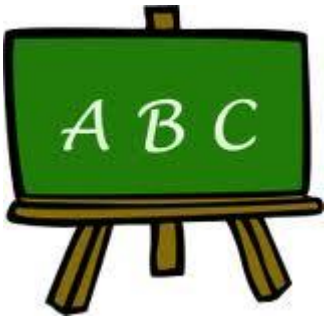
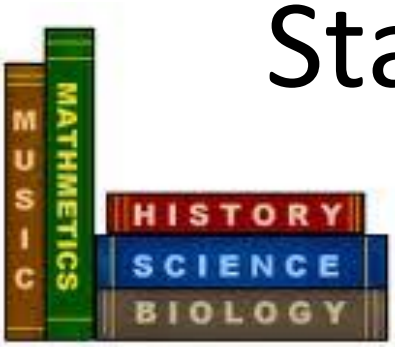


Name: _____

Worksheet Booklet

Katoomba High School

Stage 5 (10A)



<u>Instructions</u>

- Complete all the sheets in this booklet
- Write in the space provided
- Hand booklet in to Deputy Principal

Great Scientists of Our Time: S. Hawkings

5

Stephen W. Hawkings (b.1942) is a world-renowned, British born, physicist. Extending the work of Albert Einstein, he continues to unravel many of the mysteries of our universe and his impact on the scientific world is remarkable. Hawkings was one of the first scientists to research *Cosmology*, the study of the cosmos, and his work led to a better understanding of our universe. In addition to lecturing he has written several books, including the international best-seller *A Brief History of Time*. His lectures on *Black Holes and Baby Universes* have also proven popular. Hawkings has been awarded numerous honorary degrees and tributes in addition to his impressive qualifications, yet without current biomedical technology, this brilliant mind would have been lost to the world.

Stephen Hawkings has *motor neurone disease*, a degenerative disease that results in loss of nerve function. No longer able to speak, confined to his wheelchair and in need of 24-hour assistance, Hawkings continues his research, for the disease does not impair the mind. Neurones are special cells that react to electrical, chemical or mechanical stimulus. The word *motor* suggests movement, and motor neurones lead to a reaction by nerves and nerve fibres in muscles and glands. Motor neurones act like highways that transmit information away from the main 'centres' – the brain and spinal cord – to muscles and glands.

Speech synthesisers are devices used to produce a 'voice' for people who undergo tracheotomy operations (*trachea* windpipe, *tomo/tomy* to cut). Hawkings uses a synthesiser, which is also designed to save his speech to disk, where it can later be printed out. Unfortunately motor neurone disease is fatal, but for as long as he is able, Stephen Hawkings, with the aid of biomedical devices ranging from electronic wheelchairs to speech synthesisers, will continue to enrich our world with the results of his efforts.

1 Stephen Hawkings is a theoretical physicist. Use a dictionary to describe the difference between a *theoretical* scientist and an *applied* (or *practical*) scientist.

_____

2 Write a definition for *degenerative disease*. _____

3 Stephen Hawkings underwent a tracheotomy after developing pneumonia. A more common cause for requiring the operation is smoking. Suggest why. _____

4 Give three examples of *biomedical* or *prosthetic* devices and their uses. _____

_____

5 Name one other high profile person (past or present) that benefited from using prosthetic devices. Describe the device used and the reason for its use.

_____

Let's think! Another neuron disease is named after a famous American baseball player, Lou Gehrig (1903–1941). *Lou Gehrig's Disease* is also called *ALS* or *amyotrophic lateral sclerosis*.

6 Use the terms below to write out a description of the disease. Note: in this case, *lateral* describes a position relative to the spinal cord.

sclerosis: degenerating tissue (relating to brain and spinal cord) *myo*: muscle

lateral: to emerge from the sides *a*: against *trophic*: muscle wasting, starvation

ALS:_____

7 Research challenge! Summarise how speech synthesisers operate and when they are required.

8 Research: Briefly describe some of the contributions to science made by Stephen Hawkings.

_____

Green approach to Indigenous diet

A remote community working with a major food retailer has developed an education and nutrition campaign it says the government could adopt as a template for resolving major Aboriginal health issues.

For 30 years, Olga Havnen, an Aarernte woman, has watched a cavalcade of health workers grapple with the issues facing indigenous health in the Northern Territory. She says few, if any, have produced significant change or had lasting success.

'[The] health profile of Indigenous people is bad across the country but it is particularly bad in remote areas,' Havnen says. 'What continues to strike me is there is a complete lack of infrastructure in Aboriginal communities that other Australians take for granted.'

She says decent housing, clean water, sanitation, essential services, such as pre-schools and access to primary health care, are either non-existent or minimal at best.

Poor living conditions and overcrowding have led to very low birth weights. 'Low birth weight is a precursor to chronic illness in later life such as kidney failure, diabetes and heart disease,' she says. 'These are preventable and avoidable illnesses.'

As head of the Fred Hollows Foundation's Indigenous Health Program, Havnen says the key to improving the situation is tackling the issues Aboriginal people have identified as being priorities.

She points to the foundation's work with the remote Jawoyn communities east of Katherine in the Northern Territory as an example.

In a community where diabetes affects one in every two adults, the Jawoyn were keen to focus the foundation's program on nutrition, food store management, financial literacy and education, to implement long-term health improvements.

'Aboriginal communities in this country have rates of malnutrition that are equivalent to Third World countries, which is bloody horrifying,' she says.

