

## TOPIC 5 STATES OF AWARENESS

### *Worksheet 21 Sleep, stress and arousal*

Many answers are possible for these first three questions – they are intended simply to see what your understanding of these three terms is. You might have given these sorts of answers:

#### **Five situations where SLEEP is likely for you**

When I'm tired.....watching a boring movie.....at 3am.....every night.....on a bus

#### **Five situations where STRESS is likely for you**

Exams.....assignments due.....arguments.....driving test.....asking someone out

#### **Five situations where AROUSAL is likely for you**

Sport.....horror movie.....arguing with parents.....driving a new car.....seeing a snake

Create and describe a scenario in which you could experience **all three** of these within a one-hour period of time:

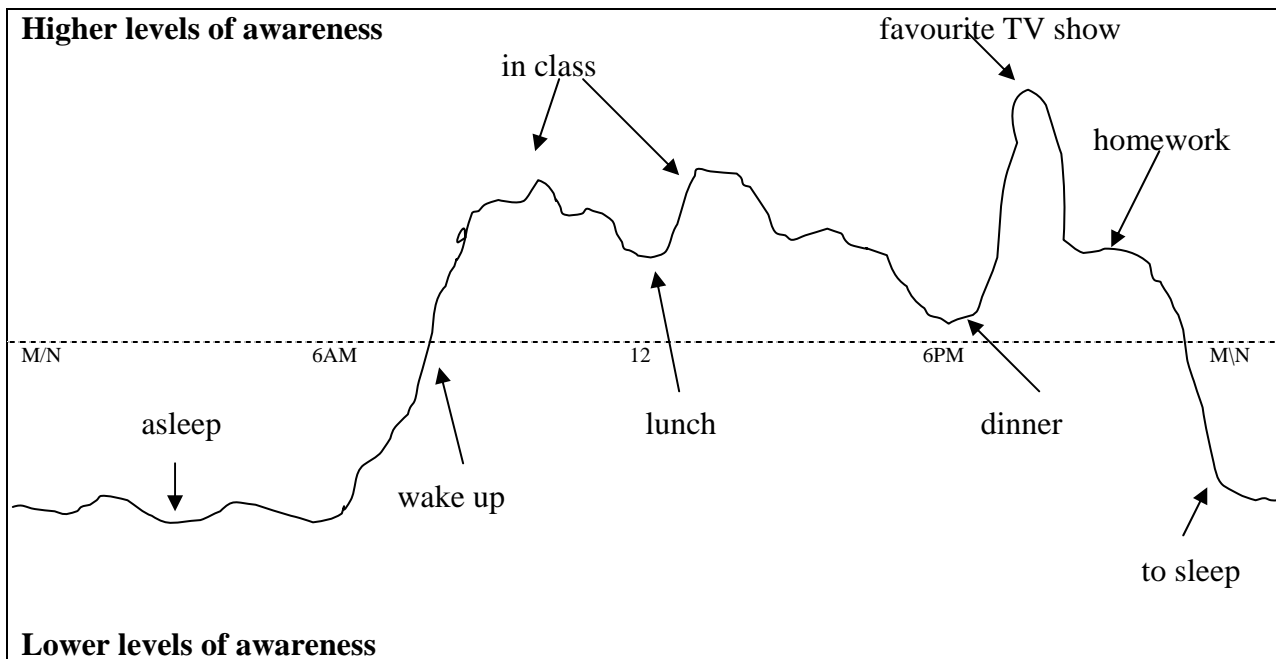
Here is one possibility: You are asleep, and wake in fright as you see a shadowy figure standing beside your bed. You realise it is your brother, who has come to tell you that he borrowed your car and has stacked it.

Your stream of consciousness might look like this:

