

L3 Lead Examiner Report 2001

January 2020

**L3 BTEC Nationals in Animal
Management: Animal Breeding and
Genetics**

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A grade boundary is where we set the level of achievement required to obtain a certain grade for the externally assessed unit. We set grade boundaries for each grade, at Distinction, Merit and Pass.

Setting grade boundaries

When we set grade boundaries, we look at the performance of every learner who took the external assessment. When we can see the full picture of performance, our experts are then able to decide where best to place the grade boundaries – this means that they decide what the lowest possible mark is for a particular grade.

When our experts set the grade boundaries, they make sure that learners receive grades which reflect their ability. Awarding grade boundaries is conducted to ensure learners achieve the grade they deserve to achieve, irrespective of variation in the external assessment.

Variations in external assessments

Each external assessment we set asks different questions and may assess different parts of the unit content outlined in the specification. It would be unfair to learners if we set the same grade boundaries for each assessment, because then it would not take accessibility into account.

Grade boundaries for this, and all other papers, are on the website via this link:

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Animal Breeding and Genetics 31644H

Grade	Unclassified	Level 3			
		N	P	M	D
Boundary Mark	0	12	25	41	57

Introduction

This paper has been examined five times now and many centres are getting much better at preparing their learners for the assessment.

The learners who achieved well had researched the area of parrot breeds well and could apply that research to the scenario presented in the paper, coming up with well-argued recommendations that referenced some of the different species of parrots they had researched.

The lower achieving learners produced very generic answers and did not tend to reference different species of parrot, producing generic answers often not linked well to the scenario.

Learners are still struggling with the genetics questions in the paper, with some notable exceptions. They find the more practical aspects of breeding more accessible.

Introduction to the Overall Performance of the Unit

Overall the paper performed well with some very pleasing performances at the distinction grade with well researched and applied responses. Even at the lower grades learners were producing creditworthy responses to the breeding areas of the paper, although struggling with the genetics questions.

Individual Questions

Question 1a

This question required learners to state two ways parrots can recognize their mates, it was answered well although some learners stated courtship rituals rather than recognition methods. Parrots do not use smell or pheromones unlike mammals.

This response demonstrates all that learners were required to write to gain the marks.

1 Visually

2 Auditory

Question 1b

Although both male and female parrots will feed the young in some circumstances and thus this was a creditable answer for both, there are some roles that only one gender undergoes, e.g. leaving the nest to forage. Learners were required to give two roles, not descriptions of behaviour.

This response demonstrates a correct response, the male forages, and on incorrect response, the female stays with the young but this is not a role in itself, the learner was required to give the role that the female was undertaking whilst with the young.

(b) Give the role of both parents in raising and caring for parrot chicks.

(2)

Female

Staying with babies

Male

finding food

Question 1c

This question required learners to explain two techniques, so the marks were for identifying a technique and expanding that identification. Many answers were very generic and not suitable for parrots, or did not include explanation.

This response has gained credit for identifying the towel wrap but the extension is too generic, and the second response would have had to identify the step up technique to be creditworthy.

(c) Explain **two** handling techniques you could use when moving parrots.

(4)

1. You may towel wrap an aggressive or difficult parrot, this makes moving easier as the parrot is restrained & can't hurt you (or itself)
2. You could free handle a friendly / tame parrot. this means no stress for the parrot, although, this would take time to learn

Question 2a

This question was well answered with two identifications appropriately expanded given by many learners.

This response demonstrates how to answer 'explain' questions as the learner has started the response with an identification of the reason and then gone on to expand it.

4 (a) Explain **two** reasons for breeding captive parrots.

(4)

1 For the pet trade; since parrots are getting more popular as pets so it is profitable. It also deters people from taking them from the wild.

2 For conservation, since there are lots of endangered species, e.g. macaws and black palm cockatoos, who need help repopulating to be reintroduced to ^{the} wild.

2b

This is the question where learners should use their research notes. Learners should refer to the desirable characteristics of the species they are recommending and their recommendation should weigh up the pros and cons of the species considered and a final recommendation of their choice. Many learners answered this well and applied their knowledge to the scenario.