'Anyone who has been out to remote communities would know that access to decent food in community stores is lacking and the poor nutrition underpins the appalling health status of Indigenous people.'

After employing a full time nutritionist to work with families in the community, the next step was improving store management to ensure nutritious food, such as fresh fruit and vegetables, was available.

'Before this, locals had to take a $70 taxi ride into town to get supplies,' Havnen says.

With the support of Woolworths, experienced store manager Barry Orr worked for 12 months as mentor and adviser to local people and the store's committee.

Now, Aboriginal woman Caroline Wurrben is employed as the full time manager of the Beswick store which for the first time is operating at a profit and boasts refrigerated display units packed with fresh meat, fruit and vegetables.

'This project demonstrates how the corporate sector can provide professional and technical support which has been so sadly lacking in indigenous communities,' Havnen says.

'If you provide the right kind of support in true partnership with Aboriginal people, you can have this amazing turnaround from a sense of despair in a short space of time to people regaining hope.'

The Jawoyn people are now targeting literacy and education in their campaign for better health standards. 'There is a clear link between education and health outcomes,' Havnen says. 'We [the foundation] have only a limited capacity, there's more that needs to be done.'

Havnen believes the Beswick store project can serve as an example to government agencies of what is possible if a similar approach is used in other regions where it is desperately needed.

Source: V. Wilson, 'Green approach to Indigenous diet,' *Sydney Morning Herald*, 25 March 2004, p. 8.

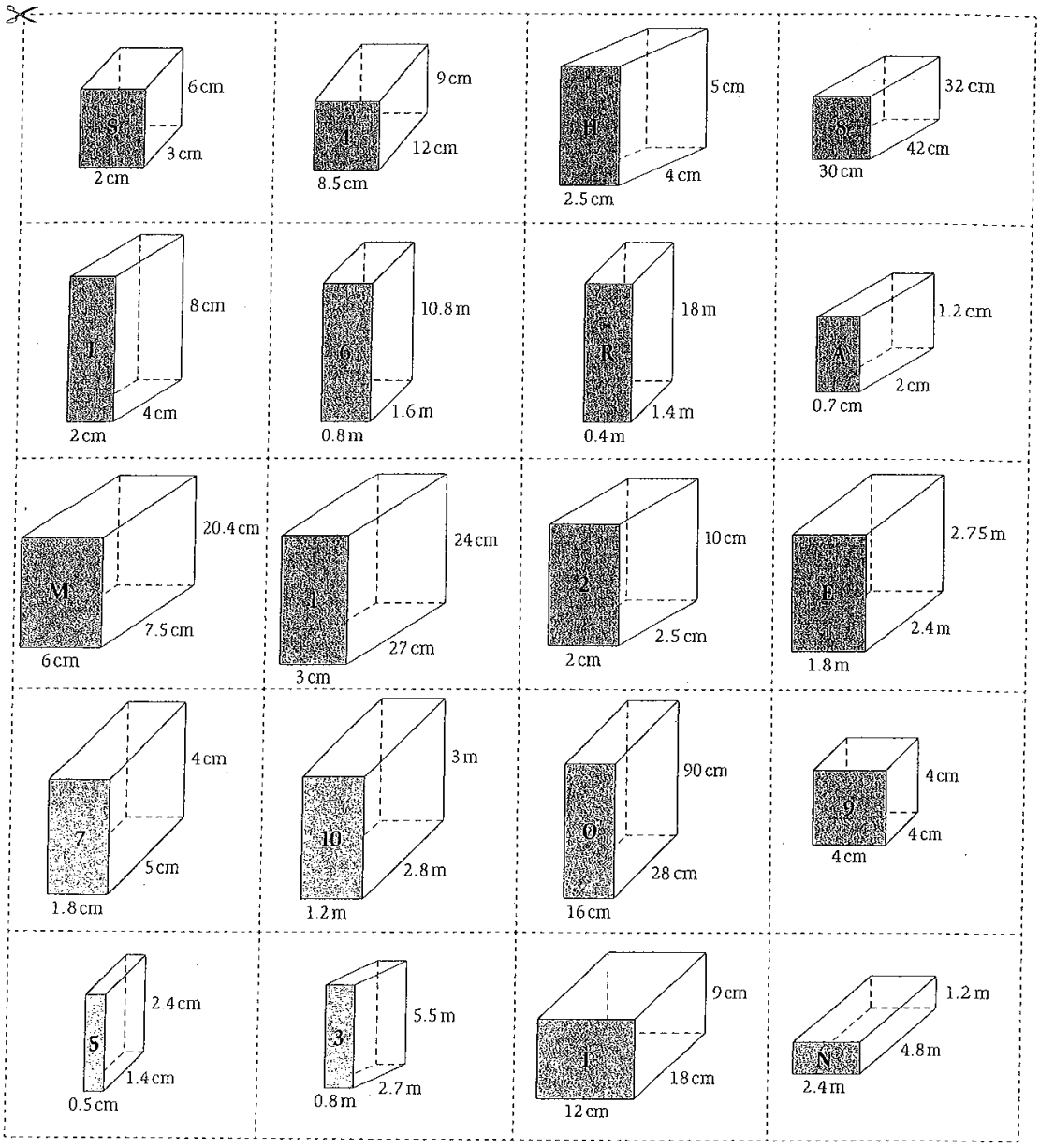
Volume

A man walks in the rain for an hour without an umbrella. His hair did not get wet. Why?