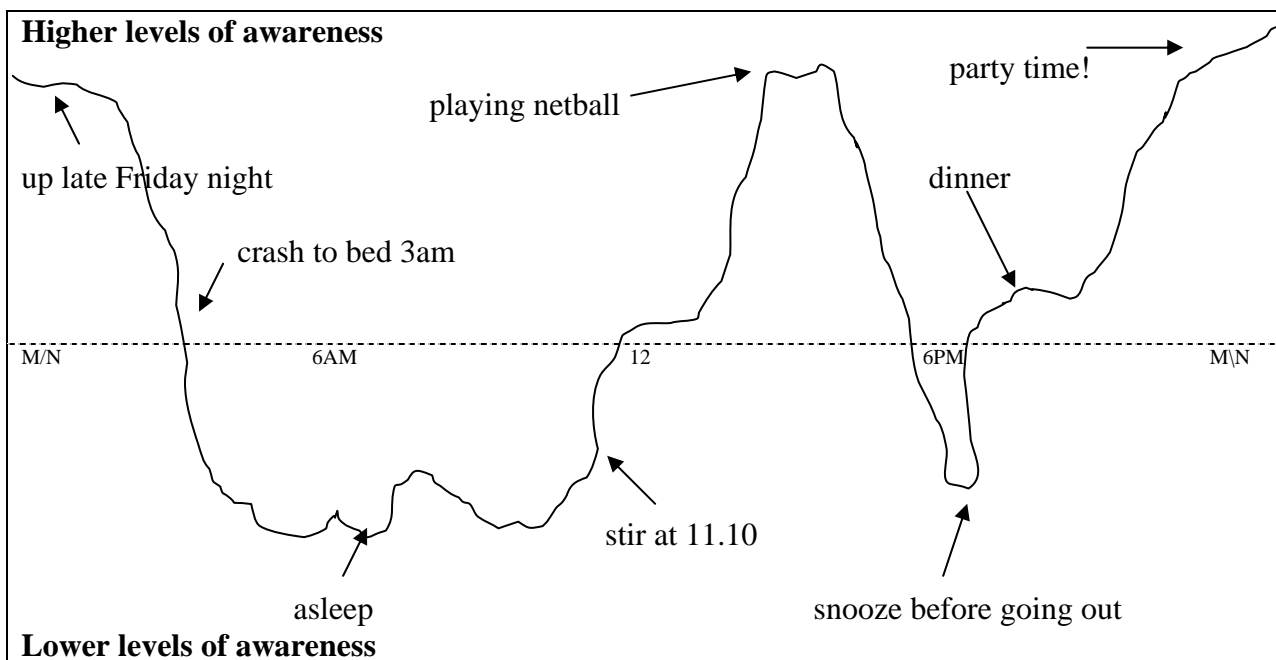


This might look stupid...oh well, here goes...was I meant to include that first one, or does it start now...too bad...is this right...i can't not think of my thoughts...what does this mean anyway...funny looking brain...hope mine looks better than that...must have a big thought to put in here...ummmmm...here it is...is my brain bigger than a baby's or just more complex...yay, well done...good thought...now for a little thought...this is silly...ummmmm, here goes – little thought...mice are dumb...thank heavens I'm nearly finished...i think I'm losing it!!

Your levels of awareness through a typical school day might look like this:



Levels of awareness on a typical Saturday might look like this:



Your numbers might be something like those below – make sure you have put high numbers for higher levels of arousal (excited, concentrating hard, angry, scared, etc), lower numbers for lower levels of arousal (asleep, bored, daydreaming, meditating, etc), and numbers close to zero for what you might consider to be a ‘normal waking level of arousal’ (perhaps close to where you are right now?):

Working on this worksheet	4	Sleep	-6
Watching a movie on TV	2	Driving on the open road	2
Playing chess	5	Under an anaesthetic	-8
Talking to a friend on the phone	1	Spider crawling on your neck	10
In a coma	-8	Completing your drivers licence test	8
Meditation	-4	Daydreaming in class	-1

### Circadian rhythms

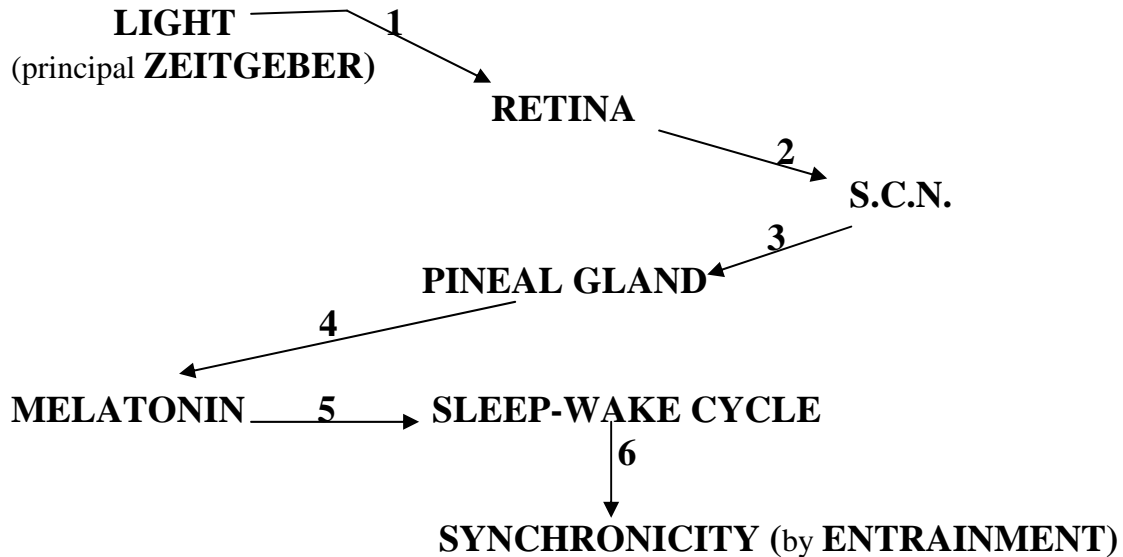
**Do you think you would remain on a 24-hour sleep-wake cycle, or do you think it would get shorter or longer? Explain your reasoning:**

This is a matter of personal perception. Some people think they would sleep for longer, so assume they would go onto a longer cycle. But this is not necessarily true – your body might be perfectly happy with a 24 hour cycle, but would just like you to let it have a little more sleep during that time.

Some people might feel they do not need a lot of sleep, so might think they would go onto a shorter cycle. This might be true.

The only way to tell for sure, of course, is to try the experiment. (Would you do it if invited to?)

Control of our circadian rhythm:



Suitable labels for the arrows would be:

- 1: 'is detected by'
- 2: 'sends nerve messages to'
- 3: 'sends signals to'
- 4: 'produces'
- 5: 'controls'
- 6: 'achieves'

**Sleep**

These first three questions show that our own experiences of sleep and tiredness are very individual. Try to compare your answers with others’.

