

Activity 4: Are you SunSmart?

Aims

- To develop an awareness of personal susceptibility to skin damage.
- To increase students' awareness of SunSmart behaviours.
- To be conscious of the cumulative and progressive effects of sun exposure.

Assessment outcomes English 4.11; H&PE 4.6

Reference fact sheets Fact sheet 1: Skin cancer
Fact sheet 6: Suntanning and sunburn
Fact sheet 4: Ultraviolet radiation

Worksheet Worksheet 4: Are you SunSmart?

Teacher guidelines

- 1 Ask the students to respond to the question, 'Do you like to get a suntan?' Those answering 'yes' move to one side of the room, those answering 'no', to the other.
- 2 Now ask students in the 'yes' group to respond to the question, 'How deep a tan do you like to get?' by placing themselves at one of five places along an imaginary line, with one end representing 'a very dark tan' progressively through 'a dark tan', 'a moderate tan', 'a light tan'.
- 3 Ask the students to share their thoughts about where they have placed themselves and why.
- 4 Read the students the following statements and ask them to decide whether they agree or disagree with them by moving to appropriate ends of the room. Students could share with class the reasons why they agree/disagree.
 - Friends think a suntan is a good idea.
 - A suntanned person looks more healthy.
 - It is easier to enjoy summer once you get a suntan.
 - I feel more healthy with a suntan.
 - Close family members think a suntan is good.
 - It is worth a lot of effort to get a suntan.
 - A suntanned person is more healthy.
- 5 Discuss with students personal characteristics that may make them more at risk to sun damage than others, and behavioural activities that also increase the risk of sun damage. For example, the fairer the skin and hair of an individual the more likely they are to be at risk.
- 6
 - a) Students complete Worksheet 4: Are you SunSmart? and identify their own areas of risk.
 - b) Once students have completed Worksheet 4 discuss the following questions with the students.
 - What damage does exposure to the sun do to individuals?
 - Do you consider being sun safe an important aspect of health?
 - What would encourage you to slip, slop, slap and to avoid being outside during peak UV times?
 - Identify how you can reduce your personal risk of being affected by UV radiation.

Worksheet 4: Are you SunSmart?

Circle your answer to the questions to give you an idea of how SunSmart you are.

Question	Answer
Do you like to get a tan?	A. Never B. Sometimes C. Usually D. Always
How often were you sunburnt anywhere on your body during the last 12 months?	A. Not at all B. 1–2 times C. 3–6 times D. More than 6 times
When you are outside, do you use SPF 30+ or higher sunscreen on skin exposed to the sun?	A. Always B. Usually C. Sometimes D. Never
When you are outside, do you wear a broad brimmed or bucket hat that protects you from the sun?	A. Always B. Usually C. Sometimes D. Never
When you are outside, do you wear close-weave clothing that covers most of your skin (e.g. long-sleeved shirts rather than singlet tops)?	A. Always B. Usually C. Sometimes D. Never
When you are outside on a sunny day, do you wear sunglasses?	A. Always B. Usually C. Sometimes D. Never
Do you try to stay in the shade or indoors between 10 am and 3 pm?	A. Always B. Usually C. Sometimes D. Never
How would you describe your skin and natural hair colour?	A. Fair skin, light hair B. Fair skin, dark hair C. Light-olive skin, any hair colour D. Medium-olive skin, any hair colour E. Dark-olive skin, dark hair F. Black skin, dark hair



Worksheet 4: Are you SunSmart? (cont.)

Work out your SunSmart score by doing the following calculations.

Score Questions 1-7: A=1, B=2, C=3, D=4

Score Question 8: A=6, B=5, C=4, D=3, E=2, F=1

Add all the scores together to work out your total score. Check the table below to see how you rated.

SunSmart behaviour rating

Score	SunSmart rating
8–15	You are probably being quite SunSmart. Keep up the good work!
16–24	You need to take greater care and be more SunSmart. Protect your skin from the sun now, and you will reduce the chance of skin cancer.
25–34	You need to take greater care and be more SunSmart. Protect your skin from the sun now, and you will reduce the chance of skin cancer.



Fact sheet 1: Skin cancer

Structure and function of the skin

The skin is the largest organ of the body. It has several important functions. It acts as a protective layer against injury and disease and also regulates our body temperature and maintains its hydration.