Equipment: scissors and glue

Calculate the volume of each shape. Cut out the cards then match two shapes that have equal volume and glue them side by side in your workbook. Record the shape letter with the number in the code box below to solve the riddle.

1	2	3	4	5	6	7	8	9	10



snapSHOT

Risk taking in adolescence

Taking increasing risk is part of growing up and becoming an adult.

Risk taking in adolescence is not only normal, it is an essential part of learning and personal development. Taking risks is part of the assertion of independence and self-testing behaviour that every healthy teenager goes through. Most developmental psychologists agree that if there is no risk, there is no growth.

Although risk taking is exploratory, some adolescents will be motivated by poor self-esteem and lack of confidence. Impulsive behaviour and recklessness are strategies used by some adolescents to gain the approval of their peers. The main problem for young people is their seeming inability to evaluate the potential risks and consequences of everyday behaviour. Sixty per cent of adolescent deaths are caused by accidents — many of these are the result of risk taking.

Thrill seeking, the desire to impress friends, feelings of invincibility and the search for new experiences are all motivating forces that drive many teenagers to act without concern for the consequences or without even being able to fully evaluate the potential risks. If a teenager engages in risky behaviour and doesn't suffer the expected consequences, for example, they are likely to deduce that the behaviour is not risky at all and that adult evaluations cannot be trusted.

This is often the case with drug and alcohol use. Teenagers don't see drinking, drug use and driving as potentially risky in the same way as adults. For them, the risk is in social rejection — not being seen as cool — if they don't do what their friends are doing ...

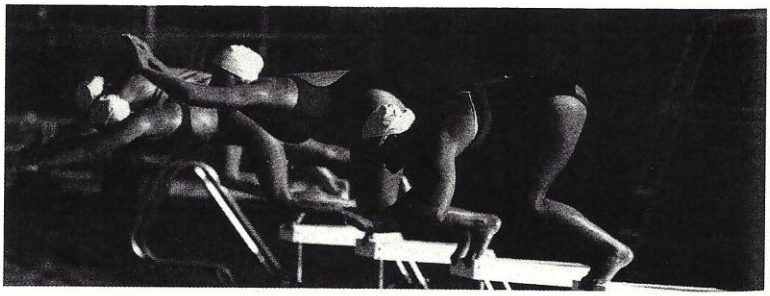
Sometimes one risky choice can lead to others. Drinking alcohol, for example, to intoxication will impair judgement and may result in unwanted sexual activity or violence that would otherwise have been avoided ...

Families, schools and the community have an important role to play in supporting young people to be happy and socially connected, to provide opportunities and challenges which will encourage responsible choices. For young people, regardless of the enticement, the thrill and the risk, there is always a choice and ultimately it is theirs to make.

Source: ABC Online 2001, 'Risk seminars — risk taking in adolescence', www.abc.net.au/northcoast/stories/~419571.htm (accessed 4 June 2004).

Questions

1. Summarise the writer's views on risk taking in adolescence.
2. Identify, from the reasons presented, why young people take risks.
3. Why do you think adults and adolescents have different views on risk taking?
4. Give examples of how one risky choice can lead to others.



Young people have some responsibility in determining their level of health. Keeping active by belonging to a swimming club, for example, can benefit both physical and social health.

Coaching Roles and Responsibilities - continued

Instruction and Training

Complete the cloze passage using the words listed below.

Word bank

strengths	equipment
facilities	communicating
tactics	interpersonal
session	body
excellence	motivate
athletes	drills
feedback	experience
perfection	

A coach should aim to encourage _____, but should not expect _____. They should aim to be aware of the individual and group needs of their athletes, create trust, command respect and _____, and inspire their athletes to perform to the best of their ability.

When _____, coaches should aim to keep their messages concise and precise and then check that their athletes have received the same message as the one they think they are communicating. Communication is not just verbal – _____ language plays a large part of a coach's style, particularly when players are on the court or field or if the coach does not wish the opposition to hear _____.

Coaches should consider how their _____ respond to particular instructions and training. Coaches may look at the athletes and determine `What are their goals?', `Is it realistic for them to achieve these goals?' and `What can I do to help them attain these goals?'.

Apart from the athlete, the actual coaching _____ should also be assessed for the future. Some of the points to consider for assessment include safety, communication and _____ skills used, long and short-term goals, future training session content and structure, and the knowledge and _____ of the athletes.

In terms of safety, coaches are responsible for a number of areas, including checking _____ for safety, using appropriate _____ for the level of athlete, the health of their athletes and providing a clear plan for the session.

The session itself should involve the coach giving clear instructions and advice, providing positive _____ and appropriate corrective action, appropriate demonstrations, opportunities for athletes to asks clarifying questions, opportunities for all athletes to challenge themselves and participate in learning new skills and _____ and the use of feedback (from the coach and athletes) on the _____ and weaknesses of the performance.