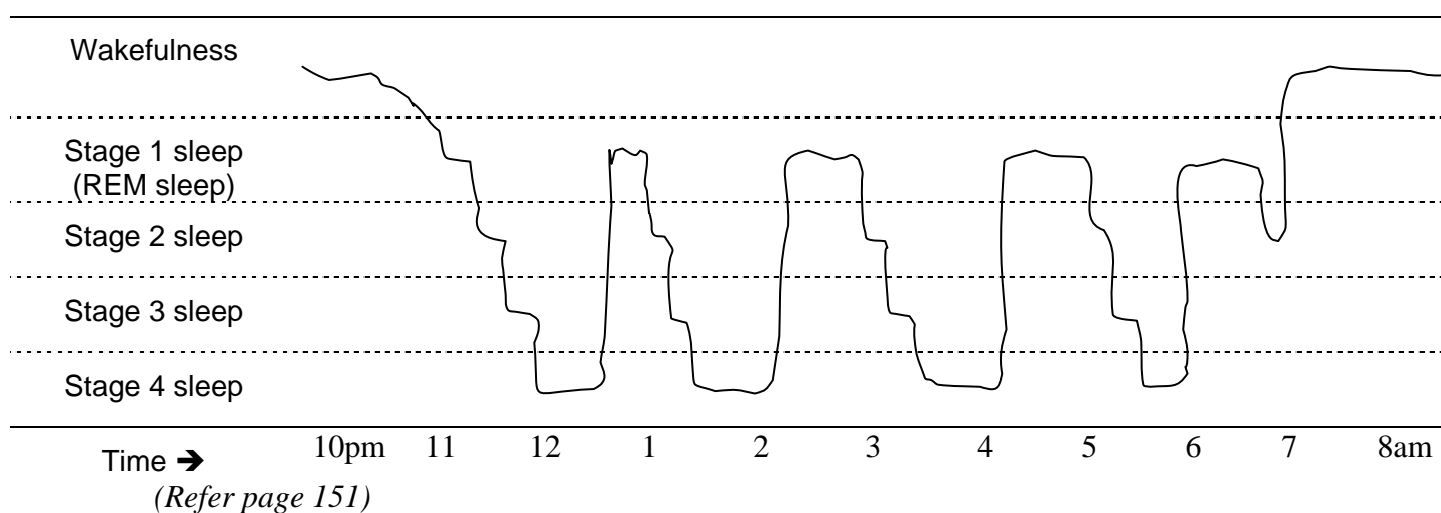
**Describe tiredness, as if to someone who had never experienced it. Explain the sensations you feel when you are tired through lack of sleep – identify at least six:**

**Think of the longest you have ever gone without sleep. Describe how long it was, and again list the sensations you felt.**

**Write your own personal observations and recollections here: What aspects about your own sleep are you aware of?**

**Stages of sleep:**

	Pre-sleep	Stage 1 (NREM) sleep	Stage 2 (NREM) sleep	Stage 3 (NREM) sleep	Stage 4 (NREM) sleep	REM sleep
Body activity (eyes, heart, breathing, muscles)	Relaxed wakefulness and ‘normal’ bodily activities	Breathing, heart and muscle activity slow. Jerks.	Slower	Slower	Slowest	State of physiological arousal, but no vol. muscle movement. Rapid eye movement.
Brain activity - wave types	Alpha waves.	Reduced brain activity. Theta waves	K-complexes, and sleep spindles (bursts of activity)	Delta waves	Delta waves	Similar to beta waves (as produced when fully awake and alert)
Light or deep sleep?	---	Very light – drifting, but not true sleep	Deeper	Deeper	Deepest	Light
Dreams?	---	Dream-like thoughts, but no dreams	No	No	No	Yes

**A typical night's sleep:****A sleep experiment:****Describe two tasks that would measure cognitive ability (Refer to Chapter 24)**

Any thinking task will measure cognitive functioning. This could be, for example, a memory test (listen to a list of words and see how many you can remember), a concentration task (in which you have to concentrate on the task over a period of time, such as looking for errors in a series of mathematical problems and solutions), or a series of mathematical questions or spelling tests.

**What do you think the results would indicate?**

It is likely that the sleep-deprived students would perform less well than the control group, however there are many variables here that would be difficult to control – such as the sleep deprived students trying harder on the tasks because they knew they were at a disadvantage, or through feeling more committed to the task because they had spent the night awake for the sake of the study.

**Explain why.**

Lack of sleep impairs cognitive functioning.

**Do you think that if you were in the sleep-deprived group you would be able to overcome any disadvantages due to the tiredness by concentrating harder?****Explain.**

It might help, but it is not the whole answer. In a sleep deprived state the brain simply cannot function as well, no matter how hard you try.

**Discuss any ethical implications involved in the investigation.**

There should be no long-term harm to the subjects, however it would be important that they not be allowed to drive or do other potentially dangerous things in a sleep deprived state. They must be fully informed and give consent, and must be free to withdraw at any time.

**Sleep disorders:**

**Billy is 74. He always used to sleep well, but now finds that he will often wake during the night and not get back to sleep for hours. He is on heart tablets.**

Billy is suffering from insomnia. Older sufferers, like Billy, typically have their sleep interrupted during the night, and it can be related to medical problems or medication such as Billy's heart tablets.

