5

How does gambling on the races work?

GambleAware

NSW GOVERNMENT

Activity introduction

Quick summary

'Punting' on races is an enjoyable pastime for many Australians. There are a variety of bets that can be placed on the results of a race, and the ability to study the form guide gives punters the impression that they can know a lot about racing to better inform their betting.

Of course, bookmakers have a system for making a profit no matter the results of a race. The calculation of payouts only after they have taken out 20% of the bets means the system rarely favours punters. Bookmakers also count on punters reinvesting their winnings to ultimately lose more on average over time.

This lesson simulates the operation of a bookmaker to illustrate to students how easy it is to get swept up in the excitement of a race, and to show how the bookmakers are always coming out having made a profit.

Learning intentions

Students will:

- understand the way payouts are determined for betting on racing

- understand that bets at longer odds have less chance of winning but higher returns if they do

- understand that the 20% that goes into Tax and profit accumulates much faster than any single person's winnings

- understand that the gambling operator takes a set percentage and always wins.

21st-century skills

Community engagement

Critical thinking

Empathy

Ethical behaviour

Personal and social skills

Problem solving

Syllabus outcomes

Mathematics Standard (Year 11)

- **MS11-5** models relevant financial situations using appropriate tools

- **MS11-7** develops and carries out simple statistical processes to answer questions posed.

Stage 6 Mathematics Syllabus Statements

Students develop awareness of the applicability of algebra in their approach to everyday life. Students analyse different financial situations, to calculate the best options for given circumstances, and solve financial problems. They develop the ability to make informed financial decisions, to be aware of the consequences of such decisions, and to manage personal financial resources effectively. Students develop an ability to justify various types of financial decisions which will affect their life now and into the future.

Knowledge of statistical analysis enables the careful interpretation of situations and raises awareness of contributing factors. Study of statistics is important in developing students' understanding of the contribution that statistical thinking makes to decision-making in society and in the professional and personal lives of individuals.

Topic
Probability

Unit of work
Mathematics Stage 6

Time required
60 minutes

Level of teacher scaffolding
Low – students may need support calculating the payouts of races. The teacher will be required to run the simulation.

Resources required

- Appendix A: Betting sheet

- Appendix B: Form guides

- Device capable of showing videos to the class

- Harness Race Footage

- Whiteboard

Keywords
Gambling, betting, sports, casino, money, gaming, probability.

Teacher worksheet

Teacher preparation

Gambling can be a high-risk activity and is a priority concern for young people. Therefore, before conducting the lesson on gambling, it is recommended that teachers and parents read the Facilitator pack. The pack provides teachers and parents with essential information about gambling harm amongst young people and clarifies the nature of gambling-related behaviours and how to approach sensitive topics.

Teacher content information

All of the following content refers to betting on horses, however, it applies equally to betting on greyhound racing. We just can't cover all types of this gambling in one lesson. Importantly, please stress the legal minimum betting age with students.

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Success criteria

Students can:

- calculate the payouts for bets placed upon races

- explain why the operator always makes a profit

- articulate the potential risks of gambling on racing.

Teaching sequence

10 minutes - Part A: Introduction to betting on racing

35 minutes - Part B: Simulation and calculation of payouts

10 minutes - Part C: Analysing the results

5 minutes - Part D: Reflection

Part A: Introduction to betting on racing

Work through this resource material in the following sequence:

Step 1

Discuss:

1. **What do you know about racing?**

2. **What do you know about gambling on racing?**

3. **What are some of the things that could influence a race?**
    Suggestions might include the state of the track (wet, dry), the form of individual horses, the barrier they draw to start from, the jockey, the weight.

4. **Do you think there is any skill involved in gambling on races?**
    Some students (and punters) might feel like the potential to study the form of the horses and the odds can give you some ability to influence your winnings.

5. **Do you think racing is a more or less risky than a casino game, for example?**
    You could discuss how the odds given by bookmakers are meant to reflect the likelihood of horses winning - but don't always match the outcome of races.

6. **Why do you think that betting on horse racing is so popular?**
    Suggestions might include the thrill of watching the race. Or the quick turnaround on the results.

Step 2

Explain to students that there are different bets that can be placed on horse or dog racing. The person placing the bets is referred to as the punter. In NSW bets can be placed with the TAB, individual bookmakers, or large bookmaker organisations.