This is an example of a good response where the learner has considered different species, linked their knowledge to the breeder's requirements and the requirements of the scenario and made a recommendation.

There are many breeds of parrots that are ideal companions for example, African grey parrots are perfect companions because they are very sociable, intelligent and can talk. They have a life span of 30 years + so will be around for a long time, so are less likely to die young which avoids upsetting the residents or pet owners. They are medium sized so it would be best to house them in the larger Avery, however this may be more expensive. Also, African Grey parrots need a lot of stimulation otherwise they become easily stressed so the breeder needs to give them lots of enrichment, especially as limited contact is given, however in the care home interactions with the residents

will benefit both the parrot and the residents.

Another

Another breed of parrot that could be considered are budgies. These parrots are very small^{and affordable} so the breeder can buy a few of them and house them in the two small aviaries which gives him more to sell and potentially more profit. Budgies are very friendly and easy to tame so it would be essential in the care home as the residents would be able to stroke them and the staff and residents can easily clean, feed and look after them.

~~However~~ Budgies only live for 5-10 years which may be a positive for owners ~~with children who do~~ who don't want a long living pet as this can be very expensive to care for in the long run. On the other hand, shorter life expectancy could cause upset for owners with children or for the residents who need them for companionship. Furthermore, budgies can't talk so may not be the best option for the residents in the care home.

Furthermore, cockatoos are very lively and affectionate parrots so residents can stroke and interact with them. However, if cockatoos are deprived of affection they can become depressed. This may be an issue for the breeder because limited contact ~~is given~~ would be given and

so he may not give the cockatoo the affection that it needs which could cause abnormal behaviours such as feather plucking. ~~to~~ On the other hand, if the cockatoo is in a care home receiving lots of affection and interactions, they would make great companions. Cockatoos are of medium size so need a larger aviary which could cost more money to house them. They live for 40-60 years so are a long lasting companion and can mimic almost any sound so are great companions and a lot of fun for the residents and families.

This is a poor response where the learner has not made a recommendation or addressed the desirable characteristics of a parrot species. Although there is a discussion of the actions the breeder should take, there is no reference to the scenario presented in the question. The answer is too generic and suggests that the learner's notes did not have any detail about parrot species.

One of the main factors which could have a negative impact on the business is that the parrots are only socialised with ~~the~~ the breeder, if parrots are to be companion parrots or sold to the general public they should be socialized with more people socialised on a daily basis this prevent aggression to people or stress on the bird if it fears people. Another factor the breeder should take into place is the breed of parrot as this is very important when considering the care of the parrot as a lot of parrot species are social very social and live in a flock.

The breeder wouldn't want species that have to live in a flock because are most likely going to be sold separately which could which will cause stress/trauma to a parrot who has been moved from the flock and in some cases the parrot will die, the breed can also affect the living conditions as a larger species of parrot will need more space than a smaller species. Factors such as how the aviaries are set up will can have an effect of the parrots because male are often very territorial and will show aggression to other males so if the mixed aviaries are too close to each other and territorial males can see each other they will build up frustration and aggression which can result in several abnormal behaviours such as attacking eggs, chicks, nesting hen, hens. The male may also self harm by plucking his feathers and sometimes due to a large amount of aggression he ~~press~~ pressure of feeding the chicks will kill him. In order to have males in close proximity to each other there should be a solid covering around the area of the aviary where the nest box is so that the males cannot see each other nest boxes resulting in a big reduction in aggression.

In order to increase the chances

of the parrot having a gentle temperament the breeder could hand feed the chicks and they see people as a source of food and comfort which will reduce fear in the parrot as well as prevent aggression towards people however once the parrot has become protective of the breeder and the birds may show aggression towards people around the breeder.

As the breeder mentioned more space in another out house this could become a nursery for chicks after weaning so the chicks can mature and the adults can begin to mate again.

Question 3 a

This question is a dihybrid genetic cross, and learners either knew how to do these and obtained good marks or seemed unfamiliar with area and gained very few marks.

