



# School-based Activities

## Sporty bodies

### Hydration and sports drinks

Sportsworks

#### Background

A large percentage of the human body is made up of water – between 55% and 60%. Men tend to have more water mass than women because of their larger muscle mass. Many sports require athletes to perform over long periods and during extreme weather conditions. A loss of as little as 2% of a person's body weight due to perspiration and exertion can cause the body to fatigue or even collapse. These pictures show some of the serious effects of dehydration and fatigue during marathon races. In everyday sports settings, students will want to know which is the best drink to take to stay hydrated. This will help them to put in their best performance as well as to save money.



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#### What you need

- A collection of sports drinks bottles with labels
- Access to the internet



### What to do

1. Create a table for comparative purposes
2. Investigate which drink provides the best value for money.

Drink	Cost \$	Taste (1 - 5) 1 = bland 5 = delicious	Carbohydrates %	Salts %	Vitamins (types)
Water					
Gatorade					
Powerade					
Lucozade					

### Try, think and explain

By reading the information found on the following websites, try to work out when a sports drink is better than water for hydrating an athlete.

### Useful websites

<http://www.ais.org.au/nutrition/documents/FactFluid.pdf>

<http://chemistry.about.com/cs/foodchemistry/a/aa070803a.htm>

[http://www.fairview.org/healthlibrary/content/sma\\_fluids\\_sma.htm](http://www.fairview.org/healthlibrary/content/sma_fluids_sma.htm)



## Is there a 'sinister' advantage in being a leftie in some sports?



### Background

We are all aware that the world is designed around the habits and preferences of the right handed. There are many examples of the advantages right handers have with everyday technology – such as can openers, fountain pens, scissors, hockey sticks, baseball gloves and golf sticks.

### What you need

- a list of sports which rely on a dominant hand/foot

### What to do

1. Investigate what percentage of your class has a preference for the left. What about other classes?
2. Investigate what sports equipment is designed for use by either left or right handers. What sports equipment is hand specific?
3. Investigate which sports have no apparent advantage for left or right handed players.
4. Investigate if the most successful teams in the AFL and international cricket include a higher percentage of lefthanders or left footers than the society average of 10%.
5. Investigate the original Latin meaning of 'sinister'.





AUS 5 / 210		FIRST INNINGS		R	BF	FW
		AUSTRALIA				
HUSSEY	8	JAKES	c R'DOLPH b P'LOCK	2	12	2
G'CHRIST	1	HAYDEN	c SMITH b P'LOCK	65	177	154
EXTRAS	10	HODGE	c SMITH b P'LOCK	7	26	176
OVER	77	PONTING	c GIBBS b NEL	117	197	207
OV REM	13	S'MONDS	c B'CHER b NEL	0	1	207
NEL	2 / 44 (18)	HUSSEY	NOT OUT	8	44	
	1 ..	G'CHRIST	NOT OUT	1	5	
		WARNE				
		LEE				
		McGRTH				
		MacGILL				

Above: The Australian cricket team has 11 members and would expect on average to have one or two left handed batsmen playing at any one time. However, in recent years Australia has tended to field a team with three or four lefthanders. In the scoreboard above, Australia has included four specialist left handed batsmen.



### Try, think and explain

1. Do the selectors know something about the advantages of having a team with more rather than fewer left handers?
2. Which factors seem to help left handed cricketers and baseball players?
3. Do right armed bowlers find it harder to work out left handed batsmen?
4. Is the wear on the pitch from the right armed bowlers likely to make things more or less difficult for left handed bats?

### Useful websites

<http://www.his.com/~pshapiro/left.handed.html>

<http://www.faqs.org/faqs/lefty-faq/>



# Monitoring heart rates and personal fitness

## Background

The American College of Medical Science recommends that we exercise at between 55%-85% of our maximum heart rate. The standard rule of thumb is to calculate our maximum heart rate by subtracting our age from 220. This is expressed using the following formula,

$220 - \text{Your age} = \text{maximum heart rate.}$

This formula varies with age, fitness and even gender.

To determine our resting heart rate all we need do is take our pulse over six seconds and multiply that figure by ten. Heart rate is usually expressed in beats per minute (or bpm). The chart is useful in providing an indication of intensity in a work out.

