

# Gorokan High School Workbook



## YEAR 9

### BOOKLET 2

**Maths, English, Science, PDHPE**







# ENGLISH

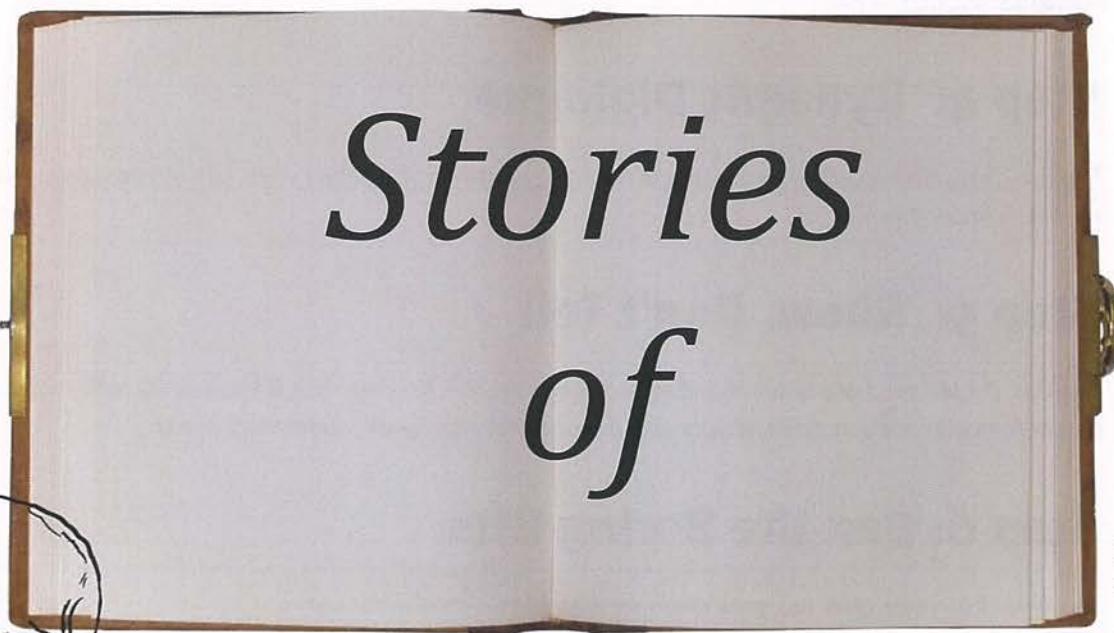




Writing Stories of Suspense



# *Reading &*



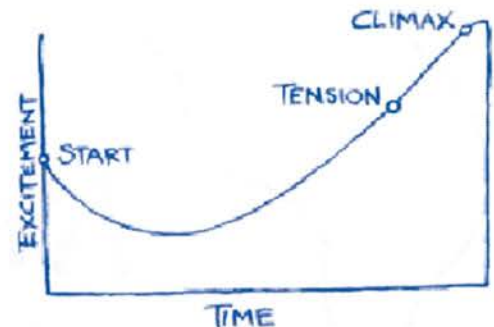
## Writing Stories of Suspense

### The Seven Steps to Super Stories

Anyone can write a successful story! You just need to follow these seven simple steps:

#### Step 1: Plan for Success

**Top Tip:** A joke, a movie, a TV sitcom, a book and a great story - what do they all have in common? They all follow the same 'story graph'. Start with a bang, slowly build up the tension and end on a real high point.



#### Step 2: Sizzling Starts

**Top Tip:** Start where the action is. Not at the beginning of the day where nothing is happening. Begin when the volcano starts oozing lava or as you walk in the door to the big disco competition.

#### Step 3: Tightening Tension

**Top Tip:** You must believe the hero (male or female) will fail. The tornado is too strong, the villain is too evil, the black forces of depression are too overwhelming. Yet, through strength, talent and determination, somehow our hero wins.

#### Step 4: Dynamic Dialogue

**Top Tip:** Think of dialogue as a mini play in the story. Let your characters walk, talk or even stalk - that's how we get to know them.

#### Step 5: Show, Don't Tell

**Top Tip:** If I tell you I am generous, do you believe me??? No way. But if I buy all 20 raffle tickets to help cancer research, are you more convinced? Actions really do speak louder than words.

#### Step 6: Ban the Boring Bits

**Top Tip:** Everyone gets up, gets dressed, travels to school...it's not exciting. So why write about it? Ban all mention of the 'boring B' words - beds, breakfast and bus trips. Think like the movies, the heroes never travel, they just arrive...

#### Step 7: Exciting Endings

**Top Tip:** Would you tell a joke without knowing the punch line? If you want to build to a big climax you have to know where you are heading.

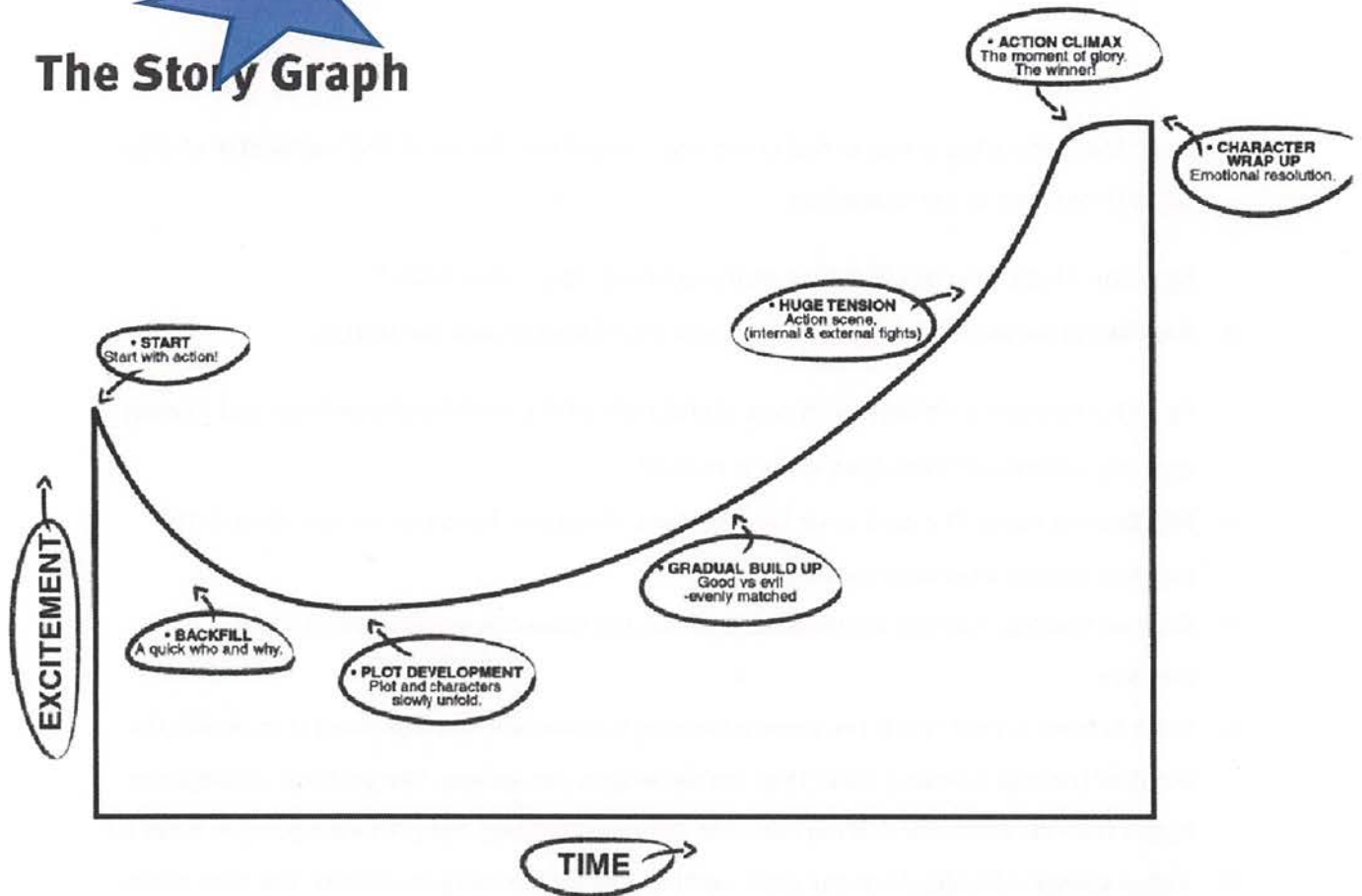


Step 1

Writing Stories of Suspense

Step 1: Plan for Success

# The Story Graph



An excellent way to plan your story is to use the story graph.

## Writing Stories of Suspense

- ? **Start:** Start where the action is. Not at the beginning of the day but at the 'moment of change' when things start to get interesting.

Eg. "Don't look now but there's a bull breathing down your back."

- ? **Backfill:** Fill the audience in very briefly about the characters and the setting.

Eg. "The Heavenly Holiday farm was slightly left of the middle of nowhere and I swear only my parents and the flies knew it existed."

- ? **Plot Development:** The problem is identified and the other characters are introduced. The problem may be internal or external.

- ? **Gradual Buildup:** The plot continues to develop, the character works towards solving the problem.

- ? **Huge Tension Scene:** This is the scene where the heroine only has five minutes to disarm the bomb or the ship is sinking faster than the passengers can escape. The problem should seem bigger than the character and the audience should be thinking 'they're never going to make it!'

- ? **Action Climax:** This should be the most exciting point of the story-the climax. The hero comes out a winner (or sometimes a loser ☹)

- ? **Character Wrap up:** The climax is usually all action but sometimes there is a final scene where the characters resolve the emotional side of the story. The guy gets the girl, the star footy player thanks the coach, etc.

### ⑨ Activity:

Draw a blank story graph (you can trace the one on the previous page) and use it to plan a story. Plot a few points for each section.

#### Some suggested titles:

- The most embarrassing moment of my short life
- The last day of Winter
- Shocked!
- Mum was so proud

## Writing Stories of Suspense

There are several ways to create suspense in a story. One way is to use foreshadowing, which is a hint or clue that suggests what might happen later in the story.

Another way is to use cliffhangers, which are moments of high tension or drama that leave the reader wanting to know what happens next.

Finally, you can create suspense by withholding information from the reader, only revealing it at key moments in the story.

By using these techniques, you can create a story that keeps the reader engaged and guessing until the very end.

One of the most effective ways to create suspense is by using a combination of these techniques. For example, you can use foreshadowing to hint at a future event, then use a cliffhanger to leave the reader hanging, and finally reveal the outcome of the event at the end of the story.

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## Writing Stories of Suspense

Ok so if you're not into graphs, another way you can effectively plan your story before you begin writing is to write a few dot points to the questions below:

1. Your story has to start with action!

-Where will the start of your story take place?

-What will be happening?

2. Backfill. No boring info please, just the vital who, what and why.

3. What is the main problem/conflict in your story?
- 

4. Things get very bad, the problem/conflict escalates. How?

5. What happens in the tension scene? Build the excitement by making your character really suffer or scared.p

6. The Climax. Amazingly they win! (or tragically they lose 😞 )How? What are their rewards?  
How do they feel?

## Writing Stories of Suspense

**Tip: You need to know how you are going to end your story before you begin writing!**



### **Step 2: Sizzling Starts:**

A great beginning should instantly grab a reader's attention and make them want to keep reading. There are lots of ways to create sizzling starts, here are 5 suggestions:

#### **Start with a bang!**

I wondered why the baseball was getting bigger. Then it hit me.

#### **Make the reader curious**

Let me explain about the divorce, the beach house and the bacon.

#### **Create a moment of change**

Everything was going well until my mum said "we're moving to India...and Dad's not coming."

#### **Use humour**

#### **Use Dialogue**

"It's just a rat," I whispered, my breathing ragged.

Mike gripped my arm with frozen fingers, "Rats don't growl"

### **⑨ Activity: Quick Starts**

Write the opening paragraph for each of the following story ideas. You don't have to write the whole story just a sizzling start! You only have one minute for each. Ready. Set. Go!

- ❑ A ghost story starring a three-legged dog
- ❑ There's a plant in the lounge room that is growing very fast. It eats ants and beetles and now the cat is getting scared.
- ❑ A man dies wearing purple but he hates the colour purple.
- ❑ She's a sophisticated, elegant fashion model...with a dog that farts.

## Writing Stories of Suspense

**9 Activity: Very BAD beginnings!**

- Brainstorm what makes a bad beginning (eg. Clichés, over-describing, etc.)
- Using the ideas you brainstormed, write a VERY BAD beginning. Have fun with this! Read your bad beginnings out to the class and then solemnly promise me that you will NEVER write this badly again!!







### Step 3: Tightening Tension

To create tension in your writing you must make the reader feel like they are involved in the action. An effective way of creating tension is to use **sensory imagery**.

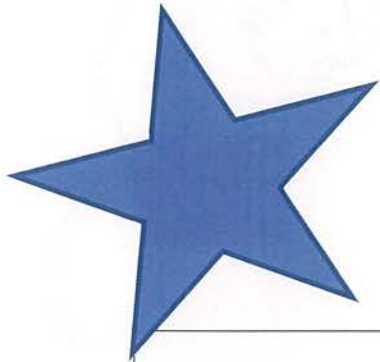
Sensory imagery describes a scene using references to all the senses-what you can see, hear, taste, touch and smell as well as what you feel emotionally.

### 9 Activity: Creating Sensory Imagery

- 2 Choose one of the settings below and list all the things you could see, hear, taste, touch, smell and feel if you were experiencing the setting.
- A bushfire
  - A storm
  - A surf competition
  - A city street

Setting:					
What can you See? 	What can you hear? 	What can you touch? 	What can you taste? 	What can you smell? 	How do you feel? 

## Writing Stories of Suspense



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- 7 Write a descriptive paragraph detailing the setting you chose. Try and incorporate poetic techniques such as similes and metaphors into your sensory imagery.

### Step 4

#### Step 4: Dynamic Dialogue

Dialogue has three functions:

1. To reveal character
2. To move the plot forward
3. To make a scene more dramatic

→ Choose one of the following emotions and settings. Write a conversation between two characters to reveal the emotion and setting without explicitly naming them. Read out to the class to see if they can guess the emotion and setting.

#### Emotions:

- \*Depressed
- \*Love
- \*Frightened
- \*Nasty
- \*Jealous
- \*Angry

#### Setting:

- \*The beach
- \*A cubby house
- \*On a bus
- \*At a disco
- \*A family reunion
- \*Under the bed

## Writing Stories of Suspense

\*Excited

\*In a spaceship

Eg. **Nasty** at a family reunion:

"Hey Aunt Sue have you seen Albert?"

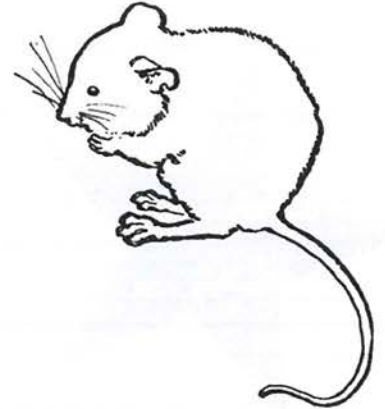
"Who's Albert?"

"You know my pet mouse, he's missing and I'm really worried."

"I haven't seen your dirty mouse, now beat it."

(Nephew leaves dejected. Auntie pulls mouse from her pocket, grins evilly then calls...)

"Here Kitty, Kitty, Kitty."



1. Try writing 2 more conversations using the same setting but different emotions.
2. Use the conversation you like the best as the basis for a short story.

### Step 5

**Tip: Remember to use correct punctuation when writing dialogue and begin a new line when each new character talks.**

#### Step 5: Show Don't Tell

What do these ideas reveal about the character?

- The woman with sagging shoulders and a toddler tugging at her skirt.
- The man rubbing the back of his neck.
- The girls talking to the boy and playing with her hair.

Describing or 'showing' something in creative writing is a lot more effective than simply telling the reader what is happening.

Eg **Telling:**

Cassandra the model was really tall and really stuck-up.

**Showing:**

Cassandra strutted up the driveway like the world was her catwalk. I rushed to the door and greeted her excitedly.

"Hi," she said flatly, checking out my outfit with a mixed look of boredom and disgust, "Vinnies having a sale are they?" She pushed past me into the hallway and did the model slow-



## Writing Stories of Suspense

motion walk to the nearest chair dramatically ducking her head under the light as if she would hit it. Ok yes she's tall but trust me, she's not that tall.

It takes longer to show not tell but the writing is so much more convincing and engaging!

The following activities will help you effectively show not tell.

### ⑨ Activity: Key Words

📝 Write a paragraph for each of the following ideas but do not use the underlined words.

\*I hate PE!

\*My little sister is soooo annoying

\*Thunder storms scare me

\*Today I'm craving chocolate cake

## Writing Stories of Suspense



### Activity: Showing not telling Feelings


What happens when you feel...



<b>Frightened</b>	<b>Embarrassed</b>	<b>Sad</b>
<b>Excited</b>	<b>Nervous</b>	<b>Happy</b>
<b>Shy</b>	<b>Shocked</b>	<b>Tired</b>
<b>Angry</b>	<b>Cold</b>	<b>Pain</b>
<b>Hungry</b>	<b>Jealous</b>	<b>Hot</b>

Write a paragraph incorporating one of the feelings above -Show don't tell!

## Writing Stories of Suspense



### Step 6

#### Step 6: Ban the Boring Bits!

Try to avoid: 'One day...'

'Beep, beep, beep, my alarm went

off...'

'And then...'

'I started...'

Everybody wakes up in the morning, gets dressed, brushes their hair and spends a lot of time travelling. It's a part of life but it's boring!! Try to avoid writing about these situations unless something abnormal and engaging happens as you are eating breakfast. If there are parts of your story that are boring or don't move the plot forward, scrap them!

#### 🕒 Activity: Editing out the boring bits (beds, breakfast, bathroom, buses...)


- 📝 Using everything we have learnt so far, rewrite the following passage to make it more interesting:

**(Make sure your rewrite includes an action beginning, backfill, dialogue, tension, sensory imagery and poetic devices such as similes and metaphors.)**

I woke up that morning, got out of bed and raced down the stairs. I stuffed my face full of cereal and then had three bits of toast and jam. Mum had two cups of coffee and more toast. Then we got into the car and drove through five sets of traffic lights towards the shopping centre but I needed to go to the toilet in a hurry so Mum did a U-turn and found the first available public toilet. I washed my hands before heading back to mum in the parked car. I opened the door and climbed in. Mum had the radio on and the newsreader was droning on about a fire. And then Mum gasped and looked down at me with a tear in her eye, "The shopping centre has burnt down!"

## Writing Stories of Suspense

### Step 7: Exciting Endings



Step 7

**You must know how your story is going to end before you begin writing!**

“Start at the end!! It’s too easy to write the first chapter and get stuck-but if you write the ending first you need to know who and what you are writing about.” –Jackie French-

#### ⑨Activity: The final sentence.

- ❑ Choose one of these final lines and create a story graph to plot the rest of the narrative.

\*Dad never found out about Davey the Dragon. I sure wasn’t going to tell him.

\*I walk to school now, it’s safer that way.

\*She reached out caught the bubbles in her hand and laughed.

\*I’ll never ever say sorry.

- ❑ Write a sizzling start for the story you plotted.

#### ⑨Activity: An exciting ending

- ❑ Choose one of the situations below and write an exciting ending for the story. You should aim to write 3 or 4 paragraphs. Remember to use sensory imagery and dialogue.

\*The light is fading on the mountain side and the fog is getting thicker when one climber breaks his leg...

\*A group is trapped in a cellar with a locked door and no window...

\*Two characters are in the middle of the ocean in a small boat with a big leak and a broken motor...

\*It is the final minutes of a grand final and the team needs two pints to win...

**Never, ever, ever use the “I woke up and it was just a dream ending! It is clichéd and tacky and makes a reader feel ripped off! It may have worked in *The Wizard of Oz* but it hasn’t worked since!!**

## Writing Stories of Suspense

The first step in writing a story of suspense is to create a strong premise. This involves identifying a central conflict or mystery that will drive the plot forward. The premise should be intriguing and raise questions that the reader will want to see answered. Once the premise is established, the next step is to develop the characters. Characters should be well-defined and have clear motivations. The protagonist should be someone who is capable of taking action and solving the mystery. The antagonist should be a formidable force that the protagonist must overcome. The setting should be carefully chosen to enhance the mood and atmosphere of the story. A dark, isolated location can create a sense of unease and tension. The plot should be carefully constructed to build suspense. It should start with a hook that draws the reader in, followed by a series of events that escalate the conflict. The story should have a clear beginning, middle, and end. The ending should provide a satisfying resolution to the mystery while leaving room for the reader to imagine what might happen next. Throughout the story, the writer should use descriptive language to create a vivid picture of the events and characters. Dialogue should be used to reveal character and advance the plot. Pacing is also important in writing a story of suspense. The story should move forward at a steady pace, with occasional moments of high tension and action. The writer should also pay attention to the use of foreshadowing and red herrings to keep the reader guessing. Finally, the writer should revise the story carefully, paying attention to the details and making sure that the plot is logical and the characters are consistent. A well-written story of suspense should keep the reader engaged and entertained from start to finish.



## Writing Stories of Suspense

### Monster Quiz

Match the following monsters with the correct definition:

Monster	Answer	Definition
A. Werewolf		A gigantic three-headed dog.
B. King Kong		An Australian monster who lives in billabongs
C. Gollum		A woman with snakes for hair that turns people to stone
D. Minotaur		A monster shark
E. Count Dracula		A giant gorilla
F. Bunyip		Ape-like underworld cannibals
G. Zombie		A miserly whining creature (in <i>The Hobbit</i> )
H. Cerberus		A monster made from recycled human parts
I. Frankenstein's Monster		A creature with acid blood that lives in space
J. Godzilla		Tiny monsters that go crazy if they get wet after midnight
K. Dragon		An ancient nobleman with a taste for blood
L. Phantom of the Opera		Also called 'the abominable snowman'
M. Hydra		A radioactive, fire-breathing lizard, 100m tall
N. Medusa		An ancient Egyptian, risen from the dead.
O. Alien		A man who has turned into a wolf
P. Mummy		A many-headed serpent whose heads grow back when cut off
Q. Morlocks		A fire-breathing monster with wings and claws.
R. Jaws		A dead person whose soul is possessed by another
S. Yeti		A mad musician whose face is hideously disfigured.
T. Gremlins		A giant creature, half man, half bull.

⑨ Match the following monsters with the correct definition:

### Activity: Visual Task

Choose 3 of the monsters above and draw what you imagine them to look

...

## Writing Stories of Suspense

### Create Your Own Monster

Using the chart we completed last lesson for inspiration, create your own terrifying monster.

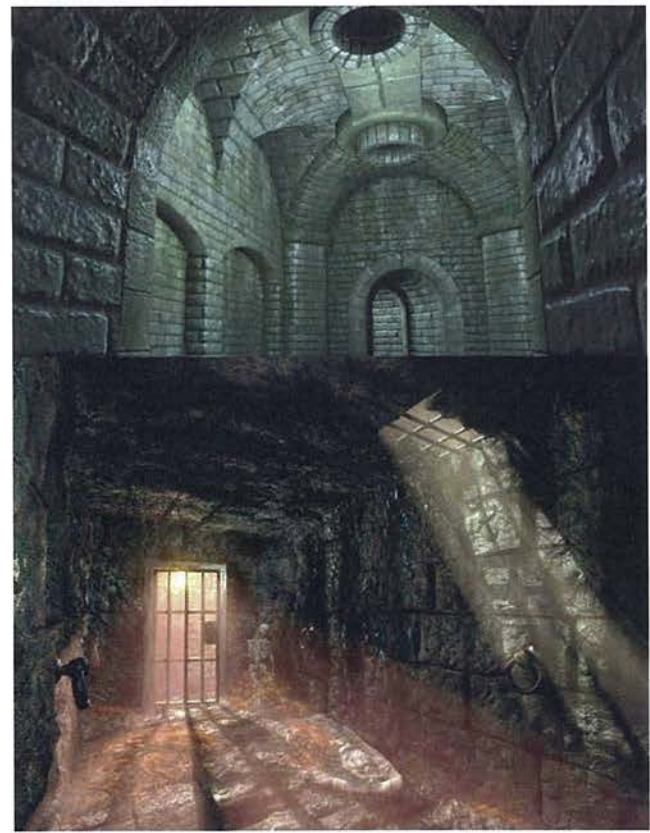
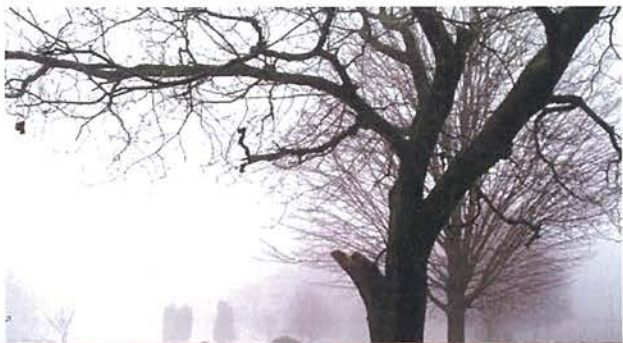
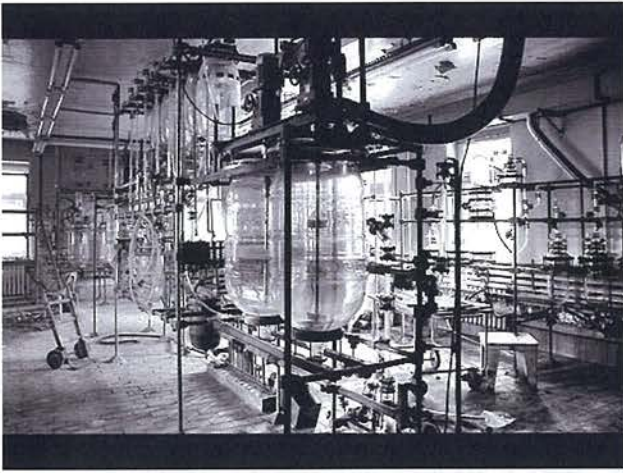
1. In your English book, write a detailed profile describing your monster. Use the following sub-headings to organise your information:
  - ? Name
  - ? Origin (where the monster came from)
  - ? Body covering (hair, skin, scales, etc)
  - ? Movement
  - ? Distinguishing features
  - ? Special powers/abilities
  - ? Habitat (describe where the monster lives)
  - ? Enemies
  - ? Other information
2. Using the above information, write a paragraph describing your monster. Remember to use sensory images.
3. Draw a picture of your monster
4. Write the opening paragraph of a scary story featuring your monster. (Remember to write a sizzling start that will engage your reader!)



## Writing Stories of Suspense

### Suspenseful Settings

- 1 Brainstorm 5 settings appropriate for a scary story.
- 2 Write a list of the features that characterise each setting eg. A graveyard: thick fog, headstones, shadows or silhouettes, pale moonlight, an owl, a freshly dug grave...
- 3 Choose one of the images below. Imagine you are there and write a descriptive paragraph detailing your suspenseful setting. Remember to show not tell.



## Writing Stories of Suspense



### Brainstorming ideas for your suspenseful story:

1. Spend two minutes on each of the opening lines below and write a sizzling start:

Ü The clock struck midnight and a grey mist began creeping through the graveyard as if it was alive...

Ü The cauldron of thick purple liquid started to bubble over and before I could stop it...

Ü Earnest sighed in frustration, pushed his broken glasses back on his nose and turned away from his workbench...

Ü The sleek black cat started to hiss...

Ü The old house sat alone on the hill...

Ü I felt the muscles and ligaments stretching and groaning, my jaw became long and my teeth grew sharp.

2. Did any of those sizzling starts inspire you? If so choose one to continue writing. If not think of an original, engaging idea and start afresh.

Following the seven steps, complete your suspenseful story and submit for marking. You should write at least 2 pages.





### Writing Probe 42

Finally there will be no more wars, fights or battles. But this is only possible if...

TOTAL WORDS WRITTEN	
<b>My writing;</b>	
	Includes ALL full stops
	Includes ALL capital letters
	Makes sense
	Includes complex sentences
	Includes commas to show phrasing
	_____

### Writing Probe 43

The day I dreaded the most had come! I really didn't want to do this. I had to share what my father's job was. I didn't want people to know he was a...

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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TOTAL WORDS WRITTEN	
<b>My writing;</b>	
<input type="checkbox"/>	<b>Includes ALL full stops</b>
<input type="checkbox"/>	<b>Includes ALL capital letters</b>
<input type="checkbox"/>	<b>Makes sense</b>
<input type="checkbox"/>	<b>Includes complex sentences</b>
<input type="checkbox"/>	<b>Includes commas to show phrasing</b>
<input type="checkbox"/>	<b>_____</b>

Date: \_\_\_\_\_

### Writing Probe 44

Hannah asked "But what exactly does freedom mean"? Lily replied "Freedom is..."

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

TOTAL WORDS WRITTEN	
_____	
My writing;	
11	Includes ALL full stops
11	Includes ALL capital letters
11	Makes sense
11	Includes complex sentences
11	Includes commas to show phrasing
11	_____

## Writing Probe 45

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced horizontal grey lines running across the width of the page. The lines are thin and consistent in color and thickness. There is no handwriting, printed text, or any other markings on the paper.

---

### My writing;

- | | Includes ALL full stops
  - | | Includes ALL capital letters
  - | | Makes sense
  - | | Includes complex sentences
  - | | Includes commas to show phrasing
-

TOTAL WORDS WRITTEN	
<hr/>	
<b>My writing;</b>	
<input type="checkbox"/>	<b>Includes ALL full stops</b>
<input type="checkbox"/>	<b>Includes ALL capital letters</b>
<input type="checkbox"/>	<b>Makes sense</b>
<input type="checkbox"/>	<b>Includes complex sentences</b>
<input type="checkbox"/>	<b>Includes commas to show phrasing</b>
<input type="checkbox"/>	<hr/>



"Pssshhh, please nothing could ever scare me, I had seen it all"! That's what I used to say until...

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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TOTAL WORDS WRITTEN	
<hr/>	
My writing;	
	Includes ALL full stops
	Includes ALL capital letters
	Makes sense
	Includes complex sentences
	Includes commas to show phrasing
	<hr/>

I will tell you a story that is only half true. The story begins with...

**TOTAL WORDS WRITTEN**

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**My writing:**

- || Includes ALL full stops**
- || Includes ALL capital letters**
- || Makes sense**
- || Includes complex sentences**
- || Includes commas to show phrasing**
- || \_\_\_\_\_**

### Writing Probe 49

I woke up from the same reoccurring dream. I wasn't scary, it was embarrassing. In my dream, I...

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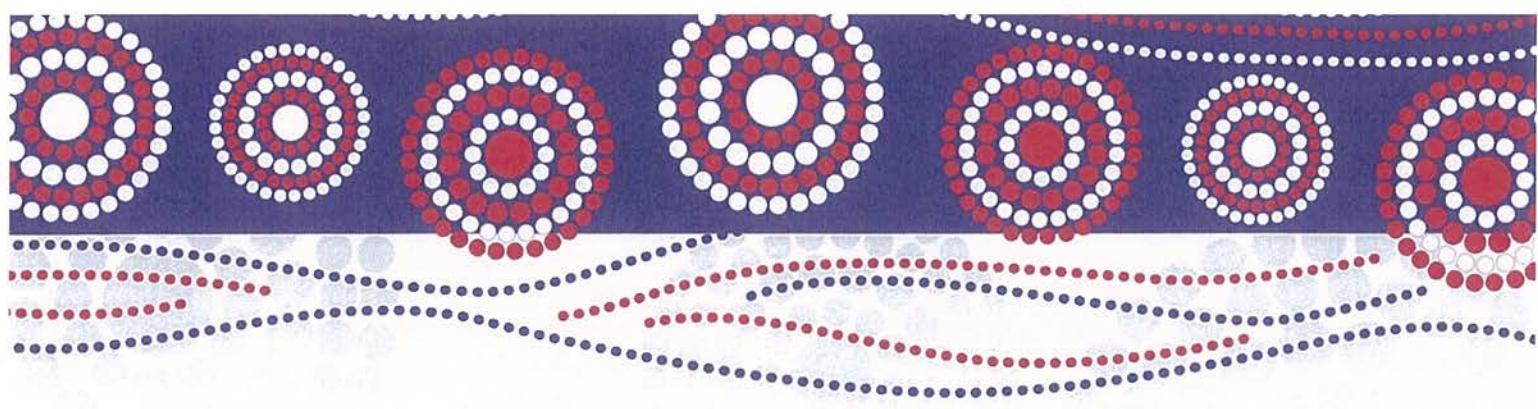
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**TOTAL WORDS WRITTEN**

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**My writing;**

- || Includes ALL full stops**
- || Includes ALL capital letters**
- || Makes sense**
- || Includes complex sentences**
- || Includes commas to show phrasing**
- || \_\_\_\_\_**



# MATHS





**Gorokan High School**  
**Mathematics Online Learning**  
**Week 2 and 3**



**Year 9**  
**Equations**

**Name:**



**Student Instructions:**

Students are to work through the specified work outlined below. The prescribed work is for the duration of Weeks 2 and 3 of online learning. Should you have any questions, please email your classroom teacher.

The questions outlined in this lesson information sheet are a guide. You should complete these questions as a minimum. If you would like to complete the higher questions to challenge your understanding, please do so. The answers are attached to help you understand if you are successful in your working out. If you find you did not get the correct answer, check your working and try again until you get to the desired answer.

**Exercise 10:01 – Inverse Operations**

Read the information and examples and answer the following question in exercise 10:01.

Questions

- 1) every second question
- 2) every second question
- 4) every second question
- 5) every second question

**Exercise 10:02 – Solving Equations**

Read the information and examples and answer the following question in exercise 10:02.

Questions

- 1) first and third column
- 2) first column
- 3) a, c, e, g, i, k
- 4) first and third column
- 5) first column
- 6) first column

Fun- Spot 10:02

**Exercise 10:03 – Equations with Pronumerals on both sides**

Read the information and examples and answer the following question in exercise 10:03.

Questions

- 1) first column
- 2) first column
- 3) first column

**Exercise 10:04 – Equations with grouping symbols**

Read the information and examples and answer the following question in exercise 10:04.

Questions

- 1) a, c, e, g
- 2) a, d, g
- 3) a, d, g
- 4) a, c, e,
- 5) a, c, e

**Exercise 10:05 – Formulae**

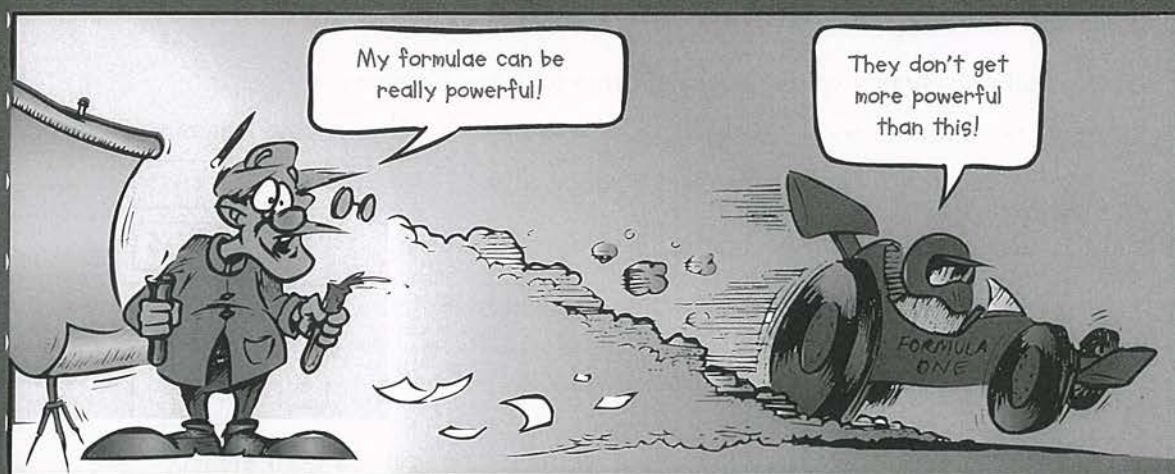
Read the information and examples and answer the following question in exercise 10:05.

Questions

- 3) all
- 4) all
- 5) all
- 6) all
- 7) all



# Equations, Formulae and Inequations



## Chapter Contents

10:01 Inverse operations

PAS4.4

10:02 Solving equations

PAS4.4

**Fun Spot: Why did the tooth get dressed up?**

10:03 Equations with pronumerals on both sides

PAS4.4

10:04 Equations with grouping symbols

PAS4.4

10:05 Formulae

PAS4.4

A Finding the subject of a formula

B Finding the value of a pronumeral that is not the subject

10:06 Solving problems using equations

PAS4.4

10:07 Graphing inequations

PAS4.4

10:08 Solving inequations

PAS4.4

**Maths Terms, Diagnostic Test, Revision Assignment, Working Mathematically**

## Learning Outcomes

PAS4.4 Uses algebraic techniques to solve linear equations and simple inequalities.