The skin consists of three layers:

- the epidermis, or the outer layer
- the dermis, or the inner layer
- the subcutaneous fat layer.

The epidermis is made up of cells that produce keratin, a substance that covers the outside of the skin and resists heat, cold and the effects of many chemicals. The cells in the epidermis also produce melanin, the substance that gives our skin its colour. Melanin is able to absorb ultraviolet light and provide some protection from its damaging effects.

What is cancer?

Cancer is a disease of the body's cells. Normally the body's cells grow and divide in an orderly manner so that growth and healing of injured tissue occurs.

Occasionally some cells behave in an abnormal way and may grow into a lump which is called a tumour.

Tumours can be non-cancerous [benign] or cancerous [malignant]. Benign tumours do not spread to other parts of the body.

A malignant tumour is made up of cancer cells. These cells have the ability to spread beyond the original site and if left untreated may invade and destroy surrounding tissues. Sometimes cells break away from the original [primary] cancer and spread to other organs. When these cells reach a new site they may form another tumour often referred to as a secondary cancer or metastasis.

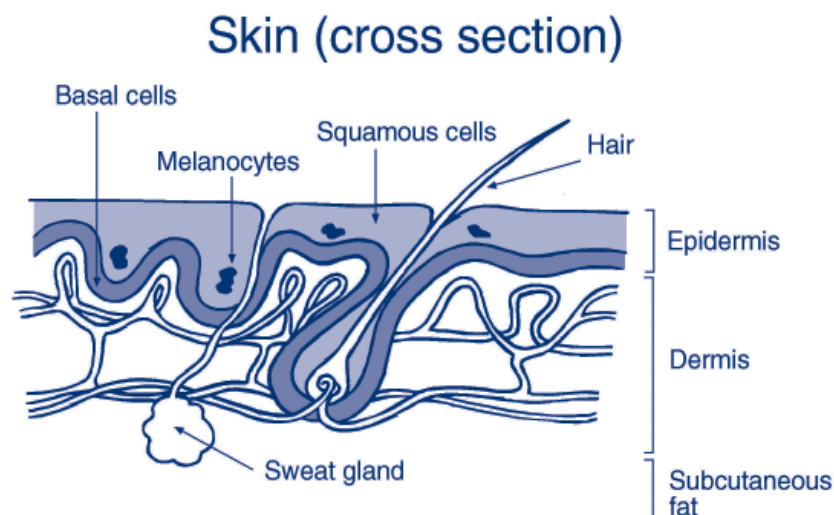
What is skin cancer?

Skin cancer is a type of cancer that begins in the basal layer of the epidermis. There are three main types of skin cancer: basal cell carcinoma, squamous cell carcinoma and melanoma. Melanomas start in the pigment cells [melanocytes] while basal and squamous cell carcinomas develop from the epidermal cells. [Carcinoma is a term used for some types of cancer].

Basal cell carcinoma [BCC]

Basal cell carcinomas are the most common but least dangerous type of skin cancer. They grow slowly over months to years but if left untreated a deep [rodent] ulcer may form. Fortunately they very rarely spread to other parts of the body. If you have one basal cell carcinoma you may have others, either at the same time or in later years.

Basal cell carcinomas are most commonly found on the face, neck and upper trunk. They appear as a lump or scaly area and are pale, pearly or red in colour. They may have blood vessels on the surface.



Fact sheet 1: Skin cancer (cont.)

Squamous cell carcinoma [SCC]

Squamous cell carcinomas are less common but more dangerous than basal cell carcinomas. They usually grow over a period of weeks to months. These cancers may spread to other parts of the body [metastasise] if not treated promptly.

Squamous cell carcinomas appear on areas of the skin most often exposed to the sun. They have scaling, red areas which may bleed easily and ulcerate, looking like an unhealed sore.

These common skin cancers generally occur in people over the age of 40. However basal cell carcinoma can occur in younger adults. The major cause of these skin cancers is sun exposure over many years.

Melanoma

Melanoma is the rarest but most dangerous skin cancer. If left untreated melanoma can spread to distant parts of the body to form secondary cancers or metastases.

Melanomas can appear anywhere on the body not only in areas that get a lot of sun. The first sign of a melanoma is usually a change in a freckle or mole, or the appearance of a new spot on normal skin. Changes are normally seen over a period of several weeks to months, not over several days. The changes are in size, shape or colour.