## What you need

- A printed copy of the Heart Rate Target chart above.
- A stopwatch or accurate second hand on a watch
- A stethoscope

## What to do

1. Investigate whether it is easier to find your pulse using your carotid, radial, temporal or the apical (chest) pulse.
2. Take your resting heart rate over six seconds, multiply by 10 for beats per minute.
3. Record your pulse after exercise.
4. What percentage of your maximum heart rate were you exercising at?
5. How quickly did you return to your normal resting pulse?

Heart Rate Target (6 Second Count)							
<p>To find your target heart rate, take your age, subtract it from 220 and then divide the result by 100 to get the percentage of your maximum heart rate. This calculation gives you a range of heart rates to aim for. The chart below shows the target heart rate range for different percentages of your maximum heart rate.</p> <p><b>1. Neck:</b> To find out count the carotid pulse (place the index and middle fingers gently on the side of the neck next to the throat).</p> <p><b>2. Wrist:</b> The radial pulse can be taken by placing the first two fingers lightly over the radial artery of the wrist (placed on top with the thumb).</p> <p><b>3. Temple:</b> The temporal pulse can be felt by placing the first two fingers over the temple (placed just in front of the upper part of the ear).</p> <p><b>4. Chest:</b> The apical pulse is the left chest being covered by placing the palm (flat) of the hand over the left side of the chest.</p>							
Age	55%	60%	65%	70%	75%	80%	85%
15	11	12	13	14	15	16	17
20	11	12	13	14	15	16	17
25	11	12	13	14	15	16	17
30	10	11	12	13	14	15	16
35	10	11	12	13	14	15	16
40	10	11	12	13	14	15	15
45	10	11	11.5	12	13	14	15
50	9	10	11	12	13	14	14
55	9	10	11	12	12.5	13	14
60	9	10	10.5	11	12	13	14
65	9	9	10	11	11.5	12	13
70	8	9	10	11	11.5	12	13
75	8	9	9.5	10	11	12	12
80	8	8	9	10	10.5	11	12



### Try, think and explain

1. Why is the sound of one heart beat often described as sounding like 'dub-a-dub'?  
Use a stethoscope to see if you can hear the two beats.
2. Why our lowest heart rate is usually measured upon waking each morning?
3. Why would our maximum heart rate be higher when we are younger?
4. Some athletes have resting heart rates in the low 30s. What does that suggest about the effects of exercise on the heart muscles?
5. Our heart is said to be about 0.5% of our body weight. Calculate what your heart weighs.

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### Useful Websites

<http://www.fitlinxx.com/resources/tools/targethr.asp>

[http://ar.essortment.com/targetheartrat\\_rxmh.htm](http://ar.essortment.com/targetheartrat_rxmh.htm)





# Stretching

## Background

Stretching is said to be the perfect antidote for long periods of inactivity as well as being a great way of preparing our bodies for exercise. However, there are many different ideas about stretching. Many sports scientists warn against starting a stretching program without some expert advice. Although stretching is used to warm up our muscles, many people prefer to warm up their muscles with gentle activity before doing any stretches.

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Above: Group stretching can be a lot more fun than stretching on your own. There is a wide variability in any group and teachers must be careful not to encourage students to stretch inappropriately. Gentle starts are recommended.

## What you need

- Photographs of people stretching
- A metre ruler
- Access to a computer

## What to do

1. Students perform the sit and reach stretch and record their results.
2. The results can be tabulated and entered into an Excel program.
3. Students analyse their class results. Are girls generally more flexible than boys?

## Try, think and explain

1. By reproducing the various stretches, students identify the major muscle groups being stretched.
2. Why do sportsmen and women stretch? Is it to prevent injury or improve performance?
3. What kinds of stretches are regarded as counter productive to improved flexibility?

## Useful websites

[http://www.shelterpub.com/\\_fitness/\\_office\\_fitness\\_clinic/OFC\\_bene.html](http://www.shelterpub.com/_fitness/_office_fitness_clinic/OFC_bene.html)

<http://www.thestretchinghandbook.com/archives/stretching-scientifically.htm>

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## Everybody's walking....



### Background

Walking for fitness and fun has become a lot more popular with adults in recent times. Walking is the most popular participation sport for women (23%) and second only to golf for men (14%). What makes walking such a popular form of exercise?

### What you need

- A local street map which includes all the walking/bike pathways

### What to do

1. Take a half hour survey of the foot and bicycle traffic on one of your local pathways.
2. From the survey, extrapolate and estimate how many people are using the track during daylight hours.