Bets can be made on individual races with some of the possible bets being taken on:

- the winner
- a place (finish in the first three)
- first two in order
- first two in any order
- first three in order
- first three in any order.

They can also be made on multiple races, ie: your bet only wins if all of these things happen, spread over different races. Some of the possible bets being taken on:

- the winners of 2 designated races (often called the Daily double)
- the winners of 2 races in a row
- the winners of a designated 4 races (often called the Quadrella or Quaddie)
- the winners of multiple races, chosen by the punter.

Step 3

Explain that the TAB is run differently to bookmaker organisations. As it is quite simple, we will examine in some detail how it works.

For all bets, the payout (payout per $ bet) is calculated using the formula:

$$payout \;=\; \frac{total\ invested\ on\ this\ type\ of\ bet\ (less\ 20\%)}{the\ money\ bet\ on\ the\ winner}$$

The "less 20%" is important as this is the percentage legally taken out of the total pool by the TAB to cover their operating costs, profit and taxation. In other words, only 80% of the money invested is returned in prize money - the rest goes to the game operator.

Step 4

This example is for betting on the winner of the race, but equally applies to any other form of betting on the race.

Let's assume there is a six-horse race with a total of $45,000 bet on horses to win.

The bets are distributed as follows.

Number	Name	$'s bet on this horse
1	William's Pride	2,000
2	Jo's Coolest	5,000
3	The Greatone (pronounced "The Great one" - Great One)	21,000
4	Wasup	100
5	Ykickadaisy (pronounced "Why kick a daisy")	10,000
6	Good but not Great	6,900
	Total	45,000

Discuss:

- **Which horse is the favourite? (Favourite means the one most people think will win.)**
  The Greatone has $21,000 bet on it to win, meaning a lot of people have put money on it to win, because they think it is the best chance.

Step 5

As a class, calculate the payout per $1 bet if William's Pride was to win.

The payout is calculated applying the above formula using these figures.

The total invested is $45,000 less 20% = 45,000 x 80% = $36,000.
The money bet on the winner is $2,000.

$$payout = \frac{36,000}{2,000} = \$18$$

This means that for each $1 a punter bet on William's Pride to win, they would receive $18 in return.

Step 6

Independently, students calculate the payout for each of the other 5 horses (to the nearest cent).

Number	Name	$'s bet on this horse	Payout
1	William's Pride	2,000	$18
2	Jo's Coolest	5,000	$7.20
3	The Greatone (pronounced "The Great one" - Great One)	21,000	$1.71
4	Wasup	100	$360
5	Ykickadaisy (pronounced "Why kick a daisy")	10,000	$3.60
6	Good but not Great	6,900	$5.22
	Total	45,000	

Step 7

Discuss:

- **Which horse pays the most? Why?**
  Wasup pays $360 per $1 bet, because only $100 out of $45,000, or 0.2% of the bets made, were placed on Wasup. However, most punters would consider this horse no real chance of winning and it would be at odds of 359 to 1.

Part B: Simulating the TAB

Now we will simulate the TAB by using some harness racing replays and form guides to place our bets.

Note: Harness racing has been chosen because the fields are smaller and it is easier to track the progress of your chosen horse throughout the race.

Step 1

Understanding the Form Guide (see Appendix B).

Here we have Race 1 over 1720m.

Column	Meaning
A	This is the placing the horse has achieved in its 5 most recent starts. **s** means the horse was sent for a spell (rest) and didn't race for a while. **0** means 10th or worse **r** means the horse was retired and is now making a comeback so it has no recent form.
B	**Fr** means they are all starting on the front row. In some races the better horses have a handicap and start further behind the others.
C	This column indicates the rating of the horse over its entire career. The higher the number the better the rating. Each horse starts with 50 and every time it comes 1st, 2nd, or 3rd it gains points. The number of points depends upon the prize money available for the race. Every time the horse comes after 6th it loses points.
D	This is the payout offered by the TAB at the time of printing this guide. Note these figures will change according to future bets made.

The horse's name and the name of the driver are also supplied but not really of much interest to us for this mathematical exercise.

Step 2

Discuss:

- **Which horses seem more likely to win this race?**
  Consider recent form, although none of these horses have run any better than 3 in their last 5 starts, the payout column, and their rating.

