

bioCATS

A partnership program by:



Vertical Limit!

A maths investigation with Patrick Dangerfield.



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bioCATS

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The BioCATS program is all about **maths and science with a healthy edge!**

Each activity developed under the BioCATS brand provides a unique insight into the application of maths and science skills using real life scenarios from the Geelong Football Club.

Our educational experiences are themed with physical activity and the wonders of the human body to engage students in a unique learning environment and emphasise the importance of healthy body, healthy mind.

This partnership program was designed in 2012 by BioLAB: The Victorian BioScience Education Centre in partnership with the Geelong Football Club. It has been successfully delivered to over 10,000 Victorian primary school students from the Deakin Cats Community Centre at GMHBA stadium.

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Curriculum Links

Mathematics Level 5 & 6

- ✓ Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies.
- ✓ Describe and interpret different data sets in context.
- ✓ Interpret secondary data presented in digital media and elsewhere.

Science Level 5 & 6

- ✓ Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate.

Learning Intention and Success Criteria

Learning Intention

To be able to use your mathematics skills to collect, analyse and interpret primary and secondary data.

Success Criteria

- ✓ Collect and record primary data.
- ✓ Collect and record secondary data.
- ✓ Analyse and interpret data.
- ✓ Identify ways in which mathematics is used in AFL Football.
- ✓ Use tables to represent data.

Why do we test?

Each year players are drafted to play AFL or AFLW for the Geelong Football Club.

A Draft Combine is held at Marvel Stadium each year, where young players are put through a number of body measurements, fitness tests and interviews. Coaching and support staff choose the best players based on the results of these tests, interviews and discussions.

Players who perform well in the majority of these tests are often the players that the Cats show the most interest in drafting.

Types of Fitness Tests include; Beep Test, Standing Vertical Jump Test, Strength Test, Sprint Test and a number of skills tests.

Our investigation

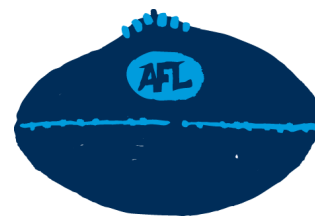
Today you are going to perform the **Standing Vertical Jump Test** which is a measurement of a person's lower body strength and explosive leg power. This test is completed by every new player looking to be drafted to the Geelong Football Club.

This test measures the height a player can jump in the air and the results help us to predict a player's ability to mark, tap, and defend the ball during a match.

After completing the test, you will analyse your results and compare your vertical jump height to your classmates and the Cats Players!

Equipment required

- Pen or pencil
- Tape measure or ruler
- BioCATS work booklet
- **BioCATS Vertical Limit Video with Pat Dangerfield**
- Chalk



Data entry

1) Record your **STANDING VERTICAL REACH** results in the table below;

STANDING VERTICAL REACH
_____ cm

2) Record your five **STANDING VERTICAL JUMP** trials in the table below;

	STANDING VERTICAL JUMP
Trial 1	_____ cm
Trial 2	_____ cm
Trial 3	_____ cm
Trial 4	_____ cm
Trial 5	_____ cm

3) For the next section you will need to work out the **difference** between your **STANDING VERTICAL REACH** and your **STANDING VERTICAL JUMP**. We call this difference your **VERTICAL JUMP HEIGHT**.

Data analysis

1) Enter your results in the table below;

TABLE A	Standing Vertical Reach <i>* these will all be the same</i>	Standing Vertical Jump	Vertical Jump Height
Trial 1	_____ cm	_____ cm	_____ cm
Trial 2	_____ cm	_____ cm	_____ cm
Trial 3	_____ cm	_____ cm	_____ cm
Trial 4	_____ cm	_____ cm	_____ cm
Trial 5	_____ cm	_____ cm	_____ cm

1a) Explain why we complete five trials of the vertical jump test rather than just one?

2) Record your mean (average) results in the table below;

TABLE B	Standing Vertical Reach	Standing Vertical Jump	Vertical Jump Height
Mean results	_____ cm	_____ cm	_____ cm

Hint: To work out your mean results you will need to add up each column in Table A (above) and then divide the answer by five.

Data analysis

3) Record your minimum, mean and maximum VERTICAL JUMP HEIGHT in the table below;

Minimum Vertical Jump Height	_____cm
Mean Vertical Jump Height	_____cm
Maximum Vertical Jump Height	_____cm

4) Identify and explain one reason why the MINIMUM, MEAN and MAXIMUM result is useful to analyse;

MINIMUM	
MEAN	
MAXIMUM	

5) Explain which data set (minimum, mean or maximum) you would recommend sport scientists and coaches analyse when choosing players to draft to the Cats.



Athlete Performance Report

The role of a sport scientist at the Geelong Football Club is to report all player data back to the players and coaches.

Compare your results to the CATS players Use your maths skills to fill in the blank cells.

	Standing Vertical Reach	Standing Vertical Jump	Vertical Jump Height
My Results			
Pat Dangerfield	240 cm	290 cm	50 cm
Tom Hawkins	255 cm	300 cm	
Harry Taylor		298 cm	51 cm
Luke Dahlhaus	221 cm	270 cm	

Order the player **VERTICAL JUMP HEIGHT** from highest to lowest in the table below.

HINT: Include your own results in this table.

	1st	2nd	3rd	4th	5th
Player					
Vertical Jump Height					

Identify and explain one strategy coaches might implement that could improve your **VERTICAL JUMP HEIGHT** _____