EXERCISE

15 Interpreting a Graph

Objectives

To improve skills in

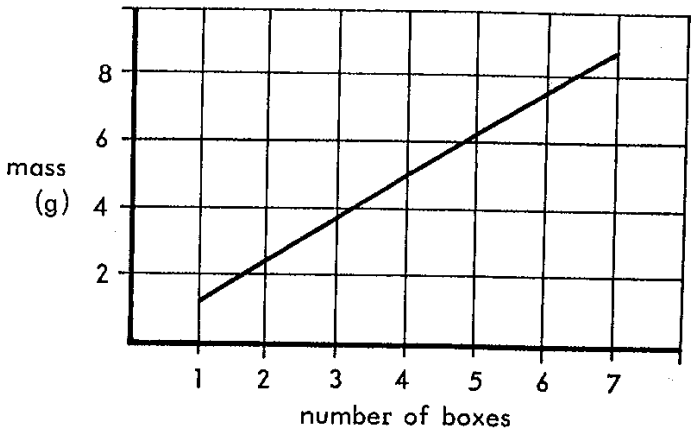
- interpreting line, bar, pie and column graphs
- interpolating information from a line and bar graph
- extrapolating information from a line graph
- using a diagrammatic key
- constructing a line, bar, pie and column graphs
- transposing information from one form to another

Instructions

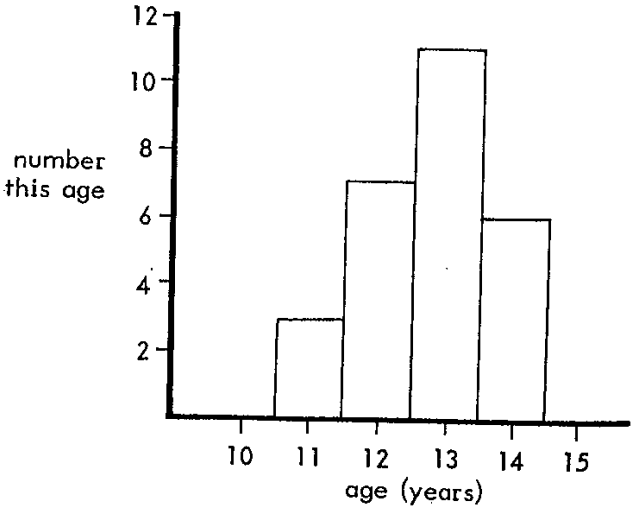
Answer each of the questions below.

Questions

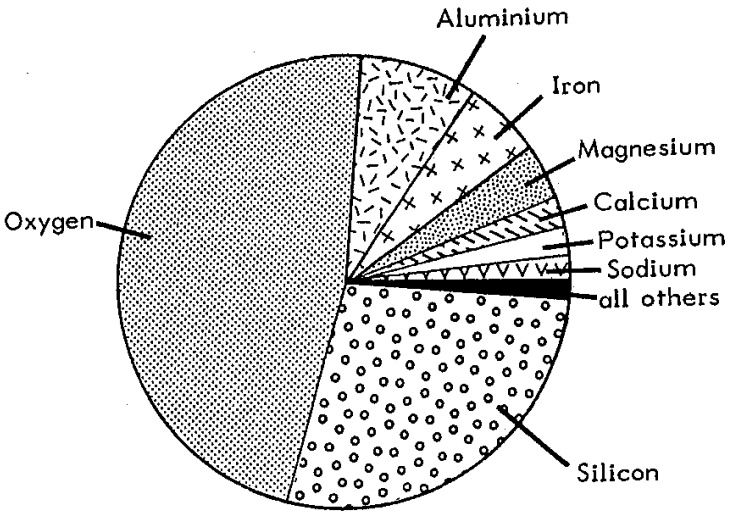
1. The graph (right) shows the reading on a balance which contains various numbers of small identical boxes.
   (a) What would be the mass of 9 boxes?
   (b) If 3 more boxes were added to a balance which contained 8 boxes, what would the balance read?
   (c) If 3 boxes were removed from a balance which had 8 boxes on it, what would the balance read?
   (d) What is the mass of one box?



2. The graph (right) shows the ages of several students.
   (a) How many students aged 13 are represented by the graph?
   (b) How many students in total are represented by the graph?
   (c) What is the average age of the students? (Show your working.)
   (d) How many students are younger than average?
   (e) Construct a similar graph to show the ages of the students in your class.



3. The graph (right) shows the relative amounts of the main elements which make up the earth's crust.



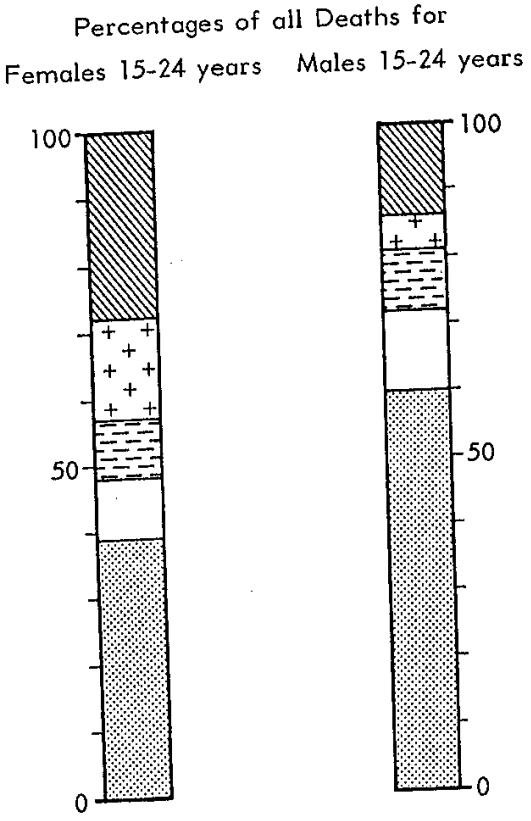
(a) (i) What is the most common element in the earth's crust?
(ii) How much of the earth's crust is taken up by this element?