Sample comments

I am going to bet on the favourite at $1.80 as it seems a better chance than the rest.

None of them have very good form.

I think horses on the front row have an advantage.

Step 3

Depending on time we will simulate betting on 3 races. (Note a total of 6 races are included in the resources so if you want to run this with another class you can use different races in case the students tell their friends who wins, or you can extend this class if they're enjoying the lesson).

Each student has an imaginary $10, can only place bets on who they think will win, and each bet must be a whole number of dollars.

Students **may bet on more than one horse in a single race** but they **must always have enough money left to place bets in subsequent races** if none of their bets are successful. i.e. if there are 2 races to go you must retain at least $2 so you can bet $1 in each of the following races.

Step 4

Independently, students select the horse/s they think will win, and how much they wish to bet.

Step 5

Before the race starts, collate each bet on a table of the board.

Step 6

To simulate the real situation and avoid a horse with no bets on it actually winning, the teacher must place $1 on each horse with no bets on it before the race starts. Keep a record of all teacher bets and the winnings of the TAB on the board where everyone can see them.

Note: in the real world every horse will have a bet placed on it because there is a large number of people betting.

For example: Sample bets for a class of 20 students (shown on the following page).

RACE 1				
Horse	Bets	Total	Teacher total bet/win	TAB winnings (20% of the total bet)
1	2, 2, 2, 2	$8		
2	2, 2, 1	$5		
3	1	$1	1	
4	2, 2	$4		
5	2, 1	$3		
6	2	$2		
7	2, 2, 2, 2, 2, 1, 1	$12		
8	1	$1	1	
9	2, 2, 1, 1	$6		
10	2, 2, 1, 1	$6		
Total		$50	$2	$10

Note: You do not need to keep track of the 20% bet on every horse. Calculate 20% of what is bet on the race in total.

It's important that you keep track of:

- this 20% across the course of all races that you simulate
- the total amount bet on each race
- the total amount the teacher (TAB) bets on each race.

Step 7

Run the replay of the race to find the winner.

Step 8

Once you know the winner, calculate the payout using the formula we have previously seen.

Step 9

All students subtract the dollars they have bet in the race from their current total.

Step 10

Any students who bet on the winner calculate their payout based on the amount they bet and the payouts amount and add this money to their total. Note students are responsible for recording their own personal bets, wins and losses, as the board is only used to record the whole class position. See Appendix A: Betting sheet to support students in recording their positions.

Step 11

Prepare to record the bets for the next race by clearing the bets from the table on the board.

After Race 1 students can place bets in the next race. They can bet as much as they like as long as they leave at least $1 per remaining race. This is in case they lose it all they still have money to bet in the following races.

Continue until all 3 races have been run and the winnings calculated.

Extension

If you have time to come back after completing the lesson you could look at another race or two or have a final race where students have to bet on the top 2 horses.

Part C:
Analysing the results

Step 1

Discuss:

- **Did anybody have a strategy they used to select their bets?**

Sample answers might include:

- Always back the favourite. The problem here is the payout is smaller. Imagine if everyone in the class bet on the favourite. The payout would be less than $1. (in the real world the minimum payout is $1, you must at least get your money back. This is easily covered by the bets on all the other horses.)

- Don't bet on the worst horse, they hardly ever win. Given the odds are sometimes over 100:1 these horses are only expected to win once every 100 starts so the small sample we have is not really representative.

Step 2

Discuss:

- **Who has the most money now? Has anybody got more than the $10 they started with?**

- **Has anybody got more money than this?**
  The TAB should definitely have more, unless something unusual has happened.

Step 3

To prove this, find the total amount students started with ($10 x number of students).

Total up all the money that the class has remaining after all races.

Express this total as a % of the money they started with.

Step 4

The % returned almost certainly will be less than the expected 80%. This is strange, because the TAB should only have taken 20% of the original amount, and paid out the remaining 80% to the winners, right? Even if some students lost, other students should have won big.

Discuss:

- **Why do we now have less than the 80% we expected to have returned?**

Suggested answers might include:

- the punters were unlucky
- the punters knew nothing about harness racing and so they lost more than expected
- the TAB is cheating.

None of these are correct.