Working Mathematically Stage 4

1 Questioning, 2 Applying Strategies, 3 Communicating, 4 Reasoning, 5 Reflecting



An **equation** is a number sentence in which one (or more) of the numbers is missing or unknown and is represented by a pronumeral.



Equations are sometimes called algebraic sentences.

## 10:01 | Inverse Operations

Outcome PAS4.4



Write an algebraic expression for each of the following sentences.

- 1 Add 5 to  $x$ .
- 2 Multiply  $a$  by 3.
- 3 Divide  $y$  by 8.
- 4 Take 2 away from  $p$ .
- 5 Multiply  $x$  by 3 and then add 2.
- 6 Subtract 2 from  $y$  and then multiply the result by 7.

What is the opposite of:

- 7 adding 8?
- 8 subtracting 5?
- 9 multiplying by 4?
- 10 dividing by 3?

- We build algebraic expressions by starting with the pronumeral.

Algebraic Expression	Meaning	Arrow Diagram
$x + 5$	$x$ has had 5 added to it.	$\boxed{x} \xrightarrow{+5} \boxed{x + 5}$
$x - 5$	$x$ has had 5 subtracted from it.	$\boxed{x} \xrightarrow{-5} \boxed{x - 5}$
$5x$	$x$ has been multiplied by 5.	$\boxed{x} \xrightarrow{\times 5} \boxed{5x}$
$\frac{x}{5}$	$x$ has been divided by 5.	$\boxed{x} \xrightarrow{\div 5} \boxed{\frac{x}{5}}$

- Arrow diagrams can be used to show how the expression has been made.
- The operation that has caused the change is written above the arrow.
- When solving equations, we need to reverse the steps to get back to the pronumeral. In other words, we need to perform the **inverse operations**. For instance, if:

$$\begin{array}{l} \boxed{x} \xrightarrow{+5} \boxed{x + 5} \text{ then } \boxed{x + 5} \xrightarrow{-5} \boxed{x} \\ \boxed{x} \xrightarrow{-5} \boxed{x - 5} \text{ then } \boxed{x - 5} \xrightarrow{+5} \boxed{x} \\ \boxed{x} \xrightarrow{\times 5} \boxed{5x} \text{ then } \boxed{5x} \xrightarrow{\div 5} \boxed{x} \\ \boxed{x} \xrightarrow{\div 5} \boxed{\frac{x}{5}} \text{ then } \boxed{\frac{x}{5}} \xrightarrow{\times 5} \boxed{x} \end{array}$$



■ Inverse means opposite.

$$\begin{array}{l} \boxed{2} \xrightarrow{+5} \boxed{7} \\ \boxed{7} \xrightarrow{-5} \boxed{2} \end{array}$$

Adding 5 and subtracting 5 are inverse operations.

## worked examples

1 Note how each expression has been built from the pronumeral.

a  $y \xrightarrow{-8} y-8$

b  $a \xrightarrow{\times 3} 3a \xrightarrow{+5} 3a+5$

c  $q \xrightarrow{+6} q+6 \xrightarrow{\times 2} 2(q+6)$

d  $m \xrightarrow{\div 2} \frac{m}{2} \xrightarrow{-4} \frac{m}{2}-4$

e  $n \xrightarrow{-11} n-11 \xrightarrow{\div 7} \frac{n-11}{7}$

2 Note the inverse operations used to get back to the pronumeral.

a  $9m \xrightarrow{\div 9} m$

b  $8x+15 \xrightarrow{-15} 8x \xrightarrow{\div 8} x$

c  $4(y+3) \xrightarrow{\div 4} y+3 \xrightarrow{-3} y$

d  $\frac{a-1}{5} \xrightarrow{\times 5} a-1 \xrightarrow{+1} a$



## Exercise 10:01

Foundation Worksheet 10:01

Algebra review PAS4:3

Simplify:

1  $a \times x$

b  $a+2$

2  $a \times x + 3x$

b  $7y-y$

3  $a+3-3$

b  $b \times 4 \div 4$

c  $m-8+8$

d  $y+2 \times 2$

1 Complete the following arrow diagrams by writing the correct operation above the arrow.

a  $x \rightarrow 9x$

b  $a \rightarrow a+2$

c  $q \rightarrow q-7$

d  $y \rightarrow 5y \rightarrow 5y-1$

e  $m \rightarrow \frac{m}{10}$

f  $n \rightarrow n+6 \rightarrow \frac{n+6}{5}$

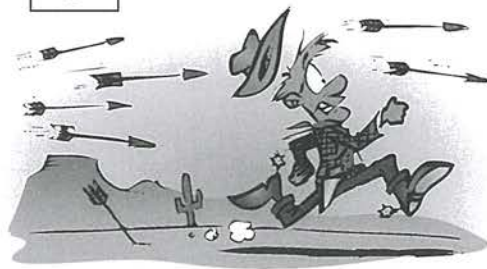
g  $a \rightarrow \frac{a}{3} \rightarrow \frac{a}{3}+9$

h  $a \rightarrow a-8 \rightarrow \frac{a-8}{7}$

i  $n \rightarrow \frac{n}{-5} \rightarrow \frac{n}{-5}+3$

j  $p \rightarrow p+3 \rightarrow 2(p+3)$

k  $x \rightarrow -3x \rightarrow -3x+5$





**2** Complete these arrow diagrams, showing how to get back to the pronumeral.

a $\boxed{3m} \rightarrow \boxed{m}$	b $\boxed{\frac{x}{2}} \rightarrow \boxed{x}$	c $\boxed{n+5} \rightarrow \boxed{n}$
d $\boxed{p-7} \rightarrow \boxed{p}$	e $\boxed{10x} \rightarrow \boxed{x}$	f $\boxed{\frac{a}{3}} \rightarrow \boxed{a}$
g $\boxed{8+t} \rightarrow \boxed{t}$	h $\boxed{q-5} \rightarrow \boxed{q}$	i $\boxed{2m+1} \rightarrow \boxed{2m} \rightarrow \boxed{m}$
j $\boxed{5p-2} \rightarrow \boxed{5p} \rightarrow \boxed{p}$	k $\boxed{7x+3} \rightarrow \boxed{7x} \rightarrow \boxed{x}$	l $\boxed{9q-4} \rightarrow \boxed{9q} \rightarrow \boxed{q}$
m $\boxed{6+3x} \rightarrow \boxed{3x} \rightarrow \boxed{x}$	n $\boxed{7+\frac{m}{2}} \rightarrow \boxed{\frac{m}{2}} \rightarrow \boxed{m}$	o $\boxed{\frac{x}{5}-2} \rightarrow \boxed{\frac{x}{5}} \rightarrow \boxed{x}$
p $\boxed{\frac{a+7}{3}} \rightarrow \boxed{a+7} \rightarrow \boxed{a}$	q $\boxed{\frac{b-2}{5}} \rightarrow \boxed{b-2} \rightarrow \boxed{b}$	r $\boxed{5-3x} \rightarrow \boxed{-3x} \rightarrow \boxed{x}$
s $\boxed{8-2p} \rightarrow \boxed{-2p} \rightarrow \boxed{p}$	t $\boxed{5-\frac{x}{3}} \rightarrow \boxed{\frac{-x}{3}} \rightarrow \boxed{x}$	

**3** Draw arrow diagrams to show how the following expressions were made from the pronumeral.

a $8m$	b $\frac{p}{7}$	c $5+x$	d $q-10$
e $3x+2$	f $5n-3$	g $6p+7$	h $9a-1$
i $\frac{x}{3}+5$	j $7+\frac{a}{4}$	k $\frac{y+3}{4}$	l $\frac{n-1}{5}$
m $7(m+2)$	n $9(x-3)$	o $5(2+x)$	p $3(q-4)$
q $3-2x$	r $-5a+7$	s $6-\frac{x}{3}$	t $10-9p$

**4** Complete the following arrow diagrams.

a $\boxed{a} \xrightarrow{-2} \boxed{\phantom{0}}$	b $\boxed{x} \xrightarrow{\times 4} \boxed{\phantom{0}}$	c $\boxed{m} \xrightarrow{\div 3} \boxed{\phantom{0}}$
d $\boxed{t} \xrightarrow{+9} \boxed{\phantom{0}}$	e $\boxed{p} \xrightarrow{\times 5} \boxed{\phantom{0}} \xrightarrow{+2} \boxed{\phantom{0}}$	f $\boxed{x} \xrightarrow{\times 6} \boxed{\phantom{0}} \xrightarrow{-4} \boxed{\phantom{0}}$
g $\boxed{y} \xrightarrow{+1} \boxed{\phantom{0}} \xrightarrow{\times 7} \boxed{\phantom{0}}$	h $\boxed{b} \xrightarrow{\div 4} \boxed{\phantom{0}} \xrightarrow{+2} \boxed{\phantom{0}}$	i $\boxed{q} \xrightarrow{-3} \boxed{\phantom{0}} \xrightarrow{\div 3} \boxed{\phantom{0}}$
j $\boxed{n} \xrightarrow{\times (-2)} \boxed{\phantom{0}} \xrightarrow{+6} \boxed{\phantom{0}}$	k $\boxed{b+10} \xrightarrow{-10} \boxed{\phantom{0}}$	l $\boxed{a-7} \xrightarrow{+7} \boxed{\phantom{0}}$
m $\boxed{5m} \xrightarrow{\div 5} \boxed{\phantom{0}}$	n $\boxed{\frac{n}{4}} \xrightarrow{\times 4} \boxed{\phantom{0}}$	o $\boxed{2x+3} \xrightarrow{-3} \boxed{\phantom{0}} \xrightarrow{\div 2} \boxed{\phantom{0}}$
p $\boxed{5p-4} \xrightarrow{+4} \boxed{\phantom{0}} \xrightarrow{\div 5} \boxed{\phantom{0}}$	q $\boxed{6+7t} \xrightarrow{-6} \boxed{\phantom{0}} \xrightarrow{\div 7} \boxed{\phantom{0}}$	r $\boxed{\frac{m+5}{4}} \xrightarrow{\times 4} \boxed{\phantom{0}} \xrightarrow{-5} \boxed{\phantom{0}}$
s $\boxed{\frac{a}{3}-5} \xrightarrow{+5} \boxed{\phantom{0}} \xrightarrow{\times 3} \boxed{\phantom{0}}$	t $\boxed{5-2x} \xrightarrow{-5} \boxed{\phantom{0}} \xrightarrow{+(-2)} \boxed{\phantom{0}}$	

**5** What operations must be performed on  $x$  to get the following expressions?

- |                   |                   |                     |                     |
|-------------------|-------------------|---------------------|---------------------|
| a $x - 6$         | b $\frac{x}{3}$   | c $x + 5$           | d $7x$              |
| e $2x + 3$        | f $5x - 2$        | g $6 + 3x$          | h $7x - 1$          |
| i $\frac{x+7}{5}$ | j $\frac{x-4}{3}$ | k $\frac{x}{8} + 5$ | l $\frac{x}{3} - 4$ |
| m $2(x + 3)$      | n $5(x - 9)$      | o $-6x + 8$         | p $10 - 3x$         |



**6** What must be done to these expressions to make them equal to  $a$ ?

- |                   |                     |              |                 |                   |
|-------------------|---------------------|--------------|-----------------|-------------------|
| a $a - 7$         | b $5a$              | c $6 + a$    | d $\frac{a}{3}$ | e $-4a$           |
| f $2a + 5$        | g $3a - 1$          | h $5 + 7a$   | i $5a - 6$      | j $8 - 3a$        |
| k $\frac{a+3}{7}$ | l $\frac{a}{7} + 3$ | m $5(a + 2)$ | n $3(a - 1)$    | o $\frac{a-9}{5}$ |

**7** What order of inverse operations must be performed to get back to the pronumeral?

- |                    |                   |                      |                       |
|--------------------|-------------------|----------------------|-----------------------|
| a $\frac{2a+3}{5}$ | b $6(3x + 7)$     | c $\frac{7-3p}{6}$   | d $9 + \frac{2m}{3}$  |
| e $5(2 - 3m)$      | f $\frac{5-n}{7}$ | g $6 - \frac{5q}{3}$ | h $\frac{7(3y+4)}{5}$ |

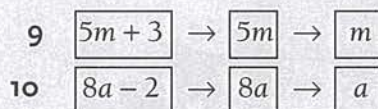
## 10:02 | Solving Equations

Outcome PAS4.4

Simplify the following: 1  $7x \div 7$  2  $x + 4 - 4$  3  $a - 7 + 7$  4  $\frac{m}{5} \times 5$

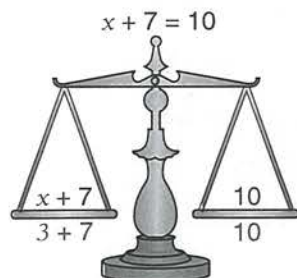
What is the inverse of: 5 multiplying by 3? 6 adding 7? 7 subtracting 1? 8 dividing by 5?

Complete these arrowing diagrams, putting operations above each arrow.

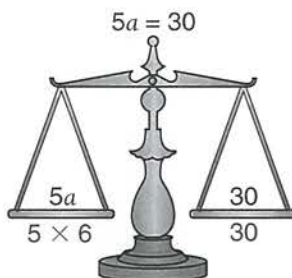


10:02

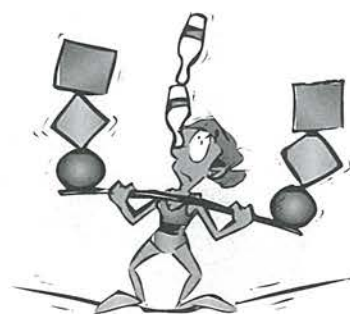
- Solving equations is like balancing scales.
- With equations, we know that one side is equal to the other.
- The solution of the equation therefore is the value of the pronumeral that 'balances' the equation.



$x + 7 = 10$   
 $x = 3$  balances the scale  
 so  $x = 3$  is the solution.

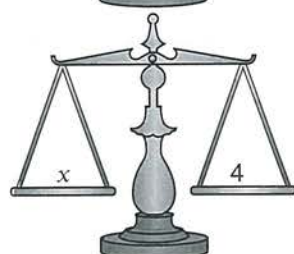
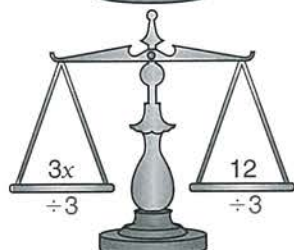
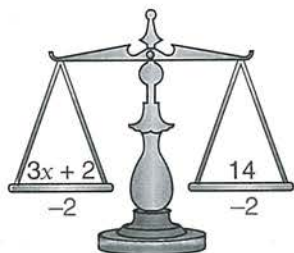


$5a = 30$   
 $a = 6$  balances the scale  
 so  $a = 6$  is the solution.



- Often, solving an equation requires us to change the equation into a simpler one. We can do this by adding (+), subtracting (−), multiplying (×) or dividing (÷) both sides of the equation by the same number.
- Look at the solutions of these two equations, noting that both sides remain balanced because the same operation is done to both sides.

$$3x + 2 = 14$$



$x = 4$  is the solution.

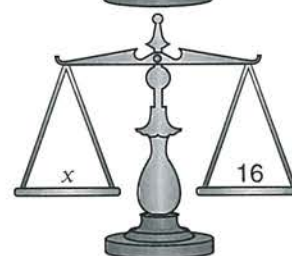
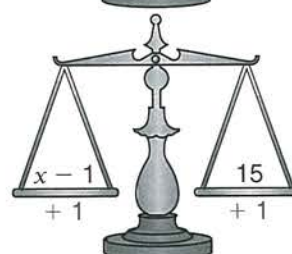
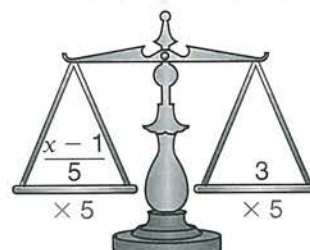
■ We need to perform operations that will leave only the pronumeral on one side of the equation.



See why it's important to know about inverse operations and how to work back to the pronumeral.

$$3x + 2 \xrightarrow{-2} 3x \xrightarrow{\div 3} x$$

$$\frac{x-1}{5} = 3$$



$x = 16$  is the solution.

■ Note here that the inverse operations were:

$$\frac{x-1}{5} \xrightarrow{\times 5} x-1 \xrightarrow{+1} x$$



Now examine the solutions to the equations in the following worked examples, noting the operations that have been done to both sides (shown in colour).



## worked examples

1 These solutions involve only one step.

a  $m + 27 = 59$

$$- 27 \quad - 27$$

$$m = 59 - 27$$

$$\therefore m = 32$$

b  $a - 16 = 9$

$$+ 16 \quad + 16$$

$$a = 9 + 16$$

$$\therefore a = 25$$

c  $3p = 23$

$$\div 3 \quad \div 3$$

$$p = \frac{23}{3}$$

$$\therefore p = 7\frac{2}{3}$$

d  $\frac{x}{7} = 12$

$$\times 7 \quad \times 7$$

$$x = 7 \times 12$$

$$\therefore x = 84$$

2 The solutions of these equations involve two steps.

a  $2a + 5 = 7$

$$- 5 \quad - 5$$

$$2a = 2$$

$$\div 2 \quad \div 2$$

$$\therefore a = 1$$

b  $\frac{x+3}{5} = 2$

$$\times 5 \quad \times 5$$

$$x + 3 = 10$$

$$- 3 \quad - 3$$

$$\therefore x = 7$$

c  $\frac{p}{3} - 6 = 15$

$$+ 6 \quad + 6$$

$$\frac{p}{3} = 21$$

$$\times 3 \quad \times 3$$

$$\therefore p = 63$$

d  $10 - 3m = 25$

$$- 10 \quad - 20$$

$$- 3m = 15$$

$$\div -3 \quad \div -3$$

$$\therefore m = -5$$

## Exercise 10:02

Foundation Worksheet 10:02

Solving equations 1, PAS3:1b

1 Solve these equations.

a  $\square + 7 = 10$     b  $\square - 1 = 6$

c  $6 \times \square = 18$     d  $\square \div 2 = 3$

2 Which of the numbers

2, 7 and 10 are solutions?

a  $\square + 4 = 11$     b  $3 \times \square = 30$

1 Solve each of these one-step equations.

a  $x + 7 = 15$

b  $p + 9 = 11$

c  $y + 7 = 21$

d  $15 + n = 18$

e  $7 + q = 15$

f  $20 + k = 29$

g  $y - 5 = 3$

h  $m - 7 = 2$

i  $x - 10 = 3$

j  $5x = 15$

k  $7x = 42$

l  $3p = 36$

m  $12 = 3y$

n  $18 = 9y$

o  $24 = 8x$

p  $\frac{n}{3} = 2$

q  $\frac{x}{5} = 3$

r  $\frac{m}{4} = 4$

2 These one-step equations involve negative integers.

a  $x + 3 = 2$

b  $m + 5 = 1$

c  $n + 6 = 4$

d  $7 + p = -1$

e  $6 + q = 0$

f  $10 + y = -2$

g  $a - 7 = -2$

h  $x - 10 = -3$

i  $p - 9 = -4$

j  $q - 2 = -1$

k  $y - 4 = -4$

l  $t - 6 = -2$

m  $3m = -6$

n  $8p = -16$

o  $6w = -6$

p  $-2n = 12$

q  $-3q = 27$

r  $-4m = -8$

s  $\frac{x}{3} = -2$

t  $\frac{m}{4} = -20$

u  $\frac{n}{7} = -28$

v  $x - (-2) = 5$

w  $-5 - y = 3$

x  $6 - (-x) = 3$

■ Notice:

If  $-a = 3$ ,  
then  $a = -3$   
(Multiply both  
sides by  $-1$ .)

3 The solution to an equation can be checked by substituting it into the equation.

Check to see if the solution to each equation below is correct.

a  $x + 16 = 43$

$$x = 27$$

b  $9 + y = 13$

$$y = 5$$

c  $m - 10 = 3$

$$m = 13$$

d  $n - 12 = 15$

$$n = 27$$

e  $6 - q = 4$

$$q = 2$$

f  $8 - y = 10$

$$y = 2$$

g  $7m = 10$

$$m = \frac{10}{7}$$

h  $3a = 2$

$$a = \frac{2}{3}$$

i	$-5y = -15$	j	$\frac{x}{3} = 6$	k	$\frac{m}{5} = 10$	l	$\frac{n}{6} = 3$
	$y = -3$		$x = 18$		$m = 2$		$n = \frac{1}{2}$

- 4** Solving these equations involves two steps. Clearly show each step in your working. (All the answers are integers.)

a	$2x + 1 = 5$	b	$3a + 2 = 8$	c	$2m + 7 = 13$
d	$3n - 2 = 7$	e	$5k - 1 = 24$	f	$6t - 4 = 8$
g	$6 + 5a = 26$	h	$10 + 3w = 13$	i	$12 + 4q = 16$
j	$10 - 3x = 1$	k	$15 - 2m = 11$	l	$20 - 5q = 0$
m	$15 = 2x - 3$	n	$7 = 5y - 3$	o	$10 = 2 - 4a$
p	$4 - x = -7$	q	$-3 - x = -2$	r	$2 = 4 - x$

- 5** Solving these equations also involves two steps. (The solutions are all positive integers.)

a	$\frac{3x}{2} = 3$	b	$\frac{2x}{5} = 4$	c	$\frac{3m}{4} = 6$
d	$\frac{x+1}{4} = 3$	e	$\frac{a+2}{3} = 1$	f	$\frac{n+7}{2} = 10$
g	$\frac{m-4}{2} = 5$	h	$\frac{n-1}{3} = 6$	i	$\frac{a-2}{4} = 10$
j	$\frac{y}{3} + 1 = 3$	k	$\frac{x}{4} + 2 = 1$	l	$\frac{m}{5} - 3 = 2$
m	$5 + \frac{a}{2} = 10$	n	$2 + \frac{x}{3} = 8$	o	$5 + \frac{m}{2} = 7$

$$\begin{array}{rcl} \frac{3x}{5} & = & 6 \\ \times 5 & \times 5 & \\ 3x & = & 30 \\ \div 3 & \div 3 & \\ x & = & 10 \end{array}$$

■ Multiply each term on *both* sides by the denominator.

- 6** The solutions to these equations involve fractions.

a	$2x + 1 = 4$	b	$2a + 5 = 10$
c	$3m + 4 = 5$	d	$5n + 2 = 8$
e	$2p - 3 = 2$	f	$4q - 1 = 2$
g	$5n - 5 = 4$	h	$6y - 3 = 1$
i	$5 + 2k = 12$	j	$7 + 3x = 9$
k	$8 + 3a = 10$	l	$1 + 2a = 4$
m	$2m + 6 = 3$	n	$5p + 7 = 1$
o	$3 - 2a = 6$	p	$5 - 3a = 1$

$$\begin{array}{rcl} 3a + 2 & = & 6 \\ -2 & -2 & \\ 3a & = & 4 \\ \div 3 & \div 3 & \\ a & = & \frac{4}{3} \text{ or } 1\frac{1}{3} \end{array}$$

Opposite operations are the key.

- 7** Now try this set of equations, which are either one- or two-step types.

a	$5x = 35$	b	$m + 7 = 11$	c	$2x + 1 = 3$	d	$5 - n = 0$
e	$3a + 1 = 10$	f	$a - 2 = -3$	g	$y + 3 = 1$	h	$3m - 1 = 5$
i	$-4x = 16$	j	$5 + 3n = 10$	k	$3x = 2$	l	$6 - q = 10$
m	$\frac{x}{5} = 10$	n	$\frac{3p}{2} = 6$	o	$\frac{x+2}{5} = 1$	p	$\frac{a}{3} - 4 = 2$
q	$6 + \frac{a}{3} = 8$	r	$\frac{5+a}{2} = 1$	s	$\frac{m-4}{7} = 6$	t	$\frac{5m}{2} = 3$
u	$6 - 2a = 8$	v	$3p + 5 = 2$	w	$\frac{q+6}{2} = 1$	x	$\frac{3-x}{2} = 5$

Work out the answer to each part and put the letter for that part in the box above the correct answer.

$$\text{T } x + 8 = 15$$

$$\text{T } x + 8 = 15$$

**A**  $a = -4 - 6$

**A**  $a = (\frac{1}{2})^3$

$$\text{T } 3 + x = 1$$

$$T \quad 8m = -56$$

**D**  $11x = 121$

**A**  $x + x = 1$

**T**  $75 \div a = 15$

**E**  $0.2x = -1$

**E**  $8a = 0$

**S**  $8 + x = 12$

$$\text{H } 1 - x = 4$$

$$\mathbf{U} \quad 60 - n = 0$$

**O**  $35 \div n = 1$

**N**  $5(x - 9) = 0$

$$T_n = 20 - n$$

**U**  $7 - x = 8$

$$\bullet \frac{100}{m} = 5$$

○  $6 \div x = 2$

$$W \frac{1}{4} + n = 1$$

$$\text{T} \quad 7a = 7$$

$$1 \quad -3 - 3 = a$$

$$\text{K} \quad 1 - x = -1$$

**S**  $4x = 1$

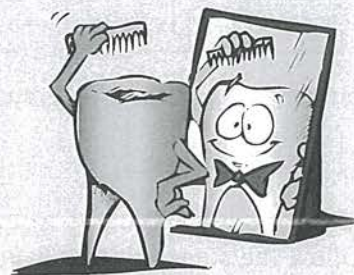
**B**  $-a = -8$

T  $a - 8 = 2a$

$$1 \quad \frac{x}{3} = 2$$

**T**  $10 - n = -2$

$$\mathbf{E} \quad \frac{m}{20} = 5$$

[illegible]

-8	20	-7	$1\frac{1}{2}$	2	-5	6	10	35	-1	12





# 10:03 | Equations with Pronumerals on Both Sides

Outcome PAS4.4

prep quiz

10:03

Simplify the following:

1  $3x - 2x$

2  $5a + a$

3  $4y - 4y$

4  $-6p + 6p$

Which operation should be written above each arrow?

5  $\boxed{3x + 5} \rightarrow \boxed{3x}$

6  $\boxed{2a - 4} \rightarrow \boxed{2a}$

7  $\boxed{\frac{x+3}{5}} \rightarrow \boxed{x+3}$

Complete these arrow diagrams using the operation above each arrow.

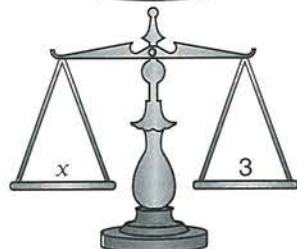
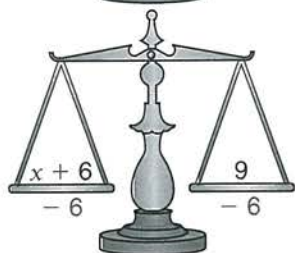
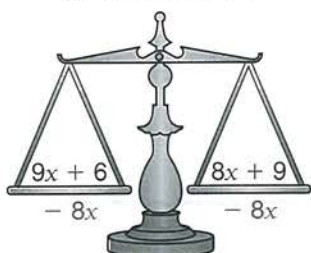
8  $\boxed{5 + 2x} \xrightarrow{-2x} \boxed{\phantom{00}}$

9  $\boxed{3x + 1} \xrightarrow{-3x} \boxed{\phantom{00}}$

10  $\boxed{5 - 2x} \xrightarrow{+2x} \boxed{\phantom{00}}$

- To solve these equations we may have to add or subtract pronumerals as well as numerals. Follow the steps in each diagram.

$$9x + 6 = 8x + 9$$

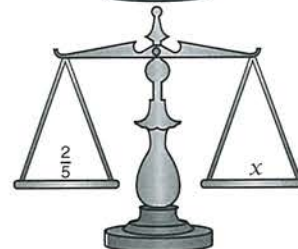
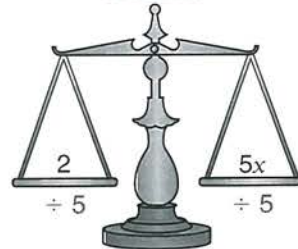
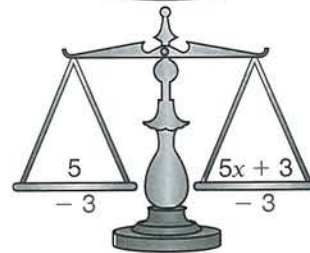
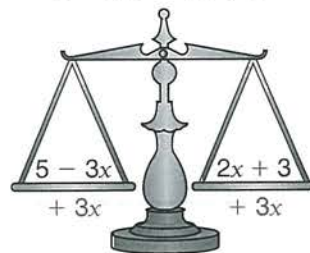


So  $x = 3$  is the solution.

We must first leave the pronumerals on only one side of the equation.



$$5 - 3x = 2x + 3$$



So  $x = \frac{2}{5}$  is the solution.

**Hint:** Leave the pronumeral on the side where the term will be positive.

## worked examples

$$\begin{array}{rcl}
 1 \quad 3a + 5 & = & 2a + 7 \\
 -2a & -2a & \\
 \hline
 a + 5 & = & 7 \\
 -5 & -5 & \\
 \hline
 \therefore a & = & 2
 \end{array}$$

$$\begin{array}{rcl}
 2 \quad 5x - 3 & = & 2x + 9 \\
 -2x & -2x & \\
 \hline
 3x - 3 & = & 9 \\
 +3 & +3 & \\
 \hline
 3x & = & 12 \\
 \div 3 & \div 3 & \\
 \hline
 \therefore x & = & 4
 \end{array}$$

$$\begin{array}{rcl}
 3 \quad 2 - 2x & = & 8 + x \\
 +2x & +2x & \\
 \hline
 2 & = & 8 + 3x \\
 -8 & -8 & \\
 \hline
 -6 & = & 3x \\
 \div 3 & \div 3 & \\
 \hline
 -2 & = & x \\
 \therefore x & = & -2
 \end{array}$$

Therefore!

...

## Exercise 10:03

### Foundation Worksheet 10:03

#### Solving equations 2, PAS4-4

1 Solve by inspection:

a  $x + 15 = 16$       b  $a - 9 = 2$

c  $4m = 32$       d  $\frac{x}{2} = 7$

2 Solve by inspection:

a  $3 + a = 9$       b  $10 + y = 11$

c  $m \times 3 = 6$       d  $10 + x = 2$

1 Solve the following equations. (The answers are all integers.)

a  $2a + 5 = a + 7$

b  $3x + 1 = 2x + 8$

c  $7p - 2 = 6p + 1$

d  $10q - 3 = 9q + 5$

e  $7n = 6n + 5$

f  $8x = 7x - 3$

g  $5m + 2 = 4m - 1$

h  $3a + 7 = 2a + 5$

j  $5m + 2 = 3m + 8$

k  $5y - 4 = y + 12$

m  $2x + 5 = 3x - 1$

n  $4m + 2 = 6m + 10$

p  $3x + 2 = 7 - 2x$

q  $6m - 1 = 15 - 2m$

i  $3x + 1 = x + 7$

l  $3x + 7 = x + 1$

o  $x + 7 = 5x - 1$

r  $5 - 3p = p + 5$

2 Check to see if the given solution is correct or incorrect by seeing if it 'fits' the equation.

a  $5m - 2 = 4m + 1$

b  $3p + 7 = 2p + 12$

c  $10q + 3 = 11q + 1$

$m = 3$

$p = 5$

$q = -2$

d  $7a + 3 = 5a + 1$

e  $8q - 7 = 5q + 5$

f  $x + 10 = 5x - 2$

$a = 2$

$q = 4$

$x = 2$

g  $3n + 1 = n - 7$

h  $2m + 5 = 5m - 1$

i  $8a + 1 = 3a - 4$

$n = -3$

$m = 2$

$a = -1$

j  $5x = 2x + 6$

k  $5a + 8 = 3a$

l  $3x = 10 + 2x$

$x = 2$

$a = 4$

$x = 2$

m  $3 + 2x = 7 + 3x$

n  $5 - 2m = 6 + m$

o  $5p - 2 = 5 - 2p$

$x = 4$

$m = -1$

$p = 1$

3 Solve these equations.

a  $3x + 1 = x + 2$

b  $5m + 2 = 3m + 5$

c  $4p + 2 = p + 4$

d  $5m = 2m + 1$

e  $3a = a - 1$

f  $6n + 2 = n + 8$

g  $5a - 1 = 3a + 4$

h  $12n - 9 = 9n + 1$

i  $8q - 5 = 5q + 3$

j  $6n + 4 = 4n + 3$

k  $8a + 5 = 5a + 7$

l  $4k - 2 = k - 6$

m  $2a + 5 = 4a + 2$

n  $x + 6 = 4x + 2$

o  $2q + 7 = 6q - 2$

p  $8t = 5t + 8$

q  $3m = 6m - 2$

r  $6x = 5 - 2x$

s  $3a + 2 = 5a + 6$

t  $w - 3 = 7w + 5$

u  $2m - 3 = 5m + 1$

v  $5 - 2y = 3 + y$

w  $10 + 3x = 9 - 5x$

x  $3 - p = 16 - 4p$



# 10:04 | Equations with Grouping Symbols

Outcome PAS4.4



Rewrite these expressions without grouping symbols.

- 1  $2(x + 3)$       2  $3(a - 5)$       3  $2(4a + 6)$       4  $5(2p - 1)$       5  $7(3 - 2q)$

Solve these one-step equations.

- 6  $x + 7 = 12$       7  $x + 7 = 2$       8  $5p = 10$       9  $10p = 5$       10  $8 - x = -3$

- If you remember how to 'expand' grouping symbols, these equations are no harder than the ones you have already seen.

## worked examples



- 1 Expand the grouping symbols and then solve the equation.

a  $2(x + 4) = 10$

$$2x + 8 = 10$$

$$- 8 \quad - 8$$

$$2x = 2$$

$$\div 2 \quad \div 2$$

$$\therefore x = 1$$

b  $5(a - 3) = 3$

$$5a - 15 = 3$$

$$+ 15 \quad + 15$$

$$5a = 18$$

$$\div 5 \quad \div 5$$

$$\therefore a = \frac{18}{5} \text{ or } 3\frac{3}{5}$$

c  $3(2m - 4) = 4m - 6$

$$6m - 12 = 4m - 6$$

$$- 4m \quad - 4m$$

$$2m - 12 = -6$$

$$+ 12 \quad + 12$$

$$2m = 6$$

$$\div 2 \quad \div 2$$

$$\therefore m = 3$$

- 2 Expand each set of grouping symbols and then solve the equations.

a  $3(a + 7) = 4(a - 2)$

$$3a + 21 = 4a - 8$$

$$- 3a \quad - 3a$$

$$21 = a - 8$$

$$+ 8 \quad + 8$$

$$29 = a$$

$$\therefore a = 29$$

b  $3(x + 4) + 2(x - 5) = 4$

$$3x + 12 + 2x - 10 = 4$$

Collect like terms.

$$5x + 2 = 4$$

$$- 2 \quad - 2$$

$$5x = 2$$

$$\div 5 \quad \div 5$$

$$x = \frac{2}{5}$$

## Exercise 10:04

- 1 Expand the grouping symbols and then solve each equation.

a  $2(x + 3) = 4$

c  $7(n + 2) = 14$

e  $3(a - 2) = 6$

g  $9(x - 1) = 18$

i  $2(a + 3) = 7$

k  $2(x - 2) = 1$

m  $2(3 - a) = 4$

b  $3(a + 2) = 12$

d  $6(p + 2) = 24$

f  $2(m - 3) = 8$

h  $5(q - 2) = 10$

j  $3(x + 1) = 8$

l  $5(t - 1) = 2$

n  $4(7 - x) = 12$

### Foundation Worksheet 10:04

Solving equations 3, PAS4.4

- 1 Solve these equations.

a  $a + 11 = 30$       b  $b - 5 = 21$

c  $4x = 136$       d  $y + 3 = 11$

- 2 Is  $x = 8$  a solution?

a  $2x + 1 = 17$

- 3 Expand grouping symbols.

a  $3(2x + 5)$

**2** Solve each equation by first expanding the grouping symbols. (Answers are all integers.)

- |                       |                        |                        |
|-----------------------|------------------------|------------------------|
| a $3(2x + 1) = 9$     | b $2(3a + 4) = 20$     | c $5(2m + 1) = 25$     |
| d $4(3a - 1) = 8$     | e $5(2p - 3) = 5$      | f $4(3q - 2) = 16$     |
| g $2(x + 2) = x + 5$  | h $3(a + 3) = 2a + 12$ | i $5(m + 2) = 3m + 12$ |
| j $3(m - 1) = 2m - 1$ | k $4(n - 2) = 2n + 4$  | l $3(2a + 1) = 4a + 7$ |
| m $2m + 5 = 3(m - 1)$ | n $6x + 3 = 3(x + 2)$  | o $5 - 2x = 3(x - 5)$  |

**3** Solve each equation.

- |                       |                       |                        |
|-----------------------|-----------------------|------------------------|
| a $2(x + 1) = 5$      | b $3(a + 3) = -10$    | c $5(p + 3) = 2$       |
| d $3(a - 2) = 0$      | e $5(q - 1) = -3$     | f $7(t - 2) = 5$       |
| g $2(3x + 1) = 5$     | h $3(2p + 3) = 12$    | i $5(2w + 3) = -20$    |
| j $3(x - 1) = x + 2$  | k $2(q - 3) = 4q - 9$ | l $5(k + 2) = 2k + 11$ |
| m $3m + 2 = 5(m - 1)$ | n $7x = 5(2x - 1)$    | o $3n - 7 = 6(2n - 2)$ |

**4** Find the solution to each equation by expanding all grouping symbols first.

- |                              |                                   |
|------------------------------|-----------------------------------|
| a $3(a + 2) = 2(a + 1)$      | b $5(x - 1) = 4(x + 2)$           |
| c $5(p - 2) = 4(p + 2)$      | d $3(q + 2) = 2(q + 5)$           |
| e $3(m + 1) = 5(m - 1)$      | f $6(x + 2) = 4(x + 6)$           |
| g $2(a - 7) = 5(a - 4)$      | h $7(t + 2) = 4(t + 5)$           |
| i $3(2a + 1) = 5(a + 2)$     | j $4(3p - 1) = 5(2p + 1)$         |
| k $6(t + 7) = 4(t + 10) + 8$ | l $5(2a - 1) = 3(a + 6) - 7$      |
| m $3(2 + m) = 5(2 - m) + 6m$ | n $6(p + 3) = 5(2 - p) + 7p - 12$ |

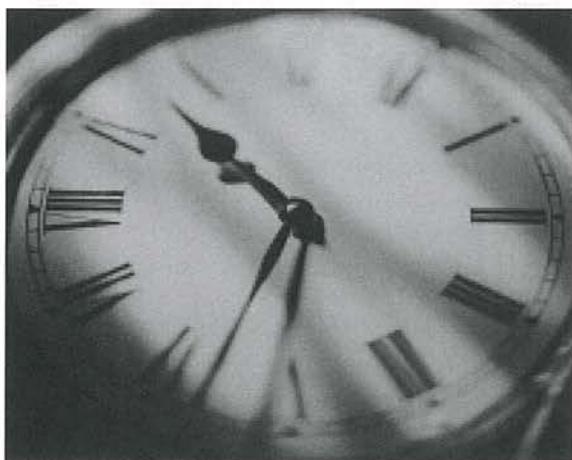
**5** Solve each equation. (See Worked Example 2b on p 250.)

