

Exemplar for Unit Standard Numeracy Level 1

This exemplar supports assessment against:

Unit Standard 26626

Interpret statistical information for a purpose

An annotated exemplar is an extract of student evidence, with a commentary, to explain requirements of the standard. It assists assessors to make assessment judgements against those requirements.

New Zealand Qualifications Authority

To support internal assessment

Exemplar	Chicken Feed – trend, range
1.	<p>This sample of learner work has been taken from a portfolio of evidence generated over an acceptable period of time (Guidance Information [GI] 3). The evidence presented is naturally occurring from the assessment for Standard 90918 in a Level 1 Agriculture Course (GI2). It reflects the level of demand described by step 5 of the <i>Reason Statistically</i> strand of the Learning Progressions for Adult Numeracy (GI3).</p> <p>The learner has been provided with a real and applied purpose [1] (GI 5). The interpretation of two appropriate data features (Performance Criteria [PC] 1.3) to draw a reasonable conclusion [2] (PC1.1 and PC1.2) and meet the purpose contributes to Outcome 1.</p> <p>There is acceptable evidence for range and trend in this learner work. The range for each of the data sets has been used to determine the weight gains for each trial group. The learner has correctly observed that the largest range represents the best weight gain, and has used this to justify the conclusion [3]. The description of a trend - 'The Trial 2 group gained weight steadily from day 2' [4] - is directly relevant to the purpose, and the conclusion reached provides acceptable evidence for trend.</p>

THE CHICKEN DILEMMA

Callum wanted to buy and raise day old chicks to use in his free range egg farm. He had various types of chicken feed left over from previous flocks of chickens he had raised and only wanted to use the feed that would be most suitable for his day old chicks, to ensure they developed early and put on weight quickly.

To help him with this dilemma, the class decided to purchase 18 day old, female, brown shaver chicks (laying chickens) and use the following commercial chicken foods Callum had at home to see if they could help him make a decision about what food would be best for him to use with his new batch of chicks.

The commercial feeds used were:

- Weston's Chick Choice *Trial 1*
- Reliance Starter Chick Mash *Trial 2*
- MainFeeds Barnyard Layer Pellets *Trial 3*

The Weston's Chick Choice and Reliance Starter Chick mash claim to provide the best start for baby chicks, however MainFeeds Barnyard Layer Pellets are 'the complete food for laying hens'.

The following equipment was also available:

- Purpose built wooden chick box
- Brinsea heating pads
- Chick feeders
- 1 litre capacity water drinkers
- Electronic balance
- Newspaper
- Chicken wire

YOUR TASK

Design and carry out a comprehensive practical investigation that will provide evidence to help Callum identify the best commercial feed choice for his day old chicks.

COLLECTING AND PROCESSING

Record and process your data so that a trend is able to be seen.

This could be in the form of a table and/or graph. (Remember to keep any raw data collected)