Melanoma can occur from adolescence onwards and is the most common cancer in the 15–44 year age group. In rare instances it may develop in children.

How common is skin cancer?

Skin cancer rates are higher in Australia than anywhere else in the world. It is the most common form of cancer in Australia affecting all age groups from adolescents upwards. Most common is basal cell carcinoma which accounts for about 75% of all skin cancers. Squamous cell carcinoma accounts for 20% and melanoma less than 5%.

One out of two Australians will develop a skin cancer in their lifetime – usually a basal cell carcinoma. In South Australia in 2003 the lifetime risk for developing melanoma was 1 in 31 for men and 1 in 39 for women.

Signs and symptoms

As skin cancers are visible, they can be seen and checked as soon as they develop. Early symptoms of skin cancer may seem quite minor but any suspicious spot should be seen by a doctor immediately.

The signs to look for are:

- A crusty, non-healing sore.
- A small lump which is red, pale or pearly in colour.
- A new spot, freckle or mole changing in colour, thickness or shape over a period of several weeks to months. Particular attention should be paid to spots that are dark brown to black, red or blue-black.

Diagnosis

If a doctor suspects a skin cancer, a biopsy may be performed. A biopsy is the removal of all or part of the affected skin, generally under local anaesthetic. It is a simple procedure that can be done by your family doctor or you can be referred to a specialist. The piece of skin that has been removed is then examined under a microscope. However in many cases the whole tumour is removed and a specimen is then sent to the laboratory for diagnosis.

Treatment

Common skin cancers



A variety of methods are available to treat the common skin cancers. Your doctor will choose your treatment by taking into consideration a number of factors. These will include the type of skin cancer, its size and position on your body and your personal preference.

Surgery can be used to remove the skin cancer and a small area of normal skin. This is quite simple and can usually be done under local anaesthetic.

Sunspots or pre-cancers can be briefly frozen with liquid nitrogen. This is called cryotherapy. Following cryotherapy the skin can become intensely red and peel away. Healing will begin in about a week.

Another technique is simply scraping off small common cancers [curettage] and burning the spot [cautery or diathermy].

Fact sheet 1: Skin cancer (cont.)

Radiation therapy is another option although less commonly used now. It causes a crusting sore which takes some weeks to heal and then leaves a scar.

Melanoma

Surgery is the preferred method of treatment for melanoma. Very thin melanomas are usually removed along with a small area of normal skin, under local anaesthetic.

For deeper melanomas a wide area of skin may need to be removed to make sure that all the cancer cells have been taken out. The local lymph glands may also be removed at this time.

Outlook

Virtually all basal and squamous cell carcinomas that are found and treated early are cured.

The majority of people with early melanoma which is appropriately treated do not have any further trouble with their disease. However because there is a chance that the melanoma will reappear, your doctor will examine you at regular intervals.

For further details on outlook you should speak to your own doctor who is familiar with your full medical history.

Causes of skin cancer

The major cause of skin cancer is exposure to the ultraviolet rays of the sun over many years.

Sunlight exposure

Childhood exposure to the sun is an important factor in the development of skin cancer later in life. Research also suggests there may be a link between sunburn during childhood and melanoma in adulthood.

Occupation

People who work outdoors have a greater risk of developing the common skin cancers than indoor workers. This is because of their greater exposure to sunlight. Workers in some industries have to take precautions against other known causes of common skin cancers, such as arsenic, polycyclic hydrocarbons and a number of other chemical compounds.

Who is at risk?

Everyone is at risk of skin cancer, although people with skin that burns easily and rarely tans are at the greatest risk. Those who burn in early summer and then tan are also at high risk if they do not protect their skin. Unprotected skin, whether tanned or not, is likely to be damaged by the sun and may develop skin cancer later in life.

Skin type

Skin cancer is seen most often in fair skinned people who have lived in Australia all their lives. It is most common in people of Celtic [Scottish, Irish and Welsh] background. However it also occurs in people whose parents migrated from Southern Europe e.g. Greece or Italy and who have themselves spent all or most of their lives in Australia. This is because the Australian sunlight is very harsh.