- |                               |                              |
|-------------------------------|------------------------------|
| a $3(a + 2) + a + 5 = 15$     | b $5(m - 1) + 2m = 2$        |
| c $2(m + 3) + 5(m + 2) = 23$  | d $3(x + 2) + 2(x - 3) = 10$ |
| e $5(p + 1) + 2(p + 4) = 20$  | f $4(t - 2) + 2(t + 5) = 14$ |
| g $4(2a + 3) + 2(a - 5) = 22$ | h $2(2m + 3) + 3(m - 5) = 5$ |
| i $5(a - 3) + 3(2 + 3a) = 19$ | j $7(a + 5) + 2(6 - 3a) = 1$ |

**6** Try solving these equations, but first read the warning sign!

- |                              |                                |
|------------------------------|--------------------------------|
| a $3(a + 2) - 2(a + 1) = 6$  | b $5(m + 3) - 4(m + 2) = 10$   |
| c $5(n + 4) - 3(n - 2) = 30$ | d $6(a + 2) - 4(a - 1) = 20$   |
| e $4(a + 3) - (a + 2) = 13$  | f $4(p + 5) - (p + 3) = 23$    |
| g $5(2a + 1) - 2(a - 4) = 2$ | h $6(2x + 5) - 5(3x + 2) = 10$ |

**Warning!**  
Remember how to expand with a negative term:  
 $-2(x + 4) = -2x - 8$   
or  
 $-3(a - 1) = -3a + 3$



10:04 Equations



- At half past 10 what is the angle between the hands of a clock?
- What would be the angle between the hands two hours later?



If  $a = 5$  and  $b = 3$ , find the value of each of these expressions.

1  $a - b$       2  $b - a$       3  $2a + 3b$       4  $3a - 2b$       5  $a^2 + b^2$

Find the value of the expression  $2x - y$  if:

6  $x = 3, y = 4$     7  $x = 2, y = 5$     8  $x = -2, y = 4$     9  $x = 5, y = -2$     10  $x = -3, y = -4$

- A **formula** is a type of equation which may represent a special relationship. For instance, the formula  $A = L \times B$  represents the relationship between the area ( $A$ ) of a rectangle and its length ( $L$ ) and breadth ( $B$ ).
- A formula is different to an equation because it will have more than one pronumeral. To find the value of one pronumeral, we must know the values of every other pronumeral in the formula.
- There are two types of questions. These are as shown by the following examples.

## worked examples A

For these formulae we need to find the value of the pronumeral that is by itself.

1 If  $P = 2L + 2B$ , find  $P$   
if  $L = 4$  and  $B = 3$ .

2 If  $v = u + at$ , find  $v$   
if  $u = 1.2$ ,  $a = 0.5$  and  $t = 12.6$ .

### Solutions

1  $P = 2L + 2B$   
 $= 2 \times 4 + 2 \times 3$   
 $= 8 + 6$   
 $= 14$   
 $\therefore P = 14$

Substitute  
 $L = 4$  and  
 $B = 3$ .

2  $v = u + at$   
 $= 1.2 + 0.5 \times 12.6$   
 $= 1.2 + 6.3$   
 $= 7.5$   
 $\therefore v = 7.5$

The pronumeral  
by itself is called  
the subject.



## worked examples B

For these formulae we need to find the value of the pronumeral that is *not* by itself.

1 If  $y = 3x - 2$ , find  $x$  if  $y = 10$ .

2 If  $A = \frac{a+b}{2}$ , find  $a$  if  $A = 7$  and  $b = 10$ .

### Solutions

1  $y = 3x - 2$   
 $10 = 3x - 2$   
Solving this equation:  
 $12 = 3x$   
 $4 = x$   
 $\therefore x = 4$

Substitute  
 $y = 10$ .

Notice:  
For this type of  
question we  
need to solve  
an equation.

2  $A = \frac{a+b}{2}$   
 $7 = \frac{a+10}{2}$   
so  $14 = a + 10$   
 $4 = a$   
 $\therefore a = 4$



## 10:05A Finding the subject of a formula

### Exercise 10:05A

- 1 The formula for the area of a rectangle is  $A = lb$ .  
Find the value of  $A$  if:
- |                   |                   |                   |
|-------------------|-------------------|-------------------|
| a $l = 5, b = 3$  | b $l = 6, b = 2$  | c $l = 15, b = 9$ |
| d $l = 20, b = 2$ | e $l = 15, b = 5$ | f $l = 7, b = 4$  |

- 2 The perimeter of a rectangle is given as  $P = 2l + 2b$ . Find the value of  $P$  for the values of  $l$  and  $b$  given in Question 1.

- 3 The average of two numbers,  $m$  and  $n$ , is given by the formula  $A = \frac{m+n}{2}$ . Find  $A$  if:

- |                      |                      |                      |
|----------------------|----------------------|----------------------|
| a $m = 6, n = 10$    | b $m = 12, n = 18$   | c $m = 6, n = 9$     |
| d $m = 2.1, n = 1.7$ | e $m = 1.6, n = 3.2$ | f $m = 4.5, n = 3.1$ |

- 4 Given the formula  $v = u + at$ , find the value of  $v$  if:

- |                            |                                     |                                    |
|----------------------------|-------------------------------------|------------------------------------|
| a $u = 3, a = 2, t = 4$    | b $u = 5, a = 4, t = 8$             | c $u = 12, a = 1, t = 9$           |
| d $u = 6, a = 10, t = 0.5$ | e $u = 20, a = \frac{1}{2}, t = 12$ | f $u = 8, a = \frac{1}{4}, t = 20$ |

- 5 For the formula  $y = mx + b$ , find  $y$  if:

- |                                   |                         |                          |
|-----------------------------------|-------------------------|--------------------------|
| a $m = 2, x = 7, b = 3$           | b $m = 0, x = 3, b = 2$ | c $m = 4, x = 1, b = -3$ |
| d $m = \frac{1}{2}, x = 4, b = 2$ | e $m = 4, x = 1, b = 0$ | f $m = -1, x = 4, b = 5$ |

- 6 a If  $A = \frac{1}{2}bh$ , find  $A$  if  $b = 6, h = 10$ .

- b Given  $C = 2\pi r$ ,  $\pi = 3.14$  and  $r = 1.2$ , find  $C$ .

- c If  $D = ST$ , find  $D$  if  $S = 1.3, T = 0.9$ .

- d For  $A = \pi rs$ , find  $A$  if  $\pi = \frac{22}{7}, r = 3\frac{1}{2}$  and  $s = 5$ .

- e If  $C = \frac{5}{9}(F - 32)$ , find  $C$  if  $F = 86$ .

- f Given  $T = a + (n - 1)d$ , find  $T$  when  $a = 10, n = 4, d = 3$ .

- g If  $I = \frac{PRN}{100}$ , find  $I$  given  $P = 2000, R = 8$  and  $N = 3$ .

- h  $v = \sqrt{u^2 + 2aS}$ ; find  $v$  if  $u = 8, a = 10$  and  $S = 4$ .

- 7 The formula  $A = \frac{1}{2}h(a + b)$  gives the area ( $A$ ) of a trapezium when the height ( $h$ ) and the length of the two parallel sides ( $a$  and  $b$ ) are known. Find the area when:

- |  |   |
|--|---|
| a $h = 3 \text{ cm}, a = 8 \text{ cm}, b = 6 \text{ cm}$ | b $h = 20 \text{ m}, a = 4 \text{ m}, b = 9 \text{ m}$    |
| c $h = 30 \text{ m}, a = 80 \text{ m}, b = 70 \text{ m}$ | d $a = 10 \text{ mm}, b = 8 \text{ mm}, h = 3 \text{ mm}$ |

- 8 'Young's Rule' is used to calculate a child's medicine dose.

It is  $C = \frac{nA}{n + 12}$ , where:  $C$  is the child's dose in mL  
 $n$  is the child's age in years  
 $A$  is the adult dose in mL.

The adult dose is 30 mL. Find the dose for a child aged:

- |           |           |            |
|-----------|-----------|------------|
| a 3 years | b 8 years | c 12 years |
|-----------|-----------|------------|



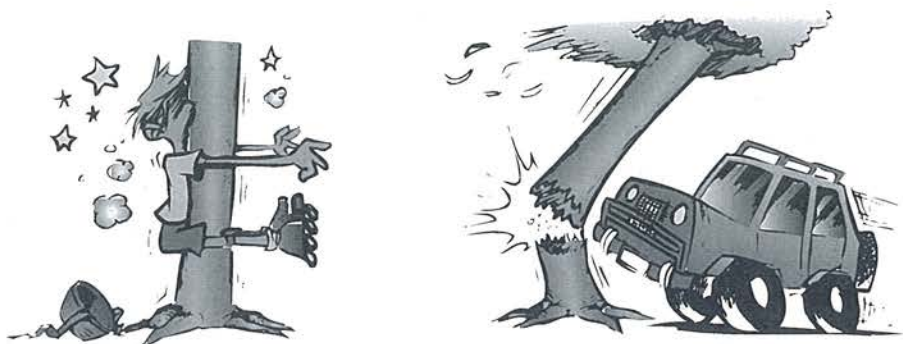
#### Remember!

- Replace the pronumerals with the numerals given.
- Then find the value of the remaining pronumeral.

Do you recognise the formulae in (a), (b) and (c)?



- 9 The cartoon below illustrates the fact that the energy of a moving vehicle depends on two things, its mass and its velocity (or speed).



The formula connecting  $E$  (energy),  $m$  (mass) and  $v$  (velocity) is  $E = \frac{1}{2}mv^2$ .  
(In this formula it is only the  $v$  that is squared.)

Energy is measured in joules, mass in kilograms and velocity in metres per second.

Find the energy of the object in each part below.

- |  |  |  |
|--|--|--|
| a $m = 4 \text{ kg}$ , $v = 2 \text{ m/s}$   | b $m = 10 \text{ kg}$ , $v = 3 \text{ m/s}$  | c $m = 2 \text{ kg}$ , $v = 10 \text{ m/s}$          |
| d $m = 2.6 \text{ kg}$ , $v = 4 \text{ m/s}$ | e $m = 6 \text{ kg}$ , $v = 1.2 \text{ m/s}$ | f $m = 8 \text{ kg}$ , $v = \frac{1}{2} \text{ m/s}$ |

## 10:05B Finding the value of a pronumeral that is not the subject

### Exercise 10:05B

Foundation Worksheet 10:05

Formulae PAS4.4

1 If  $F = m \times a$ , find the value of  $F$  if:

a  $m = 4$  and  $a = 5$

2 If  $A = c + P$ , find the value of  $P$  if:

a  $A = 12$  and  $c = 7$

- 1 For the formula  $A = lb$ , find the value of  $b$  if:

a  $A = 20$ ,  $l = 5$

b  $A = 256$ ,  $l = 16$

c  $A = 6$ ,  $l = 1.5$

d  $A = 9.3$ ,  $l = 0.6$

- 2 Given the formula  $v = u + at$ , find:

a  $u$  if  $v = 20$ ,  $a = 3$ ,  $t = 6$

b  $u$  if  $v = 36$ ,  $a = 9$ ,  $t = 3$

c  $u$  if  $v = 12$ ,  $a = -3$ ,  $t = 2$

d  $a$  if  $v = 10$ ,  $u = 2$ ,  $t = 4$

- 3 Using the formula  $A = \frac{m+n}{2}$ , find  $m$  if:

a  $A = 12$ ,  $n = 16$

b  $A = 20$ ,  $n = 8$

c  $A = 12.6$ ,  $n = 14.3$

- 4 Using the formula for the perimeter of a rectangle,  $P = 2l + 2b$ , find the length  $l$  if:

a perimeter = 20 m, breadth = 4 m

b perimeter = 32 cm, breadth = 6 cm

c perimeter = 8.4 km, breadth = 2.1 km

d perimeter = 0.8 m, breadth = 0.1 m

- 5 Given the formula  $y = mx + b$ , find:

a  $b$  if  $y = 12$ ,  $m = 4$ ,  $x = 3$

b  $b$  if  $y = 20$ ,  $m = 4$ ,  $x = 3$

c  $b$  if  $y = 6$ ,  $m = 4$ ,  $x = 3$



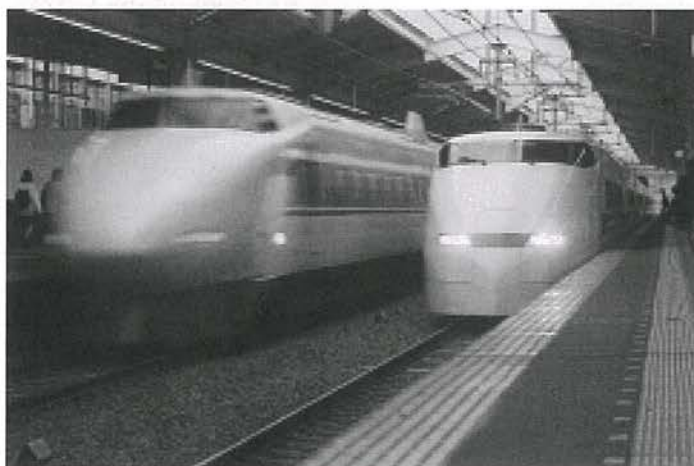
- 6 a If  $A = \frac{1}{2}h(a + b)$ , find  $a$  if  $A = 10$ ,  $h = 5$ ,  $b = 2$ .  
 b If  $M = a(x + y)$ , find  $y$  if  $M = 25$ ,  $a = 5$ ,  $x = 3$ .  
 c For  $T = a + (n - 1)d$ , find  $n$  if  $T = 70$ ,  $a = 7$ ,  $d = 9$ .  
 d If  $F = 32 + \frac{9}{5}C$ , find  $C$  if  $F = 86$ .  
 e Given  $c^2 = a^2 + b^2$ , find  $a$  if  $c = 17$  and  $b = 15$ .  
 f Given  $A = \frac{1}{2}bh$ , find  $b$  if  $A = 9$ ,  $h = 6$ .  
 g For the formula  $E = \frac{1}{2}mv^2$ , find  $m$  when  $E = 16$  and  $v = 4$ .

- 7 Emma's pay (\$P) each week depends on the number of sales ( $s$ ) she makes. The formula is  $P = 20(3s + 4)$ .  
 a How much is Emma paid if she makes no sales?  
 b How much is she paid if she makes 10 sales?  
 c How many sales must she make to earn \$500 in a week?

- 8 The Pioneer bus company calculates its charge for excursions using the formula  $C = \frac{11n}{2}$ , where  $C$  is the cost in dollars and  $n$  is the number of students. Excursions must have at least 20 students. No more than 40 students can go on the one excursion.  
 a What is the smallest charge?  
 b What is the greatest charge?  
 c Why do you think they insist on at least 20 students?  
 d If the cost is \$143, how many students are involved?

- 9 A factory makes  $n$  wardrobes each day and its daily profit, \$P, can be calculated from the formula  $P = 200n - 400$ .  
 a How many wardrobes must be made to make \$1000 profit in one day?  
 b How many must be made to 'break even' in one day?  
 c If only one wardrobe is made in a day, what is the profit? Explain your answer.

Do you recognise the formulae in (a), (e), (f) and (g)?



- The formula connecting average speed ( $S$ ) with the total distance travelled ( $D$ ) and the total time taken ( $T$ ), is  $S = \frac{D}{T}$ .
  - Find the speed of the train if it covered a distance of 481 km in 3 h 15 min.
  - Find the time taken if the train travelled at an average speed of 122 km/h for  $4\frac{1}{2}$  hours.

# 10:06 | Solving Problems Using Equations

Outcome PAS4.4



Solve these simple equations.

1  $7x = 56$

2  $9 + a = 6$

3  $\frac{m}{3} = 6$

4  $n + 6 = 4$

5  $3x = -12$

Write expressions for:

6 the sum of  $a$  and  $b$

7 the product of 5 and  $y$

8 the number 5 bigger than  $x$

9 the number 6 less than  $m$

10 the next even number after  $n$ , if  $n$  is an even number.

- The main use of equations is to help us solve problems. To do this we must be able to translate or rewrite a problem given in words into an equation, where the pronumeral will represent the number we are trying to find. Follow the steps below.

## Solving problems

**Step 1** Introduce a pronumeral.

**Step 2** Write down an equation.

**Step 3** Solve the equation.

**Step 4** Answer the problem.



## worked examples

- 1 The product of a certain number and 6 is 72. What is the number?

### Solution

Let the number be  $n$ .  $\leftarrow$  Step 1  $\rightarrow$

$6n = 72$   $\leftarrow$  Step 2  $\rightarrow$

$\therefore n = 12$   $\leftarrow$  Step 3  $\rightarrow$

$\therefore$  The number is 12.  $\leftarrow$  Step 4  $\rightarrow$

- 2 If a number is multiplied by 6, and 7 is subtracted from the product, the answer is 23. What is the number?

### Solution

Let the number be  $x$ .

$6x - 7 = 23$

$6x = 30$

$\therefore x = 5$

$\therefore$  The number is 5.

- 3 The sum of three consecutive integers is 30. What are the integers?

### Solution

Let the smallest integer be  $n$ .

So  $n + (n + 1) + (n + 2) = 30$

$3n + 3 = 30$

$3n = 27$

$\therefore n = 9$

$\therefore$  The integers are 9, 10 and 11.

■ 'Consecutive' means 'one after the other', so the next consecutive integer after  $n$  would be  $n + 1$ .





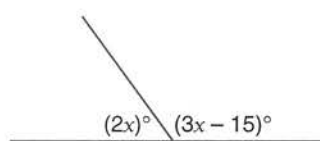
- 4 A rectangle is twice as long as it is wide. If the perimeter is 144 cm, what are its dimensions?



### Solution

Let the width of the rectangle be  $x$ .  
 Then the length will be  $2x$ .  
 So  $2x + x + 2x + x = 144$   
 ie  $6x = 144$   
 $\therefore x = 24$   
 $\therefore$  The width of the rectangle is 24 units.  
 The length of the rectangle is 48 units.

- 5 Find the value of  $x$  in this diagram.



### Solution

To solve this problem you need to remember that the two angles add to give  $180^\circ$  (angles on a straight line).  
 So  $2x + (3x - 15) = 180$   
 ie  $5x - 15 = 180$   
 $5x = 195$   
 $x = 39$   
 $\therefore$  The value of  $x$  is 39.

## Exercise 10:06

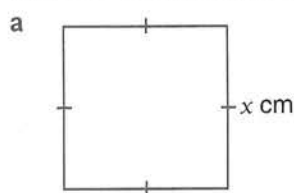
- 1** Solve these number problems by first writing an equation.
- The sum of a certain number and 11 is 23. What is the number?
  - A certain number minus 9 is equal to 13. What is the number?
  - 15 minus a certain number is equal to 8. What is the number?
  - The product of 9 and a certain number is 108. What is the number?
  - The sum of a certain number and 3 is  $-5$ . What is the number?
  - A certain number is bigger than 10 and the difference from 10 is 7. What is the number?
- 2**
- If a number is multiplied by 3, and 5 is added to the product, the result is 17. What is the number?
  - When 6 is subtracted from the product of 4 and a certain number, the answer is 14. What is the number?
  - The sum of a certain number and 3 is then multiplied by 7. If the answer is 63, what is the number?
  - The product of a certain number and 5 is subtracted from 90. If the answer is 25, what is the number?
  - 9 is subtracted from a certain number and the result is multiplied by 4. If the answer is 24, what is the number?
  - The sum of two consecutive integers is 23. What are the integers?
  - The sum of three consecutive integers is 51. What are the integers?
- 3** The equation for each of these problems will have the pronumeral on both sides.
- The result of adding 12 to a certain number is the same as multiplying the number by 4. Find the number.
  - Twice a number plus seven is the same as three times the number plus one. What is the number?
  - Five times a number less seven is the same as three times the number plus five. Find the number.
  - If the sum of a number and 3 is multiplied by 4, the answer is the same as twice the number plus 16. Find the number.

■ Let the number be  $n$ .

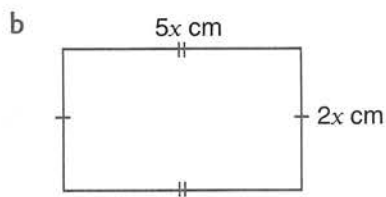
■ • These will be two-step equations!  
 • Also, you may need grouping symbols.

■ If  $n$  is an even number, then the next one will be  $n + 2$ .

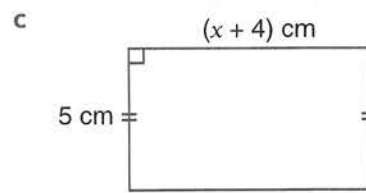
- 4 Use the information given with each figure to form an equation and then solve it to find the value of the pronumeral.



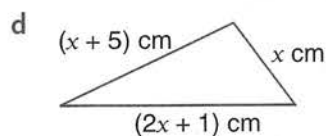
Perimeter = 64 cm



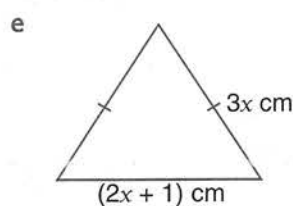
Perimeter = 98 cm



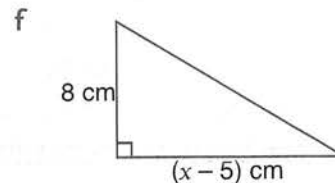
Area = 45 cm<sup>2</sup>



Perimeter = 22 cm

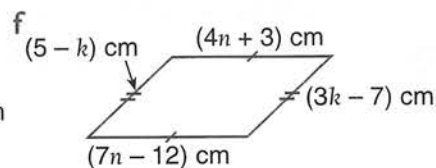
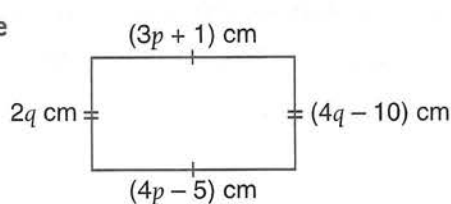
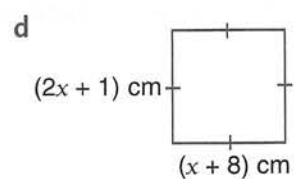
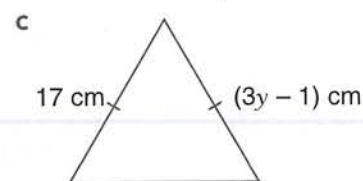
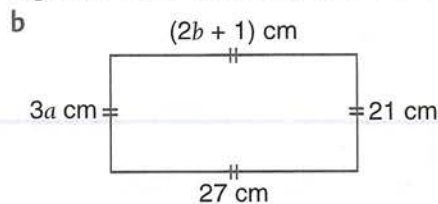
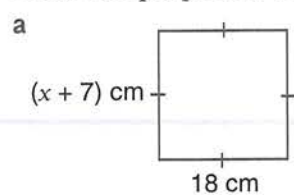


Perimeter = 57 cm

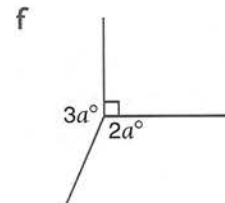
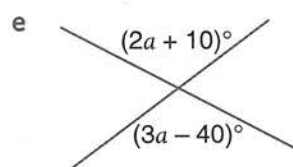
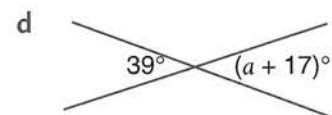
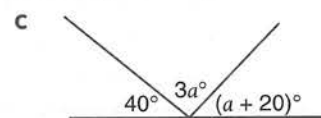
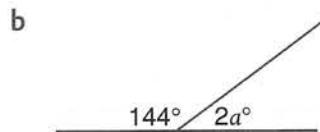
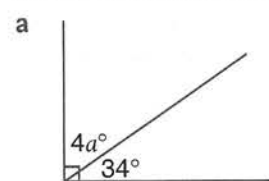


Area = 24 cm<sup>2</sup>

- 5 From the properties of the figures, write down equations and solve them for each pronumeral.



- 6 Find the value of  $a$  in these figures. You will need to remember some geometry.



### Exercise 9:05

- 1 a cube, closed      b rectangular prism, open      c triangular prism, closed      d rectangular prism, closed  
 2 a  $54 \text{ m}^2$       b  $104 \text{ m}^2$       c  $176 \text{ m}^2$       d  $220 \text{ m}^2$       e  $352 \text{ m}^2$       f  $412 \text{ m}^2$   
 3 a  $300 \text{ m}^2$       b  $260 \text{ m}^2$       c  $264 \text{ m}^2$       4 a  $152 \text{ cm}^2$       b  $241 \text{ cm}^2$       c  $496.72 \text{ cm}^2$   
 5 a  $x = 5, 84 \text{ cm}^2$       b  $x = 12 \text{ cm}, 480 \text{ cm}^2$   
 6 These answers are approximate.      a  $3.6 \text{ cm}^2$       b  $5.3 \text{ cm}^2$       c  $6.9 \text{ cm}^2$       d  $7.9 \text{ cm}^2$   
 7 a No. A cube with volume  $8 \text{ cm}^3$  (surface area  $24 \text{ cm}^2$ ) would have less surface area than a prism of volume  $8 \text{ cm}^3$  with dimensions  $1 \text{ cm} \times 2 \text{ cm} \times 4 \text{ cm}$  (surface area  $28 \text{ cm}^2$ ).  
 b No. A cube with surface area  $24 \text{ cm}^2$  and volume  $8 \text{ cm}^3$  as above has the same surface area as a rectangular prism with dimensions  $1 \text{ cm} \times 2 \text{ cm} \times 3\frac{1}{3} \text{ cm}$ . However, the volume of the prism is  $6\frac{2}{3} \text{ cm}^3$ .

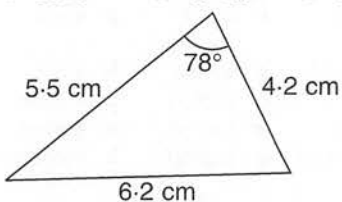
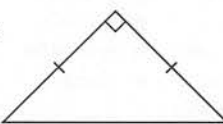
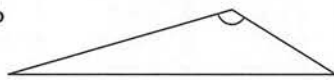

### Fun Spot 9:05

- 1 D      2 A, B and C      3 B to C      4 A and D      5 A and B      6 C

### Diagnostic Test 9: Area and Volume

- 1 a  $54 \text{ cm}^2$       b  $49 \text{ cm}^2$       c  $60 \text{ cm}^2$       2 a  $20 \text{ cm}^2$       b  $36 \text{ cm}^2$       c  $36 \text{ cm}^2$   
 3 a  $112 \text{ cm}^2$       b  $100 \text{ cm}^2$       c  $104 \text{ cm}^2$       4 a  $60 \text{ cm}^2$       b  $84 \text{ cm}^2$       c  $48 \text{ cm}^2$   
 5 a  $60 \text{ cm}^2$       b  $50 \text{ cm}^2$       c  $162 \text{ cm}^2$       6 a  $16 \text{ cm}^2$       b  $38.5 \text{ cm}^2$       c  $42 \text{ cm}^2$   
 7 a  $150 \text{ cm}^3$       b  $125 \text{ cm}^3$       c  $630 \text{ cm}^3$       8 a  $80 \text{ cm}^3$       b  $360 \text{ cm}^3$       c  $378 \text{ cm}^3$   
 9 a  $70 \text{ cm}^3$       b  $100 \text{ cm}^3$       c  $256 \text{ cm}^3$       10 a  $504 \text{ cm}^3$       b  $84 \text{ m}^3$       c  $864 \text{ cm}^3$

### 9A Revision Assignment

- 1 a  $6a$       b  $9b$       c  $2a$       d  $16a^2$       2 a  $2\%$       b  $\$30$       c  $16.5\%$       d  $\$12.38$   
 3 a  $4 \text{ m}$       b  $10.90 \text{ m}$   
 4 a  $a = 0.5, b = 1.3$   
 5 a  $5026$       b  $60\,700$       c  $7\,020\,006$   
 6  7 a  b  c   
 8 a  $\frac{1}{6}$       b  $\frac{1}{3}$       c 0      d  $\frac{1}{3}$   
 9 a yes ( $18 \text{ m}^3$ )      b A:  $42 \text{ m}^2$ , B:  $54 \text{ m}^2$ , no      c  $\$453.60$   
 10  $375 \text{ cm}^2$

### 9B Working Mathematically

- 1 105      2 39      3 325      4 18      5 58  
 6 a parallel lines      b perpendicular lines      c concurrent lines      d angle ABC or CBA  
 e acute angle      f transversal      g corresponding angles      h alternate angles  
 i  $\angle CAD = 60^\circ$       j CD is perpendicular to AB

## Chapter 10: Equations, formulae and inequations

### Prep Quiz 10:01

- 1  $x + 5$       2  $3a$       3  $\frac{y}{8}$       4  $p - 2$       5  $3x + 2$       6  $7(y - 2)$       7 subtracting 8  
 8 adding 5      9 dividing by 4      10 multiplying by 3

### Exercise 10:01

- 1 a  $\times 9$       b  $+ 2$       c  $- 7$       d  $\times 5, - 1$       e  $\div 10$       f  $+ 6, \div 5$   
 g  $\div 3, + 9$       h  $- 8, \div 7$       i  $\div (-5), + 3$       j  $+ 3, \times 2$       k  $\times (-3), + 5$   
 2 a  $+ 3$       b  $\times 2$       c  $- 5$       d  $+ 7$       e  $\div 10$       f  $\times 3$   
 g  $- 8$       h  $+ 5$       i  $- 1, \div 2$       j  $+ 2, \div 5$       k  $- 3, \div 7$       l  $+ 4, \div 9$   
 m  $- 6, \div 3$       n  $- 7, \times 2$       o  $+ 2, \times 5$       p  $\times 3, - 7$       q  $\times 5, + 2$       r  $- 5, \div (-3)$   
 s  $- 8, \div (-2)$       t  $- 5, \times (-3)$   
 3 a  $m \xrightarrow{\times 8} 8m$       b  $p \xrightarrow{+ 7} \frac{p}{7}$       c  $x \xrightarrow{+ 5} 5 + x$       d  $q \xrightarrow{- 10} q - 10$   
 e  $x \xrightarrow{\times 3} 3x \xrightarrow{+ 2} 3x + 2$       f  $n \xrightarrow{\times 5} 5n \xrightarrow{- 3} 5n - 3$       g  $p \xrightarrow{\times 6} 6p \xrightarrow{+ 7} 6p + 7$       h  $a \xrightarrow{\times 9} 9a \xrightarrow{- 1} 9a - 1$   
 i  $x \xrightarrow{+ 3} \frac{x}{3} \xrightarrow{+ 5} \frac{x}{3} + 5$       j  $a \xrightarrow{+ 4} \frac{a}{4} \xrightarrow{+ 7} 7 + \frac{a}{4}$       k  $y \xrightarrow{+ 3} y + 3 \xrightarrow{+ 4} \frac{y + 3}{4}$       l  $n \xrightarrow{- 1} n - 1 \xrightarrow{+ 5} \frac{n - 1}{5}$



$$\begin{array}{lll}
 m \quad m \xrightarrow{+2} m+2 \xrightarrow{\times 7} 7(m+2) & n \quad x \xrightarrow{-3} x-3 \xrightarrow{\times 9} 9(x-3) & o \quad x \xrightarrow{+2} 2+x \xrightarrow{\times 5} 5(2+x) \\
 p \quad q \xrightarrow{-4} q-4 \xrightarrow{\times 3} 3(q-4) & q \quad x \xrightarrow{\times (-2)} -2x \xrightarrow{+3} 3-2x & r \quad a \xrightarrow{\times (-5)} -5a \xrightarrow{+7} -5a+7 \\
 s \quad x \xrightarrow{\div (-3)} -\frac{x}{3} \xrightarrow{+6} 6-\frac{x}{3} & t \quad p \xrightarrow{\times (-9)} -9p \xrightarrow{+10} 10-9p & \\
 4 \quad a \quad a-2 & b \quad 4x & c \quad \frac{m}{3} & d \quad t+9 & e \quad 5p, 5p+2 & f \quad 6x, 6x-4 \\
 g \quad y+1, 7(y+1) & h \quad \frac{b}{4}, \frac{b}{4}+2 & i \quad q-3, \frac{q-3}{3} & j \quad -2n, -2n+6 & k \quad b & l \quad a \\
 m \quad m & n \quad n & o \quad 2x, x & p \quad 5p, p & q \quad 7t, t & r \quad m+5, m \\
 s \quad \frac{a}{3}, a & t \quad -2x, x & & & & \\
 5 \quad a \quad -6 & b \quad +3 & c \quad +5 & d \quad \times 7 & e \quad \times 2, +3 & f \quad \times 5, -2 \\
 g \quad \times 3, +6 & h \quad \times 7, -1 & i \quad +7, +5 & j \quad -4, +3 & k \quad +8, +5 & l \quad +3, -4 \\
 m \quad +3, \times 2 & n \quad -9, \times 5 & o \quad \times (-6), +8 & p \quad \times (-3), +10 & & \\
 6 \quad a \quad +7 & b \quad \div 5 & c \quad -6 & d \quad \times 3 & e \quad \div (-4) & f \quad -5, \div 2 \\
 g \quad +1, \div 3 & h \quad -5, \div 7 & i \quad +6, \div 5 & j \quad -8, \div (-3) & k \quad \times 7, -3 & l \quad -3, \times 7 \\
 m \quad \div 5, -2 & n \quad +3, +1 & o \quad \times 5, +9 & & & \\
 7 \quad a \quad \times 5, -3, \div 2 & b \quad +6, -7, \div 3 & c \quad \times 6, -7, \div (-3) & d \quad -9, \times 3, \div 2 & e \quad +5, -2, \div (-3) & \\
 f \quad \times 7, -5, \div (-1) & g \quad -6, \times 3, \div (-5) & h \quad \times 5, \div 7, -4, \div 3 & & & 
 \end{array}$$

### Prep Quiz 10:02

1  $x$  2  $x$  3  $a$  4  $m$  5 dividing by 3 6 subtracting 7 7 adding 1 8 multiplying by 5 9  $-3, \div 5$  10  $+2, \div 8$