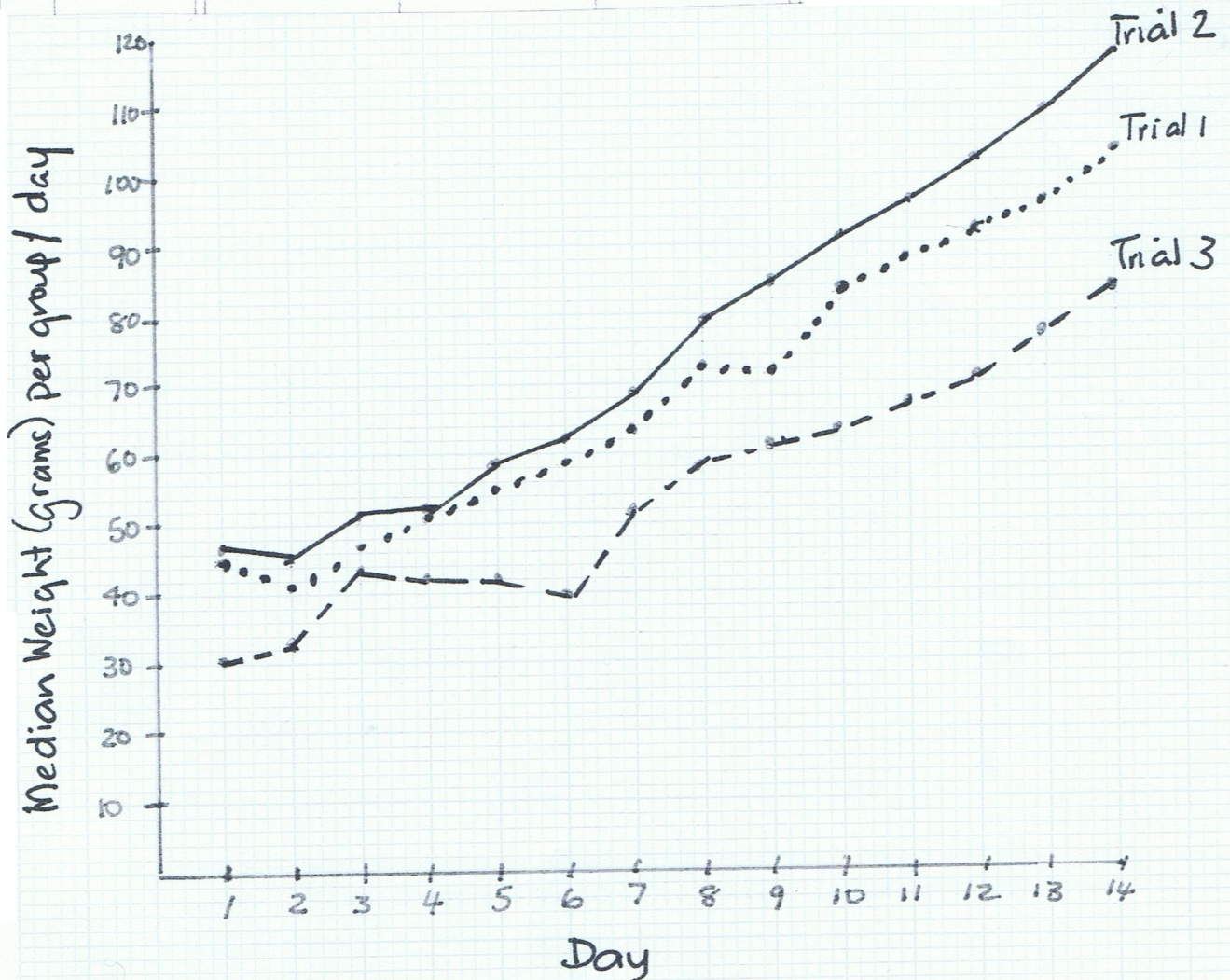
Average (Median) Weight per group/day

Day	Trial 1	Trial 2	Trial 3
1	45.83	46	30.66
2	41.83	45.33	33.56
3	47.8	51.2	44
4	51.6	51.83	42.5
5	55.5	59	42.33
6	59.17	62.66	40.5
7	64.5	69.16	52
8	73.3	79	58.16
9	72.16	84.6	61.6
10	84.5	91.66	64.66
11	88.16	96	67.16
12	92.33	102.33	71.83
13	96.5	109.16	78
14	103.83	117.33	84.16

How much 3 did they gain?

Trial 1	$103.83 - 45.83$ = 58g
Trial 2	$117.33 - 46$ = 71.33g
Trial 3	$84.16 - 30.66$ = 53.56

(Week 14 - Week 1) weights



INTERPRETING AND REPORTING

Help Callum identify the best commercial feed choice for his day old chicks **1**

Write a valid conclusion about your investigation that:

- Is based on your interpretation of your processed results
- Links to the purpose of your investigation

Callum should use 'Reliance Starter Mash' from Trial 2 because the chicks in Trial 2 gp gained the most weight. **2** The weight gain for this group over 14 days was 71g compared to Trial 1 gp (58g) and Trial 3 (about 54g). **3**

From the graph that shows the average weight gain over 14 days for each trial gp you can see that it is the Trial 2 gp that gained weight steadily from day 2 ~~on~~ onwards. **4**

The other trial groups didn't gain weight as steadily. Trial 3 group lost weight from day 3 to day 6. We increased the amount of feed from 100g to 150g from day 6 for all groups.