### Try, think and explain

1. Why do you think walking is so popular?
2. Investigate how many different styles of walking there are in your class. Does everyone have their own distinctive style?
3. What are the walking variables which combine to make everybody's walking style different?
4. Investigate the individual differences in the following variables:  
Stride length, preferred stride frequency, extent of arm swing.

### Useful website

Walking styles reflect your personality:  
<http://www.crystalinks.com/walking.html>





## Food groups and sport

### Background

We are constantly exposed to new ideas on food. Some dieticians recommend we increase our carbohydrates, while others stress the benefits of vitamins, proteins and fats. From Atkins to Pritikin it is difficult to know what is best for us and our particular lifestyle. How do we sort out the chaff from the grain when it comes to the correct diet for us? Is the test of 'what feels good for me' as valid as any other?

Sportsworks



Above: Fruit is the original fast food but often seems to have lost out to other carbohydrates. This food stall was very popular at the Port Fairy Folk Festival but may not work with the spectators at the MCG.

### What you need

- Permission from the students to take a survey of the food they bring to school one day, including lunch, snacks and drinks.

### What to do

1. With the students' collaboration, identify the range of food groups found in class lunches or snacks.
2. Create a table or pie graph of the proportions of food groups contained in lunches.

### Try, think and explain

1. How do we know certain food groups are important?
2. Should we include something from every food group in our school lunches?
3. Which foods are particularly good for increasing our intake of calcium, iron, protein, carbohydrates and vitamins?
4. Which foods provide us with lots of energy?
5. Which foods provide the best overall benefits across all food groups?

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### Useful websites

<http://www.nutritionaustralia.org/Default.htm>

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Above: Examples of healthy food choices on display in Sportsworks

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## The Long walk



### Background

Walking has always been a good way to get around. Nowadays there are so many other means of transport, we rarely walk very far. Are we much better off?

### What you need

- Butcher's paper suitable for making a wall chart
- A pedometer
- A quality street map.

### What to do

1. Keep a personal walking diary to see how far you walk each day. A pedometer makes it very easy to multiply the number of steps you take for a fairly accurate assessment of the distance covered. Otherwise calculate the distance you walk using the scale on a street map.
2. Transfer the daily or weekly walking totals to a wall chart or spreadsheet.
3. Analyse the results. What is the mean or median distance walked by the class?

### Try, think and explain

1. Investigate how we benefit from walking.
2. Research the benefits of walking 10,000 steps each day.
3. Investigate the distance covered by some of the most famous walks in Australian history e.g. Burke and Wills.
4. Investigate how walking is sometimes used in political protests and consciousness raising e.g. Michael Long's initiative at Princes' Park.

### Useful websites

<http://216.185.112.5/presenter.jhtml?identifier=756>

<http://www.shapeup.org/shape/steps.php>





# Adapting for disability

## Background

Athletes with a disability have made huge progress over the past three decades. In the first Melbourne Marathon, the fastest wheelchair athlete completed the 42 kms in about 3h 30m. Since that time wheelchair or seated athletes have shaved over 90 minutes off their previous best time. Changes in technology and training seem to be responsible for this huge improvement.

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Above left: The start of a 400m race for seated athletes.

Above right: The start of a 200m race for amputee athletes.

## What you need

- Photographs of sportsmen and sportswomen competing with a disability

## What to do

Write a brief description of a specific technology which enables athletes with a disability to compete.

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Examples may include the following

**Racing wheelchair:** This particular wheelchair has been modified for racing. The ordinary wheelchair has two different sized wheels, a large set and a small set. This racing chair uses three wheels of a similar size. The rear wheels have been angled in such a way to make the wheelchair more stable on corners.

**Prosthetic leg and foot:** This technology enables the athlete with a missing lower leg to run, thus avoiding the use of a wheelchair. The replacement leg is made of sprung steel. This provides the runner with an extra spring in their step. Some athletes with an amputation use a range of different leg prostheses for different sports.

**Try, think and explain**

1. What technological adaptations are made to sporting equipment for the following disabilities?
2. What are the various grades for describing physical disabilities in athletics?

Disability	Adaptation
Visually impaired or blind cricket	e.g. bells inside ball to hear it coming
Blind running	
Amputee below the knee	
Paraplegia	

**Useful website**

<http://www.sports.org.au/>

Pictured on the right is a prosthetic leg with cutaway revealing the pneumatic piston mechanism. This mechanism provides cushioning to the amputee's stump.