### Exercise 10:02

$$\begin{array}{llllllll}
 1 \quad a \quad x=8 & b \quad p=2 & c \quad y=14 & d \quad n=3 & e \quad q=8 & f \quad k=9 & g \quad y=8 & h \quad m=9 \\
 i \quad x=13 & j \quad x=3 & k \quad x=6 & l \quad p=12 & m \quad y=4 & n \quad y=2 & o \quad x=3 & p \quad n=6 \\
 q \quad x=15 & r \quad m=16 & & & & & & \\
 2 \quad a \quad x=-1 & b \quad m=-4 & c \quad n=-2 & d \quad p=-8 & e \quad q=-6 & f \quad y=-12 & g \quad a=5 & h \quad x=7 \\
 i \quad p=5 & j \quad q=1 & k \quad y=0 & l \quad t=4 & m \quad m=-2 & n \quad p=-2 & o \quad w=-1 & p \quad n=-6 \\
 q \quad q=-9 & r \quad m=2 & s \quad x=-6 & t \quad m=-80 & u \quad n=-196 & v \quad x=3 & w \quad y=-8 & x \quad x=-3 \\
 3 \quad a \quad \text{correct} & b \quad \text{incorrect} & c \quad \text{correct} & d \quad \text{correct} & e \quad \text{correct} & f \quad \text{incorrect} & g \quad \text{correct} & h \quad \text{incorrect} \\
 i \quad \text{incorrect} & j \quad \text{correct} & k \quad \text{incorrect} & l \quad \text{incorrect} & & & & \\
 4 \quad a \quad x=2 & b \quad a=2 & c \quad m=3 & d \quad n=3 & e \quad k=5 & f \quad t=2 & g \quad a=4 & h \quad w=1 \\
 i \quad q=1 & j \quad x=3 & k \quad m=2 & l \quad q=4 & m \quad x=9 & n \quad y=2 & o \quad a=-2 & p \quad x=11 \\
 q \quad x=-1 & r \quad x=2 & & & & & & \\
 5 \quad a \quad x=2 & b \quad x=10 & c \quad m=8 & d \quad x=11 & e \quad a=1 & f \quad n=13 & g \quad m=14 & h \quad n=19 \\
 i \quad a=42 & j \quad y=6 & k \quad x=-4 & l \quad m=25 & m \quad a=10 & n \quad x=18 & o \quad m=4 & \\
 6 \quad a \quad x=\frac{3}{2} & b \quad a=\frac{5}{2} & c \quad m=\frac{1}{3} & d \quad n=\frac{6}{5} & e \quad p=\frac{5}{2} & f \quad q=\frac{3}{4} & g \quad n=\frac{9}{5} & h \quad y=\frac{2}{3} \\
 i \quad k=\frac{7}{2} & j \quad x=\frac{2}{3} & k \quad a=\frac{2}{3} & l \quad a=\frac{3}{2} & m \quad m=-\frac{3}{2} & n \quad p=-\frac{6}{5} & o \quad a=-\frac{3}{2} & p \quad a=\frac{4}{3} \\
 7 \quad a \quad x=7 & b \quad m=4 & c \quad x=1 & d \quad n=5 & e \quad a=3 & f \quad a=-1 & g \quad y=-2 & h \quad m=2 \\
 i \quad x=-4 & j \quad n=\frac{5}{3} & k \quad x=\frac{2}{3} & l \quad q=-4 & m \quad x=50 & n \quad p=4 & o \quad x=3 & p \quad a=18 \\
 q \quad a=6 & r \quad a=-3 & s \quad m=46 & t \quad m=\frac{6}{5} & u \quad a=-1 & v \quad p=-1 & w \quad q=-4 & x \quad n=-7
 \end{array}$$

### Prep Quiz 10:03

1  $x$  2  $6a$  3 0 4 0 5  $-5$  6  $+4$  7  $\times 5$  8 5 9 1 10 5

### Exercise 10:03

$$\begin{array}{llllllll}
 1 \quad a \quad a=2 & b \quad x=7 & c \quad p=3 & d \quad q=8 & e \quad n=5 & f \quad x=-3 & g \quad m=-3 & h \quad a=-2 \\
 i \quad x=3 & j \quad m=3 & k \quad y=4 & l \quad x=-3 & m \quad x=6 & n \quad m=-4 & o \quad x=2 & p \quad x=1 \\
 q \quad m=2 & r \quad p=0 & & & & & & \\
 2 \quad a \quad \text{correct} & b \quad \text{correct} & c \quad \text{incorrect} & d \quad \text{incorrect} & e \quad \text{correct} & f \quad \text{incorrect} & g \quad \text{incorrect} & h \quad \text{correct} \\
 i \quad \text{correct} & j \quad \text{correct} & k \quad \text{incorrect} & l \quad \text{incorrect} & m \quad \text{incorrect} & n \quad \text{incorrect} & o \quad \text{correct} & \\
 3 \quad a \quad x=\frac{1}{2} & b \quad m=1\frac{1}{2} & c \quad p=\frac{2}{3} & d \quad m=\frac{1}{3} & e \quad a=-\frac{1}{2} & f \quad n=1\frac{1}{3} & g \quad a=2\frac{1}{2} & h \quad n=3\frac{1}{3} \\
 i \quad q=2\frac{2}{3} & j \quad n=-\frac{1}{2} & k \quad a=\frac{2}{3} & l \quad k=-1\frac{1}{3} & m \quad a=1\frac{1}{2} & n \quad x=1\frac{1}{3} & o \quad q=2\frac{1}{4} & p \quad t=2\frac{2}{3} \\
 q \quad m=\frac{2}{3} & r \quad x=\frac{5}{8} & s \quad a=-1\frac{1}{3} & t \quad w=-1\frac{1}{3} & u \quad m=-1\frac{1}{3} & v \quad y=\frac{2}{3} & w \quad x=-\frac{1}{8} & x \quad p=4\frac{1}{3}
 \end{array}$$

### Prep Quiz 10:04

1  $2x+6$  2  $3a-15$  3  $8a+12$  4  $10p-5$  5  $21-14q$  6  $x=5$  7  $x=-5$  8  $p=2$  9  $p=\frac{1}{2}$  10  $x=11$

### Exercise 10:04

- |                        |                       |                       |                      |                      |                      |                       |                      |
|------------------------|-----------------------|-----------------------|----------------------|----------------------|----------------------|-----------------------|----------------------|
| 1 a $x = -1$           | b $a = 2$             | c $n = 0$             | d $p = 2$            | e $a = 4$            | f $m = 7$            | g $x = 3$             | h $q = 4$            |
| i $a = \frac{1}{2}$    | j $x = \frac{5}{8}$   | k $x = 2\frac{1}{2}$  | l $t = 1\frac{2}{5}$ | m $a = 1$            | n $x = 4$            |                       |                      |
| 2 a $x = 1$            | b $a = 2$             | c $m = 2$             | d $a = 1$            | e $p = 2$            | f $q = 2$            | g $x = 1$             | h $a = 3$            |
| i $m = 1$              | j $m = 2$             | k $n = 6$             | l $a = 2$            | m $m = 8$            | n $x = 1$            | o $x = 4$             |                      |
| 3 a $x = 1\frac{1}{2}$ | b $a = -6\frac{1}{3}$ | c $p = -2\frac{3}{5}$ | d $a = 2$            | e $q = \frac{2}{5}$  | f $t = 2\frac{5}{7}$ | g $x = \frac{1}{2}$   | h $p = \frac{1}{2}$  |
| i $w = -3\frac{1}{2}$  | j $x = 2\frac{1}{2}$  | k $q = 1\frac{1}{2}$  | l $k = \frac{1}{3}$  | m $m = 3\frac{1}{2}$ | n $x = 1\frac{2}{3}$ | o $n = \frac{5}{9}$   |                      |
| 4 a $a = -4$           | b $x = 13$            | c $p = 18$            | d $q = 4$            | e $m = 4$            | f $x = 6$            | g $a = 2$             | h $t = 2$            |
| i $a = 7$              | j $p = 4\frac{1}{2}$  | k $t = 3$             | l $a = 2\frac{2}{7}$ | m $m = 2$            | n $p = -5$           |                       |                      |
| 5 a $a = 1$            | b $m = 1$             | c $m = 1$             | d $x = 2$            | e $p = 1$            | f $t = 2$            | g $a = 2$             | h $m = 2$            |
| i $a = 2$              | j $a = -46$           |                       |                      |                      |                      |                       |                      |
| 6 a $a = 2$            | b $m = 3$             | c $n = 2$             | d $a = 2$            | e $a = 1$            | f $p = 2$            | g $a = -1\frac{3}{8}$ | h $x = 3\frac{1}{3}$ |

### Prep Quiz 10:05

- 1 2      2 -2      3 19      4 9      5 34      6 2      7 -1      8 -8      9 12      10 -2

### Exercise 10:05A

- |                       |                     |                      |                     |               |           |       |      |
|-----------------------|---------------------|----------------------|---------------------|---------------|-----------|-------|------|
| 1 a 15                | b 12                | c 135                | d 40                | e 75          | f 28      |       |      |
| 2 a 16                | b 16                | c 48                 | d 44                | e 40          | f 22      |       |      |
| 3 a 8                 | b 15                | c $7\frac{1}{2}$     | d 1.9               | e 2.4         | f 3.8     |       |      |
| 4 a 11                | b 37                | c 21                 | d 11                | e 26          | f 13      |       |      |
| 5 a 17                | b 2                 | c 1                  | d 4                 | e 4           | f 1       |       |      |
| 6 a 30                | b 7.536             | c 1.17               | d 55                | e 30          | f 19      | g 480 | h 12 |
| 7 a $21 \text{ cm}^2$ | b $130 \text{ m}^2$ | c $2250 \text{ m}^2$ | d $27 \text{ mm}^2$ |               |           |       |      |
| 8 a 6 mL              | b 12 mL             | c 15 mL              |                     |               |           |       |      |
| 9 a 8 joules          | b 45 joules         | c 100 joules         | d 20.8 joules       | e 4.32 joules | f 1 joule |       |      |

### Exercise 10:05B

- |                 |               |  |               |                   |           |            |           |
|-----------------|---------------|--|---------------|-------------------|-----------|------------|-----------|
| 1 a 4           | b 16          | c 4  | d 15.5        | 2 a $u = 2$       | b $u = 9$ | c $u = 18$ | d $a = 2$ |
| 3 a 8           | b 32          | c 10.9   |               | 4 a 6 m           | b 10 cm   | c 2.1 km   | d 0.3 m   |
| 5 a 0           | b 8           | c -6   |               |                   |           |            |           |
| 6 a $a = 2$     | b $y = 2$     | c $n = 8$  | d $C = 30$    | e $a = 8$ (or -8) | f $B = 3$ | g $m = 2$  |           |
| 7 a \$80        | b \$680       | c 7  |               |                   |           |            |           |
| 8 a \$110       | b \$220       | c They need at least 20 students to make a worthwhile profit.  | d 26 students |                   |           |            |           |
| 9 a 7 wardrobes | b 2 wardrobes | c -\$200. This is a loss of \$200. It costs \$400 a day in wages, rent etc. just to run the factory. |               |                   |           |            |           |

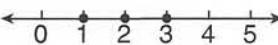
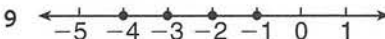
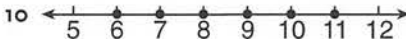
### Prep Quiz 10:06

- 1  $x = 8$       2  $a = -3$       3  $m = 18$       4  $n = -2$       5  $x = -4$       6  $a + b$       7  $5y$       8  $x + 5$       9  $m - 6$       10  $n + 2$

### Exercise 10:06

- |              |  |                           |   |                  |                  |              |  |
|--------------|--|---------------------------|---|------------------|------------------|--------------|--|
| 1 a 12       | b 22   | c 7                       | d 12  | e -8             | f 17             |              |  |
| 2 a 4        | b 5  | c 6                       | d 13  | e 15             | f 11, 12         | g 16, 17, 18 |  |
| 3 a 4        | b 6  | c 6                       | d 2   |                  |                  |              |  |
| 4 a 16       | b 7  | c 5                       | d 4   | e 7              | f 11             |              |  |
| 5 a $x = 11$ | b $a = 7, b = 13$  | c $y = 6$                 | d $x = 7$   | e $p = 6, q = 5$ | f $n = 5, k = 3$ |              |  |
| 6 a 14       | b 18   | c 30                      | d 22  | e 50             | f 54             |              |  |
| 7 a 12, 36   | b \$7, \$28  | c pen = 55c; pencil = 30c | d $5.5 \text{ cm} \times 16.5 \text{ cm}$ ; area = $90.75 \text{ cm}^2$ |                  |                  |              |  |
|              | e 100 units $\times$ 15 units, area = $1500 \text{ units}^2$ |                           | f Gregory = \$16, Penny = \$10, Phillip = \$3                           |                  |                  |              |  |
|              | g father = 48, George = 24                                   |                           |   |                  |                  |              |  |
| 8            | Each log is 5 m long.  |                           |   |                  |                  |              |  |

### Prep Quiz 10:07

- 1 True      2 True      3 True      4 True      5  $\{0, 1, 2, 3\}$
- 6  $\{2, 3, 4, 5, 6\}$       7  $\{-3, -2, -1\}$       8 
- 9       10 





# SCIENCE





# 2 Medical science

Student learning matrix

- 2.1 Infectious diseases
  - 2.2 Non-infectious diseases
  - 2.3 Immunity
  - 2.4 Vaccination
  - 2.5 Medical science: puzzles
  - 2.6 Medical science: summary
- Reflection






# Student learning matrix

Name: ..... Class: ..... Due date: .....

Monitor your learning throughout this topic by completing this page.

Shade the circle to indicate that you have completed an activity and how well you think you have understood it using the traffic light system.

(**Green:** I understand; **Yellow:** I can do it with help; **Red:** I do not understand).

My progress				
TOPIC 2 Medical science	eWorksheets			
2.1 Infectious diseases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.2 Non-infectious diseases	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.3 Immunity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.4 Vaccination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.5 Medical science: puzzles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.6 Medical science: summary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Areas for improvement: .....

.....

.....

Signatures:

Parent/guardian: ..... Teacher: .....



## 2.1 Infectious diseases

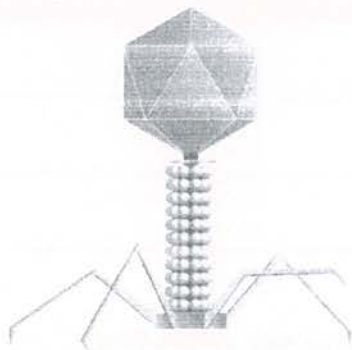
Student: ..... Class: ..... Date: .....

Infectious diseases are diseases that are contagious. They are caused by a pathogen.

1. Define the term 'pathogen'.

.....

2. Pathogenic organisms can be microscopic or macroscopic. The following diagram shows an example of a virus.



(a) Is the virus a microscopic or macroscopic pathogen?

.....

(b) Explain whether or not viruses possess all the characteristics of living things.

.....

.....

(c) Identify three viral diseases that affect humans.

.....

3. Athlete's foot or *Tinea pedis* is a fungal disease. Read the following text and use this information to complete the table below.

*Trichophyton rubrum* is the yeast fungus that most commonly causes Athlete's foot. The first sign of Athlete's foot is itching between the toes. The skin between the toes then becomes red and inflamed. Eventually the skin may blister and crack and seeping sores may appear. Athlete's foot is treated by applying an antifungal cream or spray to the affected area. The fungus is transmitted through wet surfaces such as shower floors and pool sides. The fungus thrives in warm, moist environments so drying the skin between your toes after showering and changing your socks after playing sport can prevent the symptoms of Athlete's foot even if you do become infected with the fungus.

Disease	Athlete's foot
Organism that causes the disease	
Symptoms	
Method of transmission	
Treatment	

## 2.2 Non-infectious diseases

Student: ..... Class: ..... Date: .....

Non-infectious diseases are not contagious. You cannot 'catch' them from other people.

1. Classify the following diseases as infectious or non-infectious.

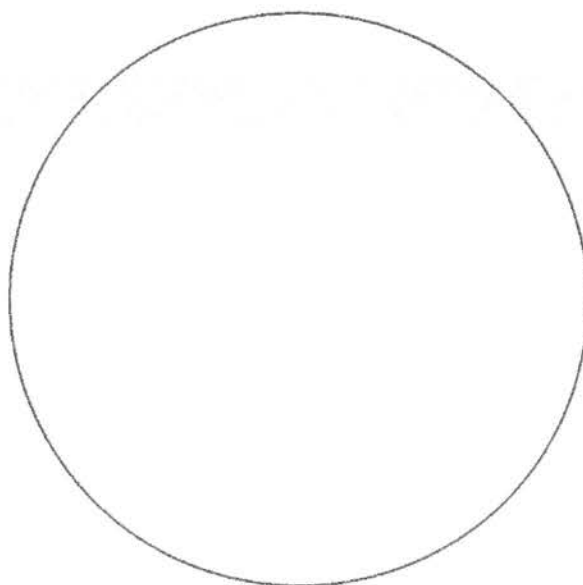
Disease	Classification	Disease	Classification
Measles		Anorexia	
Schizophrenia		Mumps	
Heart disease		Typhoid fever	

2. Cancer statistics

Generally cancer is classified as a non-infectious disease. The following data comes from Australian statistics for 2003.

Cancer	Prostate	Colorectal	Breast	Melanoma	Lung	All other cancers
% of total cancers	14.5	13.5	12.8	10.2	8.9	40.1

- (a) Complete the table above by calculating the percentage (%) of incidence of 'All other cancers'.  
 (b) Use the data in the table above to construct a pie graph in the space provided below.



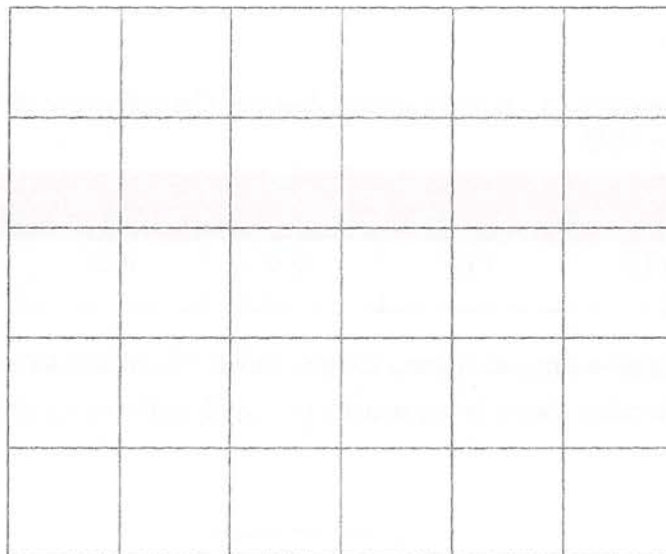


## 3. Cardiovascular disease statistics

The following data on cardiovascular disease covers the period 2004–2005.

Type	Incidence	% of total
Coronary heart disease	637 900	
Stroke	225 770	
Heart failure	263 000	
High blood pressure	2 100 700	
Rheumatic heart disease	1402	
Other	473 728	
<b>Total</b>	<b>3 702 500</b>	

- (a) Complete the above table.
- (b) Plot a column graph of the percentage (%) of each disease.



## 2.2 Non-infectious diseases

Student: ..... Class: ..... Date: .....

Non-infectious diseases are not contagious. You cannot 'catch' them from other people.

1. Classify the following diseases as infectious or non-infectious.

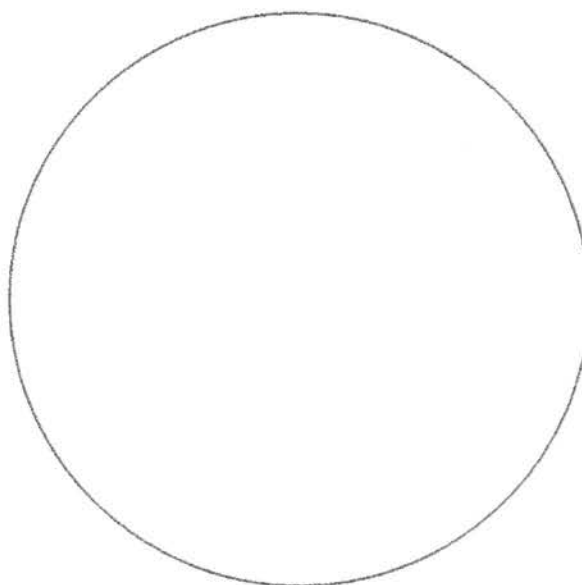
Disease	Classification	Disease	Classification
Measles		Anorexia	
Schizophrenia		Mumps	
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Other	473 728	
<b>Total</b>	<b>3 702 500</b>	

- (a) Complete the above table.
- (b) Plot a column graph of the percentage (%) of each disease.



## 2.3 Immunity

Student: ..... Class: ..... Date: .....

### 1. Immunity terms

Define the following terms:

Antigen: .....

Antibody: .....

### 2. Defending the body

Immunity is the body's third line of defence.

(a) Identify the body's first two lines of defence:

(i) .....

(ii) .....

(b) Naturally induced active immunity involves the production of special cells called **lymphocytes**.

Complete the following cloze passage.

Lymphocytes ..... small, round cells. Most white blood cells are lymphocytes. There are two main types of lymphocytes: B lymphocytes and T lymphocytes. As the B lymphocytes travel ..... the bloodstream they attack and immobilise various pathogens via the production ..... antibody proteins that bind to antigens ..... the surface of the pathogen. Phagocytes then remove the immobilised pathogen.

Different types of T lymphocytes are produced. Their roles ..... assisting B cells, the destruction of pathogen cells and the secretion of substances ..... activate phagocytes.



### 3. Antigens and blood groups

The surface of red blood cells contain specific antigens that produce different blood groups. One group of antigens are the ABO antigens. The following table provides information about these antigens and the antibodies in the blood serum.

Blood group	Antigen on red cell	Antibody in blood serum
O	O	Anti-A and Anti-B
A	A	Anti-B
B	B	Anti-A
AB	AB	None

Blood will clot if an antigen and its equivalent antibody are mixed. Thus a person with the A group blood makes anti-B antibodies in their blood serum. They must not receive blood that contains B antigens otherwise blood clotting results.

Explain why a person with the AB blood group can receive blood from any other donor.

.....

.....

.....

## 2.4 Vaccination

Student: ..... Class: ..... Date: .....

Read the following passage concerning polio vaccinations and then answer the following questions.

### POLIO VACCINATION

Immunisation is used to protect the body against pathogens such as viruses and bacteria. Immunisation is the process in which a serum or vaccine is introduced into the body to stimulate the immune system to produce antibodies. Each antibody is specific to a particular antigen. Vaccines may contain killed microbes, weakened microbes or harmless strains of living microbes.

Polio (or Infantile paralysis) is a viral disease that attacks the nervous system, leading to paralysis, including leg paralysis. Since the polio vaccine is made from the polio virus itself, vaccines have been made from both killed poliovirus as well as live, attenuated poliovirus. In 1952 Jonas Salk began a series of trials using a polio vaccine containing killed virus particles. The advantage of this vaccine was that the killed particles could not cause the disease to appear in the recipients. The vaccine's disadvantage was that a chemical, called formaldehyde, used in its manufacture led to the immune system reacting to the dead virus in a different way than it would to the live virus, reducing the period of immunity. By 1954 the Salk vaccine was released for general use in the prevention of polio.

Whilst the Salk vaccine was being used in the 1950s, Albert Sabin was developing a live attenuated poliovirus vaccine. This technique would lead to life-long immunity from the disease. Unlike the Salk vaccine, which was injected into the body, the Sabin vaccine was an oral vaccine. The level of polio immunity in the general community was boosted by the use of this vaccine. This occurred because the attenuated viral particles were also eliminated from the bodies in faeces and these weakened particles therefore entered the ecosystem. Sabin's vaccine was mainly used outside the USA in the late 1950s, but by 1963 it was used worldwide. It quickly replaced the Salk vaccine.

In the 1980s UNICEF began a program to eradicate polio around the world by mass immunisation programs. In 1988 the Global Polio Eradication Initiative was launched. In the 20 years since 1988, the number of annual polio cases decreased by 99%. Paralysis in over 5 million children was prevented by this immunisation program. In addition, over 1.5 million deaths were prevented. The number of cases of polio is in decline due to this immunisation program. By 2007 about 400 cases of polio were reported in four countries (Afghanistan, India, Nigeria and Pakistan). A further six countries reported about 60 cases of polio re-infection (Angola, Chad, Democratic Republic of Congo, Niger, Myanmar and Somalia). This program will continue until polio is completely eliminated.

### Questions

1. Explain why polio is such a dangerous disease.

.....  
.....

2. Compare the types of vaccines used to immunise children against polio.

.....

.....

3. Explain the meaning of the term 'attenuated virus'.

.....

4. Explain why cases of polio are still reported each year despite the UNICEF program of vaccination.

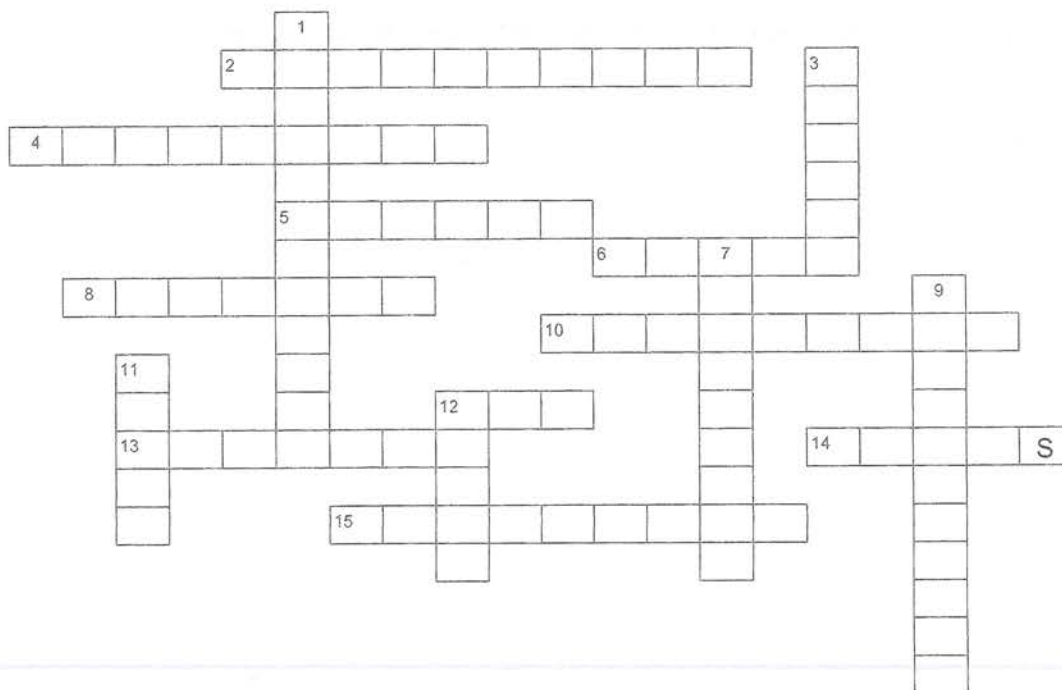
.....

.....

.....

## 2.5 Medical science: Puzzle

Student: ..... Class: ..... Date: .....



### Across

2. Type of white blood cell
4. System that produces hormones
5. Disease that results from abnormal cell proliferation
6. An organ of the nervous system
8. Hormone that controls sugar levels in the blood
10. Hormone released from the thyroid gland
12. The virus that causes AIDS
13. A serum that promotes immunity in the body to a particular disease
14. Cannot reproduce without invading other cells
15. Spinal cord injury can produce this condition

### Down

1. Acid present in our stomach
3. Nerve cell
7. Stimulates the heart to beat faster
9. A connecting neuron
11. Part of the body's second line of defence
12. Organ in which cardiovascular disease can occur



## 2.6 Medical science:

# Summary

Student: ..... Class: ..... Date: .....

Use the listed words to complete the sentences.

fallopian	fetus	hips	menstrual	ovulation
pituitary	semen	sexual	testes	uterus

1. In human males the sperm are formed inside the ..... The mature sperm leave the testes and travel via the vas deferens towards the urethra. Nutritive fluids are combined with the sperm to form ..... During sexual intercourse the semen is ejaculated from the penis.
2. In human females, the eggs are contained in the ovaries. Once per month an egg matures and travels through the ..... tube and then through the uterus before it is lost in the ..... blood flow. If the egg is fertilised in the fallopian tube it will implant in the wall of the ..... and over nine months develop into a baby.
3. The developing ..... in the uterus (or womb) is nourished by nutrients and oxygen that is transferred across the placenta. Wastes are removed in the reverse direction.
4. The menstrual cycle is controlled by a range of hormones produced by the ..... gland and the ovaries. .... (the release of the egg from the ovary) typically occurs on day 14 of the 28 day cycle.
5. Puberty is marked by the appearance of secondary ..... characteristics. These characteristics include the appearance of pubic hair and a growth spurt. In males the voice deepens and the testes and penis grow. In females the ..... widen and breasts develop.

# Reflection

Name: ..... Class: ..... Due date: .....

## 1. Which parts of this topic did you enjoy most? Why?

.....

..

.....

..

.....

..

.....

..

## 2. Which parts of this topic did you enjoy least? Why?

.....

..

.....

..

.....

..

.....

..

## 3. For each of these statements, tick the box that you think is correct for you.

Statements about my learning in this topic	Strongly agree	Agree	Disagree	Strongly disagree
I enjoyed learning through group discussions.				
I enjoyed learning through completing activities.				
I used my learning time effectively, finishing all set tasks.				
I cooperated and contributed in group tasks.				
Pictures and diagrams helped my learning throughout this topic.				



**4. What ideas and information in this topic were a surprise to you?**

.....  
..

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.....  
..

**5. What would you like to learn more about?**

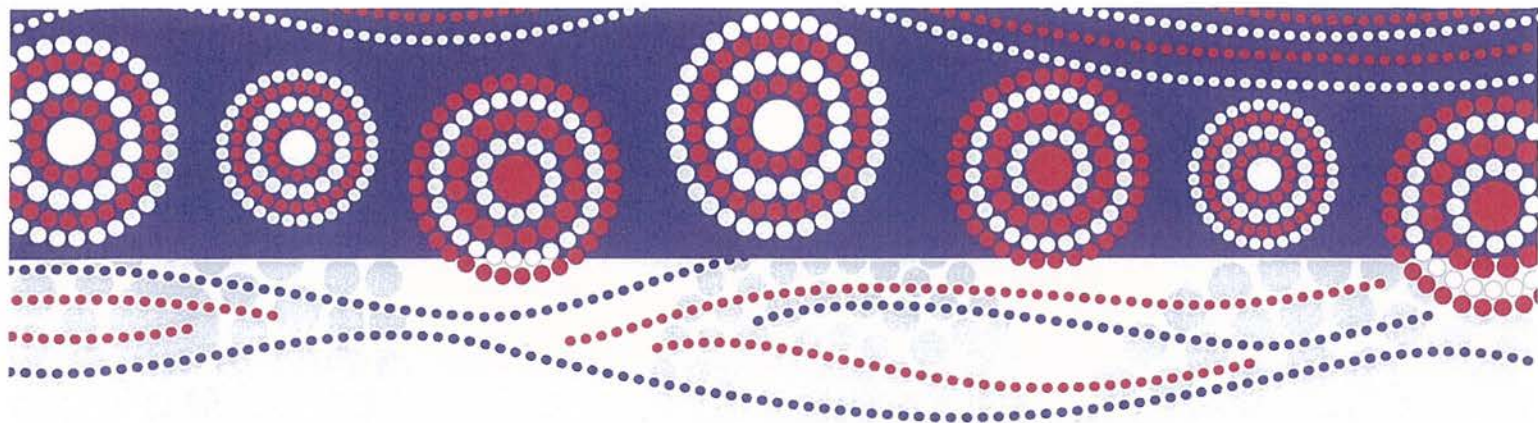
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PDHPE



**YEAR 9**  
**PDHPE**  
**HOME**  
**BASED**  
**LEARNING**  
**BOOKLET**

### **Week 1 Theory**

1. What is the definition of an invasion game?

2. What is the definition of spatial awareness?

3. What does it mean to attack and defend in sport?

4. Why is communication so important in sport?

5. Define teamwork.

PICK ONE OF THE FOLLOWING SPORT AND RESEARCH IT USING THE DOCUMENT AND THE INTERNET: **AFL, NFL, Futsal, OzTag, Soccer, Touch Football**

6. 5 main goals of a sport of your choice:

- a) What is the objective of the game:
- b) Equipment required to play the game:
- c) 5 attacking goals/tactics/strategies:
- d) 5 defensive goals/tactics/strategies:
- e)
- f) 10 most crucial rules you need to know in order to play the game:



### Week 1 – Prac

#### Choose your Sport - AFL, NFL, Futsal, OzTag, Soccer, Touch Football

Activity = Research the unmodified version of this sport and then; Change the rules, equipment, settings, aim (modify) so that the sport can be played in isolation with the resources you have at home.

Eg. Volleyball- equipment (use balloons, or socks for the ball and furniture to create a net), change aim (to keep up off the ground, one hit each side), setting (inside or outside), rules (if you have a partner you are working together, game is timed (5 mins) etc,).

#### **Expectations:**

1. Type up the equipment required for the sport
2. Type up the new aim of the sport (can be similar) may have to throw socks at a bottle to knock it over rather than put a ball in a hole.
3. Type up new rules for sport in the classwork section
4. What is the new setting? (Is it played inside or outside? Or both, on the stairs? Under the dining table etc)
5. Complete by Friday 2.30pm
6. Send through video recording of you playing the modified sport with new rules
7. Complete the physical activity task assigned for the week and submit video

SPORT:	
Equipment	
Aim	
Rules	
Setting	

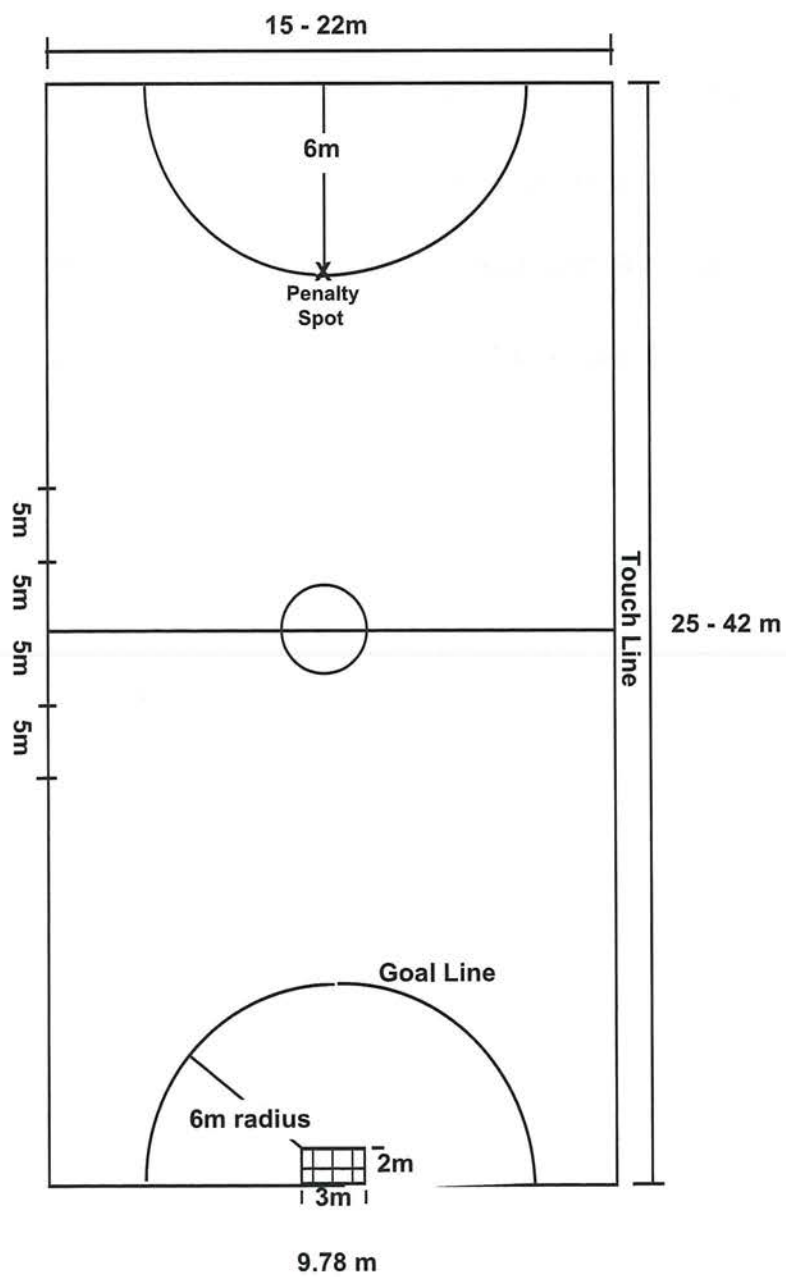
**Challenge:**

The toilet paper challenges!