Exemplar	Fitness Programme – median, shift
2.	<p>This sample of learner work is from a portfolio of evidence generated over an acceptable period of time (Guidance Information [GI] 3). The evidence presented is naturally occurring from the teaching and learning programme of a level 1 Physical Education course (G12), and reflects the level of demand described by step 5 of the <i>Reason Statistically</i> strand of the Learning Progressions for Adult Numeracy (G13).</p> <p>The learner has been provided with a real and applied purpose [1] (GI5) and sufficient statistical information to interpret. The selection and interpretation (GI5) of two appropriate data features (Performance Criteria [PC] 1.3), to draw a reasonable conclusion [2] (PC1.1 and PC1.2) and meet the purpose, contributes to Outcome 1.</p> <p>There is acceptable evidence for median and shift from this learner work. The lack of change in the median times [3] is correctly used to justify the conclusion that the fitness program had little impact on the 50 m sprint times in Term 4. There is acceptable evidence for shift [4] in the observation that the box (the middle 50%) has not moved much, also supporting the conclusion that there was no real improvement in running speed.</p>

FITNESS Programme

The PE Department is evaluating their Year 11 Fitness Programme. At the beginning of Term 1 and during Term 4 students complete a range of fitness tests. There are 21 students the group. The teacher measured and recorded all the times below for the 50 metre sprint.

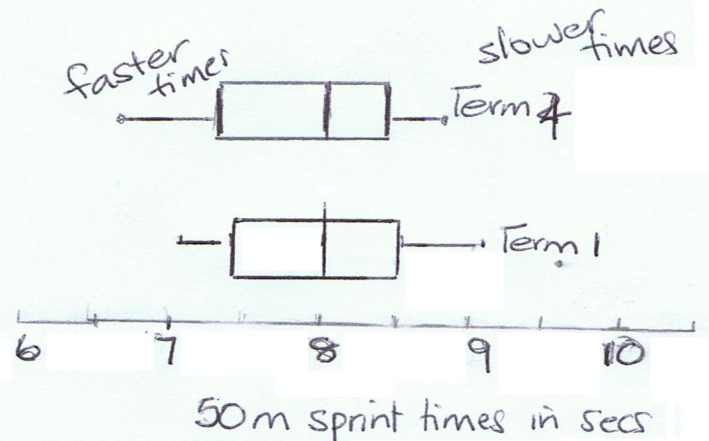
How effective is the current fitness programme for improving running speed? 1
Choose the most appropriate data features to justify the conclusions you make.

50 metre sprint time (seconds)

Term 1		Term 4
	6.00	60 90
90 90 70 50 40 30 20 10 04	7.00	20 20 30 30 60 60 80 90
90 90 60 60 50 40 40 30 00 00 00	8.00	00 00 10 20 40 40 50 50 60 70 90
	05 9.00	

50 metre sprint times (seconds)