**Alisha recently got her first job as an airline flight attendant. She does a round trip to Europe each week, with a two-day break between. She is constantly tired.**

Alisha has a circadian-related sleep disorder. In her work she is constantly travelling to different time zones, and her circadian rhythm does not have a chance to readjust itself. It could be thought of as having permanent jet-lag.

**Mia's parents tell her she often had night terrors as a child, though she can't remember it. She has recently begun having nightmares, and often wakes in a panic.**

Mia is probably suffering nightmares. They typically reappear after periods of stress, so she might consider whether or where the stress is in her life at the moment.

**George is 67. He is not aware of any sleep problems, but is always tired. His wife Betty does most of the driving now because of a few near accidents recently.**

**George is in good health.**

George is probably suffering sleep apnea, in which he stops breathing during his sleep. This will be interrupting his sleep without him knowing it, and causing his sleepiness. He may have snoring accompanying this, in which case Betty would probably be aware of the condition. George appears to be a little overweight, a condition related to apnea.

## Arousal

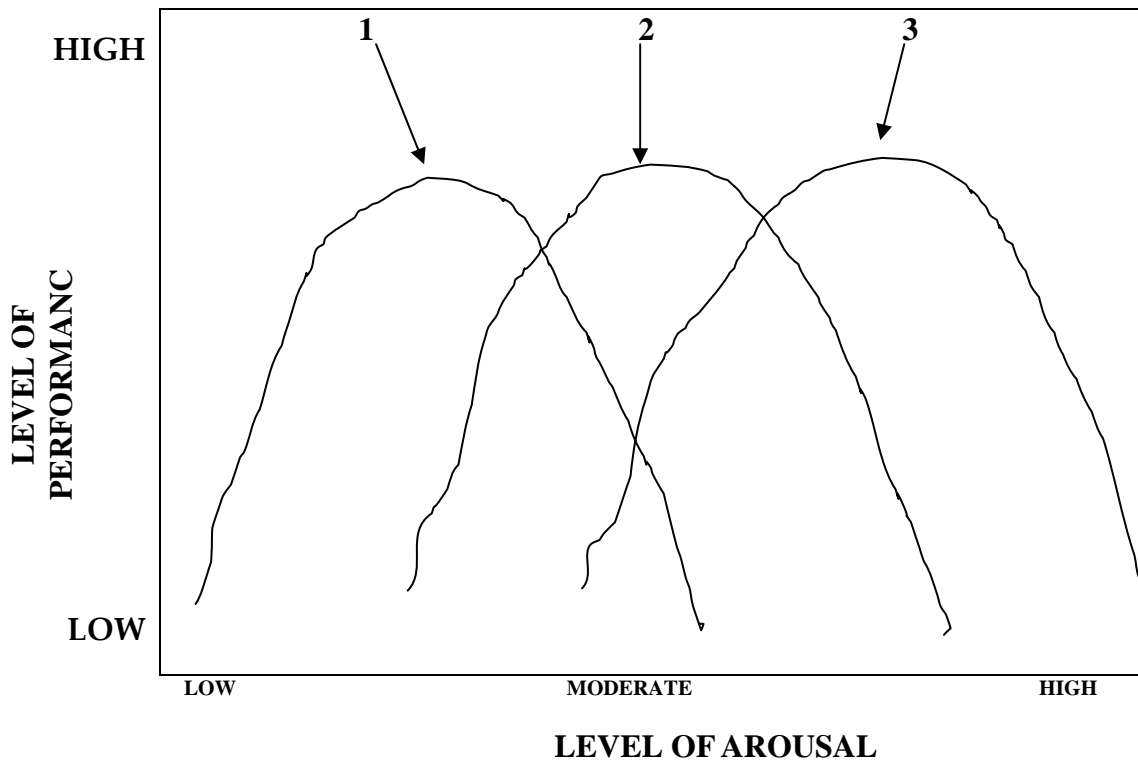
Two more examples are given for each column. Make sure your examples are occasions where you *deliberately* alter your level of arousal to enable you to perform as well as possible on the task before you:

List 1 Situations in which you <u>elevate</u> your level of arousal to maximise performance	List 2 Situations in which you <u>reduce</u> your level of arousal to maximise performance
Listening to loud music at a party to get myself pumped up to have a good time with my friends	Sitting and taking quiet deep breaths before going in to see the dentist
Rousing pre-game address from the coach to get the team committed and focussed before the game	Quietly rehearsing the procedure in my mind before doing the reverse park during my driving licence test
Confronting the local bully who has been giving your little brother a hard time.	Reading a relaxing book before going to sleep.
Working out how to get past the neighbours' rottweiler who has got you bailed up in the corner of the yard.	Relaxing and rehearsing your lines before explaining to your father precisely how you managed to reverse his car into the corner of the house.

The last example on each list above is used below.