Record yourself completing the 3 challenges to the best of your ability and post to our Google Classroom.

1. The lift over toilet paper tower: stack toilet 5 toilet paper rolls, lay down in front of the rolls. Picking one up at a time transfer the toilet paper with your feet over your head to create a tower behind your head.
2. In a headstand take off one toilet paper roll at a time. Using your feet pick up one roll of toilet paper at a time a drop it away from the tower.
3. Rolling over balancing toilet paper on your foot. Start the toilet paper on your foot (having a shoe on helps!) keep it balanced and roll completely over.

	page
•court dimensions	2
•rules & concepts	3
•drills & practices	6
•practical session	10





### Teams

A match is played by two teams, each consisting of no more than five players, one of whom is the goalkeeper.

### Substitutions

The number of substitutions made during a match is unlimited. A player who has been replaced may return to the pitch as a substitute for another player.

The maximum number of substitutes permitted is seven.

Substitutions must take place through the substitution zone.

A goalkeeper may change places with any other player.

### Duration of Play

The match lasts two equal periods of 20 minutes.

The teams are entitled to request a one-minute time-out in each half.

### Start and Restart of Play

A kick-off is a way of starting or restarting play:

- at the start of the match.
- after a goal has been scored.
- at the start of the second half of the match.
- at the start of each period of extra time, where applicable.

A goal may be scored directly from the kick-off.

The following conditions apply for the kick off:-

- all players are in their own half of the field.
- the opponents of the team taking the kick-off are at least 3 m from the ball until it is in play.
- the ball is stationary on the centre mark.
- the referee gives a signal.
- the ball is in play when it is kicked and moves forward.
- the kicker may not touch the ball a second time until it has touched another player.

A dropped ball is a way of restarting the match after a temporary stoppage.

### Ball In and Out of Play

The ball is out of play when:

- it has wholly crossed the goal line or touch line, whether on the ground or in the air.
- play has been stopped by the referee.
- it hits the ceiling.

The ball is in play at all other times including when:

- it rebounds from a goal post or the crossbar onto the pitch.
- it rebounds from either of the referees when they are on the pitch.

### Scoring

A goal is scored when the whole of the ball passes over the goal line, between the goalposts and under the crossbar, unless it has been thrown, carried or intentionally propelled by the hand or arm by a player of the attacking side, the goalkeeper included.

### Free Kicks

Free kicks are either direct or indirect.

For both direct and indirect free kicks, the ball must be stationary when the kick is taken and the kicker may not touch the ball a second time until it has touched another player.

- Direct free kick - if a direct free kick is kicked directly into the opponent's goal, a goal is awarded.
- Indirect free kick - a goal may be scored only if the ball subsequently touches another player before it enters the goal.

- A direct free kick is awarded to the opposing team if a player commits any of the following offences in a manner considered by the referee to be careless, reckless or using excessive force:
  - kicks or attempts to kick an opponent.
  - trips or attempts to trip an opponent.
  - jumps at an opponent.
  - charges an opponent, even with the shoulder.
  - strikes or attempts to strike an opponent.
  - pushes an opponent.
  - holds an opponent.
  - slides in an attempt to play the ball when it is being played or is attempted to be played by an opponent (sliding tackle)
  - handles the ball deliberately, except for the goalkeeper in his own penalty area.

A penalty kick is awarded if a player commits any of the aforementioned offences inside his own penalty area, irrespective of the position of the ball but provided that it is in play.

- An indirect free kick is awarded to the opposing team if a goalkeeper commits one of the following offences:
  - after releasing the ball from his possession, he may not receive it back from a teammate, without the ball first having passed beyond the halfway line or without it having been played or touched by an opponent.
  - if he touches the ball with his hands after it has been deliberately kicked to him by a team-mate.
  - if he touches the ball with his hands after he has received it directly from a kick-in taken by a team-mate.
  - if he touches or controls the ball with his hands or feet, on any part of the pitch, for more than four seconds, except when he touches or controls the ball on the opponent's half of the pitch.
- An indirect free kick is also awarded:-
  - plays in a dangerous manner.
  - deliberately impedes the progress of an opponent when the ball is not being played.
  - prevents the goalkeeper from releasing the ball from his hands.

### Accumulated Fouls

Fouls that result in free kicks are accumulated during each half.

For the first five fouls accumulated by each team in a half:-

- the players of the opposing team may form a wall to defend a free kick.
- all opponents are at least 5 m from the ball until it is in play.
- a goal may be scored directly from this free kick.

Beginning with the sixth accumulated foul recorded for either team in each half:

- the players of the opposing team may not form a wall to defend a free kick.
- the player taking the kick has to be identified properly.
- the goalkeeper must remain in his penalty area and at least 5 m from the ball.
- all the other players on the pitch must remain behind an imaginary line that is level with the ball and parallel to the goal line, and outside the penalty area. They must be 5 m from the ball and may not obstruct the player taking the free kick. No player may cross this imaginary line until the ball has been touched or played.

The player taking the free kick must kick the ball with the intention of scoring a goal and may not pass the ball to another player.

Once the free kick has been taken, no player may touch the ball until it has been touched by the goalkeeper, or has rebounded from the goalpost or crossbar, or has left the pitch.

### Penalties

A penalty kick is awarded against a team which commits any of the offences for which a direct free kick is awarded, inside its own penalty area and while the ball is in play.

A goal may be scored directly from a penalty kick.

The players other than the kicker are located:

- inside the pitch.
- outside the penalty area.
- behind or to the side of the penalty mark.
- at least 5 m from the penalty mark.

### Kick In

A kick in restarts play when the whole of the ball passes over a touch line, either on the ground or in the air, or hits the ceiling.

The following apply to the kick in:-

- the ball must be stationary on the touch line.
- the ball may be kicked back into play in any direction.
- the player taking the kick-in has part of each foot either on the touch line or on the ground outside the touch line at the moment of kicking the ball.
- the players of the defending team must be at least 5 m from the place where the kick-in is taken.
- the player taking the kick-in must do so within 4 seconds of taking possession of the ball.
- the player taking the kick-in may not play the ball a second time until it has touched another player.
- the ball is in play immediately after it has been kicked or touched.

*A goal cannot be scored directly from a kick-in.*

### Goal Clearance

A goal clearance restarts play when the whole of the ball, having last touched a player of the attacking team, passes over the goal line, either on the ground or in the air, and a goal is not scored.

The following apply to the goal clearance:-

- the ball is thrown from any point within the penalty area by the goalkeeper of the defending team.
- opponents must remain outside the penalty area until the ball is in play.
- the goalkeeper may not play the ball a second time until it has been played by an opponent or crossed the halfway line.
- the ball is in play when it is thrown directly beyond the penalty area.

*A goal cannot be scored directly from a goal clearance.*

### Corner Kick

A corner kick restarts play when the whole of the ball, having last touched a player of the defending team, passes over the goal line, either on the ground or in the air, and a goal is not scored.

The following apply to the corner kick:-

- the ball is placed precisely inside the corner arc at the nearest corner.
- opponents remain at least 5 m from the ball until it is in play.
- the ball is kicked by a player of the attacking team.
- the ball is in play after it has been kicked or touched.
- the kicker may not play the ball a second time until it has touched another player.

*A goal may be scored directly from a corner kick, but only against the opposing team.*



## INDIVIDUAL PRACTICE

- Ball Control - Keeping the ball off the ground using any legal body parts. Score number of consecutive touches.
- Dribbling
  - Straight line
  - zig zag / change direction ( around cones )
  - using instep and outstep of feet
- Passing / Trapping - against rebound wall
- Heading - against rebound wall
- Shooting
  - at target on wall
  - at goal / between cones

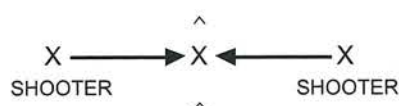
## PARTNER ACTIVITIES

- Passing / Trapping - varying distances apart
- Dribble / Pass / Trap
  - varying distances apart. Dribble around partner, back to spot then pass to partner who traps and so on.
  - dribble ball then pass to partner and so on up the field and back
- Trapping
  - throw ball to partner who traps with :-
    - head
    - chest
    - knee
- Heading
  - throw the ball to partner who heads back
  - rally with partner to see how many consecutive headers can be achieved
- Throw In / Trapping - practice throw in to partner who traps then passes the ball back
- Shooting / Goalkeeping
  - one shooter / one goalkeeper
  - practice:-
    - \* penalties
    - \* stationary shots from varying distances
    - \* dribble and shoot
- Keepings Off
  - one partner tries to dribble ball and dodge defender who tries to steal.
  - ( Define area with cones )

## GROUP ACTIVITIES

## Shooting

# Groups of Three - Two shooters / one keeper as follows.

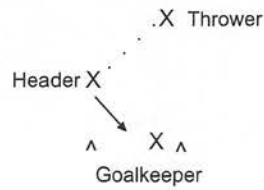


- when one shooter takes shot the other acts as backstop if the ball gets through.

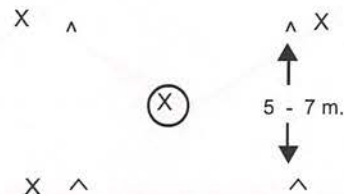


# futsal

- Head at goal
  - One thrower / one shooter / one keeper
  - ball is thrown to shooter who heads at goal



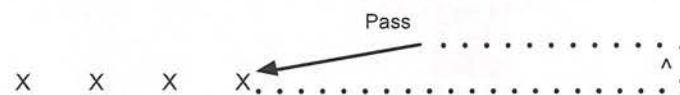
- Grid Work  
( groups of four )



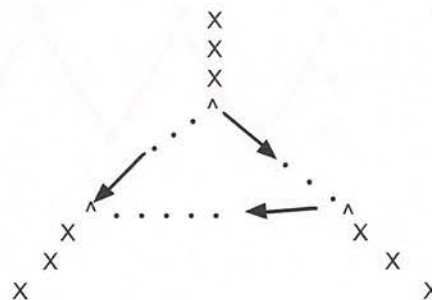
- the outside players ( attackers ) try to keep the ball off the defender (X)
- defender tries to intercept
- attackers can only run and pass along the edge of the grid ( no diagonals ) and can only receive the ball whilst at a corner cone

## Dribbling

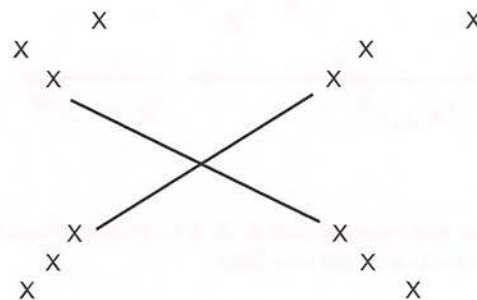
- Straight Dribble - dribble around cone and back, then pass to the next player



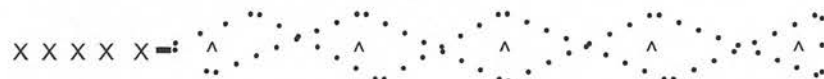
- Triangle Dribble - dribble then pass to next player. Follow up to the back of the next cone.



- Criss Cross

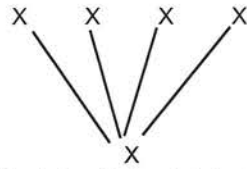


- Zig - Zag



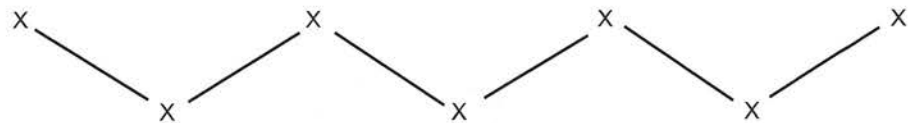
## Pass and Trap

### • Corner Spry



- trap the ball with head / chest / foot then pass back

### • Cross Ball



## Heading

- Leader Ball - leader throws the ball to each person in turn who heads it back. The last person heads the ball to themselves then catches it and runs to the front to become the new leader. Old leader goes to the front of group.



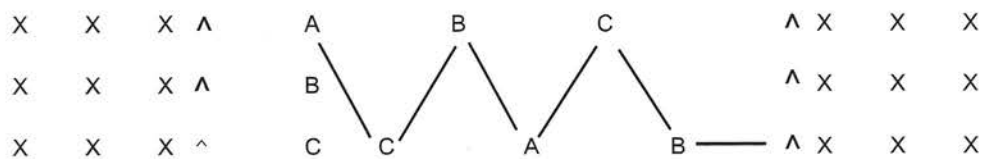
## Combination Drills

### • Keepings Off

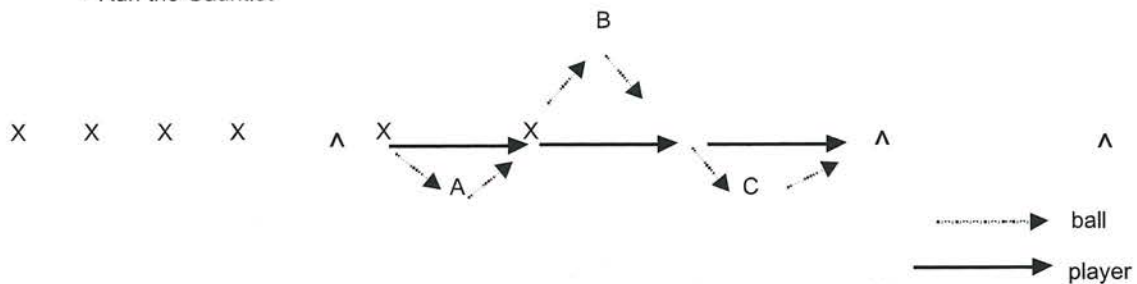
- in grids of varying sizes:-

- \* 1 on 2
- \* 2 on 2
- \* 2 on 3
- \* 3 on 3

### • Three Man Weave

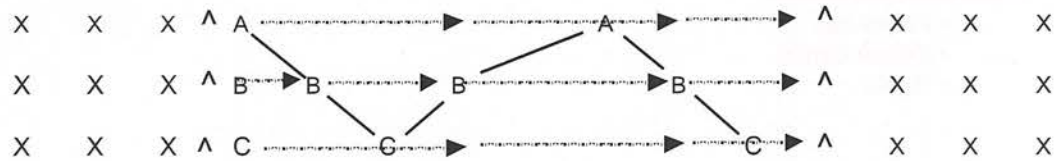


### • Run the Gauntlet



- player X passes and receives from A, B, & C dribbles around the cone and repeats procedure on the way back.

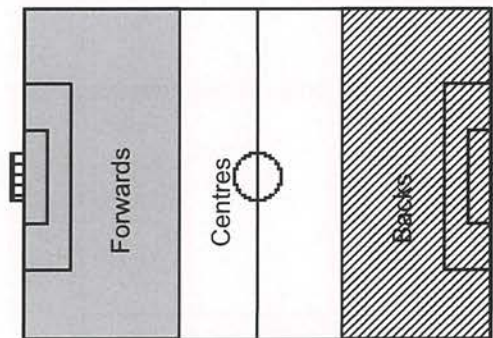
• Lateral Passing



- Follow the Leader - one ball per student each dribbling the ball following the leader around a designated area. Rotate leader on the whistle.

MINOR GAMES

- Soccer Softball - Softball field and rules but with soccer skills  
i.e. pitch - throw in  
batter - traps and kicks or volleys
- Half Court - teams of 3 - 6 on half the court  
- same goalie for both sides  
- defending team must take the ball up to centre line after gaining possession.
- Three Zone Soccer - court is divided into three zones



- players are not allowed to leave their zone
- rotate positions regularly

**Equipment**

- Futsal ball
- Colour bands
- Goals

**Activity**

- Divide class into three teams.

**Modified Rules**

- Game is played on a netball court - goal area is marked by the semi circle at either end of the court.
- To commence the game players line up in their defensive halves - the team winning the toss plays the first ball back into their own half on the whistle. No player other than the kicker is permitted in the centre circle at the commencement of play.
- No players other than the goalkeeper may enter the goal circle.
- Following a goal the game recommences from the centre.
- Goalie's are permitted to play the ball with their hands inside the goal circle.
- Under no circumstances is the goalie permitted to kick or throw the ball over the half way line (i.e. ball must be touched by another defensive player in the defensive half before crossing the centre line)
- Goalie rotation - assign a number to each team member - rotate the goalie in number order at the end of each half

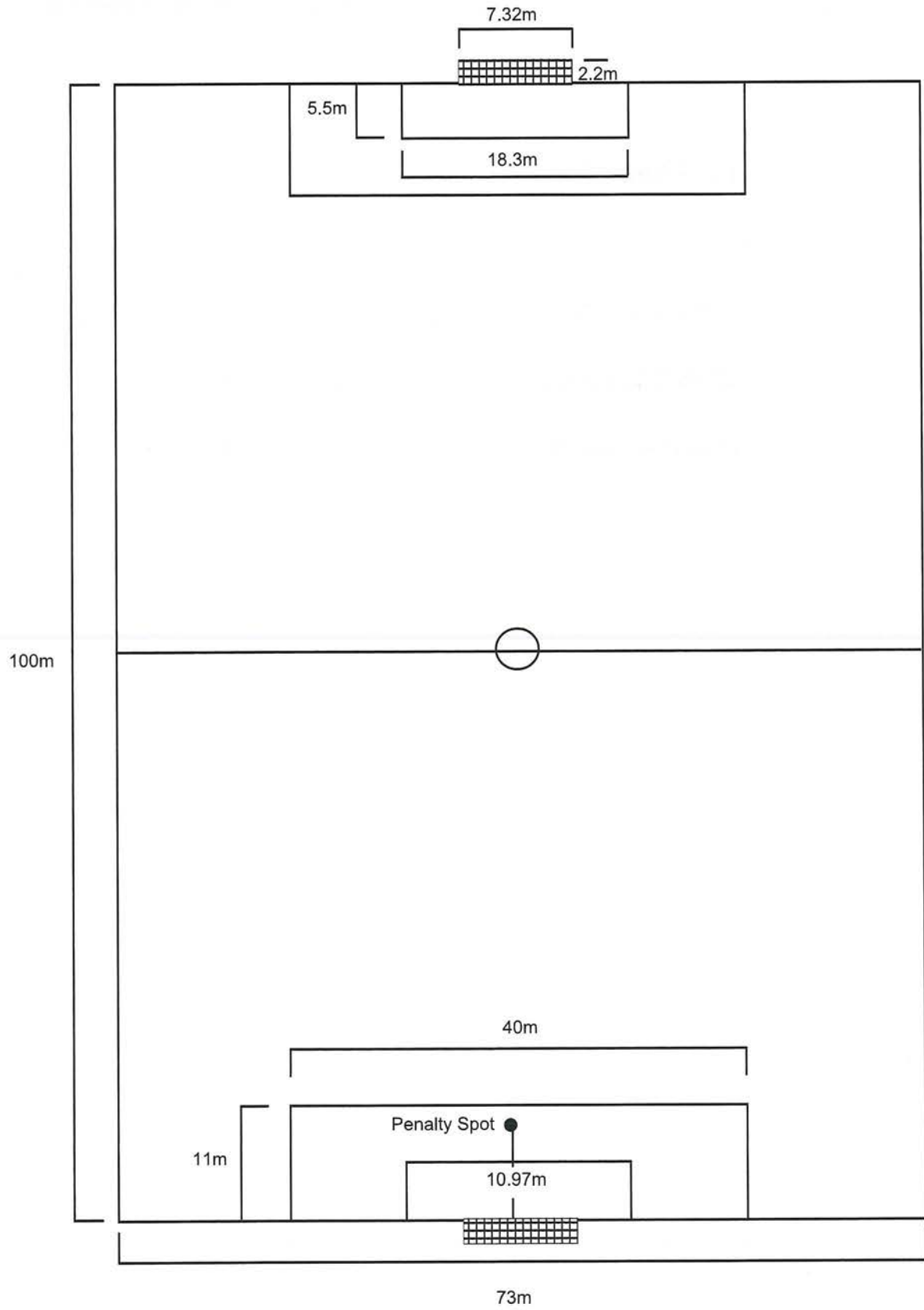
**Round Robin Activities**

- Play a round robin with games consisting of two 6 - 8 minute halves.
- Draw:-      1 v 2              1 v 3              2 v 3

Round	Team 1	Team 2	Team 3
1			
2			
3			



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• <i>field dimensions</i>	2
• <i>playing positions</i>	3
• <i>rules &amp; concepts</i>	4
• <i>drills &amp; practices</i>	5
• <i>practical session</i>	9



### 3 - 5 - 2 Formation



### 4 - 4 - 2 Formation



**Teams** - Consist of 11 players with up to 2 substitutes.

**Start of Play** - A kick off is taken :-

- at the beginning of the game
- to start the second half
- after a goal is scored ( by the team losing the goal ).

- All players must be in their own half ( defending half of the ground ) and the ball is played forward into the opponents half of the field and cannot be touched again by the kicker until another player has touched it.

**Scoring** - When the whole of the ball has passed over the goal line between the goal posts and under the crossbar.

**Fouls and Misconduct**

**Direct Free Kick-**

A direct free kick is awarded if a player intentionally :-

- kicks ( or attempts to kick ) an opponent
- trips an opponent
- charges an opponent violently
- charges an opponent from behind
- strikes ( or attempts to strike ) an opponent
- holds an opponent
- pushes an opponent
- handles the ball in any way

- The kick is taken from where the infringement occurred and a goal can be scored directly from the kick.

**Penalty Kick** - A penalty kick is awarded if a player commits any of the previously mentioned offences within the penalty area. It is taken from the 12 yard spot and all other players must be outside the penalty area and 10 yards from the ball.

**Indirect Free Kick** - An indirect free kick is awarded if a player :-

- plays in a dangerous manner ( e.g. tries to kick the ball held by the keeper)
- charges a player fairly but not within playing distance of the ball
- obstructs an opponent deliberately when not playing the ball
- charges the goalkeeper except when they are holding the ball, obstructing a player, or is outside the goal area
- who is the goalkeeper takes more than 4 steps whilst in possession of the ball, or wastes time deliberately

**Goal Kick** - If an attacker plays the ball over the goal line a goal kick is taken by a defender ( usually the goalkeeper but not necessarily ) from within the half of the goal area where the ball went out. The ball must be kicked beyond the penalty area, a goal can not be scored directly and the keeper is not permitted to kick the ball to themselves.

**Corner Kick** - If a defender plays the ball over their own goal line a corner kick is taken by an attacker from the nearest corner to where the ball went out. A goal can be scored directly from the kick.

**NOTE:** At all free kicks all defenders must be at least 10 yards from the ball.

**Throw In** - If the whole ball goes over the sideline it is thrown in by a player on the other team to that player who was last to touch it.

- The player taking the throw must :-

- face the field
- keep both feet on the ground and outside the line
- use both hands
- throw the ball from above the head
- not touch the ball again until another player has touched it.

- If the "throw in" is taken incorrectly a "throw in" is awarded to the other team. A goal can not be scored directly from a throw in.

**Offside** - A player is offside if they are closer to their opponent's goal line than the ball at the moment the ball has been played, unless :-

- in their own half of the field
- there are two or more opponents closer to the goal line
- the ball last touched an opponent or them
- the ball is received directly from a goal kick, corner kick or "throw in."



## INDIVIDUAL PRACTICE

- Ball Control - Keeping the ball off the ground using any legal body parts. Score number of consecutive touches.
- Dribbling
  - Straight line
  - zig zag / change direction ( around cones )
  - using instep and outstep of feet
- Passing / Trapping - against rebound wall
- Heading - against rebound wall
- Shooting
  - at target on wall
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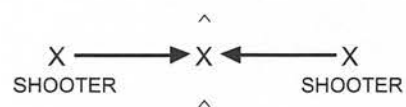
## PARTNER ACTIVITIES

- Passing / Trapping - varying distances apart
- Dribble / Pass / Trap
  - varying distances apart. Dribble around partner, back to spot then pass to partner who traps and so on.
  - dribble ball then pass to partner and so on up the field and back
- Trapping
  - throw ball to partner who traps with :-
    - head
    - chest
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- Heading
  - throw the ball to partner who heads back
  - rally with partner to see how many consecutive headers can be achieved
- Throw In / Trapping - practice throw in to partner who traps then passes the ball back
- Shooting / Goalkeeping
  - one shooter / one goalkeeper
  - practice:-
    - \* penalties
    - \* stationary shots from varying distances
    - \* dribble and shoot
- Keepings Off
  - one partner ties to dribble ball and dodge defender who tries to steal. ( Define area with cones )
- Corner Kicks
  - one partner practices corner kick to other player. Swap every 5 kicks.

## GROUP ACTIVITIES

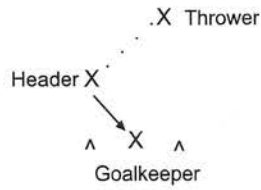
### Shooting

# Groups of Three - Two shooters / one keeper as follows.

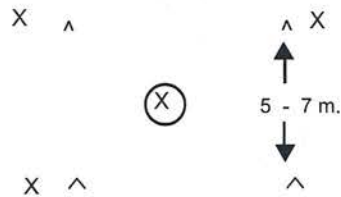


- when one shooter takes shot the other acts as backstop if the ball gets through.

- One thrower / one shooter / one keeper
- ball is thrown to shooter who heads at goal



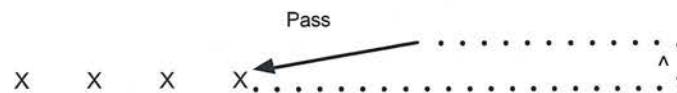
- Grid Work  
( groups of four )



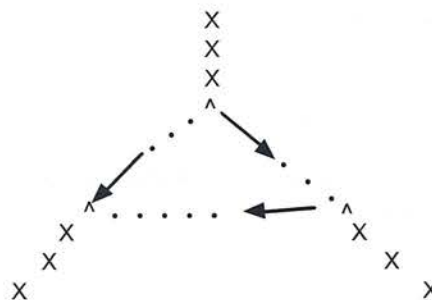
- the outside players ( attackers ) try to keep the ball off the defender (X)
- defender tries to intercept
- attackers can only run and pass along the edge of the grid ( no diagonals ) and can only receive the ball whilst at a corner cone

#### Dribbling

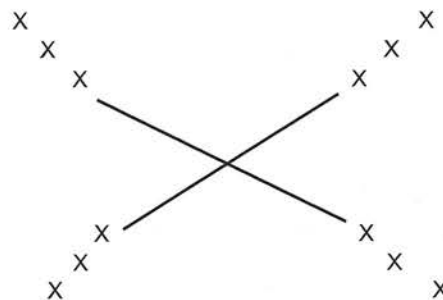
- Straight Dribble - dribble around cone and back, then pass to the next player



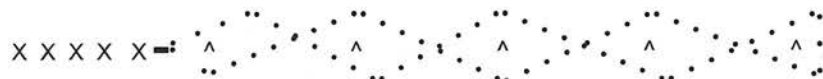
- Triangle Dribble - dribble then pass to next player. Follow up to the back of the next cone.



- Criss Cross

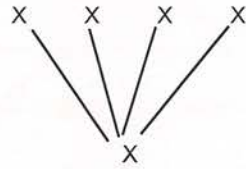


- Zig - Zag



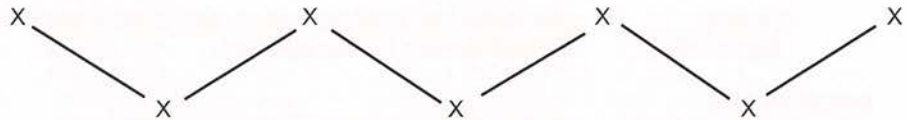
## Pass and Trap

- Corner Spry



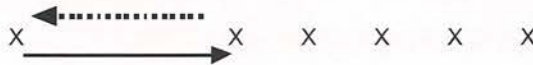
- trap the ball with head / chest / foot then pass back

- Cross Ball



## Heading

- Leader Ball - leader throws the ball to each person in turn who heads it back. The last person heads the ball to themselves then catches it and runs to the front to become the new leader. Old leader goes to the front of group.



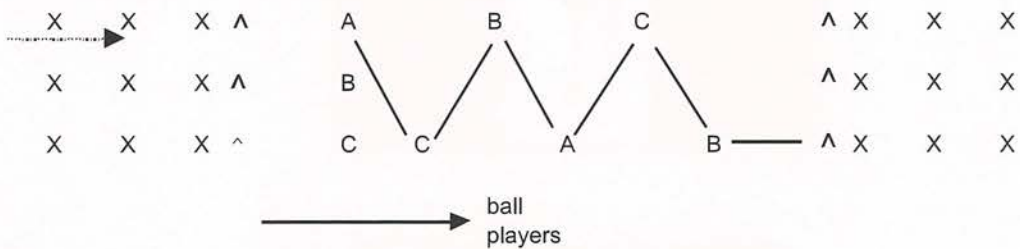
## Combination Drills

- Keepings Off

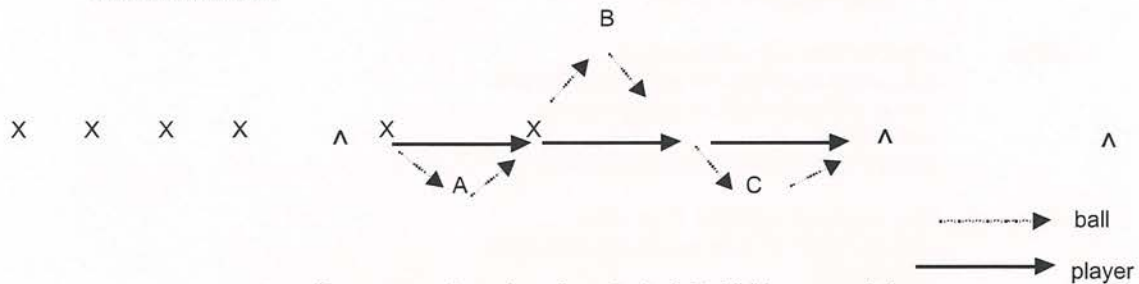
- in grids of varying sizes:-

- \* 1 on 2
- \* 2 on 2
- \* 2 on 3
- \* 3 on 3

- Three Man Weave

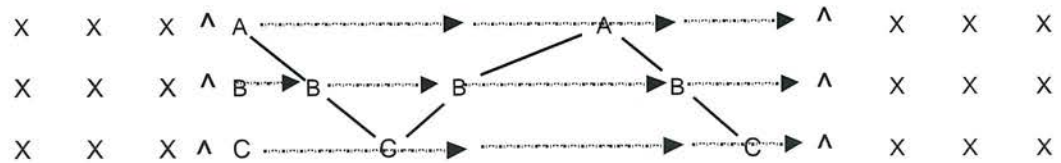


- Run the Gauntlet



- player X passes and receives from A, B, & C dribbles around the cone and repeats procedure on the way back.

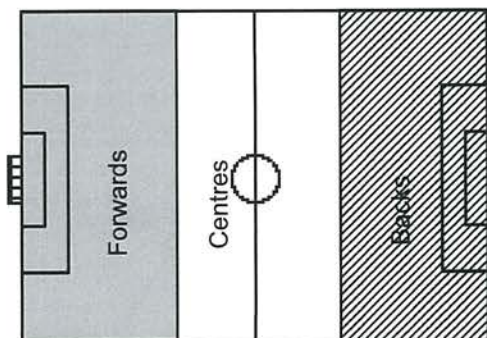
• Lateral Passing



- Follow the Leader - one ball per student each dribbling the ball following the leader around a designated area. Rotate leader on the whistle.
- Corners/  
Indirect Freees - two teams one attacking trying to score from a corner / indirect free and the other defending trying to intercept/ steal.

MINOR GAMES

- Soccer Softball - Softball field and rules but with soccer skills  
i.e. pitch - throw in  
batter - traps and kicks or volleys
- Half Court - teams of 3 - 6 on half the field  
- same goalie for both sides  
- defending team must take the ball up to centre line after gaining possession.
- Three Zone Soccer - field is divided into three zones



- players are not allowed to leave their zone
- no offside
- rotate positions regularly
- Skittles - a grid is filled with many cones  
- players try to dribble the ball round the grid  
- aim is to knock as many cones over as possible  
- involve more than one player at a time
- Long kicking- Two teams on opposite 18 yd lines  
- Players take it in turns to kick the ball as far as possible  
- The other team returns the ball from where it bounced and so on until one team kicks the ball over the end goal line



**Equipment**

- Indoor soccer ball
- Colour bands
- Goals

**Activity**

- Divide class into three teams.

