

15

Technology, participation and performance

OUTCOMES

In this chapter a student:

- 3.1** demonstrates actions and strategies that contribute to enjoyable participation and skilful performance
- 3.2** evaluates the characteristics of enjoyable participation and quality performance in physical activity and sport
- 4.1** works collaboratively with others to enhance participation, enjoyment and performance
- 4.2** displays management and planning skills to achieve personal and group goals
- 4.3** performs movement skills with increasing proficiency
- 4.4** analyses and appraises information, opinions and observations to inform physical activity and sport decisions.



STARTING POINT

Technology is used to increase the number of people involved in physical activity and sport, as well as to enhance the performance of those people. It is ever-changing and dynamic, using new equipment, resources, tools, objects and gear to make sport better than before. At the same time that the use of technology increases, so do the questions we ask about its use.

- Is technology making physical activity and sport better?
- What impact will technology have on physical activity and sport?
- Is technology getting more people active?
- Who decides what technology should be allowed?
- What happens if you can't afford the new technology?

This chapter explores the issues of using technology and evaluating its impact, and how to manage technology use in physical activity and sport.

The contribution of technology to participation and performance

Technology has **widespread** applications in physical activity and sport. Technology has contributed since ancient Olympic times, when changes in the track or javelins may have resulted in improved performances.

When fruit and rubber from trees were used to make kicking balls in many different cultures, people played football-type games. Improvements in technology and **equipment** have made footballs longer lasting and have contributed to a decrease in injuries and an increase in performance.

The fields of sports science and technology are growing each year. The links between health and physical activity are well known, so the contribution of technology in improving our health and ability to be physically active is important. Consider the growing trend of medical professionals and scientists joining sporting teams to keep athletes primed for competition, to evaluate techniques and fitness levels, and to aid quick recovery from injury and illness.

The entertainment industry has closely intertwined physical activity and sport with technology. Mobile phones can now be used to watch sporting games, and how events advertise and cater for spectators is rapidly changing.

Figure 15.1 Improvements in technology have made longer-lasting footballs



Figure 15.2 Applications of technology in sport and physical activity



HotSpot



What specific technology changes and equipment do you see in modern physical activity and sport? Write a technology change or equipment for each letter of the alphabet.

A	J	S
B	K	T
Computer games	L	U
D	M	V
E	N	W
F	O	X
G	P	Y
H	Q	Z
I	R	

Preparation

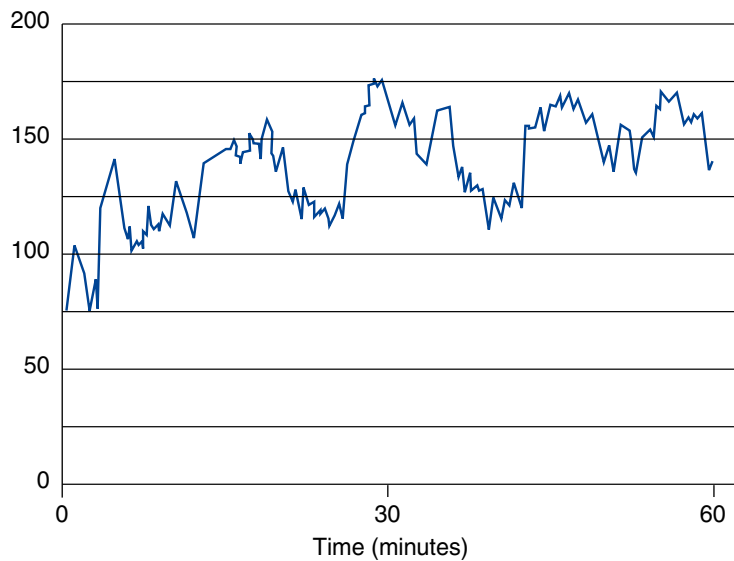
The need for preparation in physical activity and sport is not confined to the elite athlete. All people can use professional equipment and knowledge to enhance performance. To prepare for performance, a participant can use a variety of technology applications. This could mean drinking a sports drink, mentally preparing by listening to an MP3, recording their technique and modifying their action to improve skill, seeing a physiotherapist to assist healing of an injury or even using a treadmill to exercise.

Heart rate monitoring equipment can also help an athlete to prepare for an activity or sport. This equipment comprises a recorder and a receiver to collect data, helping a participant exercise at the required exertion level for best results and safety. The data collected includes the heart rate of the participant when training, time, distance covered, and average and peak speeds. It can also **compare** this information to that of other performances and participants. The data can be graphed visually for an athlete to analyse and monitor their performances, which assists with preparation by allowing an athlete to train with the required intensity, and evaluate what improvements they have made by comparing their other performances.

Technique analysis is another method frequently used for preparation. Using cameras and computers, an athlete is recorded when performing a movement or skill. The aim of technique analysis is to capture exact pictures of the athlete moving and to analyse them to make improvements. Coaches can identify weaknesses or incorrect technique and prepare a program to correct them.

Preparing for the performance is important in giving the participant every possible chance to succeed. Utilising good preparation will go a long way to ensure a good performance.

Heart rate
(beats per minute)



The maximum was 193 bpm, and the average was 134 bpm.

Figure 15.3
Results of a heart rate
monitor

Learning experience

- 1 What information does a heart rate monitor give an athlete? Look at figure 15.3 and answer the following questions.
 - a What does 'bpm' stand for?
 - b How long did the exercise session go for?
 - c What is the starting heart rate? Compare this to yours.
 - d What was their peak heart rate?
 - e How long did it take their heart rate to rise above 125 bpm?
 - f How long did they stay above 150 bpm?
 - g Evaluate whether or not this exercise session and data would be beneficial to the athlete.
- 2 Some technique analysis software utilises markers on a body to track what the body is doing, and then transforms this information into digital stick figures for analysis.

Where would you place 16 markers on these athletes (the golfer on the right and the dancer on page 244) to obtain enough information about their technique? (The dots would be about the size of a 10-cent piece in real life.)





- 3 Imagine you are the coach of an elite team of junior athletes. They are interested in using technique analysis software.
- Explain five benefits of using the technology to the athletes.
 - Describe three negative aspects or difficulties in using the technology.
 - Write a plan of how each of the 10 athletes could use the software over a two-week cycle.

Performance

Technology can be used to assist a participant during their performance. It can include changes and improvements in their clothing, equipment, hydration techniques and safety. New types of playing surfaces have also contributed to advances in performance standards.