	<b>Example from List 1</b> <i>e.g. Playing football</i>	<b>Example from list 2</b> <i>e.g. Seeing the dentist</i>
<i>Your example</i>	<b><i>The rottweiler</i></b>	<b><i>Dad's car</i></b>
<b>Consequence if level of arousal too high</b>	<i>e.g, nervous, shaking, can't handle the ball or kick</i> <i>Your example</i>  <i>Dog senses my aggression, and is more likely to attack. I am in a fluster and cannot concentrate – more likely to panic and run</i>	<i>e.g, tense, might jump or bite the drill or scream</i> <i>Your example</i>  <i>Can't concentrate or remember what I wanted to say. Dad will sense my arousal and might take it as anger or fear, and react badly.</i>
<b>Consequence if level of arousal too low</b>	<i>e.g, not concentrating, forget to follow game plan</i> <i>Your example</i>  <i>Not concentrating, might not be ready to react if he comes at me. I will move too slowly.</i>	<i>e.g, might not hear or follow his instructions</i> <i>Your example</i>  <i>Dad will think I don't care if I look too casual. I won't remember what I wanted to say if I'm not alert.</i>

The graph will look like this – yours might be a little different, but the pattern should be the same:



**Arousal and exam performance:****Is the exam a simple or a complex task?**

Complex

**Will you be a more skilled or a less skilled ‘performer’?**

This is not a simple question. In terms of the amount of experience you have had with exams, you will be a ‘less skilled’ performer. However, the more ‘skill’ you develop through your year – subject knowledge, practice in exam situations, knowledge of how to construct a good answer – the ‘more skilled’ you will be. If you compare yourself to a grade 4 student and to your teacher, your skill level could best be described as ‘moderate’.

**Will you need to be at a high level or a low level of arousal to perform at your best?**

According to the research, a person with moderate skill doing a complex task needs a *moderate to low* level of arousal for optimum performance. You clearly don’t want to go into the exam pumped up and punching the air, but nor do you want to be in a semi-trance. Maybe best to describe it as ‘focused and relaxed’. (Good luck.)

**Finally, back to the chess player and the bungee jumper. Knowing what you now do about arousal and performance, who needs to be the most aroused to perform at their peak? (Assume equal levels of experience.) Explain your reasoning.**

The main difference here is that the bungee jump is a relatively simple task that can be rehearsed (even if only in your mind the first time), while the chess game is much more complex and unpredictable, and cannot be rehearsed (though some moves and strategies can be practised). So the bungee jumper needs a higher level of arousal to perform well, while the chess player needs a lower level.

**Stress and health**

These first six questions are to introduce you to some of the ideas in this area of the course. Your answers depend on you life and your opinion. Compare your answers with others if you can.

**Q 1: If you could take a fairly objective look at your life this year, what would you rate as the five greatest sources of stress for you?**

These can be home-related events or situations, or things related directly to school, or other experiences such as illness, work, money or relationships with friends. They can be single events or on-going situations.

**Q 2: List the five most stressful jobs (careers) you can think of, and the five least stressful.****Q 3: On a scale of 1 (low) to 10 (high), how stressful was last weekend for you? Explain the factors that contributed to it being high or low in stress.****Q 4: Six life events are depicted below. Write the numbers 1 – 6 next to these pictures, rating these events as you think you would find them personally from the lowest in stress (1) to the highest in stress (6).**



**Q 5: When you feel really stressed, what symptoms do you show or feel? Include what you feel, what you do, and any physical symptoms.**

**Q6: Return to the answers you gave to the five questions on the previous couple of pages. From these answers identify up to ten factors – events, situations, jobs, aspects of school – that cause you (or could cause you) to remain in a state of arousal for extended periods of time.**

If they can be shown to do this, they are probably genuinely stressful to you.

### **The Demand-Support-Control Model**

How did you rate each of these? The answers you gave are personal, but do serve to illustrate to you three important aspects of the stressful things at school. Everyone will encounter stress in year 12, but it is possible to minimise the impact of it on you. Think about the changes you can make.

Is your work at school low (1) or high (10) **demand**?

Do you have much (1) or little (10) **support** from teachers and friends?

Do you have much (1) or little (10) **control** over your work at school?

?
?
?

**Worksheet 22 Experiences, events and interventions**

**Jet lag**

<b>Events</b> ➔	Plane arrives	Eat dinner	Meet reps	Go to bed	Wake 7am	Conf. begins	Lunch 1pm	Go to bed	Wake 6am
	(see times above)	7pm local time	9pm local time	11pm local time	local time	9am local time	local time	1am local time	local time

According to Jim's body clock the time is ➔	<b>9 pm</b>	<b>12 m/n</b>	<b>2 am</b>	<b>4 am</b>	<b>12 noon</b>	<b>2 pm</b>	<b>6 pm</b>	<b>6 am</b>	<b>11 am</b>
According to Ann's body clock the time is ➔	<b>3 am</b>	<b>2 pm</b>	<b>4 pm</b>	<b>6 pm</b>	<b>2 am</b>	<b>4 am</b>	<b>8 am</b>	<b>8 pm</b>	<b>1 am</b>

- They can begin to adjust their circadian rhythms before they leave. To do this they should go to bed an hour earlier or an hour later each night until they are going to sleep at the same time as it is at their destination. Who would be going to bed later – Ann or Jim – and who would be going to bed earlier?**

Jim would be going to bed an hour later each night, Ann an hour earlier each night. (This answer may seem incorrect to you at first – you might think that Jim needs to go to bed *earlier* because the clocks in Delhi are *earlier* than in Adelaide. But think of it like this: If he starts going to bed earlier each night, and adjusts his body clock by 5 hours, then when he gets to Delhi he will feel like going to bed at about 6pm by his body clock, but in Delhi it will be 1pm. Not a good time to be going to bed, right in the middle of the conference lunch break!)

