

# 10

## Sports betting

February 2024

Copyright © 2022 Office of Responsible Gambling, Department of Enterprise, Investment and Trade, NSW Government.  
Free for use in Australian schools.

# Activity introduction

## Quick summary

Sports betting has exploded in popularity in Australia only recently, with sports betting companies able to offer over 100 unique options on a single NRL match in order to entice people to gamble.

In this engaging, hands-on lesson, students will take ownership of a gambling organisation. They will look at long term statistics of various sporting matches to set the initial odds and then monitor live betting to adjust the odds they are offering gamblers, in order to demonstrate how sports betting organisations guarantee they always make a profit. Finally, they will consider ways to make their gambling organisation more appealing to gamblers by critically analysing the marketing ploys of real sports betting organisations.

## Activity introduction

### Learning intentions

Students will:

- understand how a sports betting organisation sets the odds to always make a profit
- understand how to use statistics to set the initial odds.

### 21st-century skills

Community engagement

Creative thinking

Critical thinking

Entrepreneurship

Ethical behaviour

Global citizenship

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.

#### Mathematics Life Skills (Years 11 and 12)

- **MLS-S2** probability.

### 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.

Students develop an understanding of the language and elements of chance and probability and apply this in real situations.

#### Topic

Probability

#### Unit of work

Mathematics Stage 6

#### Time required

55 minutes

#### Level of teacher scaffolding

Low – explicit teaching of students for the initial calculations, support them in their independent calculations.

#### Resources required

- Appendix A: Student worksheet
- 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.

## Learning intentions

Students will:

- understand how a sports betting organisation sets the odds to always make a profit
- understand how to use statistics to set the initial odds.

## Success criteria

Students can:

- use statistics to set the odds
- critically evaluate how a sports betting organisation makes itself different from other organisations that have access to the same data on gamblers.

## Teaching sequence

5 minutes - Part A: Introduction to sports betting

35 minutes - Part B: Running a betting organisation

10 minutes - Part C: What else could you do with the money?

5 minutes - Part D: Reflection

# Part A:

# Introduction to sports betting

Work through this resource material in the following sequence:

## Step 1

Discuss:

- What is sports betting?
- What sports can you bet on?
- What type of bets can you make?
- Where have you seen sports betting advertised?
- Do you think skill has a role to play in betting on sports? Or is it mostly luck based?

## Step 2

Briefly explain to students that sports betting has exploded in Australia with easy access to online wagering through smartphones and large amounts of advertising and promotion. Every popular domestic and international sport can be bet on.

Bets can be placed on obvious things like the winner, the winning margin, total score, first try scorer, and half-time margin. On one website alone there are over 100 different options for betting on a single NRL match.

For cricket you can bet on win, lose or draw and then exotics like top scorer, most wickets, run rate, number of no-balls and runs in the first over. Once again there is a vast number of options for these more exotic bets.

Discuss:

- **Why do you think the betting agency offers so many different types of bets, such as first try scorer, first try scorer for either team, first team to 10 points, half-time leader, last try scorer, and many others?**

To stimulate interest and to be able to offer a variety of odds for the punters - most of which will represent great profit for the betting agency. For example, the odds for first try might vary from \$4.80 for someone who is likely to score up to \$26 for someone who rarely scores. Picking the first try scorer is much harder than picking the winner so the odds are much better.

# Part B:

# Running a betting organisation

## Step 1

For this activity, students will be responsible for setting the odds and making a profit for gambling company “GYMU”. The letters stand for “Give Your Money to Us” but, whilst a truthful mission statement for the company, only the initials are used in branding for obvious reasons.

## Step 2

How should odds be calculated? Students may be able to offer some suggestions before you provide some insight.

In the real world, a number of factors are taken into account. Luckily for us, all the bets use the same method to calculate the odds.

- **Previous statistics are used to set the initial odds.**

Typically for NRL matches not only is the recent history between the 2 teams used but also things like where the game is to be played, which players are available and the recent form of the team.

- **The live betting is monitored, and the odds changed to reflect the amount of money bet on each option.**

If bets are mostly being placed on Team A or a large bet is made on Team A to win, the odds for team A will be reduced and the odds for Team B increased. This has the effect of making it less attractive to bet on Team A, reduces any future payout on Team A if they happen to win, and encourages people to bet on Team B so there is money available to pay if Team A wins.

- **Winners are paid out according to the odds when they placed their bet.**

This is different to the TAB where the punters return for a win is calculated after the event when all bets have been totalled.