**Modified Rules**

- Game is played on indoor netball court - goal area is marked by the semi circle at either end of the court.
- To commence the game players line up in their defensive halves - the team winning the toss plays the first ball back into their own half on the whistle. No player other than the kicker is permitted in the centre circle at the commencement of play.
- Players may enter the goal circle but:-
  - i. kicked shots for goal must be taken from outside the circle.
  - ii. players may head a goal from inside the goal circle.
- Following a goal the game recommences from the centre.
- Goalie's are permitted to play the ball with their hands inside the goal circle.
- Under no circumstances is the goalie permitted to kick or throw the ball over the half way line (i.e. ball must be touched by another defensive player in the defensive half before crossing the centre line)
- Goalie rotation - assign a number to each team member - rotate the goalie in number order at the end of each half

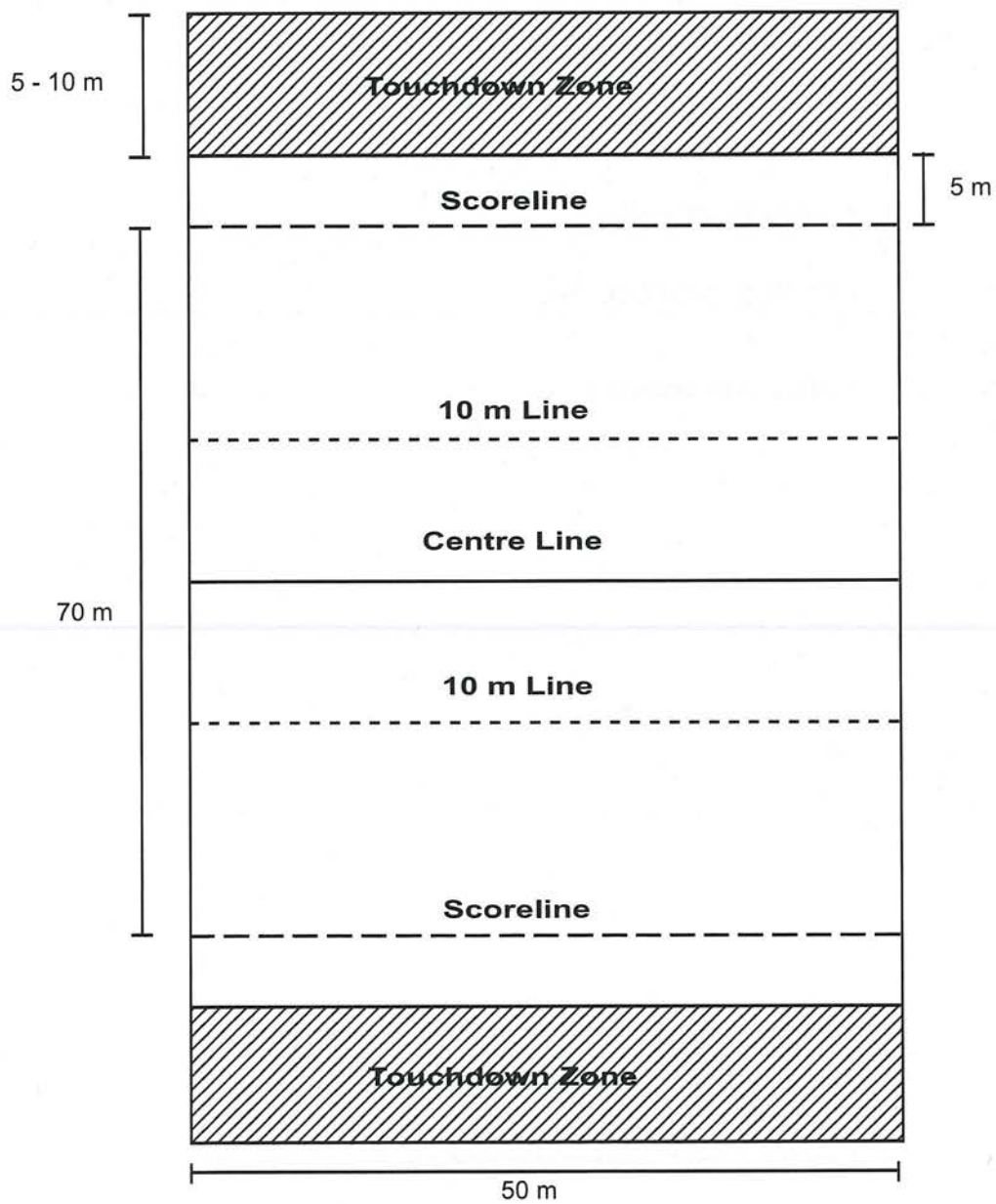
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- Play a round robin with games consisting of two 6 - 8 minute halves.
- Draw:-      1 v 2          1 v 3          2 v 3

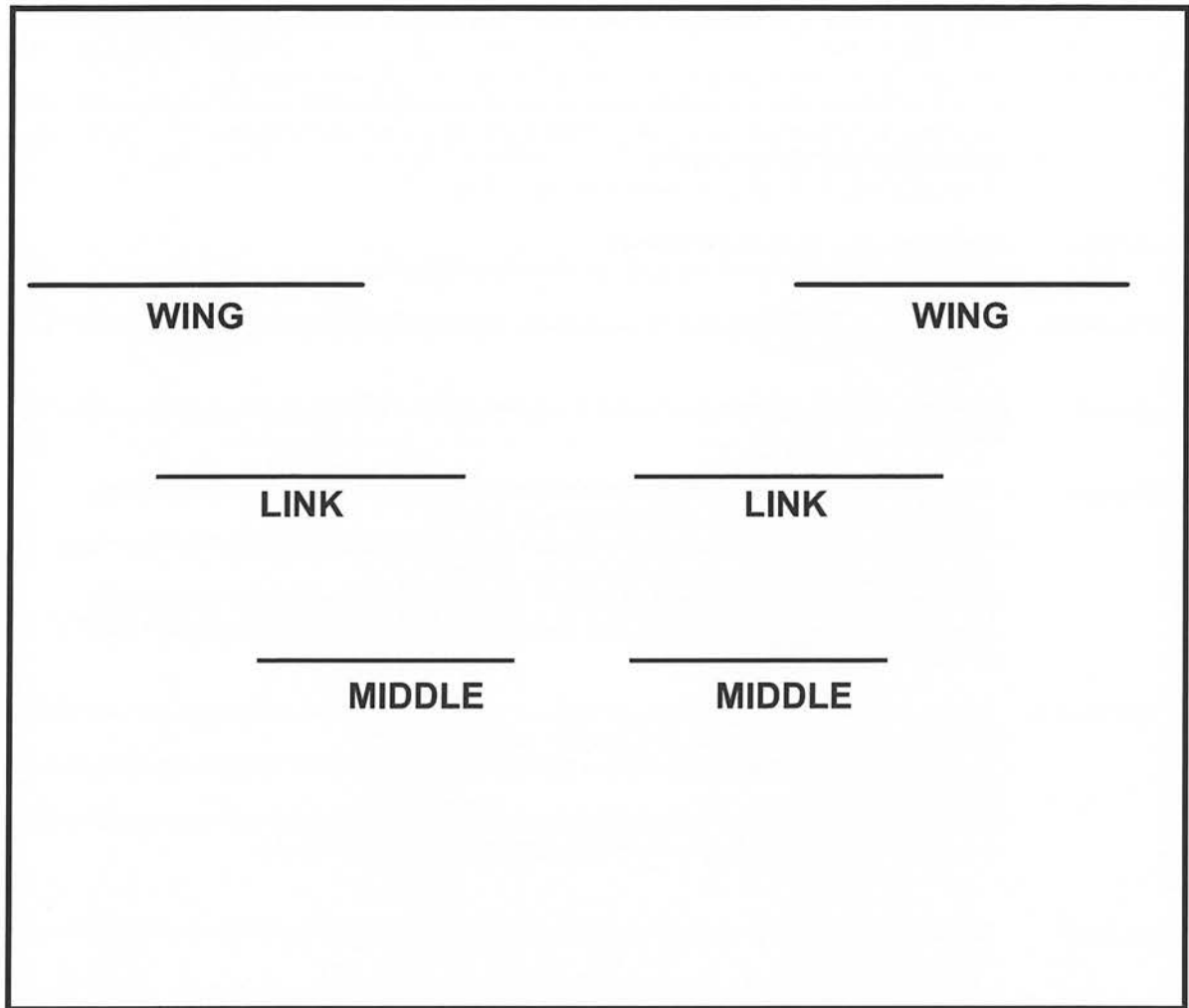
Round	Team 1	Team 2	Team 3
1			
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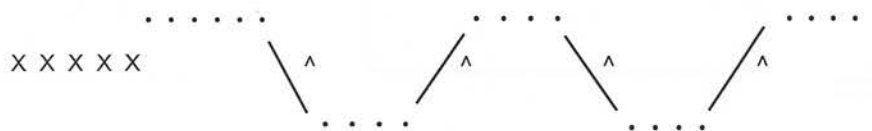
SUBSTITUTIONS

X 7

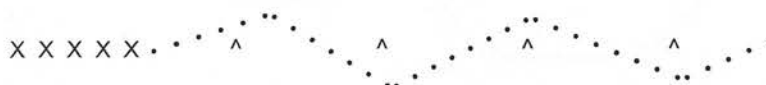
Teams	<ul style="list-style-type: none"> <li>- Consist of 7 players with up to seven substitutions.</li> <li>- In mixed teams the maximum number of males on the field at any one time is <i>four</i>.</li> </ul>
Starting Play	<ul style="list-style-type: none"> <li>- The captains toss - the winning captain gains possession and choice of ends.</li> <li>- A place kick (tap) from the centre line starts the game. ( A place kick - tap- is taken by placing the ball on the ground and kicking it not more than one metre in any direction. The ball can be picked up by any "onside" player.)</li> <li>- The opposite team commences play in the second half.</li> </ul>
Scoring	<ul style="list-style-type: none"> <li>- Try ( one point ) - a try is scored when:- <ul style="list-style-type: none"> <li>• a player first grounds the ball over the attacking try line.</li> </ul> </li> </ul>
Possession	<ul style="list-style-type: none"> <li>- The aim of the attacking team is to advance the ball and ultimately ground it in the opponent's " in goal area " for a try.</li> </ul>
Defence	<ul style="list-style-type: none"> <li>-The aim of the team defending is to stop the advance of the attacking team by means within the rules.</li> </ul>
Touches	<ul style="list-style-type: none"> <li>- A touch is recorded following minimum force contact with any part of the body or clothing.</li> <li>- Touching the ball held by an attacker counts as a touch.</li> <li>- If a touch is executed with more than minimum force a penalty is awarded to the other team.</li> <li>- When a pass and touch occur simultaneously - play on.</li> <li>- In the case of a pass being completed after a touch a penalty is awarded to the other team.</li> <li>- Immediately following a touch defending players must move backwards in a straight line to a distance of 8 metres</li> </ul>
Ball Touches	<ul style="list-style-type: none"> <li>- When a defending player touches a pass but an attacking player still catches the ball on the full the touch count recommences ( i.e. the next touch is the first )</li> <li>- If a defending player intercepts a pass in general play or behind their try line ( assuming no touch) then it is play on.</li> <li>- If a touch occurs behind the try line following an intercepted pass, the touch counts but the ball is placed 5m from the try line and a rollball is used to commence the play.</li> </ul>
Six Plays	<ul style="list-style-type: none"> <li>- The team is permitted six touches per play. Possession is handed over immediately after the sixth touch.</li> </ul>
Restarting Play after a Touch	<ul style="list-style-type: none"> <li>- The ball is rolled under or between the feet to the dummy half. The ball is not permitted to roll more than 1 metre before attacking team gains possession.</li> <li>- Defenders must be 8 metres from the players at the rollball.</li> <li>- Attackers can be forward of the rollball as long as they do not obstruct the defending players.</li> </ul>
Offside	<ul style="list-style-type: none"> <li>- place kick tap <ul style="list-style-type: none"> <li>- attacking players must remain onside until the place kick tap is completed.</li> <li>- defending players must be 10 metres from the place kick tap - they can move forward once the ball is kicked.</li> </ul> </li> <li>- roll ball <ul style="list-style-type: none"> <li>- attacking players may be forward of the roll ball provided they do not obstruct defenders.</li> <li>- defending players must be 8 meters from the roll ball and are not permitted to move until the dummy half touches the ball.</li> </ul> </li> </ul>
Fouls / Penalties	<ul style="list-style-type: none"> <li>- Forward Pass- if the ball is caught forward from where it is passed. A penalty is awarded to the other team.</li> <li>- Knock Down Pass - if the pass is not deliberately knocked down by an opposition player a change of possession occurs. <ul style="list-style-type: none"> <li>- a deliberately knocked down pass results in the touch count re-commencing.</li> </ul> </li> <li>- Obstruction - it is illegal to impede an opponent.</li> </ul>

## EVASIVE SKILLS

- **Stepping** - players run down the line stepping to dodge around the cones.



- **Swerving** - players run down the line swerving in and out of the cones.

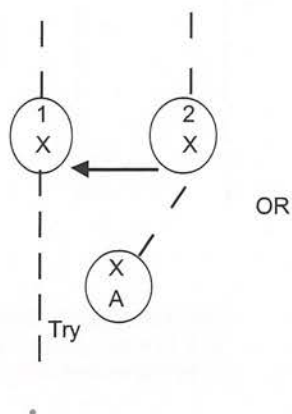


- **Picking Ball Up** - roll ball to oncoming player. Player to pick ball up and so on.

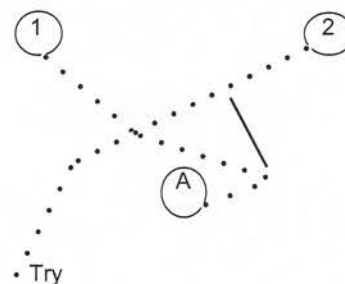


## ATTACKING

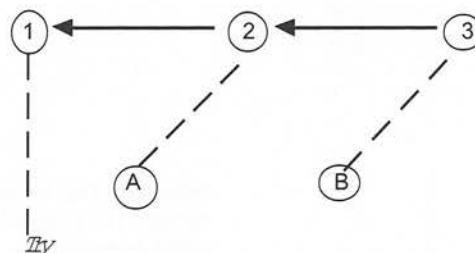
- Two on One



- 1 and 2 attempt to beat A for a try.



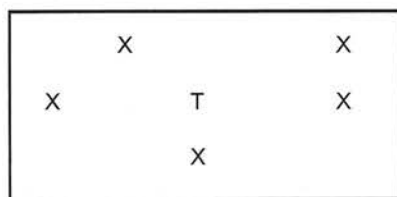
- Two on Three



- 1, 2 and 3 attempt to beat A & B for a try.

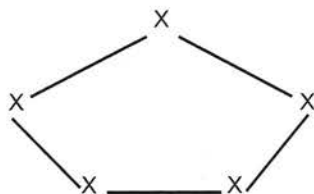
# touch rugby

- Grid Work - the tackler tries to tackle each of the five players in the grid as quickly as possible.



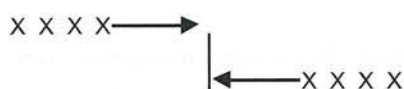
## BALL HANDLING

- Circle Pass



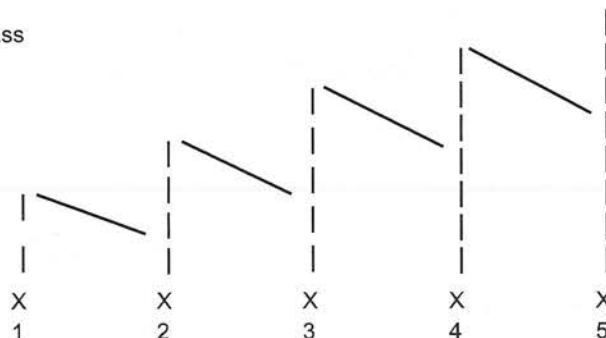
- pass the ball around the circle quickly using the hands only.

- Line Pass



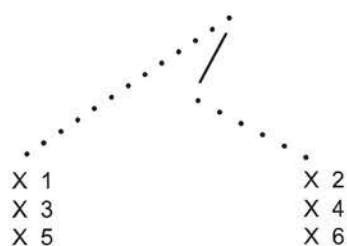
- quick pass to the player coming straight on.

- Run and Pass



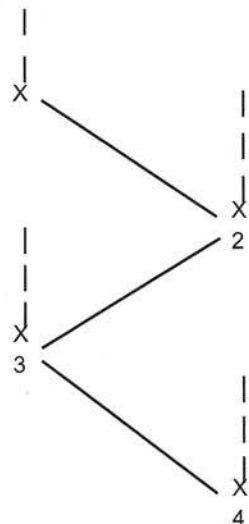
- players run up the field passing to the next player in support.

- Cross Over Pass



- using cross over technique 1 passes to 2, 2 to 3, 3 to 4 and so on. After passing go to the back of the other line and continue up the field.

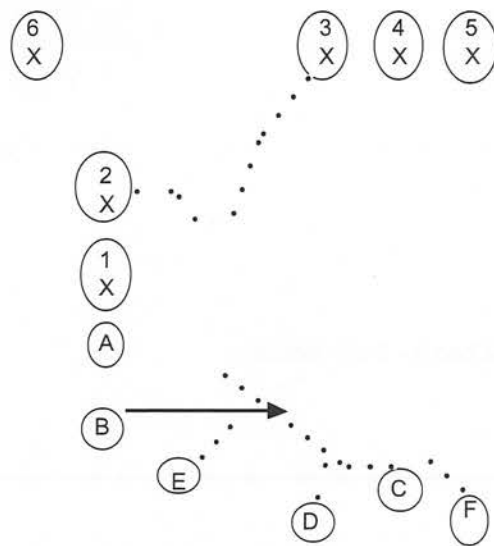
- Backing Up



- players run up the field backing up in support. 1 passes 1 to 2, 2 to 3, 3 to 4, 4 back to 1 who has made new position.

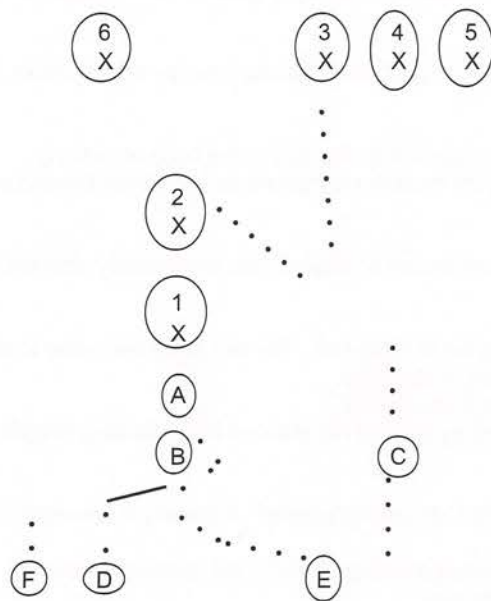


• Second Man



- player C attracts defenders 2 & 3.
- D cuts outside to receive . E supports inside and F outside.

• Hit Back



- C acts as decoy.
- B fakes to c then spins and passes to D.
- E and F support D inside and outside.

## Equipment

- Rugby ball
- Colour bands

## Activity

## • TOUCH RUGBY :

- Divide class into three teams.
- Play a round robin with games consist of two 3 - 5 min halves.

## • DRAW

1 V 2      2 V 3      3 V 1

## • BASIC RULES

Scoring - Try ( one point ) - a try is scored when a player first grounds the ball over the attacking try line.

Possession - The aim of the attacking team is to advance the ball and ultimately ground it in the opponent's " in goal area " for a try.

Defence - The aim of the team defending is to stop the advance of the attacking team by means within the rules.

Touches - A touch is recorded following minimum force contact with any part of the body or clothing.  
- Immediately following a touch defending players must move backwards in a straight line to a distance of 8 metres

Six Plays - The team is permitted 6 touches per play. Possession is handed over immediately after the sixth touch.

Restarting Play after a Touch - The ball is rolled under or between the feet to the dummy half. The ball is not permitted to roll more than 1 metre before attacking team gains possession.  
Defenders must be 8 metres from the players at the rollball.  
Attackers can be forward of the rollball as long as they do not obstruct the defending players.

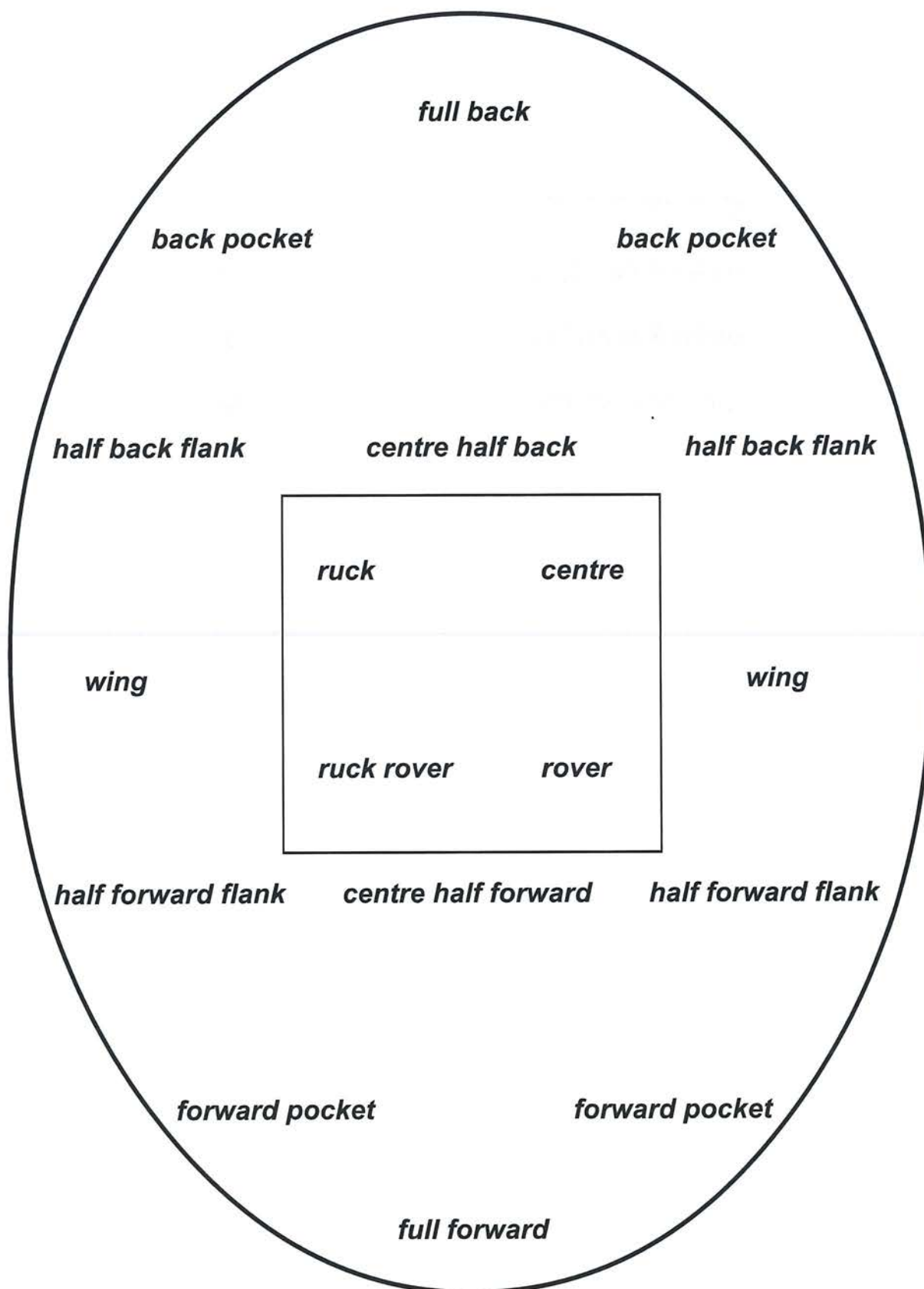
## Fouls / Penalties

- Forward Pass- if the ball is caught forward from where it is passed. A penalty is awarded to the other team.
- Knock Down Pass - if the pass is not deliberately knocked down by an opposition player a change of possession occurs.  
- a deliberately knocked down pass results in the touch count re-commencing.
- Obstruction - it is illegal to impede an opponent.

## • SCORING

Round	Team 1	Team 2	Team 3
1			
2			
3			

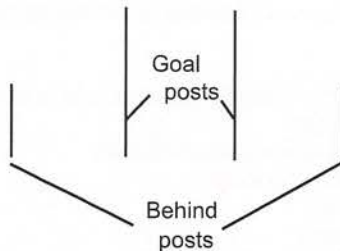
	page
•playing positions	2
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INTERCHANGE : X 4



- Teams** - Consist of 18 players plus up to 4 interchange players.
- Interchange** - Players can be interchanged at any time through the interchange area.
- Scoring** - The goal posts are 6.4 metres apart as follows:-



- **Goal ( 6 points )**  
A goal is scored when the ball kicked by an attacking player passes between the goal posts, having not been touched by any other player.
  - **Behind ( 1 point )**  
A point is scored when:-
    - the ball passes between the goal and behind posts
    - the ball passes between the goal posts but was touched by another player
    - the ball hits or travels over a goal post
    - the ball is kicked untouched through the goals by a defender
- Out of Bounds** - If the ball travels completely over the boundary line ( or hits a behind post ) it will be thrown back into play by the boundary umpire from where it crossed the line,
- Out of Bounds on the Full** - If the ball is kicked and travels completely over the boundary line, or hits or travels over a behind post without being touched, or bouncing in the field, a free kick is awarded to the other team from where the ball went out on the full.
- Start of Play** - To commence each quarter of play the umpire bounces / throws up the ball in the centre circle.
- Kicking Off from Behind** - After the behind is scored a player of the defending team shall kick the ball into the field of play from within the goal square. Contact must be made before the ball completely crosses the line of the goal square. No player is allowed within 5 m. of the goal square for the kick off. The defender must wait for the goal umpire to wave the flag ( signalling a behind ) before kicking. The defender may kick the ball to himself and play on provided the ball is kicked clear of the hands.
- Possessions**
- **Marking** - If a player catches the ball on the full from a kick that travelled more than 10 m and was not touched, a mark is awarded and the player has free possession. ( i.e. cannot be tackled ). One player from the other team is permitted to stand on the spot where the mark was taken.
  - **Holding the Ball** - A player may hold the ball for an unlimited time in general play provided they are not tackled and held by an opponent.
  - **Running with the Ball** - A player may run with the ball provided it is bounced or touched on the ground every 15 m.
- \* **N. B.** - A player is also deemed to be in possession when:-
- bouncing the ball
  - lying on / over the ball

- Tackling / Bumping** - A player may be fairly hit or checked by an opponent using the hip, shoulder, chest, arms or open hand provided the ball is within 5 m.
- A player may be pushed in the chest or side or shepherded provided the ball is within 5 m.
  - A player in possession may fend off a tackler by pushing with an open hand on the chest, shoulder, or side.
  - A player in possession may be fairly tackled / grasped anywhere below the shoulders and on or above the knees.
- Free Kicks** - A free kick is taken from the spot where the infringement occurred, and is awarded if a player:-
- throws or hands the ball to another player
  - shepherds an opponent when the ball is more than 5 m away
  - trips, kicks or attempts to kick / trip an opponent
  - strikes or attempts to strike an opponent
  - deliberately forces the ball out of bounds
  - tackles an opponent above the head or below the knee
  - charges an opponent
  - pushes an opponent from behind and in the back
  - pushes, bumps or shepherds a player above the shoulder
  - pushes, bumps, shepherds an opponent going for a mark
  - deliberately holds, throws, tackles an opponent after that opponent has disposed of the ball
  - shakes the goal post
  - wastes time deliberately
  - does not return to or drop the ball for the boundary umpire
  - enters the centre square during the centre bounce
  - interferes with the umpire trying to bounce the ball
  - deliberately takes the ball or plays the ball over the boundary line
- Centre Square** - Only four players from each team are allowed in the centre square for the bounce of the ball. Once the ball is bounced any player may enter the centre square.
- 50 Metre Penalty** - A 50 m penalty is awarded if a player encroaches over the mark or deliberately wastes time ( i.e. holding the player up or slowing them from taking a free kick ) or runs through / into the 10 m protected area around the player taking the free kick.
- Disposal** - The ball may be kicked or handballed.
- Kicking - contact below the knee
  - Handball - the ball is held in / on one hand and hit with the clenched fist of the other hand.
- Reports** - Reportable offences include:-
- deliberate time wasting
  - disputing the umpire's decision
  - assault, threatening or abusive language or manner to an umpire
  - assault of another player or official
  - shaking the goal post
  - striking or attempting to strike
  - tripping or attempting to trip
  - kicking or attempting to kick
  - charging
  - unduly rough play
  - improper or unacceptable uniform or equipment
  - misconduct

## HANDBALL

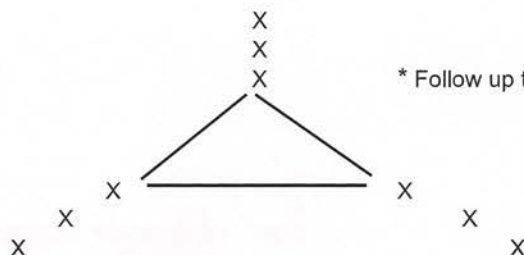
- Partner Work - handball with partner over varying distances.

- Lane Work



\* Follow handball up to join end of opposite group.

- Triangle



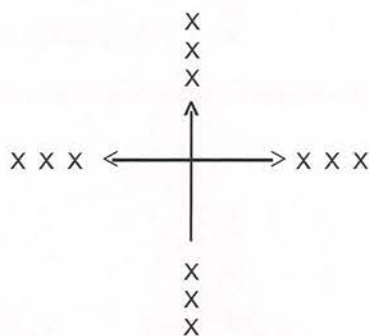
\* Follow up to the end of the next group.

- Five Point

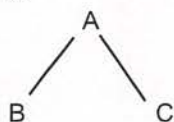


\* Follow up to the end of the next group.

- Criss Cross

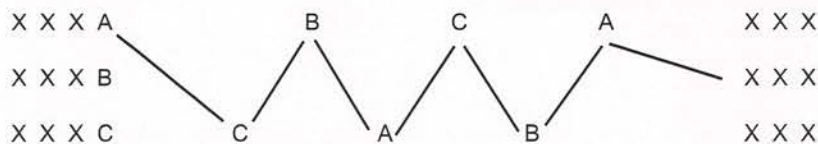


- Quick Hands

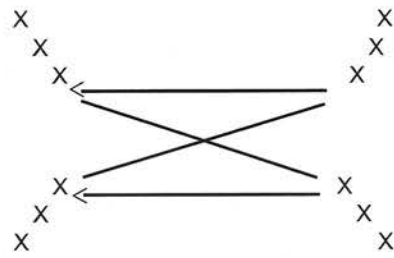


\* B & C continually feed a ball each to player A in quick succession, who must catch and handball quickly.

- Three Man Weave

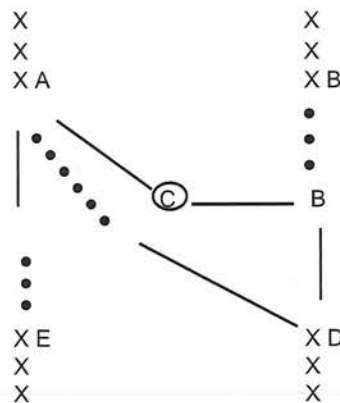


• Figure 8



- follow up to the end of the next group.

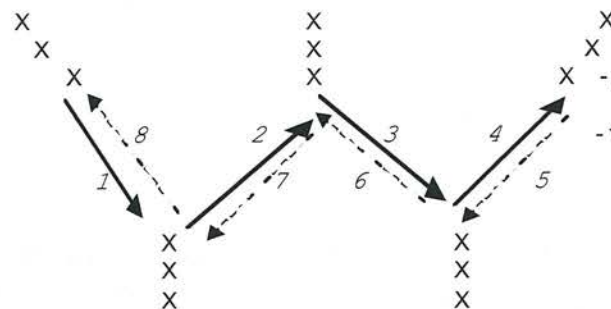
• Handball and Stay In



- A handballs to player in the middle C and then runs to replace C in the middle.
- C handballs to B running past who delivers to far end.
- D handballs to A and then replaces A in the middle.
- A - E and so on.

\*\* The person who handballs to the player in the middle replaces them in the middle.

• Zig Zag



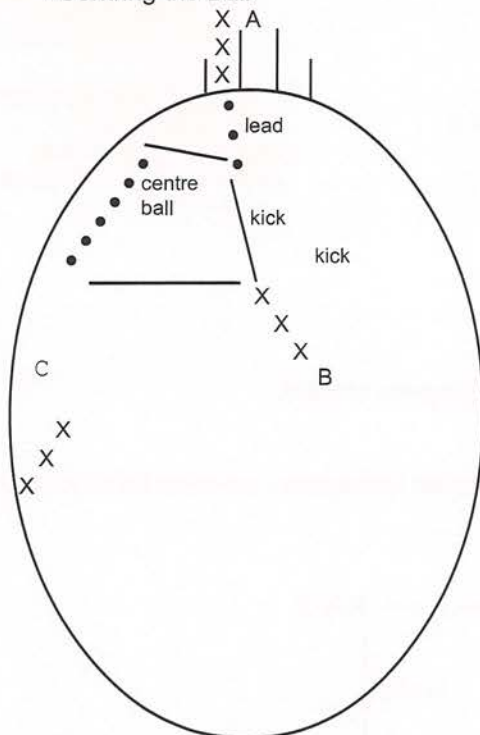
- zig zag down the line
- follow your handball

## KICKING

- Complete the same drills as for handball:-
  - \* partner work
  - \* lane work
  - \* five point
  - \* criss cross
  - \* figure 8
- Set Shot Goal Kicking - Shots at goal from varying distances and angles.



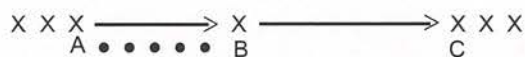
• Centring the Ball



- Kicking in triangle formation

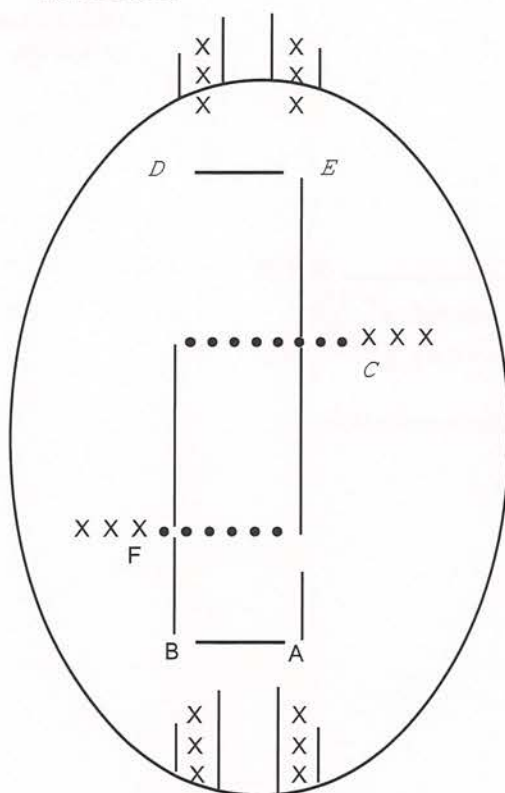
- A leads to mark centred ball then kicks to B.
- B kicks to C on boundary
- C runs into pocket then centres the ball to leading forward.

• Turn and Go



- A kicks to B and then replaces them in the middle.
- B turns and kicks to C
- C kicks to A and then replaces them in the middle.
- Continue format.

• Kick to Space



- A kicks to B.
- B kicks to space that C is leading into.
- C kicks to D on the lead.
- D kicks to E.
- E kicks to space that F is leading into.
- F kicks to lead from A
- Continue format.
- \*\* Follow kick to next group.



• Goal Kicking on the Run



- Run through shooting at goal between the cones.
- Ball moves continuously.
- Follow up to back of opposite group.

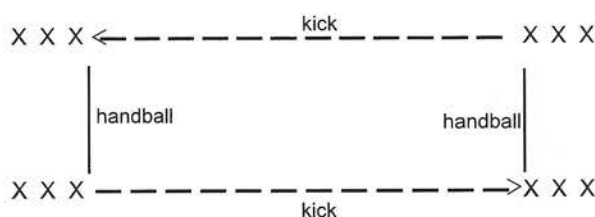
GENERAL PLAY ( KICK AND HANDBALL )

• Circle Work - move the ball around the oval using kicking and handball.

• Circle Work with Interceptors

- as above but keeping the ball off designated interceptors ( use colour bands for example )

• Rectangle Drill

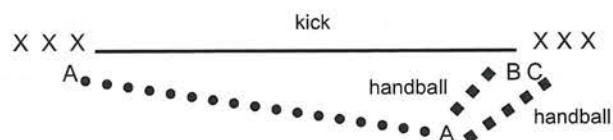


• Kick and Follow Up



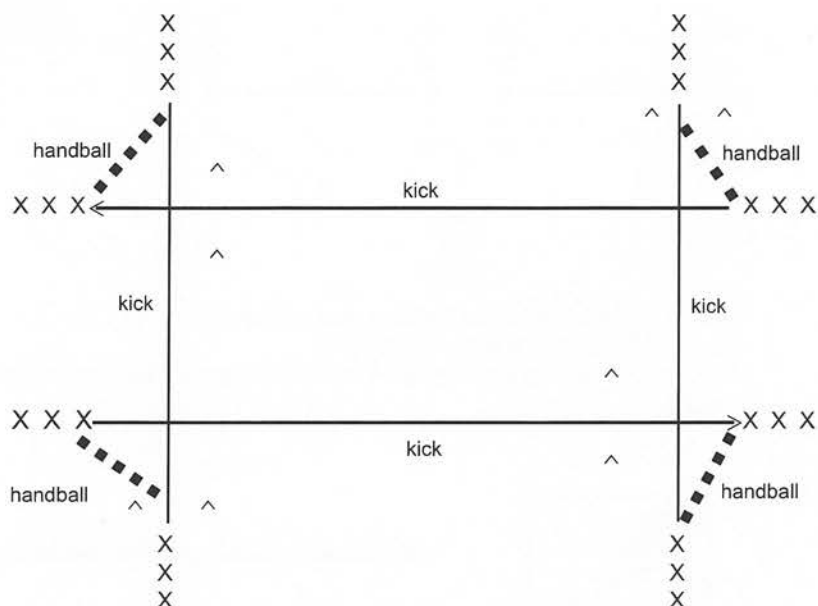
- Kick to the player in the middle
- Follow up to get the handball back
- Kick to far end.
- Follow kick to back of line
- \* Can be completed in 2's or 3's.

• Kickers Take the Handball Back



- A kicks the ball to B and follows up the kick.
- B handballs back to A
- A handballs to C
- Continue format.

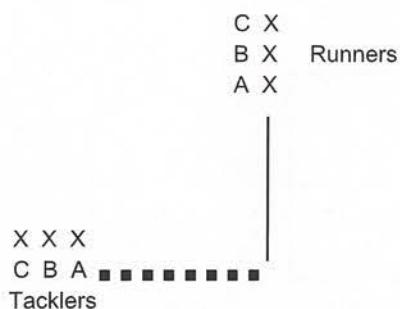
• Goal Kicking Square



- Continuous kicking and handballing around the square.
- Use cones as goals.

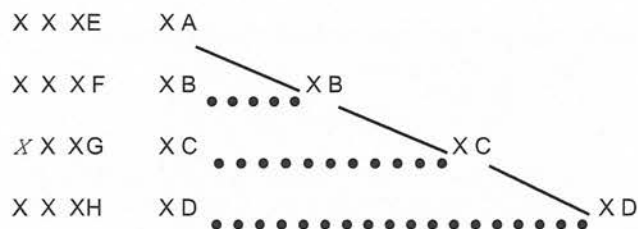
TACKLING

- Grid Work - 1 on 1, 1 on 2, tackling within a grid 5m X 5m.
- One on One - Ball is kicked by coach to players who fight for the ball and then return it to the coach.
- Side On



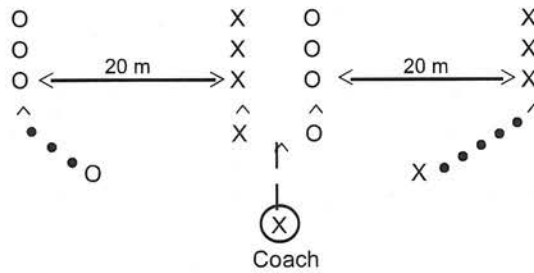
- Players run across each other. One group does the tackling the other tries to run past.
- Swap roles regularly.

• Multiple Tacklers



- A tackles B, C and D one after the other as they run down the line.
- E then tackles F, G and H.
- Continue format

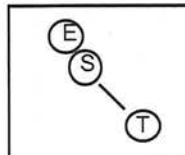
• Two on Two



- The ball is kicked high to a marking contest.
- Rovers come in from side cones.
- The two X's work against the two O's to get the ball back to the coach.