(b) What percentage of the crust is:
(i) silicon?
(ii) aluminium?
(iii) iron?

(c) The planet Xenos is also made up of the same elements, but in different proportions. The main elements on Xenos, and their percentages are: oxygen (50%), silicon (20%), aluminium (10%), iron (5%), calcium (4%), sodium (3%), potassium (3%), magnesium (2%), others (3%).

Draw line, bar, pie and column graphs to show the composition of the crust on Xenos. Include a key to identify each element.

4. The column graphs (right) show how various causes contribute to the deaths of females and males aged 15–24 years.



(a) What is the major cause of death for these:
(i) females?
(ii) males?

(b) What is the least frequent cause of death for these:
(i) females?
(ii) males?

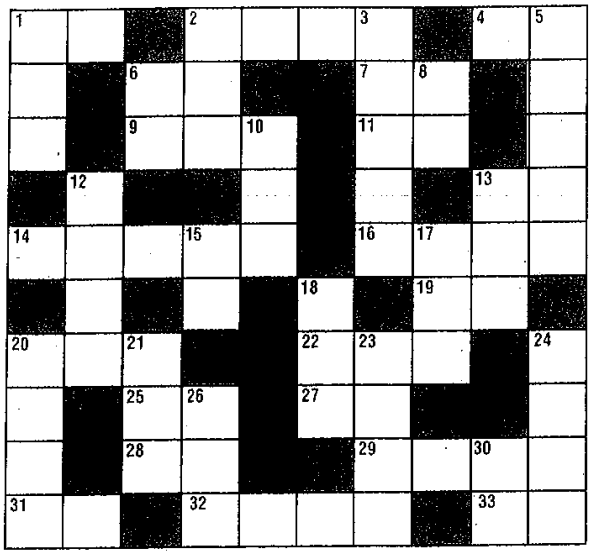
(c) Compare the number of females and males aged 15–24 years who die from some form of cancer.

(d) Put the information from the column graph into:
(i) a table (ii) a histogram
(iii) a pie graph

KEY
Car accidents
Other accidents
Suicide
Cancer
All other causes

29

Worksheet 1-13 Cross number puzzle



Clues across

1 $2 \times 2 \times 3 \times 3$

2 $10 \times 10 \times 10 + 1$

4 Seven times six divided by two

6 $768 \div 12$

7 $3 \times 3 \times 3$

9 $213 + 2 + 127$

11 $6805 - 6773$

13 $100 - 16$

14 Eleven thousand and eleven plus one hundred and forty-four

16 $10\,000 - 4765$

19 $891 \div 11$

20 Four hundred and forty-four

22 $200 - 2$

25 $4100 \div 100$

27 7^2

28 Number of eggs in a dozen

29 Largest number using 6, 8, 9, 7

31 3×6

32 $1300 - 81$

33 $3\,000\,000 \div 100\,000$

Clues down

1 Days in a leap year

2 12×12

3 Smallest number using 3, 2, 4, 1, 5

5 Counting numbers between 0 and 6

6 $3 \times 3 \times 7$

8 9×8

10 $600 - 365$

12 $4496 \div 4$

13 $8 \times 100 + 3 \times 10 + 1$

15 $2 \times 3 \times 3 \times 3$

17 144×2

18 $2 + 2 + 8 + 9 + 32 + 25 + 36$

20 $45\,001 \div 11$

21 147×3

23 $10\,000 - 1$

24 $8800 \div 5$

26 $3025 \div 25$

30 $7 \times 9 + 10$

Adopting a healthy approach

Steps taken by a group of local high school students to enrich the wellbeing of their peers have been acknowledged this week, with the creation of a unique three-way partnership.

Staff from the Griffith Community Health Centre and students from Griffith and Wade high schools are the key players in the Youth Friendly Working Party initiative, which seeks to make community health more appealing and accessible to Griffith's young.

The alliance was officially sealed on Monday, when parties gathered at the Yambil Street health centre to sign a Memorandum of Understanding, which details the aims, principles, strategies and success measures of the project.

Greater Murray Area Health Service's (GMAHS) health promotion manager Deanne Drage said the occasion symbolised the beginning of 'some truly great things to come'.

'Fundamentally, health services need to pay particular attention to those most at risk,' she said.

'It is widely recognised that young people are one of those most at risk and that investment in the health of young people is central to the attainment of better health and quality of life in adulthood. This (project) is about prevention.'

The local Youth Friendly Working Party was born out of the Mobile Youth Information Service, a two-year pilot project funded by New South Wales Health.

The scheme aimed to bring youth and service providers together to address the needs of young people and to empower and promote their voice in the community.

According to 15-year-old Wade High School student and working party member Tynille Catanzariti, it seems to be working.

Over the past four months, the group has taken a number of forward steps in raising the profile of the Community Health Centre to the city's younger residents.

A PowerPoint presentation, designed to inform students about relevant health services, is also on the verge of completion.

'We started off with nothing and it's all coming together,' Tynille said.

'We've made things actually happen. What we're doing is raising awareness to the youth and saying: "Hey, this is where the community health centre is, this is what it's for — use it".'