Improvements in clothing have been made to increase the safety of athletes, to improve the ability of an athlete to move and to expand the marketability of clothing to the sporting public. Some improvements that have been made to clothing are outlined below.

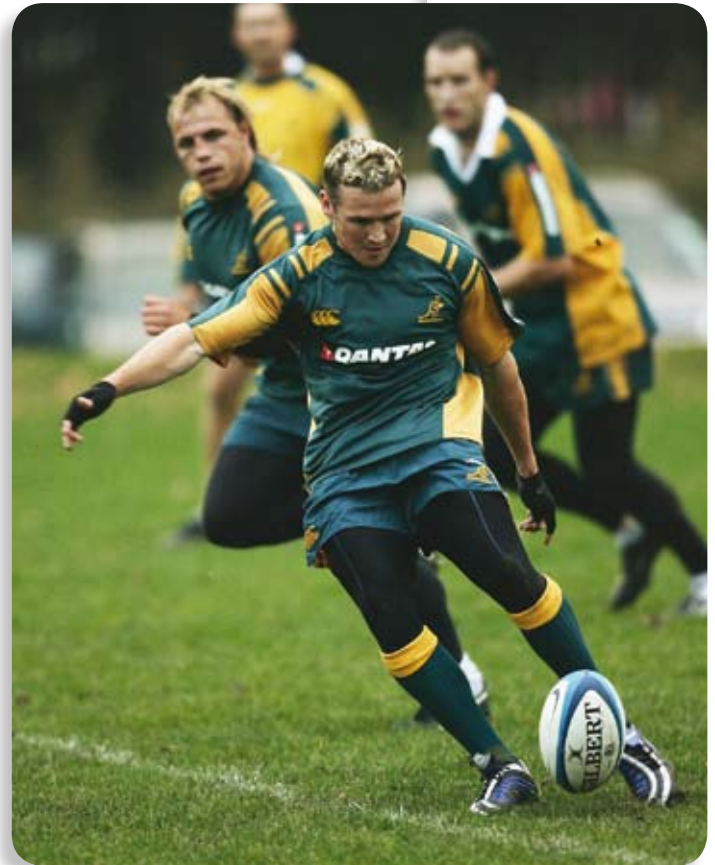
- Advances in shoe technology have allowed for more comfort, and greater cushioning, stability, grip and style. Better shoes have led to fewer injuries, more **participation** and greater performance.
- Playing jerseys made out of lycra or other materials that draw out sweat from the body help keep an athlete's heat levels lower than previous jerseys did. Modern fabrics are also tougher and therefore last longer. However, this isn't always the case—the jerseys of the Australian Wallabies are believed to be 'one wear only'. They start to disintegrate after around 100 minutes of use, but are promoted as improving athlete performance by 5–10%.
- Compression clothing aims to enhance performance as the material provides support and muscle alignment. Improvements in removing lactic acid build-up and recovery from fatigue are promoted, with key athletes advertising these products.

Technological advancements have also seen many changes made to sporting equipment. Sporting equipment to enhance performance can range from medical, safety or actual playing equipment. For example, vast sums of money are spent on designing, trialling and using new sporting equipment to enhance performance. Athletes and sports have access to billions of dollars worth of scientific ideas, testing laboratories, scientists and materials to design and create equipment that is stronger, lighter, more easily controlled, faster and more resilient than ever. Athletes with a disability can also now be more active and involved in sports with enhanced medical equipment, such as wheelchairs, transport options and prosthetics for amputees.

Improvements in where sporting events are held and the surfaces on which they are played are also responsible for advances in the standard of play and a decrease in injuries to athletes. There have been improvements in the grass and level of surfaces, upgrading of hoops and posts, and greater use of watering and cleaning systems to ensure that surfaces last longer. People are happier to be spectators and to participate in clean and safe facilities, making technology useful in increasing participation.

Figure 15.4

Improvements in equipment and clothing can improve performance

**Figure 15.5**

TigerTurf synthetic surfaces can be used for many different sports

Judging and officiating

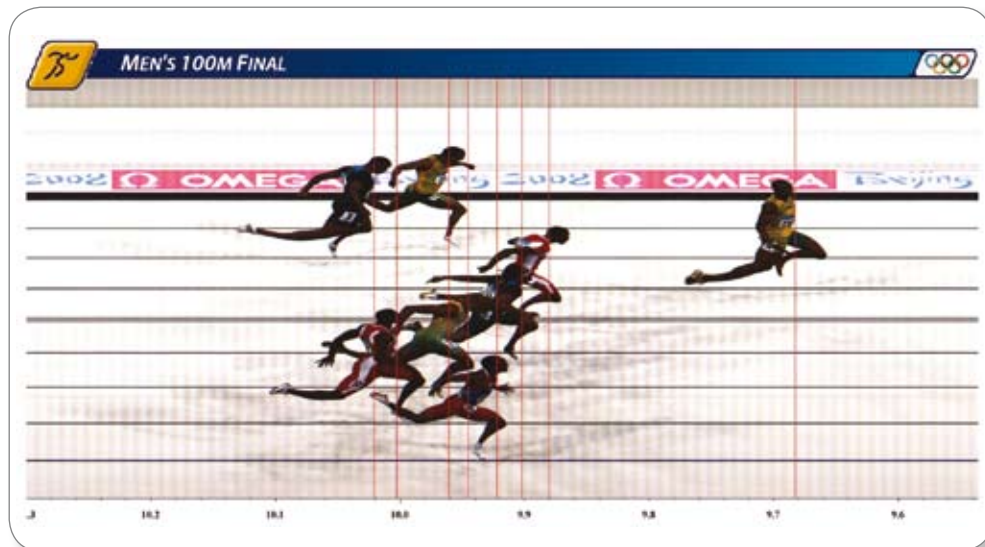
As physical activity and sport become more widespread, the pressure to use officials to make decisions is heightened. The invention of cameras, television, replays and the internet have transformed what tools are available to judges and officials. The Olympic Games first used electronic timekeeping and photo-finish cameras in Tokyo in 1964. Now they are used in every horse and dog race, and state, national and international racing events and can record down to 1/1000th of a second.

With the invention of television and recording devices, judges and officials are now able to replay situations in an event and to make a decision. These replays are also screened on large screens at the ground to keep spectators involved in the watching and decision-making. Tennis players can now challenge a call and ask for a replay of the result using video replay and computer digital technology. Video footage can also be used by officials at discipline meetings and judiciaries.