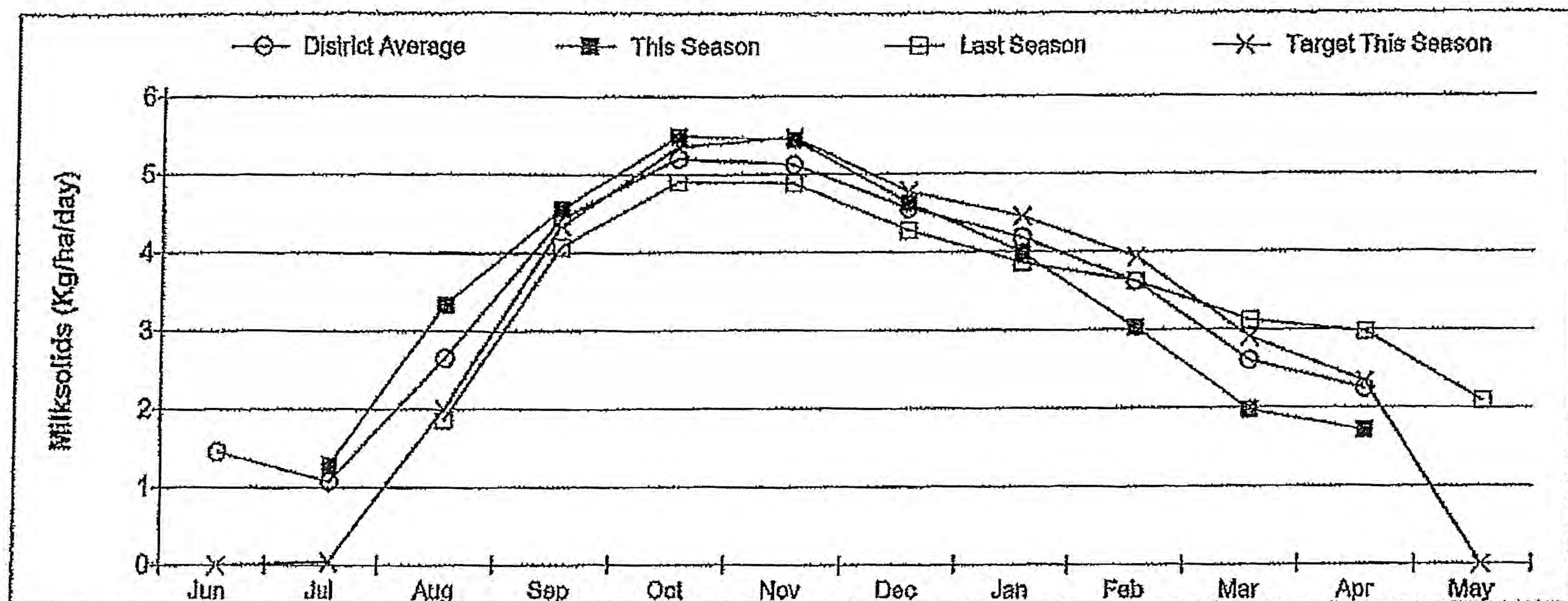
	Term 1	Term 4
Mean	8.03	7.89
Median	8.00	8.00
Min	7.04	6.60
LQ	7.45	7.30
UQ	8.55	8.40
Max	9.05	8.90
IQR	1.10	1.10



My conclusion is that the fitness programme didn't improve running speeds for the group. 2 The median time of 8 secs is the same for Term 1 and Term 4. 3 so they didn't get better at running. The box for Term 4 has not moved enough in the box and whisker to show change. 4 so this shows there is no ^{real} difference in how they went.

Exemplar	Milk Production - trend
3.	<p>This sample of learner evidence has been taken from a portfolio of naturally occurring evidence generated over an acceptable period of time, meeting the requirements of Guidance Information (GI) 2 and 3. The evidence presented has been generated in the context of an agricultural training course, and reflects the level of demand as described by step 5 of the <i>Reason Statistically</i> strand of the Learning Progressions for Adult Numeracy (GI3).</p> <p>The purpose of the activity [1] is real and applied (GI5), and relevant to the learner's situation. The interpretation of the statistical information (Performance Criteria [PC] 1.3) to reach a conclusion (PC1.1 and PC1.2) and provide advice to the farmer contributes to Outcome 1.</p> <p>There is acceptable evidence for trend from this learner work. The learner has accurately identified a trend [2] in the data set, and described what it means in relation to the purpose of the activity [3]. An appropriate and reasonable conclusion [4] has been reached (PC1.1), based on the interpretation of the statistical evidence (PC1.3) and relevant to the purpose (PC1.2).</p>

Based on the graph (below), what advice would you give the farmer?¹



The graph shows a big decrease of milk production on this farm from December onwards.² It shows that in December the actual production was slightly below target, and then the gap between the actual and their target increased over the next three months.³ I would advise this farmer to increase their supplementary feed from December onwards to try to maintain the milk production closer to their target for longer.⁴ If it gets too expensive to continue supplementary feeding, I would advise the farmer to dry their herd off early, and give some of their staff a holiday.