

Investigating the maths inside:

Prawns for profit

Activity 1

The perfect prawn? 

The perfect prawn for what?

# Introduction

Think about how the perfect prawn is described in the video.

You and a small group of friends own and run a seafood restaurant and your prawn supplier has just closed down. There are two local prawn farms which could supply the restaurant but they produce different sized prawns and sell them for different prices.

In your restaurant, most of the recipes call for larger prawns that are about the same size, although occasionally a recipe will need smaller prawns.

Which supplier should you choose? Make a detailed recommendation.

# Distributions

Data can be organised in different ways.

In class, line up in order of height from tallest to shortest.

How would you describe the heights of students in your class?

Now re-organise the line so the tallest person is in the middle, the second tallest is on the right of the tallest, the third tallest is on the left, the fourth tallest is on the right, the fifth tallest is on the left and so on until the line is completely re-arranged.

How would you now describe the heights of the students in your class?

## How big?

Prawns are classified into different size groups depending on the number of prawns per kilogram. An individual prawn’s size is measured in grams, based on its mass.

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| --- | --- |
| Size | Number of prawns |
| U/6 | 12 prawns per kilogram (Enormous. Also can be called Leader Prawns) |
| U/8 | 16 prawns per kilogram (Huge) |
| U/10 | 20 prawns per kilogram (XX-Large) |
| U/15 | 30 prawns per kilogram (X-Large) |
| 9/12 | 20 prawns per kilogram (X-Large) |
| 10/20 | 30 prawns per kilogram (Large) |
| 21/30 | 50 prawns per kilogram (Medium) |
| 30+ | 70 prawns per kilogram (Small) |
| S&B | Soft and Broken and come ungraded for size |

What is the connection between the term used for the size of the prawns and the number of prawns per kilogram? Discuss any connection you think exists. A search of the internet for a ’prawn size chart’ might help with your discussion.

At this stage you may have an idea of the size of the prawns that would be most suitable for your restaurant.

# The two prawn farms

The majority of prawn farms, including the Gold Coast Tiger Prawn farm in the video, harvest only one crop of prawns a year. They harvest the prawns when they reach a certain size and leave the smaller prawns to grow. This is called ‘continuous harvesting’ and is carried on until all of the prawns have been harvested. The ponds are then drained and cleaned.

Some prawn farms, north of Townsville in Queensland, produce two harvests of prawns. These farms harvest the entire crop of prawns each time they harvest so they can drain and clean the ponds ready for the next harvest.

Farm 1 harvests one crop per year and charges a wholesale price of $19 a kilogram delivered to the restaurant.

Farm 2 harvests two crops per year and charges a wholesale price of $16.50 per kilogram delivered.

You will be given some data on the sizes of prawns from each of the two farms.

Into which size category would the prawns from Farm 1 fit? (They may fit into more than one category).

Into which size category would the prawns from Farm 2 fit? (Again, there may be more than one category).

## Making a decision

Look at the two sets of data. What do you notice?

Enter each set of data into your graphics calculator or use the supplied spreadsheet. What statistical information will help you to make a decision?

Use relevant information to make a recommendation on which prawn farm should be your new supplier. Justify your choice.

# What about this company?

One of your partners comes back from holidays raving about the prawns from a farm he visited. He was given the following data to persuade you and the other partners to use this supplier. The wholesale price is only $15 a kilogram delivered to the restaurant.

You will be given some data on the sizes of prawns from Farm 3.

Enter the set of data into your graphics calculator or use the supplied spreadsheet. What statistical information will help you to make a decision?

Investigate this third supplier.

Does this new information change your decision? Explain.

## Further discussion

Why would different prawn farms choose to harvest either one or two crops of prawns each year? As well as considering the types of decisions you have made, you could also think about differences in climate and the time period for which fresh prawns would be available.

## Extension

In the video the perfect prawn is described as one that fits into the 80th percentile for weight. This may be different from the perfect prawn that you have chosen for your restaurant.

Estimate the value of the 80th percentile first, then find it exactly.

Would you expect a normal distribution of the weights of prawns for each of the farms? Explain your thinking.

Draw a normal curve for each set of data using the same scale.

(This is straightforward on a graphics calculator but you may need to do a search of the internet to help if you are using a spreadsheet.)