This example of a good response includes all the information required, there is no need for learners to write a lot of extra information when answering this style of question.

- (a) Calculate the phenotypic probabilities if two green birds, which are heterozygous for both genes, are crossed. (8)

$DdYy$

		♀ female			
		DY	Dy	dY	dy
male ♂	DY	DDYY	DDYy	DdYY	DdYy
	Dy	DDYy	DDyy	DdYy	Ddyy
	dY	DdYY	DdYy	ddYY	ddYy
	dy	DdYy	Ddyy	ddYy	ddyy

Phenotypic probability

9 : 3 : 3 : 1

9 = green 1 = albino
 3 = blue
 3 = yellow

This is a poor response where the learner has tried to apply the appropriate method but has not used a logical method to separate the gametes at the first stage, and this has meant that the ratios at the end are incorrect.

		DdYy			
		DY	Dy	YD	yd
D d Y y	DY	DDYY	DDYy	DDYy	DdYy
	Dy	DDYy	DDyy	DDYy	Ddy y
	YD	DDYY	DDYy	DDYY	DdYy
	yd	DdYy	Ddy y	DdYy	ddy y

Phenotypic probability

Green = $12/16 = \frac{6}{8} = \frac{3}{4} = 3:4$

Blue = $3/16 = 3:16$

Albino = $1/16 = 1:16$

4x	green
4x	green
4x	green
1x	blue
2x	blue
1x	albino

Question 3b

This question asked learners to explain two of Mendel's laws of inheritance. There are three listed in the specification. Learners had to identify the law they were referring to; this was usually though not invariably by stating the name as identified in the specification. The then had to expand on the identification to explain it for full marks.

This is an example of a good response where two laws are identified and expanded accurately.

(b) Explain **two** of Mendel's laws of inheritance. (4)

1 Law of segregation - each gamete receives one allele only. The offspring will inherit one allele from each parent.

2 Law of independent assortment - This is when alleles are inherited independently for example the inheritance of ear length doesn't affect the inheritance of fur colour.

This is an example of a poorer response, the learner has identified the laws accurately but the extensions are inaccurate, the extension for dominance alludes to the correct answer but does not say anything about being expressed rather than other alleles.

1 Dominance - This allows alleles that are dominant to be expressed.
for instance the Dark colouring (D)

2 Segregation - Separation of chromosomes when they are ^{joined to} ~~joined to~~ gametes.

Question 4a

The learner has to explain three requirements for successful incubation.

This is an example of a good answer where three requirements are identified and expanded.

4 (a) Explain **three** requirements for the successful incubation of eggs.

(6)

1 Eggs in an incubator need to be rotated at least twice a day so the fetus/chick doesn't get stuck to the side of the shell, as this could cause death.

2 The temperature needed is 37.5°C because this helps the eggs keep warm and develop ~~at~~ at a healthy rate. This should be monitored everyday.

3 Humidity needs to be 40-50% to keep the eggs moist, so they don't dry out. Humidity should be increased on last few days of incubation to help the chicks exit the egg shell.

In this poor answer the learner has identified things that are correct in themselves but are not requirements for incubation so do not answer the question and are not creditable. The reference to temperature would have been credited, but that is repeated so the second reference cannot be credited.