The Youth Friendly Services project has since won NSW Health funding for an additional two years and a project coordinator is set to be appointed early next year.

Working towards positive health outcomes

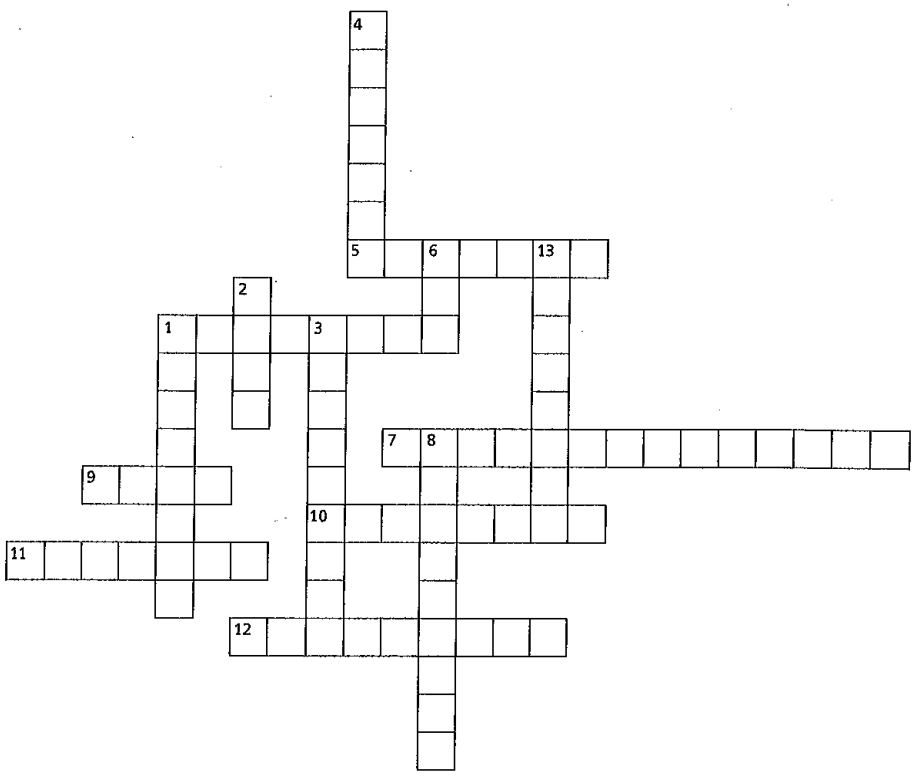
Source: L. McCalman, 'Adopting a healthy approach', *Griffith Area News*, 10 September 2003.

Questions

1. Explain why this article is an example of community empowerment.
2. Identify and explain the strategies adopted.
3. How does this initiative support the health of young people in the area?

17 The Wonderful World of Animals!

Crossword Puzzle



ACROSS

1 Organism that obtains food by reducing the fitness of a living host
5 Term for dead animals
7 Process by which vegetation converts radiant energy into food
9 No longer alive
10 Some organisms, such as legumes, 'fix' this element in soils
11 Also known as saprophyte, a plant-like organism that eats dead and decaying organic matter
12 Means 'meat eater'

DOWN

1 Any animal that hunts and kills another
2 Term for an organism killed and eaten by another
3 An organism that cleans the environment by eating any dead or dying animals (e.g. Tasmanian Devil)
4 Environmental feature not arising by the presence of living organisms (e.g. climate)
6 The eggs of fishes are collectively called _____
8 An organism that eats only vegetation
13 Something that eats both plants and animals

ABIOTIC	PHOTOSYNTHESIS	CARRION	CARNIVORE	HERBIVORE	OMNIVORE	ROE
SAPROBE	SCAVENGER	PARASITE	PREY	PREDATOR	NITROGEN	DEAD

From the choice of creatures listed below, choose the correct nine to fit the descriptions given.

BUTTERFLY	SLOTH	BAT	MOSQUITO	CHEETAH	OCTOPUS
HUMMINGBIRD	GORILLA	STARFISH	GIRAFFE	WASP	SPARROW

Descriptions

Briefly described... *I am a ...*

14 I have fingers as long as my body. _____

15 I throw ink when I am afraid. _____

16 It's a good thing I'm small, because I'm rather bad-tempered. _____

17 I'm a headless creature with many arms! _____

18 I'm an insect. We females bite but once, to nourish our eggs. _____

19 Fur and claws more canine than feline, yet I am a cat. _____

20 I can barely see, hear or smell. I have large claws to hang myself up in the trees and when I walk, I do so on the backs of my feet! _____

21 I have no vocal chords and a blue tongue. I can pop my eyes out a bit to see behind without having to turn my head. _____

22 It has been said that I inspired the helicopter. My tiny feet are poorly developed, but I am the only bird that can fly backwards! _____

Terms

23 Many terms are used when referring to animals. Write the missing vowels in the words below, then match them with their meanings.

____V____ ____N	D R____M____D____R Y
C ____N____N____	B____V____N____
F____L____N____	R____P T____L____ ____N
P____S C____N____	____P T____R____ ____S

Refers to...

24 Flightless birds (without wings) _____

25 Snakes, lizards, crocodiles, etc _____

26 Cats _____

27 Cows and bulls _____

28 Birds _____

29 Fish _____

30 Camels _____

JEST FOOLING

Following the sequence of ordered pairs below, connect the corresponding points on the graph on page 25. When you reach the word STOP, lift your pencil and start again on the next point in the sequence.