Existing skin damage

Solar keratoses [sunspots] are dry, rough spots on the skin that are common in people over 40. They are not skin cancers but an indication that the skin has had enough sun exposure to develop skin cancer. People with keratoses should take particular care to protect their skin from the sun. Keratoses may progress and develop into SCCs.

They should also be examined to make sure a skin cancer is not present.

How can you reduce your risk?

- Minimise your time in the sun between 10.00 am – 3.00 pm.
- Use shade as much as possible when outdoors.
- Wear protective clothing - a wide brimmed hat and cover-up clothing.
- Apply SPF 30+ broad spectrum sunscreen to skin which isn't covered by clothing.



Fact sheet 6: Suntanning and sunburn

Tanning

A tan is much more than the skin just turning brown. Skin cells located in the epidermis produce a pigment called melanin that gives skin its natural colour. When skin is exposed to UV radiation, melanin production is stimulated, causing the skin to darken.

Many people refer to a healthy tan – but even a light tan is a sign the skin has been exposed to too much sun. Tanning without burning may still cause DNA and skin damage leading to premature ageing, and potentially skin cancer.

Fair skinned people (a large proportion of the Australian population) have a less protective form of melanin than people with darker skins. When fair-skinned people spend time in the sun, cells called melanocytes produce melanin, which then stays in the top layer of skin for four or five days, sometimes giving a tanned appearance. The melanin produced by fair-skinned people is much less protective, meaning no amount of sunbaking will result in a lasting tan – just sunburn and skin damage.

Sunburn

In Australia, sunburn can occur in as little as fifteen minutes on a fine January day (Cancer Foundation of Western Australia 1994).

It is the UV radiation in the sun that causes our skin to burn. UV radiation is invisible; it is not warm and can pass through light cloud, so sunburn can occur on cool, cloudy days.

As soon as UV radiation hits our skin, the epidermis releases chemicals that cause the blood vessels to swell and leak fluids, causing inflammation, pain and redness – otherwise known as sunburn. This type of damage will continue to develop for twenty-four to seventy-two hours after exposure to the sun.

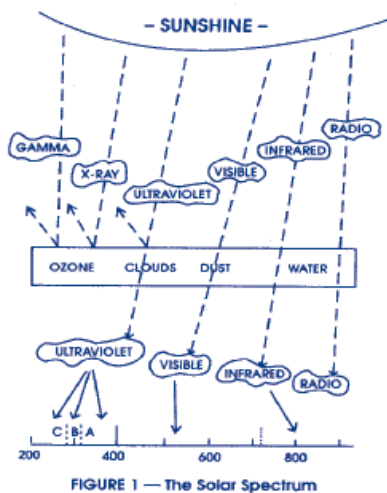


Fact sheet 4: Ultraviolet radiation

What is Ultraviolet Radiation (UVR)?

Ultraviolet radiation is the part of sunlight which causes sunburn and skin damage leading to premature ageing and skin cancer.

Sunshine is made up of different rays which travel in waves. The distance between the waves [the wavelengths] for each ray is different and allows us to categorise them. The diagram below shows the different rays arranged according to their wavelengths. The wavelengths are measured in nanometres.



Visible rays are the light-giving rays of the sun while infrared rays provide heat. There are three types of ultraviolet rays, UVA, UVB and UVC.

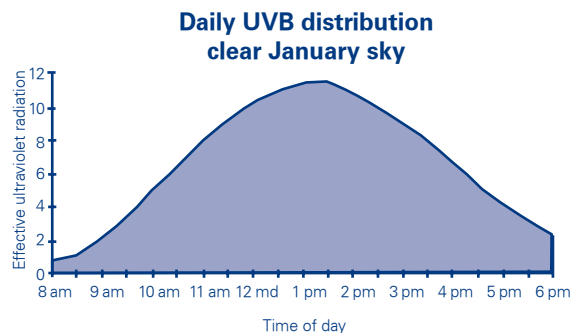
Naturally occurring UVC does not reach the earth's surface as it is absorbed or scattered in the atmosphere. However UVC can be produced artificially by arc welders and sterilising lamps and people working with such equipment should protect themselves.

UVA and UVB are the naturally occurring ultraviolet rays which are of concern because of their potential to cause skin cancer.