Sensor touch pads are now also used at the start or finish of many events, such as athletics and swimming. These touch pads give accurate timing to races and enable judges to record exact times to 1/1000th of a second. They can also catch an athlete who ‘breaks’ or starts before the gun.

Figure 15.6

Electronic devices record exact finish times



Wrong call

US 100m athlete Jon Drummond, was the second person to ‘break’ in a world championship final, thus being disqualified. He refused to acknowledge that it was him, despite the electronic touch pad indicating it was him. He laid on the track, causing disruptions in his race and many other events at the athletics meet. He finally relented and walked off in tears, still protesting his innocence.

‘It’s a wrong call. When the machine makes a wrong call, it’s all over—100 000 pairs of eyes could see, obviously, it was a wrong call.’ Ato Boldon, a friend and training partner of Drummond’s.

<<http://espn.go.com/oly/news/2003/0824/1602022.html>>

There are many aspects to wireless **communication** that have also assisted judges and officials to assess participation and performance, and to monitor the safety of people at an event. Officials can now communicate with each other and with athletes wherever they are. This allows them to send messages requesting athletes for drug tests or discussing details with officials about athlete performances or to issue statements about suspensions and bans. Other equipment, such as global positioning systems, radio transmitters, walkie-talkies and mobiles phones, also allow for greater communication between officials, coaches and athletes.

From: officials.world@sport.com

Subject: Suspension

Attention all officials.

The following athletes have been banned from competition due to admitted cheating and betting scandals. Please do not let them train in your facilities or mix with other athletes under your care.

Thank you.

Yours in sport,

Tommy Diamond

Judiciary Chairman

Figure 15.7

An example of a message that could be sent to officials around the world using internet technology

If the technology is available to assist the umpires, judges and referees to make a decision, should it be used? What are the positive and negative aspects of using technology to make decisions?



Learning experience

- 1 Form a group of two to four students. Select a physical activity or sport on which to write a report. Groups are to write about how much and which types of technology are used in that physical activity or sport. Use the heading 'The widespread use of technology in ...'

Make sure your report includes the following:

- an introductory paragraph that provides a definition and description of your topic
- a body that provides factual information about the topic
- a conclusion that summarises your main points
- technical terms (such as 'preparation', 'heart rate monitoring' and 'wireless communication')
- descriptive words (such as '*strong* and *resilient* protective helmet to provide safety').



The impact of technology

When assessing technology in physical activity and sport, both the positive and negative impacts need to be considered. Participants, officials, coaches and spectators will weigh up both these aspects and judge whether or not the technology would help improve the physical activity or sport. Understanding the short- and long-term impact of technology use can be difficult when it is first introduced.

Participation in physical activity

When looking at the impact of technology on participation in physical activity and sport, a number of questions need to be considered. Has technology impacted on the number of people involved in physical activity and sport? Has technology impacted on the amount of time people are involved in physical activity and sport?

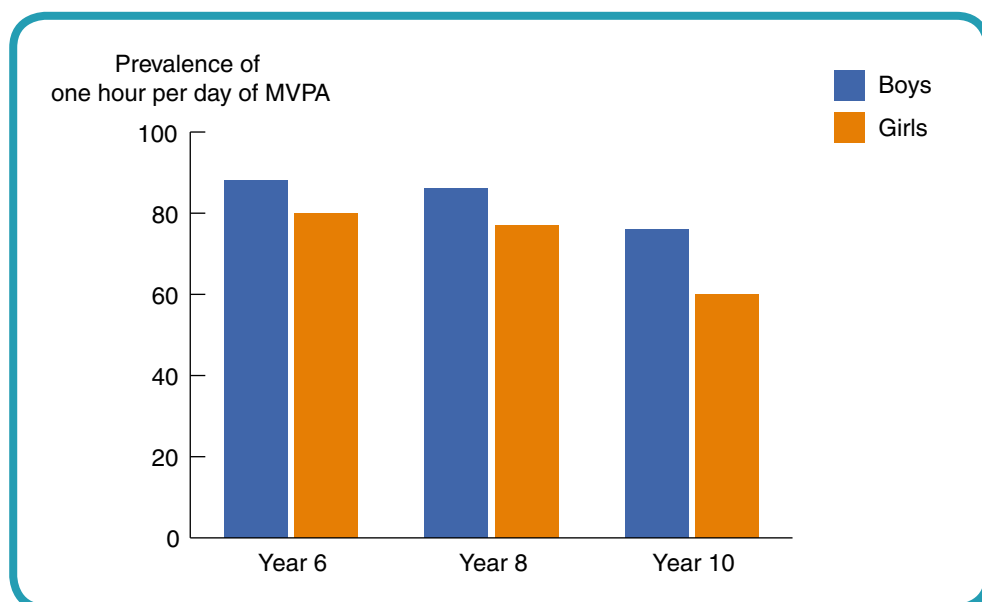
A positive impact of technology on participation has been increased access to and use of exercise equipment through gyms, schools and home use. Affordable treadmills, exercise balls, home gyms, weight machines and fitness monitoring equipment have allowed more people to access equipment and be active. Expansion of safety equipment and standards has also increased participation rates due to a decreased risk of injury, and a reduction in the severity and recovery time of injuries. Parents and guardians are more likely to allow their children to participate when safety equipment is used.

A negative impact of technology on participation has been the increased use of technology for recreation. Small-screen technology—which includes computers and the internet, game stations, television and mobile phones—has a particularly strong influence on decreasing participation rates in physical activity.

Up to 25% of Australia's young people are overweight or obese. What impact do you think technology may have had on these rates?

Figure 15.8

Prevalence of one hour per day of moderate to vigorous physical activity (MVPA) during summer school terms among boys and girls, in Years 6, 8 and 10 (%)



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	Boys			Girls		
	Year 6	Year 8	Year 10	Year 6	Year 8	Year 10
Small screen recreation	17.5	20.8	22.0	12.5	17.5	17.5
Education	2.5	5.1	6.0	3.0	5.8	7.0
Travel	1.0	2.3	3.0	1.3	2.8	3.0
Social	1.0	2.3	4.1	2.0	4.1	6.0
Cultural	3.7	3.8	2.7	5.3	3.8	3.3
Total	30.3	40.5	45.0	11.6	34.0	36.8

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Figure 15.9
Median hours per week spent in small screen recreation, educational, travel, cultural and social sedentary behaviours among boys and girls in years 6, 8 and 10 (%)

Learning experience

- Write down how many hours a week you spend doing the following activities.
 - Moderate to vigorous physical activity (MVPA)
 - Small-screen recreation
 - Education
 - Travel
 - Social activities
 - Cultural activities
- Compare your information to the figures 15.8 and 15.9. What is similar or different?
- Predict whether you think your results would be similar to your friends, people in other towns and cities in Australia, and people of different ages.
- Explain what some physical health and social consequences would be if these habits continue.