- While at the conference, they can speed up the readjustment by getting plenty of exposure to bright light – spending time outside in daylight is the simplest, though some hotels now have ‘phototherapy rooms’ so visitors can get bright light indoors. What is the term used for an environmental agent such as light that acts to set or reset the biological clock?**

Zeitgeber

**Outline briefly the process by which the body detects and responds to this bright light:**

*(Refer to the concept map on page 148 of the Workbook.)*

**When Ann and Jim plan their outside walks or time in the phototherapy rooms, the timing is important. The general rule is that if you need to stay awake later than your body wants to, you need bright light in the afternoon or evening. If you need to get up earlier than your body wants to (like most of us during the school week!), you need bright light in the morning.**

**Identify the times when Jim and Ann need light to assist in adjusting their circadian rhythms**

Jim needs bright light in the afternoon, Ann needs it in the morning.

**3. Research has been conducted into the use of melatonin to assist regulate circadian rhythms.**

**Where and when is melatonin produced in our bodies?**

Produced in the pineal gland during the night (from about 8pm to about 9am).

**Explain the effect melatonin appears to have.**

It appears to regulate the circadian rhythm by promoting sleep.

## Insomnia

Your answers to these questions are your opinion, and not necessarily very accurate. They are not meant to be a precise summary of your sleep habits, but simply to make you aware of the many ways insomnia can affect your life.

Compare your answers with others if you can, especially if you know someone who does suffer from insomnia.

<b>In any thirty-day period, on how many days do you think you would experience each of these?</b>	<b>Number of days (/30)</b>
1. Had <b>enough sleep</b> - felt alert and good the next day.	?
2. Had <b>good quality sleep</b> – restful, relaxed, refreshing.	?
3. <b>Fell asleep</b> soon after attempting to – within 30 minutes at the longest	?
4. <b>Stayed asleep</b> through the night – awake for no longer than 30 minutes	?
5. <b>Woke up</b> when you intended – at the alarm, or when you had slept enough	?
6. <b>Felt refreshed</b> during the next day – slept well enough to feel good	?
7. <b>Were not worried about sleep</b> – felt OK about the sleep you were getting	?
8. <b>Got up when you woke</b> – did not have to stay in bed trying to get more sleep	?

**Some therapies for insomnia:****Therapy based on learning principles (conditioning your sleep response)**

Go to bed only when sleepy, use your bedroom only for sleep (and sex), and get up and go out of the bedroom if you can't get to sleep or when you wake up in the morning. This method aims to condition your body to respond to being in the bedroom by going to sleep. It has been shown to be effective for many people, almost halving the time it takes them to get to sleep.

**Dietary Factors (managing what you should and should not eat/drink)**

Restrict intake of caffeine, alcohol and tobacco. If hungry at night snack on starchy, low fat foods – these promote the release of serotonin, which promotes relaxation and sleepiness.

**Behavioural Approaches (what you do to improve your sleep patterns)**

Insomniacs are instructed to adopt a strict routine for going to bed and getting up. This helps to develop a firmer body rhythm, and improves sleep.

**Cognitive Approaches (changing how you think about your sleep)**

Many insomniacs have thought patterns such as unrealistic sleep expectations, and false ideas about what causes their lack of sleep. The emotional distress arising from these contributes to the insomnia. Treatment involves replacing these thoughts with more realistic and positive ones.

**Relaxation Approaches (ways of being relaxed when you go to bed)**

There are many ways to become more relaxed before attempting to go to sleep. These range from reading, relaxation training, and meditation, and help the person to enter sleep. They also reduce the stress associated with insomnia.

**Seasonal Affective Disorder (S.A.D.)**

**If you woke and went to school in the dark, how could this explain you remaining sleepy into the morning?** (*Hint: It is not due to a lack of sleep – it is the lack of light.*)

If you had no exposure to light in the morning, melatonin production would continue and you would remain tired. Your brain would still be 'thinking' it wanted to be asleep.

**As with jet lag, melatonin is associated with S.A.D., and phototherapy (light therapy) appears to be effective in treating it. Would a person produce more or less melatonin in winter than in summer? How would the light therapy assist?**

More melatonin (exposure to light inhibits its production). Light therapy would assist by inhibiting the melatonin production.

## Coping with stress

**Stress** is chronic arousal. (Note that chronic means ‘over an extended period of time’ – it does not mean ‘severe’.)

The remainder of this worksheet is done, just as you have been asked to do, by identifying sources of stress in your life, and exploring ways to reduce them. It has been done, as an example of how it could be answered, from a **teacher’s point of view**. It will serve as an interesting comparison for you – and it never hurts to try to see things from someone else’s point of view now and again.

Note that the answers here are hypothetical, and not (necessarily) present in the author’s teaching at the moment, or at all. But they *are* issues that many teachers will identify with.

As an interesting aside, ask your teacher what reaction he/she feels as he/she reads this list. Ask two questions: Is there any emotional reaction? What does this have to do with classical conditioning?

**Area identified:** Teaching

### Sources of chronic arousal

1. Difficulty in dealing with unmotivated Year 10 students.
2. Pressure to learn new technologies all the time.
3. Constant stream of paperwork (policies, reviews, planning documents)
4. Pressure to keep lessons interesting, challenging, varied.
5. Noise.
6. Poor working relationship with another staff member.
7. Cramped and poorly organised workspace in the staff room.
8. Unreliable computer system.
9. A certain student in year 12 who constantly diverts the class’ attention.
10. My desk is always a mess and I can’t work there!

