfactory, controlled studies have been published on the subject,' meaning that the value of light therapy for SAD 'can be neither confirmed nor dismissed'.

A town called Rjukan in Norway has taken a different approach to dealing with winter darkness. In 1913, the concept of erecting large rotatable mirrors on the northern side of the valley overlooking Rjukan was proposed. The intention was to collect sunlight and reflect it down over the town below. However, it wasn't until 2002 that resident Martin Andersen started to develop some concrete plans. These involved a mirror mounted in such a way that it would turn to keep track of the sun while continually reflecting its light down towards the town square. Now three enormous mirrors stand on the mountainside above Rjukan. In January, the sun is only high enough for the mirrors to bring light to the square for a couple of hours per day, from midday until 2pm, but the beam produced by the mirrors is strong. Interestingly, Martin Andersen admits that he was used to the lack of sunlight even before this innovation, and he believes that other residents were too.

This is certainly the case in another Norwegian settlement: Tromsø. It is 400 km north of the Arctic Circle and the sun doesn't rise above the horizon between 21 November and 21 January. Yet strangely, studies have found no difference between rates of anxiety and depression in the population in winter and summer months. One suggestion is that this apparent resistance to winter depression is genetic. However, an alternative explanation is culture, meaning some people are just more willing to adapt. Recently, a psychologist called Kari Leibowitz spent ten months in Tromsø trying to discover how people cope during winter. She devised a 'winter mindset questionnaire' to assess people's attitudes and actually found that, in general, an appreciation of winter was associated with greater life satisfaction and a sense of personal growth.



Questions 1 – 8

Complete the notes below.

Choose **ONE WORD ONLY** from the passage for each answer.

Write your answers in boxes 1-8 on your answer sheet.

## **Experiment with artificial light at Lindeborg school**

### **Aims of the experiment**

- to find out if students' 1 ..... can be improved
- in the long term, to adapt lighting in 2 ..... so that employees feel better

### **Details about the artificial lighting system**

- the artificial lights are designed to reproduce the natural daytime light of 3 ..... in Sweden
- the lights turn a shade of 4 ..... towards the end of a school day
- the brightness of the lights in the morning helps regulate the amount of 5 ..... the body makes

### **Students who are involved in the experiment**

- students in two different classes used technology as well as a 6 ..... to record the amount of sleep they got
- the 7 ..... of sleep amongst students in Anna's class improved and they woke up later
- the influence of the lighting system on performance during 8 ..... is unknown



## Questions 9 – 16

Do the following statements agree with the information given in Reading Passage 1?

In boxes 9-16 on your answer sheet, write

<b>TRUE</b>	<i>if the statement agrees with the information</i>
<b>FALSE</b>	<i>if the statement contradicts the information</i>
<b>NOT GIVEN</b>	<i>if there is no information on this</i>

- 9 Sweden was the first Scandinavian country to use light therapy.
- 10 Light therapy continues to enjoy great popularity in Sweden.
- 11 The Swedish Council on Technology Assessment in Health Care has found proof that light therapy is effective.
- 12 Martin Andersen based his mirror design on an earlier idea.
- 13 Martin Andersen's mirrors can provide a full day of light during January.
- 14 In Tromsø, people experience some similar moods during both summer and winter.
- 15 Culture is more likely than genetics to help people cope with winter in Tromsø.
- 16 Kari Leibowitz's findings suggest people who like winter tend to be content.