Improved standards

When discussing standards of performance, we consider items such as records, personal bests, averages, winning streaks, prize money, and biggest, longest, highest or deepest. In some sports and events, technology has greatly influenced results. World records for swimming and athletics are consistently being broken due to improved training and performance techniques, such as technique analysis programs, weight training with state-of-the-art equipment, and optimal nutritional guidelines.

Not everyone agrees that technology has been good for improving standards. New technological equipment has resulted in an expansion of negative incidences of illegal drug use and masking, in an effort to improve performance. There is often also an unequal distribution of equipment and resources between athletes, leading to inequity of results and performances. There is also a common belief that previous athletes were better natural athletes because they did not need new technology to assist them.

Enjoyment

Has technology heightened the enjoyment of participants in physical activity and sport? Has it motivated people and made their experience better? Enjoyment as a result of using technology can be assessed in three main areas of why people are involved in physical activity and sport: fun, friends and fitness.

Spectator appeal

Spectators are the people viewing a physical activity or sport, either live at the venue or in another place, such as at a home or club. Spectator appeal is about how the people viewing the physical activity or sport enjoy it. Spectator appeal can be enhanced through technology by delivering better facilities or media, and someone viewing a sport from home can often see more than if they were actually there. However, not all changes have been accepted happily. The media organisation filming the National Hockey League overlaid an image of a red arc when a player was shooting for goal to indicate how the puck would move in an ideal shot. This upset many fans who saw the arc as a disruption and annoyance. Flashing lights at an Australian Rules game indicate when the television broadcast has gone to a commercial, usually after a goal has been scored, impacting on the play continuing.

Learning experience

- 1 Unjumble the words in the table below to reveal technological changes of facilities at a **venue**.

When you have all of the words, write a sentence about each, describing either what you think of the change or an interesting story you have about it.

- 2 Read the following list of technology that is used by the **media**.

- Microphones
- Entertainment links
- Safety messages
- Commentators in a commentary box
- Reporters
- Websites and sports reports on television, the internet and in print media
- Camera positions and angles
- Internet live scoring
- Interactive viewing
- Video referees and umpires

Jumbled word	Unjumbled word	Sentence or story
kettic prachingus	ticket purchasing	I heard tickets being advertised on the radio for a basketball game; I checked on the internet what time tip-off was and rang on the phone to order tickets.
gnitae		
roesc obard		
sttoile		
doof and krinds		
sportart		
feasty and curityes		
moshathere		
mercedishan		



Now copy the table below into your workbook and write each item from the list under the heading that best describes how you think that technology has been used to enhance spectator appeal.

- 3** Write a response about how the media have used technology to enhance spectator appeal. Complete this by using a 'pass the paper' strategy in groups of three.

The first person writes an opening paragraph about the media's use of technology and passes it to the person on their left. Each person reads the first paragraph from the person on their right. They write a comment

on what is written, building on how they think the media has used technology to enhance spectator appeal. Again they pass the piece of paper to the person on their left. Addressing what has already been written, they note down their views.

Pass the work back to the original owner who will edit the work, read all comments and provide a final analysis judgment about the media's use of technology. If it has made it better, what positives and negatives for the spectators have there been and should it continue?

Analysis table

Has made spectators a lot happier	Has made spectators only a little bit happier	Has not had much impact on spectators at all	Has made spectators unhappy

Injury rehabilitation

The ability to recover from injury and spend more time involved in physical activity and sport is a key goal of injury rehabilitation. Technology has impacted significantly by assisting athletes to recover and be rehabilitated. Technology can either identify an injury through testing, or help to manage and heal the injury. Some equipment can even monitor an athlete's lactate levels and heart rate, and indicate stress, fatigue or overtraining, which can lead to injury or illness.

The benefits of rehabilitation for participants are:

- decreased time out of physical activity and sport
- decreased risk of re-injury
- decreased severity of injury
- increased health levels.



Webconnect

Research how the following technology is used to assist in injury rehabilitation.

- MRI
- Hyperbaric chamber
- Arthroscopic surgery
- Interferential
- Strapping
- Ultrasound
- X-ray

Briefly describe what each is and how it is used for injury rehabilitation. Name someone who either operates this technology or has used it to assist them to recover from an injury.

Figure 15.10

X-ray is an example of a technology used to assist in injury rehabilitation



Safety

When participating in physical activity or sport, no-one wants to be injured or hurt. Technology has the capacity to minimise the risk to people through providing barriers to risk. These barriers could be safety barricades between a racing car and crowds, clothing barriers like sunscreen and thermal jackets, or protective equipment between a very fast ball and very private parts in cricket.

Weather predications, made using sophisticated satellite imagery technology, that are broadcast in weather reports on the internet, television, newspaper and radio can also have a positive impact on safety. This information can assist athletes and officials in deciding whether events or training will go ahead, and what barriers they may have to put in place or what changes they have to make.

Clothing that improves safety when participating in a physical activity or sport is extremely important and is an area that sees continual technological advancements. For example, thermal clothing has the ability to protect the body from weather extremes. It includes equipment for all parts of the body and for different phases of the activity or journey (walking, sleeping and water activities). It is used in a range of physical activities, predominantly outdoor adventure and water or snow activities. Technology has improved thermal clothing, making it lighter, fire resistant, more resilient, stronger, highly visible and easier to carry or store.