The actual answer is: there is no such thing as luck, they may not know much about harness racing so the results are pure chance, and the TAB is heavily regulated and would be out of business if it was cheating.

The reason the loss is more than 20% is that students may have reinvested their winnings on future races. In the long run they lose 20% of their money each time they bet. If they start with $10 on average over the long term, they will end up with $8. If they reinvest the $8, they get back 80% of that, which is $6.40. Reinvesting the $6.40 returns $5.10 etc.

Step 5

The intent of the lesson is to show them how relentless the profit is for the TAB. This is the key to the lesson, so reinforce this point to students.

Part D: Reflection

Discuss:

- **How would you describe your feelings during this simulation?**
  Hopefully students were a bit excited watching their horses come in. What we are trying to show them is how addictive gambling can become because of the adrenaline the race creates.

- **Based upon these feelings, can you see how some people may become addicted?**
  Remind students that this was virtual money and you were only watching replays. Shouting encouragement and getting emotional cannot affect the result that happened several years ago. Imagine how much more involved would you feel if it was real money and a live race?

- **How would you describe your feelings when a 'sure thing', such as the favourite, didn't win?**
  Remind students that gambling is never guaranteed, and there are lots of things that can impact the outcome of a race, similar to sports.

- **What do you think is the biggest risk involved in this kind of gambling?**
  Gambling can be an enjoyable pastime when people are not risking more than they can afford to lose. However, as demonstrated, many punters don't know when to 'walk away' and can invest many of their profits back into the next bet, losing over time.

- **Does knowing these outcomes impact the way you might approach gambling in the future?**

Teacher reflection

Take this opportunity to reflect on your own teaching:

What did you learn about your teaching today?

What worked well?

What didn't work so well?

What would you share?

Where to next?

How are you going to get there?

Appendix A: Betting sheet

Race number	Opening balance	Horse	Amount gambled	Winnings	Closing balance

Appendix B: Form guides

1 1.45 TAB LONG MAY WE PLAY PACE EQ1
1720m. $5999. 4yo & up No NR RBD Mobile.

#	Form	Horse	Driver		NR	Odds
1	36548	KAMENDABLE FEELING	Nathan Turnbull	Fr	43	5.50
2	30470	MISS NEA STAR	Blake Micallef (C)	Fr	39	15.00
3	90479	GLOBAL GODDESS	John Abbott	Fr	45	201.00
4	799s6	THE ALFIE	Jody Bryant	Fr	46	51.00
5	98434	HES A TERROR	Tiffany Ingham (C)	Fr	38	67.00
6	35969	JUZ BUTTER	Tiarne Rusten (C)	Fr	47	101.00
Second Line						
7	r	JACKSON CHIMES	John O'Shea	Fr	50	★1.80
8	7948s	AMORA DANCER	James Sutton	Fr	41	101.00
9	0s943	THE DONNY	Nathan Hurst	Fr	39	5.00
10	8	JAYJAYBENNY	Garry Edwards	Fr	49	7.00

JACKSON CHIMES 1, The Donny 2, Kamendable Feeling 3, Jayjaybenny 4

2 2.24 DUBBO TENPIN BOWL PACE EQ2
1720m. $5999. NR up to 47 PBD/L5$ Mobile.

#	Form	Horse	Driver		NR	Odds
1	s090s	YOU LOOK WELL	Laura Rusten (C)	Fr	35	101.00
2	s9880	MORE THAN A WOMAN	Terence Robb	Fr	47	101.00
3	75080	BRADNESS ABUELA	Brad Peisley	Fr	31	67.00
4	44695	DIGGER SHED	Nathan Turnbull	Fr	47	5.00
5	63849	SPORTY	John O'Shea	Fr	42	5.00
6	25776	PREACHER QUINCE	Stephen Dowton	Fr	47	17.00
Second Line						
7	78247	ROYAL FEELING	Nathan Hurst	Fr	38	9.00
8	78140	WARRA DOWNS	Isobel Ross	Fr	47	★3.00
9	91831	BABY BEE MINE	Blake Micallef (C)	Fr	45	3.75

WARRA DOWNS 1, Baby Bee Mine 2, Sporty 3, Digger Shed 4

3 3.06 STEVENSONS HYDRAULICS PACE EQ3 Q1
2120m. $5999. NR up to 53 PBD Mobile.