The danger period for UVR is between 10 am and 2 pm (11 am and 3 pm daylight saving)

The amount of UVR reaching the earth's surface varies throughout the day. On a cloud-free day, maximum UVR occurs when the sun is directly overhead at solar noon,

12 midday (1 pm daylight saving time). High levels of UVR also occur during the two hours before and after solar noon. So the danger period for UVR is between 10 am and 3 pm. These are the hours when skin damage occurs fastest. Damage can also occur before and after these hours - it just takes longer!

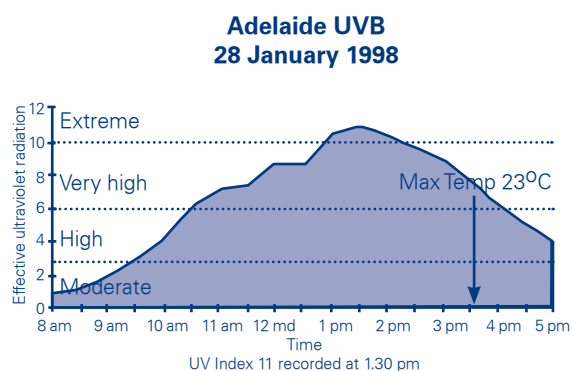


Source: Australian Radiation Protection & Nuclear Safety Agency

UVR levels are not related to the air temperature

UVR cannot be seen or felt and the intensity of such radiation is not related to the air temperature. The air temperature rises during the day as a result of the earth being heated by the sun's infrared rays. The maximum daily temperature usually occurs during the mid to late afternoon whereas maximum UVR occurs at around midday. There can be high levels of UVR on cool days.

A cool front which will cause a sudden drop in temperature has no effect on the level of UVR unless it is accompanied by substantial cloud cover.



Source: Australian Radiation Protection & Nuclear Safety Agency

Fact sheet 4: Ultraviolet radiation (cont.)

You can still get burnt while under shade

About 50% of UVR reaches you directly from the sun while the remaining 50% is scattered about the sky and reaches you indirectly. Light coloured and shiny surfaces such as concrete, sand and water reflect UVR which can reach you even if you are in the shade. Reflected UVR can reach your face under a hat.

You can still get burnt on cloudy days

Skin damage can still occur on days with a thin cloud cover. The cloud scatters the UVR in all directions and although you receive less direct UVR you may receive more indirectly. Heavy cloud does decrease the amount of UVR but scattered cloud has little or no effect on UVR levels.

More UVR at high altitudes

At high altitudes where the atmosphere is thinner, the amount of UVR reaching your skin can be as much as 20% higher than at sea level.

Fresh snow reflects up to 80% of UV, thereby increasing the amount of UVR which reaches skiers' faces and other exposed areas.

UVR levels are higher during the summer months than in the winter months. In winter the UV rays have to pass through more of the atmosphere because of the angle of the sun in relation to the earth's surface. However UVR levels do vary from day to day and a high UVR day in April or October may be more damaging than an overcast day in January.

What are the risks from UVR?

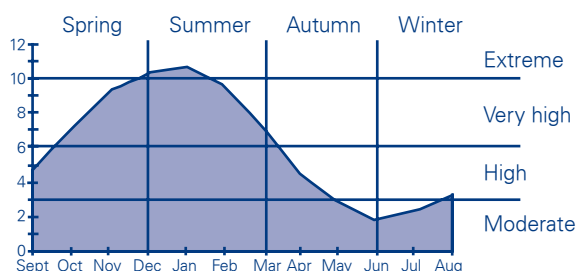
The immediate risk from over-exposure to UVR is sunburn. The more serious, long-term risk is skin cancer. UVR also causes premature ageing, causing the skin to become leathery, wrinkled and blotchy.

The eyes can also be damaged from long-term exposure to UVR.

Be SunSmart - protect yourself from UVR!

- Take particular care the sun between 10 am and 2 pm (11 am and 3 pm daylight saving) if possible.
- Wear a broad brimmed hat - this will reduce the UVR reaching your face and eyes by 50%. Sunglasses will also protect your eyes.
- Wear cover-up clothing - shirts with long sleeves and a collar, made of closely woven fabrics give good protection.
- Apply a SPF 30+ Broad Spectrum sunscreen on any exposed skin that cannot be protected with clothing.
- And remember: you can still get skin damage on cool, slightly overcast days.

**Average monthly UV Index
Adelaide 1997-1998**



Source: Australian Radiation Protection & Nuclear Safety Agency