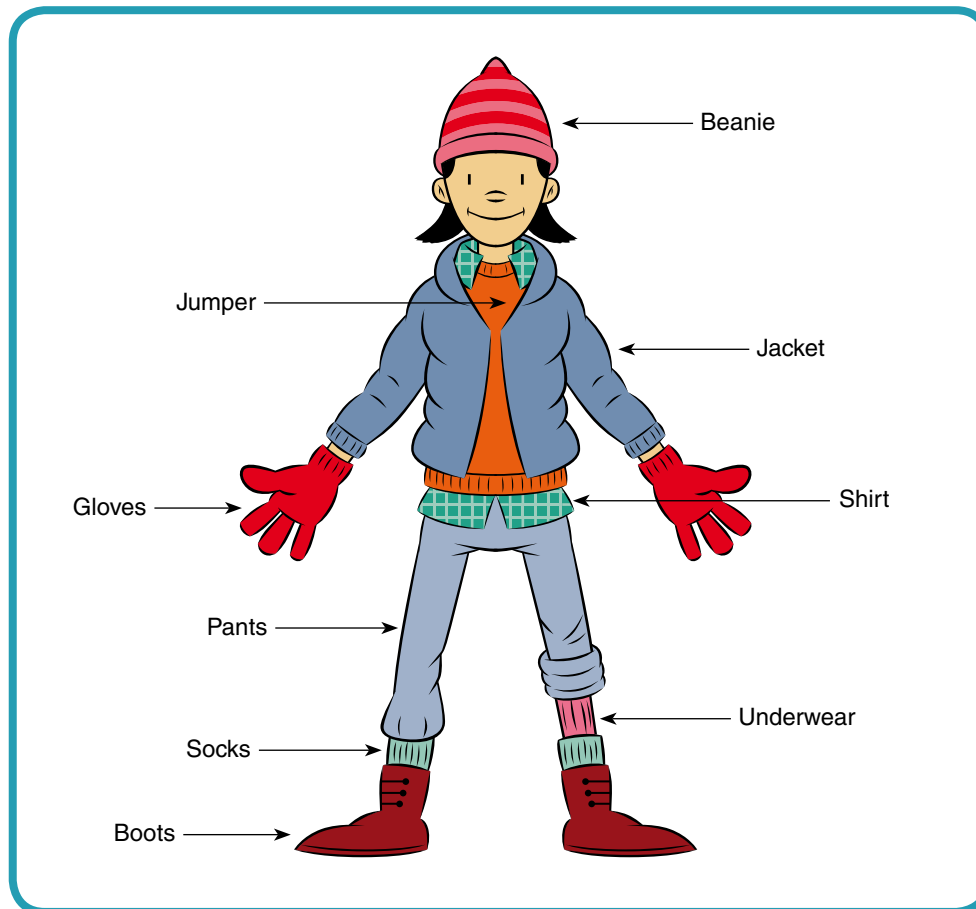


Figure 15.11

Thermal clothing provides protection against the environment

In order to participate safely in physical activity or sport, it is sometimes required that protective equipment be worn or be used by a venue. Protective equipment includes items such as mouthguards, helmets, gloves and knee or leg pads. Protective equipment at a venue can include padding on posts, poles or fences, netting or mats under jumping equipment, barricades and sand traps at motor racing events.

Learning experience

- 1 You are the busy organiser of physical activity and sporting events in your extremely active local area. Consider the following events and the weather forecast that accompanies each.
 - a Decide whether each event will still go ahead.
 - b If it will go ahead, write five things you will do to minimise the risk to athletes and spectators.
 - c If it will not go ahead, write five things you will do to postpone the event to another time.

Event 1: 10 kilometre fundraising run

Forecast: hot

Temperature: 35 degrees

Wind: no wind

Rain: no chance

Humidity: high

Special notes: hottest day predicted in two years, 1000 people expected at the event, \$10 000 expected to be raised



Event 2: school swimming carnival

Forecast: hot and sunny with a late change

Temperature: 30 degrees

Wind: light breeze, easterly

Rain: chance of a thunderstorm around 2 pm

Humidity: high

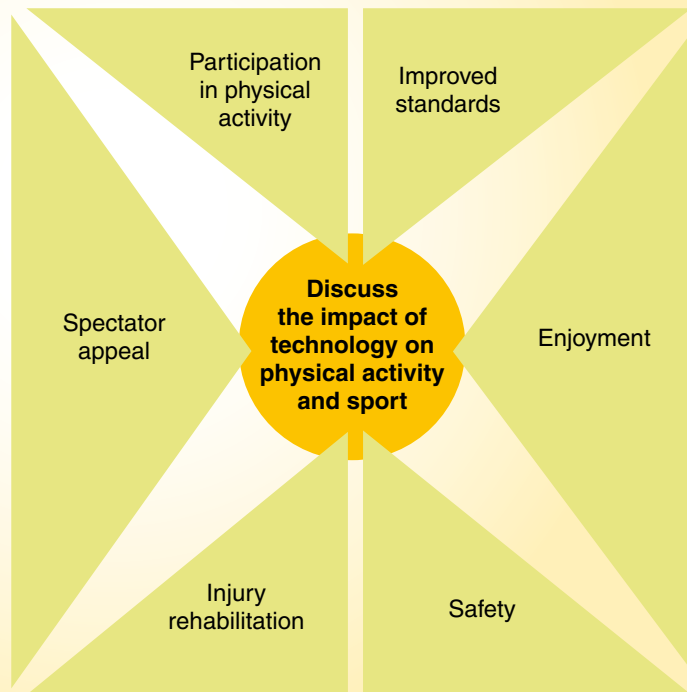
Special notes: adults and children aged 12–18 in attendance, 800 people expected at the event

- 2** Which physical activities and sports would use the following protective equipment? Aim to identify at least five activities for each type of equipment.

- Helmet
- Headgear
- Glasses
- Goggles
- Mouthguard
- Shoulder pads
- Tackle suits
- Fire retardant suits
- Arm guard
- Elbow pads
- Gloves
- Chest guard
- Groin protector
- Kneepads
- Shin pads
- Boots or shoes
- Strapping tape

- 3** In groups of three or four, discuss the impact of technology on physical activity and sport. Make sure you address all of the areas outlined in the figure below.

Write down examples of positive and negative impacts technology has had on physical activity and sport in relation to each of the areas identified in the figure. Now write your final conclusion about whether the impact of technology on sport physical activity has been largely positive or negative.