#	Form	Horse	Driver		NR	Odds
1	27492	SHANKS FOR COMING	Jemma Coney (C)	Fr	47	4.00
2	9s897	SHARP SHOOTER	Nathan Hurst	Fr	48	6.00
3	72390	NICKY BROOK	Isobel Ross	Fr	48	15.00
4	s5822	SPARKY SHARKY	Jack Pay (C)	Fr	49	21.00
5	98336	ROLL THE SEVEN	Martin Simmons	Fr	49	34.00
6	65s48	HOLY CAMP PAXTON	Robert Anderson	Fr	50	10.00
Second Line						
7	64778	FUTURE FUN	James Sutton	Fr	50	67.00
8	36753	TURBO TOMMY	Jake Davis	Fr	51	★3.00
9	79279	CARRAMAR TIMES UP	Nathan Turnbull	Fr	53	5.00

TURBO TOMMY 1, Shanks For Coming 2, Carramar Times Up 3, Sharp Shooter 4

Appendix B: Form guides

4 3.34 CRAMPTONS CARPETS EQ4 DD1 Q2
2120m. $5999. NR up to 53 PBD Mobile.

1	37218	JACOBS THUNDER	Jack Pay (C)	Fr	40	7.50
2	81009	JOGALONG BLUE	Greg Lew	Fr	48	101.00
3	98491	ALL SPRUCED UP	John O'Shea	Fr	52	4.50
4	12725	ITSALLABOUTNED	Isobel Ross	Fr	48	3.75
5	47601	HARLEY JAMES	Terence Robb	Fr	49	41.00
6	10486	BURRABADINE DANCER	Blake Micallef (C)	Fr	49	21.00

Second Line

7	16574	GABBYS IDEAL	Nathan Hurst	Fr	50	5.00
8	50s61	RAINBOW COMET	Jake Davis	Fr	50	★3.50
9	47312	WHY NOTT	James Sutton	Fr	51	34.00

RAINBOW COMET 1, Itsallaboutned 2, All Spruced Up 3, Gabbys Ideal 4

5 4.09 BLUES MEATS PACE Q3
2120m. $5999. NR up to 58 PBD Mobile.

1	87363	LOVIN EVERYDAY	James Sutton	Fr	50	13.00
2	35054	SHESA POCKETROCKET	Martin Simmons	Fr	51	41.00
3	94398	MISS PAU	Jack Pay (C,5)	Fr	57	9.00
4	45582	WARRADERRY	William Cassell (C,5)	Fr	55	9.00
5	29959	LUCKY LYLA	Blake Micallef (C,3)	Fr	59	17.00
6	15049	STUDLEIGH SONNY	Jake Davis	Fr	53	26.00

Second Line

7	s8241	BRYDON EARL NZ	Jemma Coney (C,5)	Fr	60	4.00
8	s5332	JUST WON MORE	Isobel Ross	Fr	56	★3.50
9	61r46	CAMANCHI WARRIOR	Nathan Turnbull	Fr	58	5.00
10	4578s	JILLIBY LOLLIE	John O'Shea	Fr	54	21.00

JUST WON MORE 1, Brydon Earl 2, Camanchi Warrior 3, Miss Pau 4

6 4.34 DUBBO RSL PACE DD2 Q4
1720m. $5999. NR up to 65 PBD/L5$ Mobile.

1	75745	HOLY CAMP DILLON	Robert Anderson	Fr	62	6.50
2	s8336	DOUBLE STANDARDS	Kasey Orr	Fr	56	67.00
3	26975	CARLAS ANGEL	Abbie Howell (C)	Fr	69	26.00
4	8s079	MAMMALS PRINCE	James Sutton	Fr	60	10.00
5	27445	IM SO BETTER	Jemma Coney (C,5)	Fr	72	41.00
6	45394	KARLOO BRADLEY NZ	Jack Pay (C,5)	Fr	58	5.00

Second Line

7	76165	BETTOR JIGGLE	Blake Micallef (C,3)	Fr	68	★2.75
8	16057	YES YOU MAY	Isobel Ross	Fr	61	3.25

BETTOR JIGGLE 1, Yes You May 2, Karloo Bradley 3, Holy Camp Dillon 4