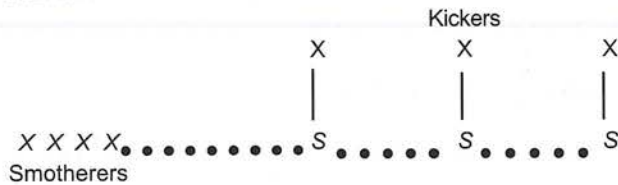
SHEPHERDING

• Grid Work



- Shepherd tries to protect the evader from the tackler.

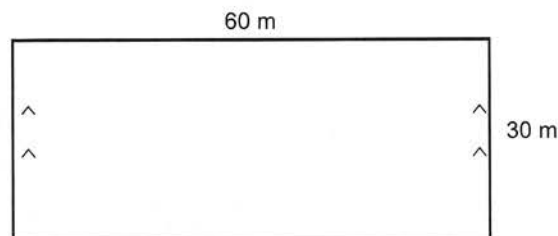
SMOTHERING



- Players run down the line smothering each kick in turn.

MINOR GAMES

• Touch Ball



- Teams of approximately 10, using handball only to advance the ball and score a goal past the keeper.
- No tackling but if a player is touched they must handball the ball immediately.

• Football Softball

- Softball diamond and rules but football skills are used.

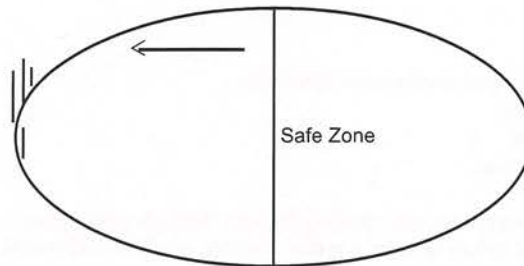
i.e. pitch - handball  
hit - kick  
fielders - kick or handball.

• Relays

- Move the ball by foot or hand around the boundary line and back to the start.
- Move the ball by hand or foot the length of the ground from goal square to goal square and back.
- Move the ball from a kick in at full back to score a goal at the other end.
- \*\* First team to complete tasks is the winner.

- Half Field Football

- Two teams of 10 - 12 players
- The ball is kicked in from the centre by the attacking team.
- The ball is played until a score is achieved or the defending team returns the ball to the centre.
- Once the ball is returned to the centre, teams change roles ( i.e. attackers - defenders / defenders - attackers )
- If a goal is scored the ball is brought back into play from the centre by the defenders.
- Normal football rules apply.



**Equipment**

- Footballs
- Colour bands
- Cones

**Activity****ZONE FOOTBALL**

Divide class into two teams and divide each team into:-

- forward group
- centre group
- defensive group

Divide session into three equal periods rotating players through each group.

- Rotation - forward group to centre group - centre group to defensive group - defensive group to forward group - and so on.

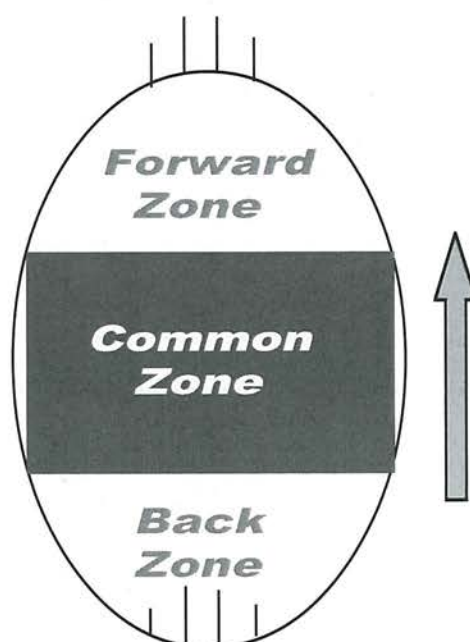
Divide the field into three zones

- Forward group are restricted to the attacking zone and common zone
- Defensive group are restricted to the defensive zone and common zone
- Centregroup are permitted in all zones

**\*\* This is a particularly useful game for a mixed class as you can restrict access to zones of different sexes.**

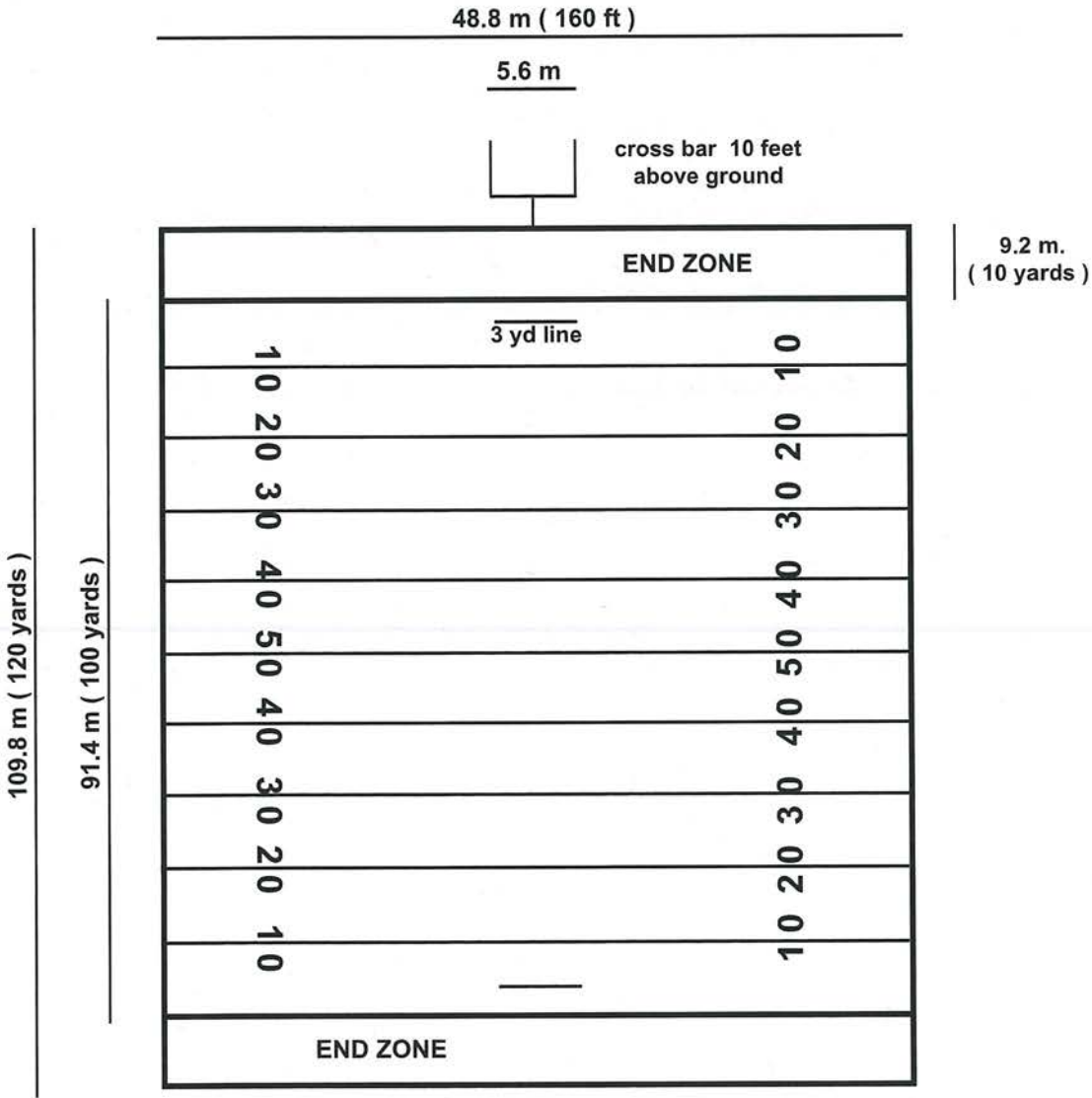
Rule Modifications:-

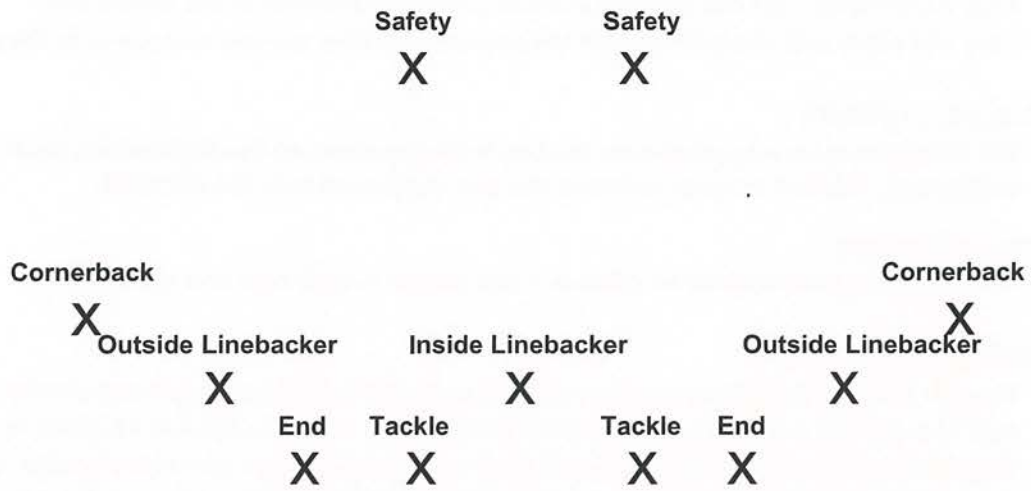
- the ball must be passed to a player in **each** zone
- only players from the forward group are permitted to score
- in mixed class only **touch tackling** is permitted in the common zone





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• <i>playing positions</i>	3
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• <i>drills &amp; practices</i>	6
• <i>practical session</i>	10



**Defence****Offense**

**GAME OBJECTIVE :**

To win the game, one team must score the most points. To score points, a team must kick the ball over the cross bar of the goal post or carry the football across the opposing team's goal line. Scoring is as follows:

**TOUCHDOWN ( 6 POINTS )**

The offensive team must cross their opponent's goal line while in possession of the ball.

**CONVERSION ( 1 POINT FOR A KICK / 2 POINTS FOR PASS OR RUN )**

After a touchdown the offence has another chance to score from the 3-yard line.

They can place kick the ball through the goal post or they can pass or run over the goal line.

**FIELD GOAL ( 3 POINTS )**

The offensive team may place kick the ball from anywhere on the field behind the line of scrimmage. The ball must go between the goal posts and over the uprights.

**SAFETY ( 2 POINTS )**

The defensive team tackles an offensive ball carrier in their own end zone.

**OFFENSIVE PLAY :**

The aim of the offence is to score points. To do that they must maintain possession of the ball. The offence gets 4 chances (called "DOWNS") to progress the ball 10 yards forward. If they do, they will start at the first down again, and have another four more downs to move the ball forward 10 yards. This continues until they score or fail to move the ball the required 10 yards and turn the football over to their opponents.

Before each down, the offence goes into a huddle - a team meeting on the field. The Quarterback tells the team the play for that down. The team is told all the details for that play, including who gets the ball, whether it's a run or a pass, when the ball will be snapped, and to what side of the line the play will occur.

There are a variety of player combinations (called "FORMATIONS") that the offense can use to move the football down the field, and Coaches will vary the formation depending on the defense, the Down and field position. A basic Formation includes -

**OFFENSIVE LINEMEN :** five players (two "TACKLES", two "GUARDS", and one "CENTRE") who run in front of the ball carrier prevent the defense from tackling him, or drop back a step and form a wall to protect the Quarterback on passing plays.

**RECEIVERS :** three players who are eligible to catch a pass. The Receiver closest to the Offensive Linemen is called the "TIGHT END" while the two closest to the sideline are called "WIDE RECEIVERS".

**RUNNING BACKS :** two players who are the work horses of the team. The "FULLBACK" is like a freight train, able to move straight ahead and carry most of the opposing team at the same time. The "TAILBACK" is the speedster on the team who takes the ball wide on running plays.

**QUARTERBACK :** he is like a captain and the starting point for the majority of plays. He will take the ball from the Centre, and either hand it to a Running Back or pass it downfield to a Receiver.

## **DEFENSIVE PLAY :**

The defence must stop the offense from getting the needed 10 yards for a first down and from scoring. The defence has two basic assignments : to tackle the runner and to break up the plays. A tackle is made when the ball carrier's knee touches the ground, in the grasp and hold of a defender, or his forward progress is stopped and he is unable to move.

As with the offence, the defence can use a variety of formations to achieve their goals. The defence is made up of "DEFENSIVE LINEMEN", "LINEBACKERS", and "DEFENSIVE BACKS", all of them trying to tackle the offensive ball carrier and give their team a chance to score.

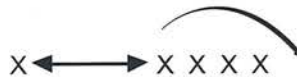


## PARTNER PRACTICE

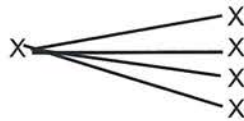
- Throwing and Receiving - varying distances apart.  
- practice catching running forwards, sideways, backwards to catch.
- Snapping - take it in turns to snap back to partner
- Punting - punt for distance / hang time  
- partner can pretend to punt return.
- Conversions - partner to hold ball  
- if in threes one person can perform snap first
- Tackling / Blocking - vary types of tackle ( oncoming / angle / chase down )  
- vary angles for blocking

## GROUP PRACTICE / MINOR GAMES

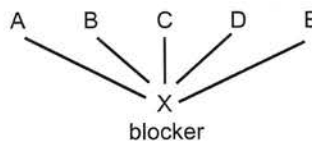
- Set Plays - vary the group numbers to practice set plays  
- ie 1. snap to Quarterback  
2. receiver(s) run to make position  
3. quarterback completes pass.  
\* can add offensive and defensive lines progressively.
- Leader Ball - leader throws the ball to each player who returns throw and moves to rear of line.  
Replace leader once each player returns the ball.



- Corner Spry

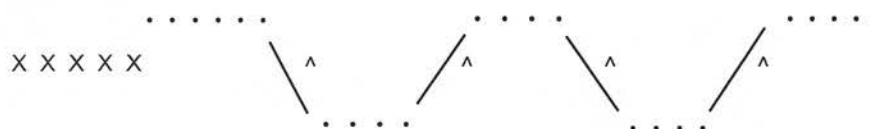


- Touch Grid Iron - play with touch instead of tackle for non contact version .  
- ideal if tackling has not been introduced yet.  
- progressions can be (i) one touch  
(ii) two touch  
(iii) holding tackle
- Keepings off - practice throwing and receiving  
- vary the number of players and the size of the playing area
- Tackle Grid - player tries to tackle each player in grid in shortest time possible
- Blocking - player "X" blocks each player in turn as they charge forward  
- ie: player A then player B and so on.

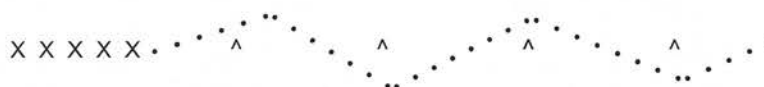


## EVASIVE SKILLS

- Stepping - players run down the line stepping to dodge around the cones.



- Swerving - players run down the line swerving in and out of the cones.



- The Fend - players run down the line fending by pushing tacklers' chest and shoulder.



## TACKLING

- Head On



- Semi Head On



- Side On



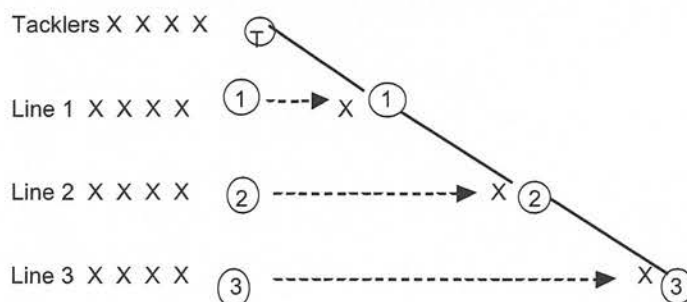
- Tackling Bag Activities - a variety of tackles can be practised using bags to limit the chances of player injury.

- Repetition Tackling

- Run the Gauntlet - players attempt to break through tackles 1, 2 and 3 consecutively. ( see below )



- Line Tackling - tacklers come out in turn and tackle the players from line 1, 2 and 3 as they run forward. ( see below )



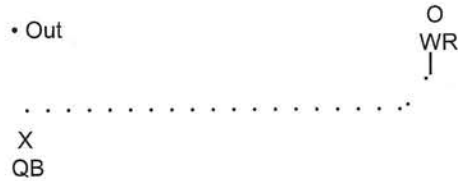
## INDIVIDUAL PASS PATTERNS

## • Curl



Wide receiver runs 10m and turns back towards quarter back to receive pass.

## • Out



Wide receiver runs 10m and cuts to the sideline to receive pass from quarterback.

## • Post



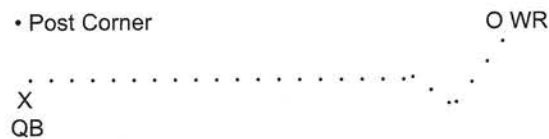
Wide receiver runs 10m and cuts towards the centre of the field at an angle of 45 degrees to receive pass from quarterback.

## • Streak



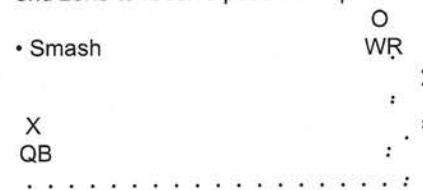
Wide receiver runs in a straight line up the field to receive a pass from the quarterback.

## • Post Corner



Wide receiver runs 10m up field cuts into the centre of the field and after 3m turns to run to the corner of the end zone to receive pass from quarterback.

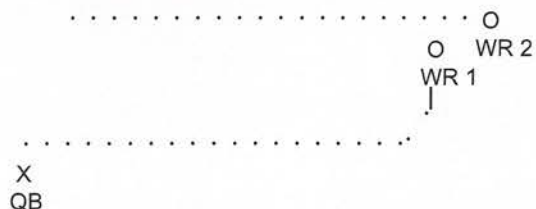
## • Smash



Wide receiver runs 10m up the field then turns to face the quarterback and side shuffles with body facing the quarterback to receive the pass.

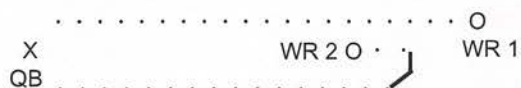
## COMBINATION PASS PATTERNS

### • Streak Out



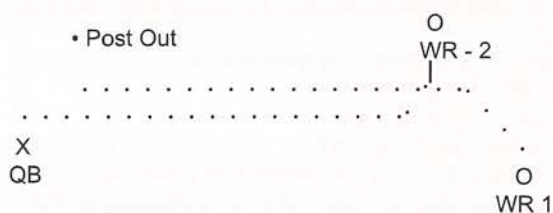
Wide receiver 1 runs 10m out and then towards the sideline - wide receiver 2 runs a streak.

### • Streak Curl



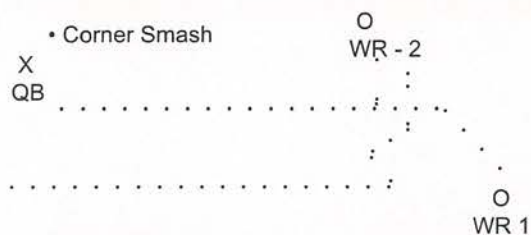
Wide receiver 1 runs a streak and wide receiver 2 runs an inside curl.

### • Post Out



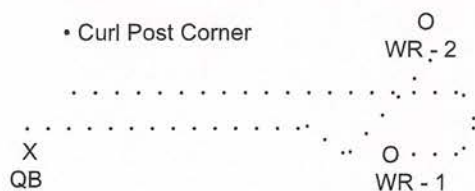
Wide receiver 1 runs a post and wide receiver 2 runs an out.

### • Corner Smash



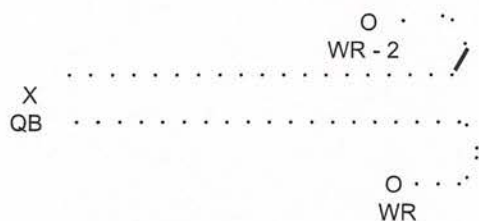
Wide receiver 1 runs a corner and wide receiver 2 runs a smash.

### • Curl Post Corner



Wide receiver 1 runs a curl and wide receiver 2 runs a post.

### • Twin Curl



Both wide receivers run curls.

## Equipment

- Footballs
- Colour bands
- Cones

## Activity

### ULTIMATE GRID IRON

#### Organisation

Set out a 20 x 40M area with cones.

Pair up 10 participants.

Rotate players, or duplicate the drill if space permits.

#### Drill

- The concept is for the team with the football to pass the ball to teammates without dropping the ball, all the while moving the ball toward the end zone.
- The player with the football has 10 seconds to pass or pitch the ball to a teammate.
- The ball can be passed or pitched forward, sideways, or backwards.
- The player with the ball can only take 2 steps after catching the ball.
- The offensive players without the ball can move anywhere on the field.
- The ball always has to be passed toward the end zone - 6 points are awarded for a touchdown.
- After a touchdown, the team that was on defense switches to offense and takes possession of the ball on their own 5 yard line.
- If the ball is dropped or intercepted, play continues with the other team in possession of the ball from the point of the turnover.
- Each defensive player must stay at arms length from the player with the ball. The defensive play is similar to that of basketball.





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#### **AOSA'S REFEREE CODE OF CONDUCT**

- Always remember that the game is for players. Player safety and fair play come first.
- Study and learn the rules of the game and understand the 'spirit' of the rules. Help fellow referees do the same.
- Encourage and enforce the Philosophies of 'Everyone Play's', 'Positive coaching' and 'Good Sportsmanship'.
- Respect other referee's decisions and do not publicly criticize another official.
- Wear the proper uniform and keep it in good condition.
- Maintain good physical condition so you can keep up with the action.
- Stay calm when confronted with emotional reactions from players, coaches and parents.
- Honour accepted game assignments. In an emergency, find a replacement.
- Support good sportsmanship with kind words to players, coaches and parents of both teams when deserved.
- Always be fair and impartial, avoiding conflicts of interest. Decisions based on personal bias are dishonest and unacceptable.



Contact



6 again – Stage 1



End of game – Stage 1



End of game – Stage 2



6 again – Stage 2



5th and last







Late Tag – Stage 1



Late Tag – Stage 2



Penalty



Offside – Stage 1



Stop play – Stage 1



Stop play – Stage 2



Offside – Stage 2



Offside – Stage 3

SECTION 17  
REFEREE HAND SIGNALS



Kick off – commence game



Knock on



Fend – Stage 1



Fend – Stage 2



Forward pass – Stage 1



Forward pass – Stage 2



Fend – Stage 3



Change over



## **MODIFIED RULES FOR GIRLS 12 – 14 DIVISIONS**

Field dimensions are 80m long x 50m wide.

### **MODIFIED RULES FOR ALL GIRLS & WOMENS DIVISIONS**

A punt kick will be used as the kick for an attempt at a conversion. These kicks will be taken no further than 10m either side of the goal posts. To be successful the kick must go over the cross bar.

## **SECTION 16 BEACHTAG RULES**

### **AT A GLANCE**

THE FOLLOWING ARE RULE VARIATIONS WHEN  
PLAYING BEACHTAG.  
**PLEASE REFER TO OZTAG RULE BOOK FOR ALL  
OTHER FACETS OF THE GAME.**

### **THE BASICS**

Field dimensions are 50m Long X 30m Wide.  
10 minute halves.

6 Players on the field at any time. Mixed divisions are played with 3 males and 3 females (maximum 10 players in a team).

There is unlimited interchange.

A tap kick at half way commences the game and is used to restart play after a try. The non-scoring team will have possession for the restart.

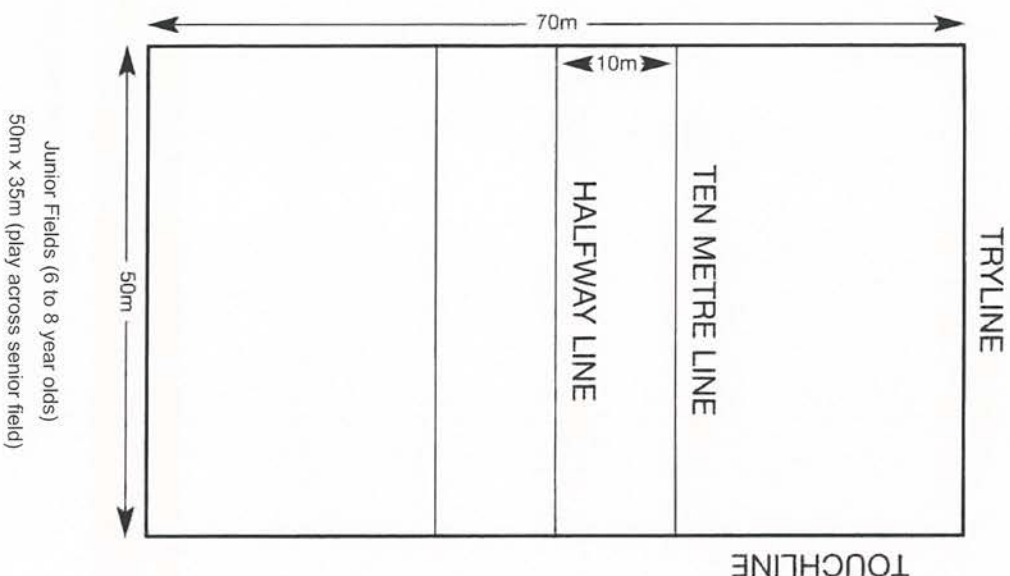
Defending team shall be back seven metres from halfway restarts.

The ball must be rolled with the hand in between the player's legs for a play the ball.

A defender must remove one tag to stop the attacker's progress. She/he then holds up the tag and drops it to the ground marking where the play the ball should occur.



## SECTION 14 PLAYING FIELD



## SECTION 15 SUPERTAG RULES

### AT A GLANCE

THE FOLLOWING ARE RULE VARIATIONS WHEN PLAYING SUPERTAG.  
PLEASE REFER TO OZTAG RULE BOOK FOR ALL OTHER FACETS OF THE GAME.

### THE BASICS

Field dimensions are 100m long x 70m wide  
20 minute halves

Ten a side for senior teams with mixed divisions playing 5 males & 5 five females. Eleven a side for junior teams with mixed divisions playing 6 boys & 5 girls.  
Unlimited interchange.

Scoring 3 points will be awarded for a try and 1 point will be awarded for a conversion or penalty goal.

Defensive line is back 10m and must wait for the dummy half to touch the ball before moving. When a penalty is awarded, the tap kick position is advanced 10m. Defending team must line up 10m from this spot.

### KICKING

Kicking in general play is allowed on any tag.

Kicking in general play is allowed over the referee's shoulder except

(a) when the attacking team crosses the opponents 20 metre line. Oztag kicking rules will then apply (i.e. no kick above the referee's shoulder height when kick is made on or inside opponents 20m line.)

(b) When the kick is classified as a bomb. Referee will determine if a kick is in this category (time in the air v distance travelled)

If a team is awarded a penalty over 20 metres away from their try line, a drop kick may be taken in an attempt of a penalty goal. No drop kicks for penalty goals may be taken inside the opponents 20 metres.

A drop kick will be used as the kick for an attempt at a conversion for all divisions. These kicks will be taken from in line with where the try was scored. To be successful the kick must go over the cross bar.

### 50/20 RULES

If a player kicks the ball in general play from within their own 20 metre line and the ball crosses the side line in the oppositions half they will receive the ball back in a changeover 10 metres in from touch where the ball crossed the line.

### OPTIONAL RULE

One player on each team may have different coloured tags. If this player scores, the points are doubled, i.e. 6 points a try & 2 points a goal. These tags may be transferred only during substitution and not amongst players already on the field.



## SECTION 12 REPRESENTATIVE RULES

1. General play kicking allowed on any tag.
2. Halfway/ten (50/10) metre kicking rule in general play and kick-offs. **Result:** A tap kick will be taken at the discretion of the referee 10m in from touch & 10m out from the try line.
3. Other rules may be changed or added at the discretion of the Tournament Director.

## SECTION 13 JUNIOR RULES

Please note that slight variations to rules may apply in Junior Competitions. Please check with your area for those variations.

5 to 10 year old divisions

1. No marker allowed.
2. Dummy half may run but if tagged a changeover will occur.
3. Dummy half cannot score.
4. Defensive line cannot move until the first receiver touches the ball or the dummy half runs.

6. The referee may dismiss a player for the remainder of the game if the referee deems the offence to be serious enough. If a player is dismissed from the field he/she automatically receives a two week suspension. This may be extended or reduced by the competition manager after reviewing the circumstances of the incident. Players have a right to appeal.
7. A player shall take no further participation in the game nor shall he/she be permitted to take up a position within the playing area where his/her presence is likely to provoke further incidents.
8. If a referee is assaulted or unduly harassed by any person as a result of a match under his/her control the referee shall submit a report of the incident to the appropriate authority.

#### **SECTION 11 DUTIES OF A REFEREE**

1. The referee is responsible for ensuring the rules of the game are adhered to. The referee is the sole judge of fact.
2. To ensure the playing field is checked and in a condition for safe play.
3. The referee shall record the score and all tries scored during the match. He/she shall be the sole timekeeper except where this duty has been delegated to another person.
4. The referee at his/her discretion, can temporarily suspend or prematurely terminate a match because of adverse weather, undue interference from spectators, misbehaviour of players, or any other cause as he/she sees fit that interferes with the control of the game.
5. The referee must carry a whistle and use it in the following circumstances:
  - To start and stop play.
  - When a try is scored.
  - When the ball is out of play.
  - When the rules of the game have been broken.
  - When play is irregularly affected e.g. ball comes in contact with the referee or any other person not participating in the game.
  - To enforce the rules for any other reason.



## SECTION 9 PENALTIES

Penalties are taken by a tap kick in any direction after the referee has verbally and physically indicated the mark (a tap kick can go higher than shoulder height).

**Note:** If a player chooses to use the play the ball action instead of taking the tap kick it is still deemed as a tap kick.

1. A penalty shall be awarded against any player who is guilty of misconduct provided that this is not to the disadvantage of the non-offending team. Unless otherwise stated, all penalties are given where the infringement occurs.
2. If a penalty kick is not taken on the mark designated by the referee, the referee will stop play & ask the team to take the tap kick again.
3. Offending team must retire ten metres from the penalty mark.
4. Further misconduct by the offending team shall allow the referee to advance the mark once only, by ten metres or as near to the try line as possible.
5. If a kicker is interfered with after kicking the ball or one of his team mates giving chase, the penalty will be awarded where the ball stops or is stopped by an opposing player. If the ball crosses the touchline or try line the penalty is given ten metres in field.
6. If misconduct occurs on any player as they are chasing a kick and the ball rolls over or lands over the try line on the full, the penalty will be awarded to the non-offending team, either ten metres from the try line in the field of play and opposite to where the ball crossed the try line or at the point where the player was impeded, whichever is the greatest advantage to the non-offending team.

## SECTION 10 MISCONDUCT, SIN BIN & SEND OFFS

1. A player is guilty of misconduct and will be penalised if he/she:
  - a) Trips, kicks or strikes another player.
  - b) When effecting or attempting to effect a tag makes contact with any part of an opponent's body intentionally, recklessly or carelessly.
  - c) Deliberately breaks the rules of the game.
  - d) Uses offensive or obscene language.
  - e) Disputes the decision of the referee.
  - f) Re-enters the field-of-play without the permission of the referee.
  - g) Behaves in any way contrary to the true spirit of the game.
  - h) Deliberately obstructs/impedes an opponent who is not in possession of the ball.
2. All players are under the control of the referee from the time they enter the playing field to the time they leave. In the event of misconduct by a player, the referee shall, at his discretion, caution, sin-bin or dismiss the player.
3. A caution may be administered to a team as a whole or to an individual player. If a caution is given to a team, each team player is considered to have received an individual caution. If a final caution is given to a player, the nature of the offence must be recorded by the referee and must be quoted if the player is subsequently dismissed.
4. The power to sin-bin (temporarily suspend) and the length of player suspension is at the discretion of the referee (max. 10 mins.). A sin-binned player can take no further part in the match and cannot be replaced for the duration of the suspension and shall re-enter the playing field only when permitted to do so by the referee. A suspended player shall take up a position behind the oppositions try line for the duration of the suspension.
5. The sin-bin may be used for the following incidents:
  - a) Blatant disregard for the rules.
  - b) Continued rule infringements.
  - c) Back chatting, dissent or sledging of referee or players.
  - d) Repeated contact infringements.
  - e) Fighting.
  - f) Professional foul.



28. If an attacker kicks in general play and the ball lands in the field of play then crosses the try line and is grounded by an attacking player in a controlled manner before the ball lands on the ground or is touched or touches a defender a try will be awarded. If a try is not scored then we revert to point 29.
29. If the ball is kicked and crosses the plane of the non-kicking teams try line they will receive a tap kick ten metres out in the centre of the field. Subject to point 28.
30. If the ball is kicked and played at by the non-kicking team and crosses the plane of the try line a dropout will restart play.
31. A player cannot kick the ball with only one or no tags on unless they have been pre or late tagged. The exception is the dummy half or a player taking a penalty tap kick may kick the ball as long as he/she only takes one step.

#### **GENERAL PLAY KICKING CHANGEOVERS**

32. If the ball travels higher than the referees shoulder, a changeover will be awarded to the defending team at the origin of the kick. The referee may consider advantage rule and play on.
33. If the ball is kicked and it goes out of the field of play on the full, the non-kicking team will receive a changeover at the point where the kick was taken.
34. If the ball is kicked and it lands in the field of play then rolls out over the touchline, the non-kicking team will receive a changeover ten metres in from where the ball crossed the touchline.
35. If the ball is kicked and played at by any member from the non-kicking team and the ball rolls over the touchline, the kicking team shall play the ball ten metres in from where the ball crossed the touchline and the tag count will be restarted.
36. If an attacking player is in front of the kicker when the ball is kicked and the ball accidentally strikes the offside player a changeover will be awarded to the defending team at the point of contact. The referee may allow a defending player an advantage if he/she regathers the ball in this situation.
37. If any kick touches the referee and play is irregularly affected a changeover at the point of contact will occur.
38. **(Kick to waste time)** If a kick in general play is deemed by the referee to have been deliberately kicked over the sideline or try line to waste time a 10 minute sin bin will be given to the player responsible. A penalty awarded to the non-offending side at the half way or where the ball was kicked from whichever is the greatest advantage.

### **SECTION 8 KNOCK-ON AND KNOCK-BACK**

1. If a player propels the ball in a forward direction with their hand or arm and the ball comes into contact with the ground, an opponent or the referee, a knock-on will be ruled. A changeover will be awarded to the non-offending team. The referee may allow the non-offending team to take possession and gain an advantage. If they are tagged it will be a zero tag.
2. If an attacking team player propels the ball in a backward direction play will continue.
3. If an attacking team knocks-on and no advantage is gained by the defending team, the ball is returned to the point of the original knock-on and the defending team will receive a changeover.
4. If the attacking team knocks on the defending team may kick the ball to gain an advantage. If this team (defending team at the time of knock-on) then retrieves the ball after the kick, play-on will be called and the next "tag" will be counted as a zero tag regardless of field position.
5. If the attacking team knocks-on and the defending team immediately kicks through and fails to regather the ball, no advantage has been gained by the defending team and the ball will be returned back to the point of the original knock-on and the defending team will receive the changeover.
6. The ball carrier cannot deliberately throw or tap the ball past a defender. Decision – Penalty.

## SECTION 7 KICKING RULES

**NOTE: NO KICKING TEAM PLAYER CAN DIVE ON THE BALL FROM ANY KICK.**  
**Safety Issue.**

### KICK-OFF RULES

1. The team which wins the toss chooses which direction to run and the opposing team will kick-off. This is reversed for the second half.
2. The kick-off is a place kick from the centre of the halfway line.
3. When a try is scored the non-scoring team shall kick-off to restart play.
4. The ball must travel ten metres before any player of either team can touch it.
5. The ball must bounce within the field of play before going over the touch or try line.
6. The players of the team kicking off (kicking team) must not cross the halfway line until the ball is kicked.
7. The team receiving the ball can be no closer than ten metres from the halfway line at the time of the kick-off.
8. If the ball bounces over the touchline, a changeover will be awarded to the receiving team, ten metres in from the touchline where the ball crossed the line.
9. If the ball bounces & crosses over the oppositions try line whether touched or not, play will restart with a dropout from the centre of the try line.
10. If the ball is caught on the full over the try line the referee will call "play on".

**All kick-off infringements will result in a penalty being awarded at the centre of the halfway line.**

### DROPOUT KICKING RULES

11. A dropout is a drop kick taken from the centre of the try line.
12. The ball must bounce within the field of play before going over the touch or try line.
13. The ball must cross the ten metre line from the try line before any player of either team may touch the ball.
14. The players of the team dropping out must not cross the try line until the ball is kicked.
15. The team receiving the ball can be no closer than ten metres from the try line at the time of the dropout.