## Step 3

For a game that is considered about even odds of \$1.93 are offered for both teams.

- **Why \$1.93? If it is about even shouldn't the payout be \$2?**

Well, the betting organisation must always make a profit, so they don't want to payout the full amount.

## Step 4

An upcoming tennis match is to be played in Sydney between Mick Curious and Dodger Federale.

The statistics for each player are shown in the table on the following page.

## Part B: Running a betting organisation

Player:	Mick C.	Dodger F.
Head-to-head	1 win 4 losses	4 wins 1 loss
Age	26	38
Win/loss in the last 12 months	21/16	21/4
Player ranking	48	12
Nationality	Australian	Swedish

Ask students to set some initial odds for the outcomes of this match. There is no correct answer but students should be prepared to justify the answer you give.

**Answer:** Dodger has the better record head-to-head (against each other), has lost less matches in the past 12 months and has a higher ranking, so deserves to be the favourite. There are only 2 possible outcomes for the match so the odds for the favourite must be less than \$2.

An answer of \$1.50 for Dodger and \$3 for Mick could easily be justified.

Some students may comment on Dodger's age and nationality which are also possible factors in the result. Mick is younger and in front of his own crowd which may spur him on.

### Step 5

On the first day of accepting bets, \$1,000 was bet on each of the 2 players. What will students do to the odds they initially offered?

**Answer:** If the odds were even then this would be expected.

But in this scenario Dodger is the clear favourite, and there has been more money bet on Mick than would be expected by the initial statistics.

Discuss the reasons for this. Suggestions might include:

- Mick is an Australian and Australians like Australians to win.
- There could be a slight injury to Dodger.

Whatever the reason, GYMU needs to reduce the price of Mick and increase the price of Dodger, or else risk paying out too much on Mick if he wins. Students need to encourage more money to be bet on Dodger, in order to cover any possible payout on Mick, and because the payout on Dodger will be less anyway.

### Step 6

Distribute Appendix A: Student worksheet.

### Step 7

Work through the following examples with students to determine whether the following odds should be changed.

#### Question 1. Should the odds be changed for this game?

Team	Odds	Amount bet
Seahorses	\$2.80	\$8,000
Mermaids	\$1.20	\$22,000

First, calculate the total pool:

$$22,000 + 8,000 = \$30,000$$

Let's say GYMU wants to guarantee a profit of 20%, to also cover expenses and tax.

$$\frac{20}{100} \times 30,000 = \$6,000$$

This amount can be set aside for GYMU.

Finally, we need to calculate how much money can be paid out.

$$\frac{80}{100} \times 30,000 = \$24,000$$

GYMU has \$24,000 to pay winning bettors their prize money (returns).

### Step 8

Let's check what would be the payout at the current odds?

If the Seahorses win:

$$8,000 \times 2.80 = \$22,400$$

If the Mermaids win:

$$22,000 \times 1.20 = \$26,400$$

## Part B: Running a betting organisation

So if the Seahorses win, GYMU is okay (just).

But if the Mermaids win, they haven't made enough from the bets to pay back the winners. Not without eating into GYMU's profits.

So, the odds need to be adjusted.

### Step 9

To do this, use the total amount GYMU has set aside for payouts with the total amount bet by punters on the Seahorses.

$$\frac{24,000}{8,000} = \$3.00$$

If the Mermaids win:

$$\frac{24,000}{22,000} = \$1.09$$

You can check these values in reverse:

$$1.09 \times 22,000 = \$23,980 \text{ (close enough)}$$

$$3 \times 8,000 = \$24,000$$

No matter which team wins, GYMU will be able to pay out every bet that was placed on them **at the new odds** and still keep a 20% profit.

It doesn't matter which team wins as in the system we've created GYMU makes 20% either way.

### Step 10

An example for the explanation section on Appendix A would be:

*"The odds should be adjust because at the original odds GYMU would be losing \$2,400 if the Mermaids win. With the adjusted odds, GYMU can cover the payouts no matter who wins."*

### Step 11

Students work through the remaining questions on Appendix A: Student worksheet. They can use the tables included there to scaffold their calculations and work through the steps demonstrated above.

# Part C:

## What else could you do with the money?

### Step 1

Explain to students that all betting agencies have access to the same data, so they need to differentiate their products by offering a different experience.

All the normal advertising gimmicks are applied here. Discuss some of these gimmicks that students may be aware of.

Students may have noticed the advertisements using famous sporting or entertainment identities to be brand ambassadors. These ads appear much more frequently during live sports broadcasts than in the general media. Some ads use humour to be remembered, whilst others are deliberately annoying so the name stays in your mind.