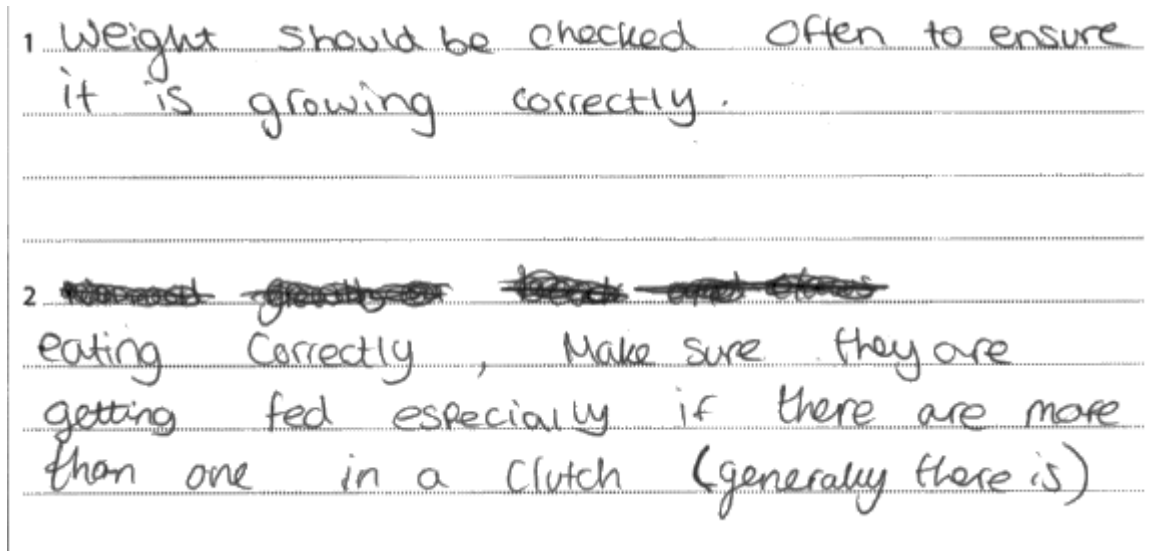
- 1 The hen must eat a lot of calcium rich food in order to prevent Egg binding (when the female cannot expel the egg from her body) and soft shell.
- 2 The nest box should be heated in order to mimic the temperature of the nest in the wild as many parrots are from tropical countries with a warm climate.
- 3 The temperature of the eggs is very important and they should be kept at 37°C or just below.

Question 4 b

Many learners failed to appreciate that this was about a newly hatched parrot, rather than a parrot fledgling in general.

Many learners identified weight gain but this is not relevant at the newly hatched stage, a plump appearance or signs of successful feeding would be relevant. Some learners referenced feather quality/condition but this is not relevant until parrots are much older, they are featherless at hatching.

This is an example of a poor response where the answers are relevant to an older chick rather than a newly hatched one.



Question 4c

This question was 'explain one reason' for 2 marks, so the learner had to identify a reason and then expand on that. Some learners identified two reasons without expanding either points thus losing marks.

This is an example of a response where the learner has identified a reason (the mother has neglected the chick) but not expanded they could have said e.g. 'to ensure the chick gets sufficient nutrients'.

If the mum doesnt look after it, she
may not feed it or be stressed and so
may kill her offspring

Question 4 d

The command verb is 'explain' and the learner has to cover two causes of disease. This is an example of a good answer covering a genetic disorder passed from parents and infection due to undeveloped immune response.

1 Hereditary/genetic diseases passed on from parent to offspring. The parent may have had a recessive genetic disorder that has been passed down to the chick.

2 low immunity can cause disease in parrot chicks because they haven't had time to build resistance to microbes.

This is an example where the learner has only attempted to explain one cause as there is repetition. There is credit for the identification but the expansions are not creditworthy.

1 Genetic diseases that affect their eyesight

2 Genetic diseases that affect their colouration/feather quality
Balding can occur ^{weak} quality and dullness.

Question 5a

The command verb for this question was describe so learners had to say two things about each interaction. This may have been identifying the name but this was not necessarily required. An example of a good response is shown below, the learner has actually put three descriptive points for each interaction, this could have got full marks without the final extension.

5 (a) Describe **three** ways genes can interact.

[6]

1 Incomplete dominance - this is when neither alleles are dominant or recessive so the traits are blended.
example - white cat bred with a black cat = grey offspring.

2 Sex-linked - this is when alleles are carried on the x or y chromosome. Example - tortoise shell cats are usually female as this trait is carried on the x chromosome.

3 Epistatic effects - when two genes affect the expression of a single trait. Example - labrador ~~fur~~ fur colour is determined by 2 genes. B determines colour b determines whether this colour is deposited in the fur.

Question 5b

The command verb is 'give' and the learner has to give four techniques for four marks. There is a definitive list of genetic manipulation techniques in the specification that the learner should be familiar with.