**Recall the ‘Demand-Control-Support’ model we reviewed in Worksheet 21. Apply the model to the area of your life you have identified as stressful, and answer these three questions:**

**Describe how demanding on you this area of your life is:**

Very demanding. It seems to consume a huge amount of my personal time (including at home and on weekends) and my physical and emotional energy.

**Describe how much control you feel you have over what happens in this area of your life:**

Probably more than I realise. If I stood back from it and looked hard at the list of things above, I probably could deal with or at least minimise several of them. But we don’t take the time to do this – we seem to get so caught up in the day-to-day that we let these things keep stressing us without dealing with them properly. I think I’m glad I wrote the list.

**Describe how much support you feel you receive from others in this area of your life:**

A lot. It is a very supportive school, and I can get support any time. But I tend not to because I feel I should deal with these things myself, and besides others are very busy too and I don't want to bother them with my issues. So I *can* get support, but generally *don't*.

<b>Technique</b>	<b>One way you could apply this technique to your identified area</b>	<b>Demand, Control, or Support?</b>
Social support	Talk some of these issues through with understanding friends, or with colleagues.	Support
Personality	Try not to be so serious about it – learn to have a bit more fun.	Control
Food substances	I already eat very well, and cooking is a form of relaxation. Maybe I should drink more water.	Control
Humour	I think we need a bit more fun at school. Let's do an all-night sleep deprivation study.	Control
Relaxation or meditation	I have thought about meditation – I think I will try it. Maybe we can do it in class?	Control
Physical activity	A school I used to be at had a lunchtime walking group. I think I'll get that going again.	Support
Environmental planning	Time to tidy up that desk. And I'll put flowers on it as a reward to myself. (Op conditioning!)	Control
Relabelling	I need to also write out a list of the ten things I really love about my job. It <i>isn't</i> all bad.	Control
Thought stopping	I will not let myself think negatively about that year 12 student. In fact I'll turn it into fun.	Control
Cognitive appraisal	My physical and psychological resources won't change much, but I can gather social resources.	Support

**Worksheet 23 Social Issues and Personal Growth****Managing sleep and fatigue problems****Explain the similarities and differences between sleepiness and fatigue.**

Both refer to conditions caused by a lack of sleep.

Fatigue describes the condition of our body and mind that is caused by the lack of sleep, while sleepiness is what we feel as a result of being in a state of fatigue.

**Identify the likely sources of Alan's tiredness and depression. How do you explain the near accidents?**

There are several reasons for Alan's tiredness, depression and near accidents: he is working shiftwork, and daytime sleep is generally shorter and of poorer quality than night-time sleep since he is awake during the day on weekends but at night during the week, he is not able to fully synchronise his circadian rhythm with either cycle, so he is suffering a circadian-related sleep disorder fatigue levels are highest around 3 – 5am, explaining his near accidents at 3am he is working a long shift (10 hours), and this also contributes to his fatigue shiftwork has been linked to both physical and psychological health issues, including depression from which Alan appears to be suffering

**Explain the likely cause of Georgie's car accident. Is it possible she did fall asleep while driving?**

Georgie is suffering fatigue related to her long working hours and lack of sleep. Her accident at 3am is explained by both her fatigue in general and her driving at the time when fatigue levels are highest. It is quite possible that she did fall asleep without knowing it – a sleepy person is poor at judging whether they are about to fall asleep.

**Is it likely that Kim's feeling unwell is related to the shift work? Is there any cause for concern about her baby?**

Shiftwork has been linked to physical health issues, including gastrointestinal illness. It is likely that this is the cause of Kim's feeling unwell with an upset stomach. She is right to be concerned about her unborn baby, as shift-workers are more likely to miscarry, and have babies with generally lower birth weights.

**What do you think could be a likely cause of Gerry's tiredness?**

It is likely that Gerry has a sleep disorder, and if he is unaware of it he could be suffering from sleep apnea. People are generally aware of having conditions such as insomnia, but not always with sleep apnea.

The following suggest some solutions for these four people. Other solutions are also possible – compare your answers with others’ if you can.

	Strategy 1	Strategy 2
Alan	Stop shift work, or at last reduce the length of shifts.	Take naps during shifts.
Georgie	Reduce work hours, and get more sleep.	Ensure she has a proper diet, and maintain hydration during her time at work.
Kim	Stop shift work – this is something she must discuss with her employer urgently	Seek advice about an appropriate diet to help alleviate the stomach problems.
Gerry	Seek help for the sleep apnea.	Nap during the day if possible to manage the fatigue.



## Managing stress problems

Your list might look like this – it is of course possible to state the factors in other ways:

<b>Stress risk factors</b>	<b>Rating (1-10) School</b>	<b>Rating (1-10) Home</b>
1 Highly demanding work physically		
2 Highly demanding work mentally		
3 Highly demanding work emotionally		
4 Lack of variety in work		
5 Short work cycles		
6 Fragmented work		
7 Meaningless work		
8 Underutilisation of your skills		
9 High level of uncertainty in work		
10 Continuous exposure to people		
11 Work overload		
12 Work underload		
13 Inflexible work schedules		
14 Deadlines		
15 Unpredictable hours		
16 Long or unsocial hours		
17 Lack of control over workloads		
18 Poor environmental conditions		
19 Poor communication		
20 Poor relationships with teachers/administrators		