Final conclusion:

The impact of technology on physical activity and sport has made them _____ because:

The ethical implications of technology

Ethics is the study of people's beliefs, values and principles. It can be what they see as right, **fair** or decent. The core question around ethics and technology in sport is whether technology has changed basic sporting values of competing fairly for honourable achievement into competing for personal advantage and commercial gain. More specifically, key ethical implications of technology use include:

- whether it is fair to compare athletes who use technology (such as special swimsuits) with others (past and present) who do not, whether or not this is by choice

- whether the cost of technological applications in sport can ever be fairly accessed, especially by those from poorer nations
- whether the power of technology in extracting improved performance has led to illegal activities, such as use of performance-enhancing drugs
- whether advertising revenues through media coverage have adversely impacted on the nature of sporting experiences.

Comparability of performance

Comparability discusses how we can match different players and teams from different years, countries or sports. A balanced approach means looking at the standard of opposition participants competed against and the impact they had on the time and future of their game, in conjunction with the records they may have set.

With modern technology, being able to compare players and teams has become easier. More statistics and images are kept of modern players. This enables two players to be put side by side and compared. This can be done by viewing two players in comparison next to each other on one screen, and viewing their statistics, their best moves, their best games or watching the opposition they played against.

Technological advances in transport have also impacted on sport and physical activity, with positives and negative **consequences**. Air travel allows participants to travel vast distances to compete against equal opposition regularly; however, more travel can also fatigue athletes.

A participant in modern day sports might not have succeeded in the past, but by using modern technology in relation to nutrition, weight training, skill analysis and coaching feedback, they have significantly improved and record outstanding performances.

Figure 15.12

Technological advances in clothing and equipment have significantly improved performances





Learning experience

When comparing players and teams of two different times and eras, a wide range of statistics, stories and records, and understanding of their impact needs to be recognised.

- 1 Create a set of criteria to gather information about two players or teams. The criteria should assist you in looking at their similarities and differences, evaluating how good they were and weighing up who had the biggest impact on their sport.
- 2 Choose two athletes or teams from the one sport. Try to select examples that are separated by at least 20 years.
- 3 Assess both teams or individuals against your criteria. Judge what strengths each brought to their sport, who had the biggest impact on the sport and who you think is ultimately better.

Examples of individuals you might choose include:

- Lance Armstrong and Eddy Merckx (cycling)
 - Peter Brock and Mark Webber (motor racing)
 - Catherine Cox and Anne Sergeant (netball)
 - Layne Beachley at age 18 and Sally Fitzgibbon at age 17 (surfing)
 - Dawn Fraser and Eamonn Sullivan (swimming).
- 4 Discuss the following questions in small groups.

Considering the ethics of comparing across time and space, is it right to compare? Should we be satisfied that there were great athletes in different eras knowing they were the best for that time?

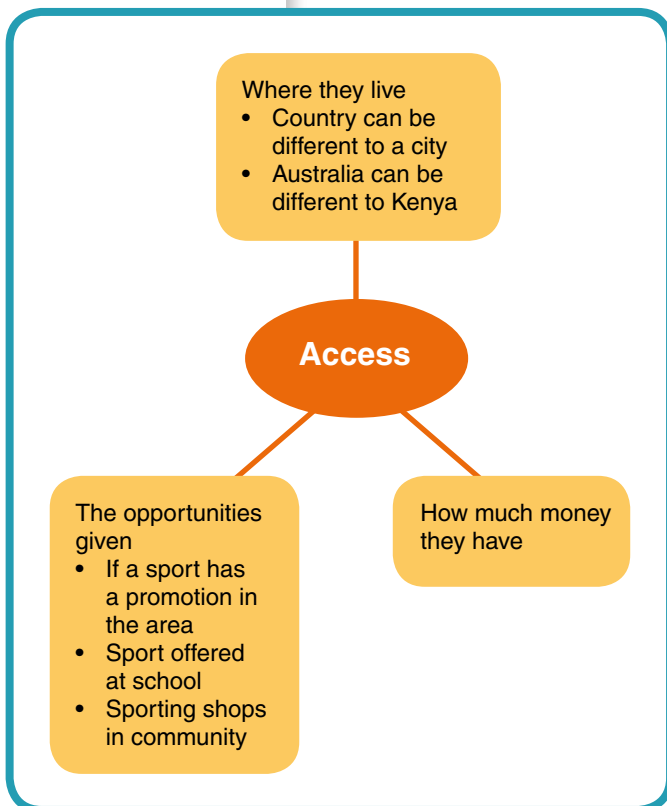


Figure 15.13
Technology access

Access and equity

Access to technology is about being able to use and take advantage of the resources that are available. Resources include all of the technological equipment mentioned in this chapter, in addition to the funding, support and science of governments and sporting organisations. Equity is about fairness and the spreading of resources to all people and communities who need it. Equity is not about making sure everyone has an equal amount, but a fair amount.

Limited access to technology resources can limit opportunities and lead to inequity of results. Sometimes participants have better access to technology resources because of where they live, how much money they have and the opportunities they are given.

Technology now has the capacity to assist referees and umpires with their decision-making. Video referees, slow motion replays, wireless communications and photo finishes can all help an official make a decision. Has this improved physical activity and sport,

or made it fair for all participants at different levels of competition? It costs a lot of money to purchase, install and maintain this technology, and to train people in using and evaluating the results. This results in the technology only being used in events for which it is financially viable to do so. For example, the National Rugby League allows the use of video referees for its first-grade premiership, finals and representative games, but not for any other levels. This is because not all grounds have the access or resources to use the technology and because the costs of implementing it at all grounds are too high.

Access to technological resources can impact on which physical activity or sport is available or offered. It can determine which sport you have equipment for, how much coaching is available and the chance to compete at state, national or international levels.

- 1 In small groups, debate the following comments.
 - More money is being spent on creating performance-enhancing drugs and the masking agents to cover their use than on catching the drug users themselves.
 - Performance-enhancing drugs should be allowed for all athletes—then the competition would be fair.
 - People caught using performance-enhancing drugs should have to name their supplier.
 - Drug testing authorities should have access to an athlete any time and anywhere.
- 2 Have advances in technology meant that the standard of refereeing and umpiring has dropped? Use three physical activities or sports and describe what technology is used and the impact it has on results and spectators, and make a final judgment about the standards of refereeing and umpiring.



HotSpot

Illegal use of technology

When technology is used outside of the **rules** or behaviour codes that govern its use, it can be classed as illegal. This is because the illegal use of technology is not fair and equal to all participants and can result in unfair results.

Technology that can be used illegally includes:

- performance-enhancing drugs and their masking agents
- video spying technology used to monitor other teams or athletes
- genetic modifications, which may include altering the genetic make-up of an embryo to supplying an athlete with hormones or substances to change their body.