16. If the ball from the dropout bounces over the touchline, a changeover will be awarded to the receiving team, ten metres in from the touchline where the ball crossed the line.

17. If the ball from the dropout bounces over the receivers try line whether touched or not, a dropout from the try line will be taken. However, if the ball is caught on the full over the try line, the referee will call "play on".

**All dropout infringements will result in a penalty ten metres out from the try line centre field.**

### GENERAL PLAY KICKING RULES

18. The attacking team may kick the ball when they first come into possession, before the initial tag and after the fourth tag. The ball must not travel off the boot higher than the referee's shoulders. The referee may consider advantage play in this instance.
19. If a player kicks the ball and is simultaneously tagged and the referee calls "play on" the kicker cannot promote the ball with another kick. If the kicker kicks it a second time a penalty is awarded where they kicked it.
20. Only attacking team players behind the kicker when the ball is kicked are onside. If the attacking players are onside they may chase the ball downfield to retrieve the ball or affect a tag.
21. If an attacking player is in front of the kicker when the ball is kicked, this player is offside and cannot affect a tag until either the ball receiver has run ten metres in any direction or the kicker runs past the offside player and puts him/her onside. However an off-side player cannot be placed onside by the kicker if he/she is already within ten metres of the receiver.
22. If the attacking offside player deliberately plays at the ball or effects a tag a penalty should be awarded at that point. (Referee may allow advantage play.)
23. The receiving team may take possession from a kick and elect to kick the ball back downfield to gain a territorial advantage. This is allowed, as a tag has not been made.
24. If the ball is kicked and it crosses the receiving teams try line after a receiving team player deliberately played at the ball, a line dropout will restart play.
25. If the ball is not played at but touches a player then a changeover will be awarded to the non-kicking team, ten metres out from the try line where the ball crossed the line.
26. If an attacking team player or the kicker deliberately impedes the progress of a defending player who is attempting to take possession of the ball after a kick downfield, a penalty will be awarded to the defending team at the point where the defending team player was impeded.
27. A kicking team player can never dive, slip or fall on the ball. This applies to all kicks whether in general play or restarts of play. A non-kicking player playing at the ball does not nullify this diving rule.



11. If the ball carrier off-loads the ball as their tag/s are removed and the referee calls "play-on", they must replace the tag/s before being able to further the ball's progress. If this player fails to replace the tags and receives the ball play is stopped and a tag counted.
12. If the ball carrier comes into contact with the referee whilst trying to evade a "tag", a tag will be counted.
13. If an attacking player receives the ball with his/her shirt out and a defender is within tagging distance the referee will call a tag.
14. A player cannot touch his/her own tag whilst in possession of the ball. If they do the referee will call a tag.
15. If the ball player goes over the try line and then crosses the plane of the imaginary sideline, play will restart with a tap kick ten metres out centre field.
16. If an attacking player knocks on over the try line whilst scoring a try, play will restart with a tap kick ten metres out centre field.
17. When a knock on or forward pass occurs, the referee should consider advantage play.
18. If a player knocks on within ten metres of the try line, a change over will occur in line with the knock on, ten metres out from the try line. If within ten metres of the touch line, move in ten metres.
19. A ball bouncing off the body or head is not a knock on. The referee will call play on.

#### **ATTACKING TEAM CHANGEOVERS**

20. If the ball comes into contact with the referee after being kicked or passed and play is irregularly affected, a changeover will be awarded to the defending team at the point where the contact occurred.
21. If any attacking player is "tagged" over the try line prior to placing the ball down for a try and it is the last tag, a changeover will be awarded to the defending team five metres out from the try line.
22. When the ball carrier accidentally or deliberately crosses the touchline before their tag is removed, a changeover will be awarded to the defending team ten metres in from where the ball carrier crossed the touchline.
23. When the ball player accidentally steps over the touchline whilst playing the ball, a changeover will be awarded to the defending team ten metres in from where the ball player stepped over the touchline.
24. If the ball player whilst in the action of playing the ball loses control of the ball and drops the ball on the ground as opposed to playing the ball, a changeover will be awarded to the defending team at the point where the ball player lost control of the ball.

25. **THREE SECOND RULE.** If the ball player delays the play the ball or there is no dummy half or the dummy half has not picked up the ball. The referee can start a 3 second count. If he reaches the 3<sup>rd</sup> count a changeover will be awarded. (Referee will determine when he starts the count.) At no time can the marker move during the 3 seconds to pick up the ball. If 3 seconds expires, the referee will award a change over.

#### **ATTACKING INFRINGEMENTS**

**The referee may award a penalty where the infringement occurred in the following circumstances:-**

26. The ball carrier must not attempt to bump or fend off a defender in their attempts to remove a tag or whilst chasing the ball. The ball carrier can in no way protect his/her tag with their hands, elbows, ball etc.
27. The ball carrier must not jump to avoid being tagged, however they may spin/swivel to avoid being tagged as long as they do not initiate contact.
28. The ball carrier will be penalised if he/she bends their body forward to prevent being tagged.
29. In changing direction on the run the ball carrier steps into a defender endeavouring to make a tag. **Onus on ball carrier to avoid contact.**
30. When an attacking player prevents a defending player from executing a tag by running behind his team mate/s causing an obstruction.
31. When the ball carrier executes a voluntary tag by deliberately playing the ball with both tags intact.
32. When the ball carrier deliberately removes their own tag.
33. When the ball player interferes with the marker at the play-the-ball.
34. When the ball is deliberately passed in a forward direction.
35. When the ball carrier gives up and does not attempt to attack during the play.
36. If the play the ball is deliberately delayed the referee will initiate the three second count.
37. When a player baulks in picking up the ball in the dummy half position. This is deceptive behaviour and not in the true spirit of the game.
38. When an attacking player is in front of the play the ball, they cannot get involved in the next play. If they do, the penalty is awarded where they became involved.

- 14 When the marker fails to stand immediately and directly in front of the ball player when the ball is being played.
  - 15 When the marker interferes with the ball player at the play-the-ball or moves too early.
  - 16 The marker cannot strike for the ball whilst the ball is being played.
  - 17 The marker under no circumstance can run around and retrieve the ball from the dummy half position. This will result in a penalty (safety issue).
  - 18 When a defending player is less than seven metres from the play-the-ball when the ball is being played. A penalty may be awarded at the point where the offside player(s) should have been standing in the defensive line.
  - 19 When a defending player impedes play from an offside position e.g. returning on side.
- If a defender removes an attackers tag when they are not in possession of the ball, the referee has the following options:-**
- 20 If it is just after the attacker has passed the ball, no action is taken and the attacker must replace the tag before being able to progress the ball downfield, (simultaneous tag/off load).
  - 21 If it is after the attacker has passed the ball, the referee should call "Late Tag, Play On" and allow the attacking team to progress the ball with only one or no tags on. This may result in a player scoring with one or no tags on. This is one case of the "Advantage Rule" being applied.
  - 22 If it is after the attacker has kicked the ball the referee should call "Late Tag/Play On" and allow the attacking team the opportunity to regather the ball. If the referee deems no advantage has been gained by the kicking team (e.g. regathers ball late in the tackle count, etc.), he should penalise the defending team where the ball stops, crosses the touch line or try line or where the opposition takes possession of the ball.
  - 23 If a defender removes a support players tag before receiving the ball he/she should call "Pre Tag" and allow the advantage play.
  - 24 If no advantage is gained in 17. & 18. the referee should penalise the defender & may consider the use of the sin bin.
- A Player 'pre or late tagged' with only one tag still on can only be stopped by removal of the remaining tag. If no tags are on the player will be deemed tagged when a defender comes within tagging distance.**

## SECTION 6 ATTACKING RULES

1. When in possession of the ball, the ball carrier can attempt to position the ball further downfield by running, kicking or passing the ball to his/her team mates. An attacker can only progress the ball with two tags on unless advantage is being played due to a late tag/pre tag.
2. The attacking team shall be allowed six successive tags then a changeover will occur.
3. When an attacking player who has possession of the ball (ball carrier) has one or more tags removed by a defending player, the ball carrier must return to the point where the first tag was removed and play-the-ball without delay.
4. Another attacking team player will take up a position directly behind the ball player and assume the dummy half position. The play-the-ball is initiated when the ball player places the ball under one of his/her feet and heels it backwards with the foot to the dummy-half, who then initiates the next play by passing, kicking or running the ball. After playing the ball, the ball player should replace his/her tags on their shorts/tights before participating in the attack again.
5. If there is no marker the ball player may replace his/her tag place the ball on the ground, release the hands from the ball and tap it with the foot and continue play. If he/she is missing a tag they may only pass or kick the ball taking no more than one step.
6. If the attacking side is tagged a sixth time, the attacking player places the ball on the ground and a changeover will be awarded to the defending team.
7. If the ball carrier fails to the ground, or a player falls on a loose ball, and a defender is within tagging distance, a tag will be deemed to be effected. This applies to the ball carrier when crossing for a try. If any part of the body (other than the feet) of the ball carrier touches the ground before the try line, and before the ball is placed over the try line, then a try cannot be awarded if a defender is within tagging distance. The ball carrier will be asked to play-the-ball no more than one metre out from the try line and the tag count will continue. If this occurs on the last tag, a changeover will be awarded to the defending team. **NOTE:** The ball carrier can drop to the ground after they have crossed the try line to score a try even with defenders within tagging distance.
8. An attacking player may receive a pass behind their try line or may run behind their try line when in possession of the ball. If an attacking player is tagged behind their try line, they shall restart play with a drop kick from the centre of the try line.
9. The dummy half can pass or kick the ball with only one tag on as long as they only take one step. If he/she should take more than one step, they will be called back and the next tag will be counted.
10. Simultaneous tag/ball off load situations will result in a "play-on" call from the referee and since OZTAG is predominantly an attacking game, the benefit of the doubt will be given to the attacking team. If the ball off-load is deemed to have been executed after the "tag", the tagged player must return to the mark and play-the-ball where the tag occurred without penalty.



#### SECTION 4 SCORING

1. One point is awarded for a try. In mixed games if a female scores it's two points.
2. The game shall be won by the team scoring the greater number of points. If the score is equal or if both teams fail to score, then the game shall be drawn.
3. A try is awarded to the attacking team when they ground the ball on or over the try line. Also see Penalty Try in Section 1.
4. A try can be scored from a kick in general play if the ball is regathered or controlled before the ball touches the ground beyond the try line. Local venues may vary this rule considering safety of players.
5. If the ball crosses the try line then travels outside an imaginary touch in goal line the ball is dead.
6. A player cannot pass the ball back after crossing the try line nor can he/she run back into the field of play to pass the ball back to another player. Decision - penalty 10 metres out directly in line with the infringement.
7. A player can dive in the air from the field of play whilst running the ball or chasing a kick to score a try. Should the dive initiate contact or deemed dangerous by the referee a penalty will be awarded. An attacker cannot deliberately dive over a player in an attempt to score a try.

#### SECTION 5 DEFENCE RULES

1. The progress of the ball carrier can only be halted if a defender removes one or both of the attacker's tags. If both tags are removed by one or more defenders then the point where the first tag was removed will be where the ball is played.
2. When a tag is removed the defender must hold it in the air at the point where the tag was made, drop it and assume a marker position or return to the defensive line. The ball carrier must return to the point where the tag was removed, play-the-ball and then replace his/her tag.
3. When the ball carriers progress has been halted and they are in the action of playing the ball, the defensive line must be at least seven metres back from the play-the-ball area and one defender may act as a marker.
4. The marker must stand directly & immediately in front of the play-the-ball.
5. The marker and the defensive line can only move forward when the ball is touched by the dummy half. If the dummy half baulks the referee should play on e.g. call "play on".
6. If the attacking side fails to score before the sixth tag has been made a changeover will be awarded to the defending team at the point where the sixth tag was affected. This team will then become the attacking team and they will now receive six tags to attempt to score a try.
7. A player may defend with one or no tags however if he/she receives the ball which has been kicked, dropped or propelled forward, they must immediately play-the-ball at the place of receipt.

#### DEFENDING TEAM INFRINGEMENTS

**NOTE: The referee should consider advantage play prior to penalising.**

**Penalties may be awarded at the point of the infringement in the following circumstances:-**

8. If a defender deliberately moves into the ball carriers path, without gaining position first and contact is made, the defender will be judged as initiating this contact.
9. When a defending player, in the referee's opinion, is not attempting to remove a tag but is deliberately impeding the progress of the ball carrier or any attacking player with their body.
10. When a defender holds onto an attacking player or their uniform and no advantage is gained by the attacking team.
11. When a defender calls "tag" without physically removing the tag it will be deemed a "phantom tag".
12. When a defending player calls for the ball as a deliberate means to deceive the attacker into passing them the ball.
13. When a defender tags an attacking player and throws the tag more than one metre away from the mark where the tag occurred.



## SECTION 2 PLAYING THE GAME

1. The objective of the game is to ground the ball over the opponents try line to score tries. The player in possession of the ball may run, kick or pass the ball attempting to get further downfield and cross the opponents try line. It is the objective of the team without the ball to prevent this by removing a "tag" from the ball carrier.
2. The attacking team has six "plays" or "tags" to place the ball over the defending teams try line. After six "tags" a changeover occurs and the defending team then becomes the attacking team.
3. The captains of the two teams shall toss for choice of ends. The captain winning the toss has the choice of which direction to run and the opposition team will use a place kick from the centre of the field to start the game.
4. The only time the kicking team player may dive at the ball from a general play kick is to score a try. If the player regathers the ball before it touches the ground or brings the ball down on or over the try line with downward pressure a try will be awarded.
5. Once play has started an attacking player who is onside can run with the ball, kick it in any direction and throw or knock it in any direction other than towards his opponents try line.
6. A player who during play is holding the ball (ball carrier) may be tagged by an opposing player (defending player) or players in order to prevent him/her from running with the ball, kicking or passing the ball to his/her team mates.
7. A player not in possession of the ball, either a defender or attacker cannot be tagged or obstructed during the game.
8. Otag is a non-tackling/non-contact game. Accidental contact will occur but contact should be avoided.

## SECTION 3 PLAYERS AND PLAYING EQUIPMENT

1. There can be a maximum of eight players per team on the field at any one time. Any number of replacements per team is allowed during the course of the game with unlimited interchange.
2. The game shall be played by two teams each consisting of at least five players per side. In the case of mixed competitions, the maximum number of male players on the field at any time is four.
3. There will be no stoppage of play during interchange of players. The player must leave the field of play before the replacement can enter the field except when there is a stoppage of play, e.g. try or injury.
4. If a player is bleeding the referee shall direct this player to leave the field and seek attention before re-joining the game.
5. Players shall not wear anything that might prove dangerous to other players. Player's normal clothing shall consist of a shirt of distinctive colours and/or patterns, a pair of authorised shorts/tights, plastic studded boots (no metal studs) or runners and authorised tags. For ease of identification, the player's shirt should be numbered.
6. The referee should inspect player's equipment prior to the commencement of the game and if necessary, the referee can prevent a player from participating in the game if he/she considers a player's equipment is dangerous. Prescription glasses are allowed.
7. If the ball bursts as a player is restarting play that player will be allowed another kick after the ball has been replaced.
8. If a player grounds the ball for a try and the ball bursts during this action the try will be allowed.
9. If the ball bursts during general play, play is stopped, the ball is replaced, a "tag" is counted and play is restarted with a play-the-ball by the attacking team where the ball burst. If the ball bursts on the sixth "tag", play is restarted with a changeover awarded to the defending team after the ball is replaced at the point where the ball burst.

**KICK** - Deliberately striking at the ball with the leg from the knee to the toe. This action does not include blocking or trapping the ball with the foot or leg.

**KICKING TEAM** - Is the team which kicks the ball.

**KICK-OFF POINT** - Is the position at the centre of the halfway line.

**KICK TO WASTE TIME** - is a kick that is deliberately kicked out over the sideline or try line to waste time.

**KNOCK-ON** - Propel the ball forward with hand or arm towards opponents try line.

**KNOCK-BACK** - Propel the ball backwards with hand or arm towards own try line.

**LATE TAG** - Is when a tag is taken off the ball carrier after they have passed or kicked the ball.

**MARKER** - Is the defending player who stands immediately and directly opposite the ball player during the play-the-ball.

**MISLEADING & DECEPTIVE CONDUCT** - When a defending player calls for the ball to deceive the attacker into passing the ball to them.

**OBSTRUCTION** - Is the act of preventing an opponent from tagging the attacking player in possession.

**OFF-SIDE** - A defending player not back the required distance or an attacking player in front of the player in possession.

**PASS** - Is to throw the ball in a backwards direction from one player to another.

**PLAY-ON** - Continue play.

**PENALISE** - Is to award a penalty against an offending player.

**PENALTY TRY** - A try awarded by the referee when in his opinion a try may have been scored subject to an infringement or foul play by an opponent.

**PHANTOM TAG** - Is when a defender calls they have made a tag but have missed it e.g. "yes" call.

**PLACE KICK** - Is to kick the ball after it has been placed on the ground.

**PLAYING AT THE BALL** - Any deliberate attempt to gain possession or touch the ball.

**PLAY-THE-BALL** - When the ball player uses the sole of the foot to propel the ball behind him/her.

**PLAYING AREA** - Includes the field of play and the area restricted to spectators by any means such as a fence, rope, line.

**PRE TAG** - Is when a tag is taken off a player before they receive the ball.

**SIMULTANEOUS TAG** - A player is tagged at the same time they kick or pass the ball.

**SLEDGING** - A verbal insult directed at a player, official or spectator, includes references to racial slurs and sexist comments.

**SURRENDER** - Is when the ball carrier deliberately gives up and does not attempt to attack during the play. e.g. When the ball carrier runs to a defender, stops and turns their hips towards the defender to be tagged.

**TAG** - The removal of the tag from the ball carrier shorts/tights.

**TAGGING DISTANCE** - When a defender is deemed to be close enough to an attacker to be able to remove their tag. Referees discretion.

**TAP KICK** - A deliberate touch of the ball with the foot.

**VOLUNTARY TAG** - Is when an attacking player either plays the ball with both tags attached or deliberately removes one or both of his/her own tags.





## Oztag Rule Book 2015 Edition 9

This Book was compiled and edited by  
Bill Harrigan, Perry Haddock and Queensland Oztag.  
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### SECTION 1 GLOSSARY OF TERMS

**ADVANTAGE** - Is to allow play to proceed to the advantage of the team which has not committed an offence or infringement.

**ARM** - (RE Knock on) is defined where the arm joins the shoulder at the arm-pit.

**ATTACKER** - Is a member of the attacking team.

**ATTACKING TEAM** - Is the team who has possession of the ball.

**BALL CARRIER** - Is a member of the attacking team who has possession of the ball.

**BALL PLAYER** - Is the member of the attacking team who is imparting motion to the ball at the play-the-ball area with his/her foot.

**BAULK** - The dummy half pretends to pick up the ball.

**CHANGEOVER** - Is the surrendering of the ball to the opposing side.

**CONTACT** - The touching or collision of bodies whether deliberate or accidental.

**DEFENDER** - Is a member of the defending team.

**DEFENDING TEAM** - Is the team without possession of the ball.

**DEFENSIVE LINE** - Is a line of defending players.

**DIVE** - A dynamic movement head first through the air where both feet leave the ground.

**DROP KICK** - The ball is released from the hands and is kicked as it rebounds off the ground.

**DUMMY-HALF** - Is the attacking player who takes up position immediately behind the ball player during the play-the-ball.

**FIELD-OF-PLAY** - The area within the touchline and try line.

**FORWARD PASS** - Passing the ball forward towards opponents try line.

**GROUNDING THE BALL** - Placing the ball with downward pressure on or over the opponents try line with hand, hands, wrist or forearm.

**IN POSSESSION** - A player has control of the ball with their hands or arm.

**IRREGULARLY AFFECTED** - A team may be disadvantaged by play being irregularly affected e.g. ball hitting a referee and bouncing back to kicking team.

**JUMP** - To spring off the ground in a vertical direction and landing on your feet.



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**2015**

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## Home Based Learning Week 2

Year 9: Personal Development, Health and Physical Education		
Term 3:	Week: 2	Lesson Focus: Media, Marketing and Health
<b>Learning Intention:</b> <ul style="list-style-type: none"> <li>- To gain an understanding of Media, Mass Media and Digital Citizenship</li> </ul>	<b>Success Criteria:</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Students are able to identify safe online practices.</li> <li><input type="checkbox"/> Students describe and can identify the difference between media, mass media and digital citizenship</li> </ul>	

Learning Tasks Summary		
WHAT YOU NEED TO DO:	Recommended Time:	Completed By:
<p><b><u>THEORY - ACCESS IN CLASSWORK SECTION OF GOOGLE CLASSROOM</u></b></p> <ol style="list-style-type: none"> <li>1. Complete the literacy activity – read over and write answers on Google Doc</li> <li>2. Read through the information on the attached PowerPoint and Google Doc.</li> <li>3. Complete the appropriate activities on the Google Doc by answering all questions.</li> <li>4. Turn in your Google Doc once completed - via the 'turn in' process by Friday 23rd of July 2:30pm</li> </ol>	<p>5-10 mins</p> <p>45-50 mins</p>	<p><b>Friday 2:30pm 23rd of July</b></p>

Classwork to be completed and submitted

## Influences on a healthy body image for young people

### Factorial explanations

Factorial explanations explain the causes or reasons for a phenomenon. This factorial explanation explains influences on a healthy body image for young people. The phenomenon (thing being explained) is a healthy body image.



### Influences on a healthy body image

**General statement**  
Identify phenomenon to be explained

A healthy body image means being comfortable with how you look and feeling good about yourself. **Influences** on healthy body image include positive role models, respecting your body, questioning media messages and using positive self talk.

Topic sentences preview each paragraph (underlined).

**Factors**  
Factor 1:  
positive role models

Positive role models can contribute to a healthy body image. Positive role models might include real people of all shapes and sizes, relatives and friends, who are happy with how they look. Real life role models are important **because** they can show us that everybody is different. **For this reason**, we can celebrate diversity and individuality.

Each factor has its own paragraph.

Factor 2:  
respecting what your body can do

Another influence on positive body image involves respecting what your body can do. Each body is amazing and can move, jump, run and dance, as well as keep us healthy. Respecting our body can **lead to** positive feelings about our body's abilities.

Cause and effect language is in **bold**.

Factor 3:  
question media messages

Questioning messages in the media enables a more realistic view of body image. Since photos of celebrities are often photo-shopped, their images are not realistic. Often, celebrities spend many hours preparing to be photographed, **so** this is also unrealistic. **Therefore**, it is important to be suspicious of all media photographs and to avoid unrealistic images.

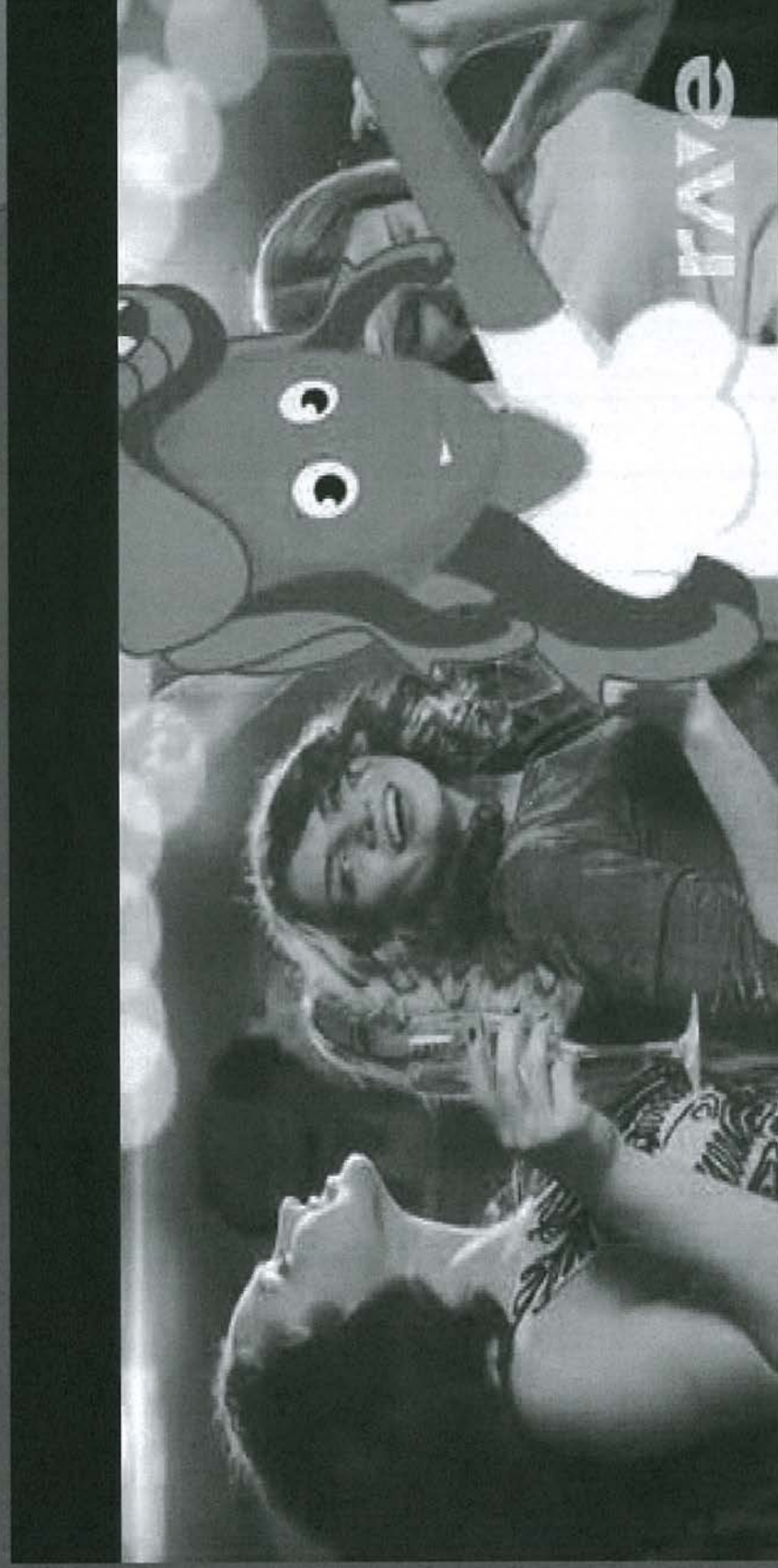




# Media, Marketing and Health

LESSON 1





<https://www.youtube.com/watch?v=7Nkl8hsndCA>

# What is our unit about?

# Definitions

## ➤ Media

- Includes; television shows and advertisements, radio, magazines, newspapers, billboards and social media (Facebook, Instagram, Twitter, YouTube and Messenger).

## ➤ Marketing:

- The marketing of products or services and how a business or other promotes its best features.

## ➤ Digital Marketing:

- The marketing of products or services using digital technologies.



# Media-Marketing

## Think/Pair/Share: 10-15mins

- Individually students respond to the following questions:
  - 1. What is media vs. mass media?
  - 2. What is the purpose of media?
  - 3. What is media literacy?
- Students find a partner and discuss their responses to the questions.
- As a class, discuss the various responses to each question.

## Media Literacy - Activity 2: 5mins

- ➔ In pairs, brainstorm 'how media literacy skills influence our decisions'.
- ➔ Share responses with the class.



# Media Literacy - Activity 2

- Responses could include:
  - 1. Media literacy emphasises critical thinking.
  - 2. Being media-literate is part of being an educated citizen.
  - 3. Media literacy promotes active participation in a media saturated environment.
  - 4. Media literacy helps us to understand key messages and their intentions.

# Digital Citizenship - What is it?

An acceptance and upholding of the norms of appropriate, responsible behaviour with regard to the use of digital technologies. This involves using digital technologies effectively and not misusing them to disadvantage others.

WATCH THIS  
VIDEO!

[https://www.youtube.com/watch?v=tok\\_BAYnjo](https://www.youtube.com/watch?v=tok_BAYnjo)  
U



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# Digital Citizenship

## Digital Citizenship Activity 2 – Digital Citizenship Test

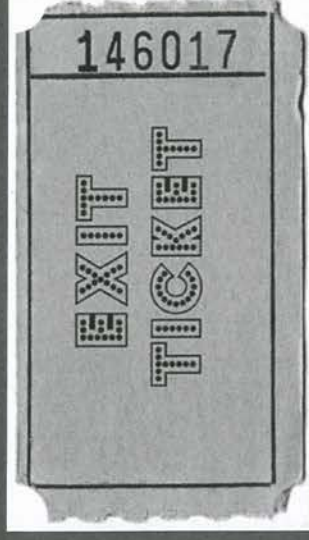
Open up the Digital  
Citizenship Activity  
Document.

Read over and put your  
answers in the google doc.

### WORKSHEET 2: DIGITAL CITIZENSHIP TEST

1. I should stop and think about everything I share using social networking sites:
- Not at all – they are free, easy to use, and everyone is using them.
  - Sometimes, when features or privacy settings change.
  - Always, because they use my data to make money and the information I post is never private.
  - Always, the internet is a dangerous place filled with terrible things waiting to hurt me.
2. Sometimes I share passwords with my friends, or post things pretending to be them as a joke:
- This is fine – my friends and I never fight. I trust them with everything.
  - A joke is a joke, and it's obvious if I pretend to be someone else for fun.
  - Never! It's identity theft and can cause unforeseen problems for both of us.
  - Always. I go online for fun, and so do they.
3. When writing my own blog or commenting on someone else's, I can share my deepest secrets:
- Yes, a blog is like a diary, and it's anonymous and safe.
  - No way, the blog is open to anyone online. I should treat it like any public place.
  - Yes, because who cares about my personal stuff? Only my friends read my blog.
  - Yes, no one will ever guess my true identity – I'm smarter than Batman.
4. When using phones or online technology in school, it is important to know:
- The agreed rules for using that technology in school.
  - How to work well with others and get the most out of using the technology.
  - How to choose appropriate language so I don't upset anyone or get into trouble.
  - All of the above.
5. If I'm allowed to download or buy things online such as apps, I should:
- Forget it – all sites are dangerous and can destroy my computer and send me to jail.
  - Ask my friends about the safest way and place to buy things.
  - Find the first site with what I want and buy it – life's too short for caution.
  - Always check to see if the site is legitimate and secure when buying something.
6. When I'm commenting or writing online in class or at home, I should:

## Exit Ticket:



Comment in one word or sentence a summary of the lesson on the week 2 Classroom Thread.





### **Literacy Activities**

Summarise this explanation above by writing one factor in each of the boxes below.

**Causes:**

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**Factors:**

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**Influences:**

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Write a short paragraph about another influences on healthy body image: positive self-talk

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### **Week 2 Theory - Media, Marketing & Health**

Follow the link - <https://www.youtube.com/watch?v=eAfyFTzZDMM> - this is our theme song for the term.

**Slide 1:**

Please complete a title page either in your book, or create an online version through programs such as PowerPoint, Canva, Word etc.

**Slide 2:**

From the video on the slide, write down three (3) points regarding what you think the unit will be about.

1.
2.
3.

**Slide 3:**

What is the definition of media?

What is the definition of marketing?

What is the definition of digital marketing?

**Slide 4:**

Research and write down the difference between media and mass media.

What do you think is the purpose of the media?

Research and write down what media literacy is.

**Slide 5 & 6:**

Read over the slides.

**Slide 7:**

Watch the video and answer the following questions:

Identify three (3) ways you can be a responsible digital citizen.

Why is it important to be a responsible digital citizen?

**Slide 8:**

Read over the slide & open up the Digital Citizenship Activity. Put your answers below:

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

**Slide 9:**

Read over the slide - complete the activity.

## **DIGITAL CITIZENSHIP TEST**

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  - b. Ask my friends about the safest way and place to buy things.



- c. Find the first site with what I want and buy it – life's too short for caution.
- d. Always check to see if the site is legitimate and secure when buying something.

6. When I'm commenting or writing online in class or at home, I should:

- a. Say whatever I want, free speech is very important.
- b. Ask a teacher or parent about some of their expectations for my behaviour online.
- c. Use a fake name if I want to say anything hurtful or negative.
- d. Do whatever everyone else is doing – if it's fine for everyone, it's fine for me.

7. How long I spend online:

- a. Is something to be aware of in case my physical and personal life starts to suffer.
- b. Can affect how I sleep.
- c. Can help me learn about the world and assist me with homework and assignments.
- d. All of the above.

8. Giving private information to strangers or companies online is:

- a. No problem if they are legitimate companies.
- b. Nothing to worry about if I know they don't live near me.
- c. Never OK, no matter what the circumstances are.
- d. Always OK; I'm not in Witness Protection, I have nothing to hide.

9. If I can tell someone is being bullied online:

- a. I should just stay away from it – I don't want to be the next target.
- b. Ignore it if I don't like who's being bullied anyway.
- c. Think about what it would feel like if it was happening to my best friend or me and step in calmly.
- d. Why does it matter? A bit of bullying toughens you up.

10. I protect my passwords:

- a. Passwords? I only have one and use it for everything.
- b. Not really, some of my friends know them.
- c. By storing them in a file called 'password'.
- d. By changing them often, never sharing them, and doing my best to hide the ones I have to store.

## Home Based Learning – Week 2

Year 9: Personal Development, Health and Physical Education		
Term 3:	Week: 2	Lesson Focus: Soccer
<b>Learning Intention:</b> <ul style="list-style-type: none"> <li>To evaluate movement strategies that lead to successful outcomes in football games</li> </ul>	<b>Success Criteria:</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> I can identify the steps required to make a successful pass in soccer.</li> <li><input type="checkbox"/> I can describe strategic formations soccer teams on the field</li> </ul>	

Learning Tasks Summary		
WHAT YOU NEED TO DO:	Recommended Time:	Completed By:
<p><b><u>Week 2 - Practical Soccer Activities</u></b></p> <ol style="list-style-type: none"> <li>1. Read through the rules of Soccer.</li> <li>2. Create a modified version from home THAT IS SAFE.</li> <li>3. Write the modified version on the Google Doc.</li> <li>4. Complete all activities on the Google Doc.</li> <li>5. Upload a video of your modified Soccer game.</li> <li>6. Turn it in by Friday 2:30pm.</li> </ol>	<p>5 mins</p> <p>15 mins</p> <p>40 mins</p>	<p><b>Friday 2:30pm 23rd of July</b></p>

### Classwork to be completed and submitted

#### **Week 2 - Practical Soccer (modified) Activity**

#### **PLEASE ENSURE YOU ARE DOING THESE ACTIVITIES SAFELY.**

Activity = Research the unmodified version of this sport and then; Change the rules, equipment, settings, aim (modify) so that the sport can be played in isolation with the resources you have at home.

Eg. Volleyball- equipment (use balloons, or socks for the ball and furniture to create a net), change aim (to keep up off the ground, one hit each side), setting (inside or outside), rules (if you have a partner you are working together, game is timed (5 mins) etc.).

**Expectations:**

1. **Type up the equipment required for the sport**
2. **Type up the new aim of the sport.**
3. **Type up new rules for sport**
4. **What is the new setting? (Is it played inside or outside? Or both, on the stairs? Under the dining table etc)**
5. **Complete by Friday 2.30pm**
6. **Send through video recording or photos of you playing the modified sport with new rules**
7. **Complete the physical activity task assigned for the week and submit video**

PRIOR SKILL ACTIVITIES

1. If you have a soccer ball then you can use this, if not, get creative; use a different ball, some socks or a few pieces of paper scrunched up.

Research the steps required to complete an effective pass in soccer:

E.g.

Step 1: Place the foot you do not kick with next to the ball.

Step 2: Ensure your foot is facing the target.

Now complete the next few steps all the way up to the follow through after kicking the ball.

Step 3:

Step 4:

Step 5:

Step 6:

Step 7:

Step 8:

Step 9:

Step 10:

2. **Passing:** Pass the ball to someone else at home, the dog or even up against the wall. Try to use the inside of your foot when making the pass - complete 10 on both feet.
3. **Keep ups/juggling:** Try to keep the ball up for as many touches as possible. Keep count and try to keep beating your score - let me know the most you get without dropping the ball (you can use any part of your body to keep the ball up other than your hands and arms).

### Strategy - attacking and defending

Research 3 different formations that soccer teams play:

E.g. 4-4-2

- 1.
- 2.
- 3.

**COMPLETE THE MODIFIED GAME AND RULES BELOW - BE SURE TO UPLOAD A PHOTO OR VIDEO WHEN YOU TURN IN YOUR WORK.**

SOCCER	
Equipment	
Aim	
Rules	
Setting	

### APP DOWNLOAD FOR YOUR PHONE

Recommended app to download to keep physically active: **ZOMBIE RUN** Download it and let me know what you think of it in the comments.