(5, 2)
(5, 8)
(11, 8)
(11, 3)
(5, 3)
STOP

(3, 1)
(13, 1)
(13, 17)
(15, 17)
(16, 18)
(14, 20)
(11, 18)
(11, 8)
STOP

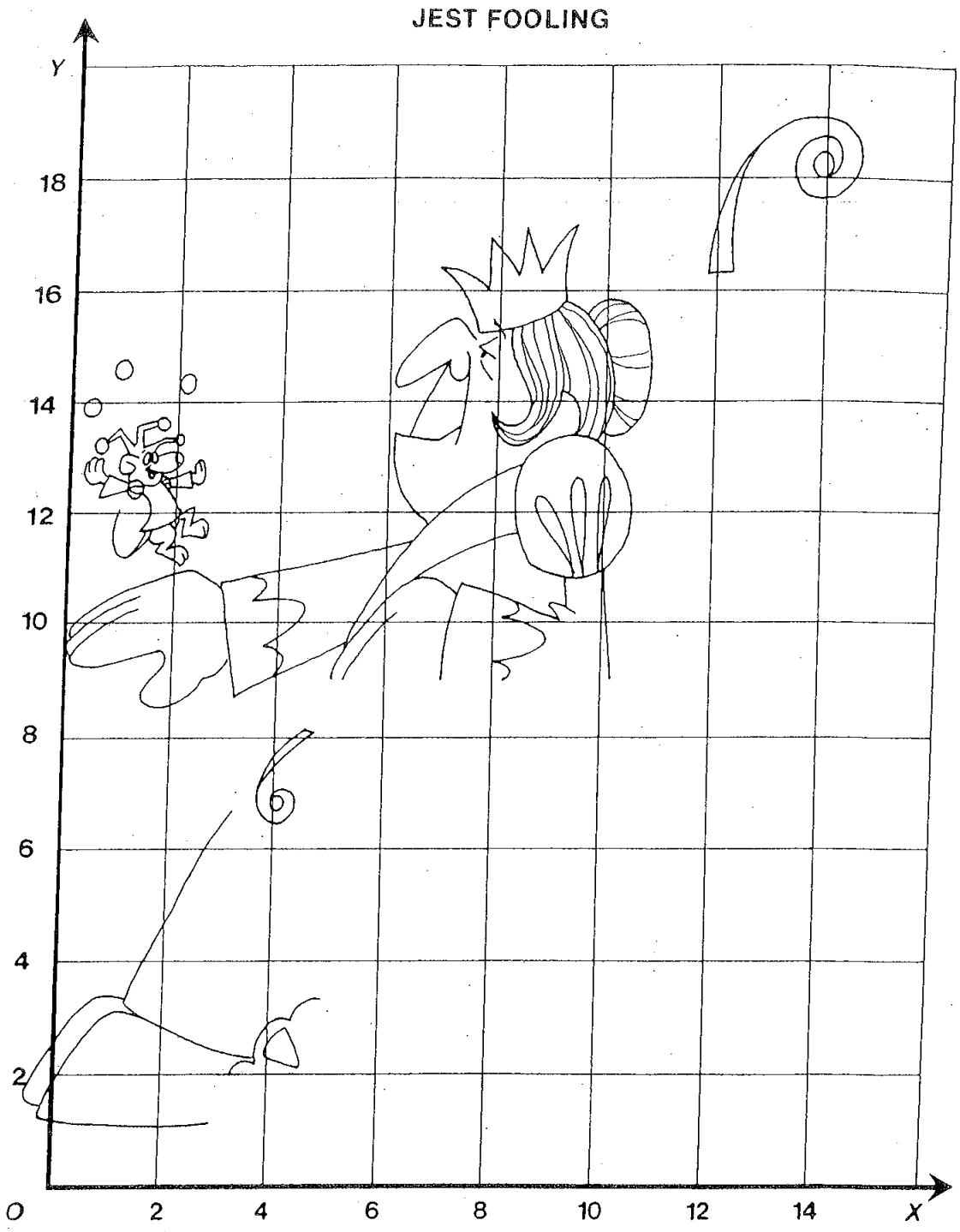
(11, 9)
(5, 9)
(3, 7)
(4, 6)
(5, 6)
STOP

(13, 2)
(3, 2)
(3, 1)
STOP

(5, 7)
(11, 7)
STOP

(7, 3)
(7, 7)
STOP

(9, 3)
(9, 7)
STOP


JEST FOOLING
Y
18
16
14
12
10
8
6
4
2
O
2
4
6
8
10
12
14
X

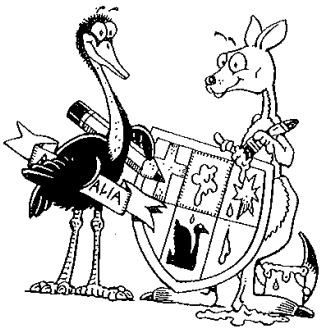
Expressing one quantity as a percentage of another

Why are the emu and the kangaroo on the Australian coat of arms?

Calculate the answers to the problems, then match the letters in the question boxes to the numbers in the code box to solve the riddle. Give your answer to one decimal place if necessary.