The use of illegal performance-enhancing drugs has contributed to participants making unfair gains in performance and personal bests. This is due to the drugs' ability to help the athlete recover faster between exhaustive training sessions or to boost the body's ability to handle performance. Extensive amounts of money are spent by organisations such as the International Anti-Doping Authority and the Australian Sports Anti-Doping Authority to keep current with the illegal substances and masking agents that are being used by athletes. In Australia, most registered sports have established guidelines for drug use, testing schedules and consequences for athletes who are caught.

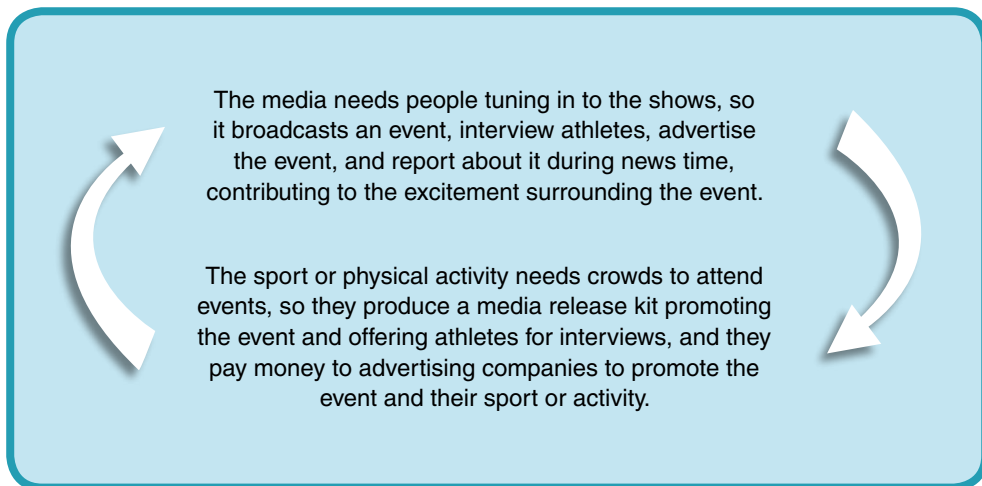
Media, marketing and profit

If the role of the media is to inform and entertain all within a budget, then opportunities to make a profit from physical activities and sports exist. The media relies upon physical activities and sports to generate audiences for its programs in the same way those activities and sports have come to rely on the media to generate greater interest and support.

It is often the physical activities and sports with access to money, supporters in the media, and a large spectatorship that have the greatest chance to profit; for example, sports such as cricket, football, basketball, swimming and motor racing events. Profit for the athletes and competitors can be generated from a number of sources, including sponsorship; promoting books, DVDs and CD-ROMs; the development of computer games; interviews in papers, magazines and television shows; merchandise; and guest appearances.

Figure 15.14

Sport needs the media and the media needs sport



Learning experience

- 1** List all the computer games you can think of that involve a physical activity or sport.
- 2** Categorise the games into groups that are similar; for example, sport-specific (cricket and football), racing, tactical, uses one hand-held controller that is same for the majority of games or uses a game-specific controller.
- 3** Choose your favourite three games (they should all come from different categories that you listed in question 2) and answer the following questions.
 - a** Why are they the best?
 - b** Who makes a profit from the purchase of this game?
 - c** How did you find out about the game?
 - d** Can it be linked to other players online?
 - e** Does this game make the player more or less physically active? Why?
- 4** Evaluate the role marketing has in promoting this game. Where it is marketed, to whom is it marketed and how (for example, celebrity endorsement)?
- 5** Evaluate benefits and the negative points that come from playing these games.



The evaluation and management of technology

With each new piece of technology that becomes available, decisions need to be made about its usefulness and usability. Understanding the impact of the technology on the physical activity's or sport's rules and etiquette, strategies and tactics, techniques and equipment, spectator appeal and media marketing needs to be considered before the technology is allowed into use. It is important to know who decides what can and can't be used, when it could be used and if it is beneficial for the activity.

Groups responsible for monitoring technological advances

There are many groups that take **responsibility** for deciding if new technological advances can be used, and ensuring that the impact of these technological advances are beneficial. These decisions are made with an awareness of the possible consequences of the change.

Each physical activity and sport has a peak organisation that is responsible for managing and coordinating the sport. These organisations usually include players, coaches, clubs, sponsors and an administration group. They are often the first to see new changes, and may request that new technology be developed by sporting and science companies. In Australia, the Commonwealth Government has funded organisations to monitor and manage technological advances. Importantly, the Australian Sports Commission was established to oversee the administration of all sports, coaching, sporting competitions, ethical issues and technological changes, and the progression of athletes from junior and local levels to advanced representative and professional levels.

Rule modifications to reduce the impact of technology

Physical activities and sports have changed significantly with advances in technology. To make physical activities and sports equal and fair for all people, administrators have created or modified rules to try and ensure a level playing field. Modifications to rules are also often made in an attempt to limit the possible impact of technology on a sport, and to keep the sport as a test of human sporting skill and ability, and not a test of available technology.

Modified rules can relate to playing equipment and safety. Equipment must conform to standard requirements of height, width, depth, length, weight, material and speed. For example, in cricket the overall length of the bat must not be more than 96.5 cm. The blade of the bat must be made solely of wood and cannot exceed 10.8 cm at the widest part. Rules around safety are modified to reduce risk of injury due to technological changes. Rule changes may address engine size in motors, the size of a playing area or the distance between opponents. For example, in horse riding, all jockeys must wear a protective vest and helmet when riding.

From codeine to a dose of code two

A Sydneysider who fears tennis has brought itself to breaking point is lobbying for a revolutionary version of the sport to end the pain, writes Philip Derriman.

During his long career as a broadcaster, Alan McGilvray often called on cricket authorities to do away with the leg bye, arguing it was plainly nonsensical since, by definition, it rewarded the batting side for a batsman's error—trying to hit the ball and missing.

McGilvray was an influential figure in cricket, yet his crusade against the leg bye got nowhere, showing how hard it is for an individual to persuade a sport to change its rules.

Gary Simmonds of Sydney, a student of tennis and former coach, is aware of this, yet he has begun a similar crusade of his own: trying to persuade tennis authorities to introduce new rules—or, rather, revert to old rules—to reduce injuries. His submission is about to be forwarded to the International Tennis Federation.