Here is a sample of how this table might look:

<b>Top five sources of stress</b>	<b>One possible strategy for each stress factor</b>
<b>Deadlines</b>	Set your own deadlines, rather than feeling that they are being imposed on you all of the time. Talk to friends about how they manage deadlines.
<b>Lack of control over workloads</b>	Be realistic – do you really have that little control over workloads, or is more an issue of being organised? Make sure you can talk to friends or family about this.
<b>Long and unsocial hours</b>	Plan more carefully. If you make the most productive use of time at school (instead of socialising) it will free up some time at home and on weekends
<b>Work overload</b>	Make sure you are being realistic – is there <i>really</i> that much work, or does it just seem like there is. Social support is very important – talk to people about this.
<b>Continuous exposure to people</b>	If this is stressful to you, make sure you give yourself some personal time. It might be really helpful to try something like meditation to distress when you are alone.

**Worksheet 24 Methods of Investigation**

**Research into sleep**

<b>Type Of Research</b> What is it called?	<b>Details</b> Describe how this research is done.	<b>Investigation Design</b> What type of investigation is it?	<b>Data Type</b> What type(s) of data are collected?	<b>Findings</b> Describe one finding from this type of research.
Polysomnography	EEG is used to record aspects of sleep	Experimental	Objective Quantitative	That brain wave patterns change through the various stages of sleep.
Activity monitors	Wrist monitors are used to monitor sleep-wake cycle	Quantitative observational  Sleep-wake Diary	Objective Quantitative  Subjective Quantitative	Train drivers are likely to get more sleep at night (2-4 hours more) than during the day.
Time-free Studies	Individuals are studied in environments that are free of time-giving cues.	Experimental  and  Quantitative Observational	Objective Quantitative	Without external cues we still follow a circadian rhythm, but this varies between individuals.
Forced De-synchrony Studies	Subjects are placed in an artificial day that is more or less than 24 hours.	Experimental	Objective Quantitative	The onset of sleep is closely linked to the body's temperature rhythm.

**Research into stress**

Some sample research questions are shown in the table. Many others are possible

<b>Category 1</b> (associated with the environment and the organisation)	1. Is it the people or the physical environment at school that is the greatest cause of stress for year 12 students?
	2. Is any particular subject in year 12 associated with higher or lower levels of student stress than the others?
	3. Is the number of hours a student works in paid employment outside school related to the level of stress reported at school?
<b>Category 2</b> (associated with the students themselves)	1. How important is social support in reducing or managing stress?
	2. How important is the issue of feeling in control in keeping stress levels manageable?
	3. Is any particular personality type associated with higher or lower levels of stress?

Some sample answers are shown below. Many others are possible. Discuss your answers with friends if possible.

<b>Questionnaires</b>	
What types?	These could be used to collect data for any of the six questions above.
Who will do them?	Ideally all year 12 students would be asked to complete a questionnaire.
How many people?	
How selected?	These would cover personal data (hours of employment worked, subjects done, etc), and information related to stress at school.
What issues covered?	
<b>Reference Group</b>	
Which groups represented?	This could include representatives from both students and staff at school – at least 10% of each group would be needed, selected at random.
How many people?	They would be required to discuss and answer questions about a range of issues related to stress, but focusing on the two categories in the table above.
How selected?	
Issues to discuss?	Researchers would collect data during the discussion.
Who collects data?	
<b>Focus Group</b>	
Which groups represented?	This group could also include representatives from students and staff, and would be involved in the process of reviewing the data from other sources to advise on the implementation of strategies to reduce stress levels of year 12 students at school.
How many people?	
How selected?	Researchers would be involved here also, collecting data to form the basis of recommendations to the school.
Issues to discuss?	
Who collects data?	

## Worksheet 25 Ethical Issues

\* In each of these tables, one more example is provided in each section. Again, many answers are possible, and you are encouraged to compare your answers with other students.

### Managing fatigue

#### At school

Responsibilities of the school and teachers	Responsibilities of yourself
1. To provide adequate notice of work to be completed to enable you to manage your time effectively	1. To manage your work so that it is not left to the last minute requiring late nights and causing sleep deprivation
2. To provide a restful area to enable students to take a break from work between lessons.	2. To use the facilities to have a rest where needed, so you are not too fatigued by afternoon lessons.

#### At Work

Responsibilities of your employer	Responsibilities of yourself
1. To ensure that you are not required to work unreasonably long shifts or to change shifts too frequently	1. To ensure that you manage your time to allow for adequate sleep
2. To provide facilities for proper nutrition and hydration during the work day.	2. To take advantage of these facilities and manage your food and water intake to reduce fatigue.

### Managing stress

#### At School

Responsibilities of the school and teachers	Responsibilities of yourself
1. To provide good environmental conditions for you to work in, including space, light, temperature and air quality	1. To help maintain the facilities in good condition, and not damage or deplete them for other students and teachers
2. To negotiate deadlines and other requirements with you so you feel you have some control over your workload at school.	2. To manage your work so you are able to meet negotiated deadlines.

#### At Work

Responsibilities of your employer	Responsibilities of yourself
1. To allow you to participate in decision making, especially in regard to your workloads	1. To take an active role in making decisions about your work
2. To provide for workers to balance their work and family commitments, such as leave for workers with ill children or partners.	2. To use these provisions properly and not take advantage of them by taking days off work for non-legitimate reasons.