There are 10 girls in a maths class of 25. Express as a percentage of the whole class. **T**

At a table of 12 chairs, 3 have cushions. Express this as a percentage of all the chairs. **C**



Ben kicked 18 of his football team's 24 goals. What percentage of the goals did he kick? **L**

In the park, 3 of the 10 dogs have black spots. What percentage of the dogs have black spots? **S**

Children are using 2 of the 3 swings in the playground. What percentage of swings are in use? **A**

There are 15 boys in a maths class of 25. Express this as a percentage of the whole class. **O**

Jen planted 16 plants. Two have yellow flowers, the rest are pink. What percentage of the plants have pink flowers? **D**

Six of the thirty students have blue eyes. Express this as a percentage of the whole class. **H**

At the RSPCA, 3 of the 10 cats have black stripes. What percentage of the cats do not have black stripes? **Y**

At a table of 12 chairs, 4 have wobbly legs. Express this as a percentage of all the chairs. **E**

Sally scored 15 of her netball team's 30 goals. What percentage of the goals did she score? **W**

Of the 50 clowns in a circus, 13 have purple hair. Express this as a percentage of all the clowns. **N**

Eight of the ten people surveyed said they liked chocolate. Express this as a percentage. **R**

In a class of 25, 7 students forgot their calculators. Express this as a percentage. **B**

Paul has 10 jumpers, 9 of which are blue. What percentage of his jumpers are blue? **K**

40%	20%	33.3%	70%

25%	66.7%	26%	26%	60%	40%

50%	66.7%	75%	90%

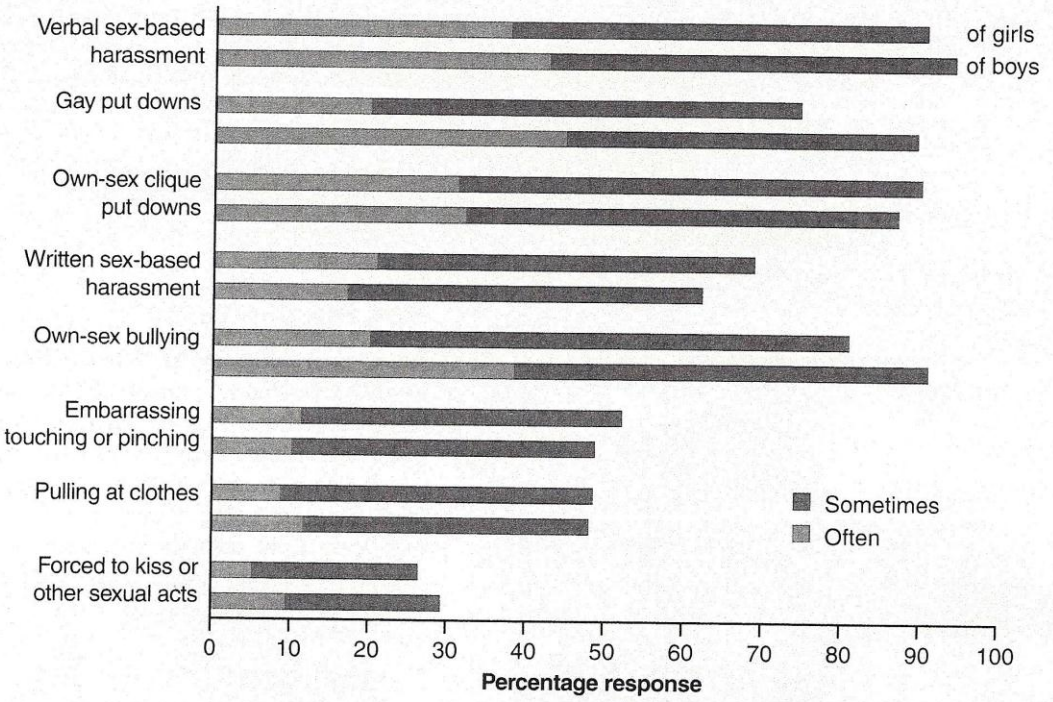
28%	66.7%	25%	90%	50%	66.7%	80%	87.5%	30%

snapSHOT

Gender and sex-based harassment

A research project into gender and school education found that in secondary schools, verbal sex-based harassment was often happening. In secondary schools, homophobic verbal bullying was a major aspect of sex-based harassment. Gayness was used as an insult. It also found that the victims of verbal sex-based harassment were just as likely to be boys as girls. Written sex-based harassment was common and directed mainly at girls (for example, in notes or on toilet walls).

While some girls were involved in sex-based harassment, research suggests that those who harass both boys and girls are predominantly boys.



Students' perceptions of the prevalence of sex-based harassment: girls' perceptions of harassment of girls, and boys' perceptions of harassment of boys

Source: C. Collins, M. Batten, J. Ainley & C. Getty 'Students' views: policy and management issues', in *Gender and school education*, Australian Council for Educational Research, Canberra, 1996 p. 25.

Questions

1. Do you think sex-based harassment is common in your school? Explain.
2. Give reasons why young people use verbal sex-based harassment.
3. Why are boys the main perpetrators of sex-based harassment?
4. According to the graph, what type of sex-based harassment do boys perceive as the most common and what type do girls perceive as the most common?
5. How do boys' beliefs about what it means to be a 'real male' have an impact on the incidence of sex-based harassment?
6. Explain the influence of gender stereotypes on sex-based harassment.
7. Is there an abuse of power in situations of sex-based harassment?
8. Why is sex-based harassment harmful to both males and females?