He says injuries in elite tennis are occurring at an alarming rate. In the past three years, Gustavo Kuerten, Guillermo Coria, Tommy Haas, Mark Philippoussis, Pat Rafter, Goran Ivanisevic, Thomas Johansson, Lindsay Davenport, Kim Clijsters, Serena Williams, Alicia Molik and Martina Hingis have all had surgery to repair various injuries.

Numerous others have been sidelined by injury for certain periods, among them Juan Carlos Ferrero, Andre Agassi, Carlos Moya, Marat Safin, Venus Williams and Jennifer Capriati.

While nobody doubts the nature of the modern game is responsible for the injuries, few people seem to understand why and how. Even fewer have come up with a remedy.

Having spent three years researching the subject, Simmonds is not only convinced he has identified the causes of the injuries, but believes he knows how the problem can be fixed.

He argues the bulk of the injuries stem from five features of modern tennis—the airborne serve; double-handed groundstrokes; the extreme groundstroke grips, both forehand and backhand, that are encouraged by big-headed racquets; the obsession with fitness, which leads to overtraining; and unsuitable court surfaces.

He has produced a detailed analysis to show how each of the five factors puts the body under extra stress. The airborne serve means a player lands on the same foot over and over, jarring the leg and hip; double-handed shots force players to take an extra

half-step to get to the ball, resulting in stretching and straining; and extreme grips cause players to contort themselves while dealing with low balls, thereby harming spines and various joints.

Because all these factors are the product of rule changes in past decades, his solution is to change the rules back. Thus, Simmonds would like to see players keep one foot on the ground while serving (obligatory until 1958), double-handed ground strokes prohibited and racquet heads reduced in size.

In other words, tennis would be played much as it was until the 1950s, when, significantly, injuries were not nearly as common.

According to Simmonds, although the ITF might see the logic, it would be reluctant to act for fear of being sued by racquet manufacturers, which have invested heavily in big-headed racquets, and by players, who might claim loss of livelihood.

He therefore proposes that the ITF should introduce a second version of tennis incorporating the safer rules, which he calls 'code two' tennis. There would be no risk of litigation, he says, since everyone could choose to keep playing under current rules with modern racquets, but he believes players would gradually switch of their own accord to code two tennis to avoid injury.

As a bonus, he says, the game would regain much of its old style, variety and subtlety and so have more appeal for spectators.

'Tennis players are great imitators,' Simmonds says. 'If they see a successful player doing something, they'll incorporate it without knowing whether it's beneficial or harmful.'

The worst example of this, in his view, is John McEnroe's serving stance. McEnroe stood facing the side of the court, then hopped front-on to get into a follow-through position. 'Players with the McEnroe stance—they've got troubles, all of them,' Simmonds says. 'It upsets the shoulders and the front leg.'

Simmonds says large-headed racquets have much to answer for. By making top-spin strokes with extreme grips easier, they have encouraged a baseline running game, which has required players to be super fit—leading to injuries from overtraining.

'There's now a huge emphasis on running. It's constant-movement tennis. All Lleyton Hewitt does is run, run, run. When you run and run, back and forwards, people in the gallery start to feel tired, too. Players are not only wearing themselves out, they're wearing spectators out. The game is speeded up and every shot looks the same.'

A return to old rules would revive obsolete shots such as the underspin lob, which could usually be retrieved, allowing the rally to continue. Instead, today's big-headed racquets enable moderately skilled players to hit top-spin lobs for winners, deterring players from coming to the net.

'There's no incentive to come in and volley, which is why there are only a few serve-volleyers left,' says Simmonds. 'Once you get down to baseline tennis only, the game is reduced because you're not using the whole court.'

Learning experience

Read the article 'From codeine to a dose of code two' and answer the following questions.

- 1 What are the main injuries occurring to tennis players in modern times?
- 2 What impact has technology had on the game of tennis?
- 3 What are some possible solutions to reduce the impact technology has on rules?
- 4 How would these changes affect tennis equipment companies?
- 5 What consequences might the rule changes suggested by Simmonds have on tennis?



Future perspectives

So what does the future hold for physical activities and sports? How will technology change what people participate in and the level of performance? What technology changes will make our activities better and what changes will make the activities very different to what we now have? Considering the immense changes that science and the media have had on modern-day physical activities and sports to date, and the rapid growth of both of these areas, it is difficult to predict what further changes will occur and what their consequences will be.

Consider what we are currently seeing in the world, as well as in physical activities and sports, and try to imagine what the next evolutions and changes may be:

- increased use of personal technology, such as mobile phones, MP3 players, the internet and computer games
- increased involvement in world issues, leading to blogging, volunteering, demonstrating or participating in events
- interactive viewing of television, which includes the ability to skip advertisements, select a variety of shows to watch at once, view statistics on screen, and help decide winners and losers (in reality-based shows)
- scientific changes in genetics and medicines, including debates over cloning and stem-cell research. The research and treatments available for disease are also improving, meaning the average life expectancy could increase to around 100 years—balance this with the fact that approximately one-quarter of Australians under 25 are overweight and obese
- computer-generated imaging, which can create images and virtual people. This technology allows an athlete's movement to be created on computer, analysed and improved, or to have virtual reality sports and activities.

Chapter cloze

Technology has the capacity to increase _____ and enhance performance. There are widespread uses of _____ that have changed the way we play and watch physical activity and sport. With developments in clothing and _____, medical breakthroughs, and advances in _____ and judging tools, everyone is impacted on by technology.

The impact of technology has both positive and negative _____. Great improvements in record breaking and personal bests have been confirmed, but how would our heroes of the past have _____ if they were able to utilise recent technological advances?

Understanding the right and _____ use of technology is important to ensure that physical activity and sport remain just and open for all people. The future of technology in physical activities and sports is important for all people involved to take some _____ for. _____ and limits need to be set so that physical activity and sport results represent the athlete's skill, athleticism, training and effort, and not the science or unfair technologies they have access to.

communication
compared
consequences
equipment
fair
participation
responsibility
rules
technology

Review questions

- 1 List six technological changes that have improved a physical activity or sport.
- 2 Explain strategies to limit the impact of technology.
- 3 Describe how judging and officiating has improved through the use of technology.
- 4 Discuss how technology has impacted on the Olympic Games.
- 5 Evaluate the degree to which technology has created equity for participants in physical activity and sport.