### Step 2

Many organisations offer free betting credit of up to \$100 when you first join. The \$100 incentive is given in betting credit, not cash.

Discuss:

- **Why do you think this is a smart way of doing this for the company?**

By offering credit the punter is forced to gamble with that money. In the long term with no reinvestment of any winnings they will only get 80% of their money back. If they reinvest the winnings regularly, the punter will end up with very little of the original \$100 and it has cost the company nothing.

### Step 3

Another way of differentiating your company is to offer incentives such as:

- if you bet a horse to win and it runs second, you get your money back in betting credit, or
- if your team is in front by 20 points at any stage, you get paid out as a winner, even if they go on to lose.

These incentives attract attention, but it is important to remember that the company already knows from long term statistics how often these outcomes will occur. They keep a small portion of money back from other bets to cover these possibilities. Also paying back the money as betting credit means they will end up getting it back in the end anyway.

### Step 4

In this activity, students will consider how to attract more gamblers to use GYMU for all their gambling needs. Students think of a way to differentiate GYMU from other companies and explain how they would pay for this.

## Part C: What else could you do with the money?

There are many possible answers. But, regardless of advertising gimmicks, in order to pay for the new incentive, the student needs to show how a reduction in other payouts is required to pay for it.

For example: with no incentives, a horse may pay \$2.40 if it wins. If there is an incentive of getting your money back if your horse comes 2nd or 3rd the payout for the winner may be reduced to \$2.20. This covers the increased amount of betting expected to occur and the potential payout if it does win.

# Part D:

## Reflection

Remind students that sports betting is organised to make the operator money, and that the average punter always loses over time.

Remember too that the odds are being adjusted in real time, by very complex computers. No matter the time a punter places a bet, the odds are always adjusted to ensure a profit for the betting operator.

Discuss:

- **Why is sports betting increasing in popularity with punters?**  
The thrill of watching the sporting event is increased for them when they have an investment in the game.
- **Why do sports betting agencies advertise during sports events?**  
This is their target audience. If you want to appeal to people to bet on NRL then advertising during an NRL game makes sense.
- **Do you think the sports betting agencies are being 'fair' in their payouts?**  
We have demonstrated how the odds are manipulated to ensure a profit for the company, which may leave some gamblers feeling like they're owed more than they're getting.
- **What would you do with an extra \$2000 per year if you didn't gamble?**  
Individual answers.

---

## 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: Student worksheet

Complete the following questions.

*To find the operator profit and amount available for payouts, multiply the total amount bet by 20% and 80% respectively.*

*To calculate the predicted payout, multiply the amount bet by the odds.*

*To calculate the adjusted odds, divide the amount available for payouts by the amount bet on each team.*

## Question 1

Team	Amount bet	Original odds	Predicted payout	Adjusted odds	Predicted payout
Seahorses	\$8,000	\$2.80			
Mermaids	\$22,000	\$1.20			
Total Bet (100% of amount bet):		Operator Profit (20%):		Amount available for payouts (80%):	

Explanation:

---



---

## Question 2

Team	Amount bet	Original odds	Predicted payout	Adjusted odds	Predicted payout
Stallions	\$250,000	\$1.40			
Monkeys	\$150,000	\$2.60			
Total Bet (100% of amount bet):		Operator Profit (20%):		Amount available for payouts (80%):	

## Appendix A: Student worksheet

### Question 2 (cont.)

Explanation:

---

---

### Question 3

Team	Amount bet	Original odds	Predicted payout	Adjusted odds	Predicted payout
Seals	\$40,000	\$1.40			
Whales	\$15,000	\$2.50			
Total Bet (100% of amount bet):		Operator Profit (20%):		Amount available for payouts (80%):	

Explanation:

---

---

### Question 4

Team	Amount bet	Original odds	Predicted payout	Adjusted odds	Predicted payout
Wizards	\$50,000	\$1.95			
Witches	\$65,000	\$1.85			
Total Bet (100% of amount bet):		Operator Profit (20%):		Amount available for payouts (80%):	

## Appendix A: Student worksheet

### Question 4 (cont.)

Explanation:

---

---

### Question 5

Team	Amount bet	Original odds	Predicted payout	Adjusted odds	Predicted payout
Seals	\$3,000	\$2.85			
Whales	\$70,000	\$2.30			
Total Bet (100% of amount bet):		Operator Profit (20%):		Amount available for payouts (80%):	

Explanation:

---

---