This learner has included two techniques, and two applications of those techniques, the applications are not creditworthy in this question.

1. Pharming
2. cloning
3. Transgenics
4. ~~DNA analysis~~ Recombinant DNA

Question 6a

This question asked learners to evaluate the factors to be considered when assessing the suitability of an animal for breeding. This is based on section B2 of the specification. The command term means that the learner should be looking at the relative importance of different factors. The mark scheme is levels based so the number of points made in the response does not necessarily link to the mark awarded, it is whether the answer meets the requirements of the level descriptors.

This is an example of a good answer looking at different factors, however the answer could have been further improved by linking the factors considered back to the first sentence, the purpose of breeding, so for instance, temperament is very important for some purposes, for other it may not be so important.

When selecting a parrot for a breeding programme you must consider its purpose. This will determine how large or what colour you want it to be. Therefore, appearance should be considered.

You must also consider the age of the animal. You must ensure it has reached sexual maturity so it is capable of breeding. Additionally, if its too old it might be too stressful and hard work, they may not lay eggs any more or very little.

You should also consider the health of the animal. Check if they have any diseases like STI's that they could spread to their mate or if they could pass on a genetic disorder.

Furthermore, you should assess their behaviour. Some animals are not sociable and have a bad/aggressive temperament. Will they display maternal behaviour like provide food.

Question 6b

This is the final question on the paper where learners are expected to look at the ethical issues of an area of animal breeding. In this paper the area was intensive selection. Some learners confused this with intensive farming, an area not covered in this unit.

This learner identified selective breeding as an area linked to intensive selection, but then went on to discuss areas not connected to the question e.g. cloning, the reference to people was ignored when marking but suggests that the learner did not read back through their work to ensure accuracy.

selective breeding

(b) Discuss why intensive selection for desirable characteristics may not be ethical. (12)

There are 3 ways selection for desirable characteristics can be done, this is through the use of selective breeding, genetic modification and also cloning.

selective breeding is used by humans to develop new organisms with desirable characteristics. Breeders select 2 people that have beneficial phenotypic traits to produce an offspring with popular characteristics.

Cloning is a complex that lets one exact copy of a certain organisms genetic makeup to be copied or transferred to cause another organism to inherit traits from the donor.

Genetic modification is accomplished by the isolation of DNA fragments from a donor and insert them into a vector.

This is an example of an answer where the learner has discussed the pros and cons of intensive selection in different scenarios and linked it to the ethical issues around welfare and 'playing god' so providing a much better answer.

Intensive selection for desirable characteristics may be considered unethical as:

It can encourage inbreeding which reduces the variation of DNA, this may lead to a inbreeding depression, where animals may start suffering from health issues and lose immunity to lots of illness, this leads to a poor quality of life. It could also be called unnatural, religious people may consider it 'playing god', since this would not occur naturally in the wild.

It could also be argued against since it may encourage poor practice, intensively breeding the same animals again and again for that characteristic, or when they're too young or too old to breed, leading to poor welfare which is against 'The Animal Welfare Act'

Although, it could be argued for, if there has been intensive out-breeding, as it can return needed characteristics for survival, in addition, brighter males often ~~it~~ have higher success with with females, in reference to conservation, useful characteristics may provide helpful - better immunity or perhaps breeding females with higher success rates in terms of clutches.

Again, arguing against, intensive breeding of ~~one~~ characteristic may unintentionally intensively bring another, for example, perhaps smaller beaks, making eating difficult, or health issues - a rise in lethal alleles or higher rates of inherited disease.

Summary

- Learners should ensure that their notes are detailed and include details of different breeds or species as appropriate.
- Learners should apply their notes to the scenario they are presented with, and reflect this in the written answer they produce.
- Learners should practice writing answers that meet the demands of the command terms used in this paper, to ensure they cover enough points to access the marks available.
- In the short answer questions, especially those with the command terms give and state, learners should try to be succinct. Many learners write extensive answers to these, which takes time away from questions requiring a more extended response.
- Often learners write single statements where 2 or 4 marks are available and then lose the opportunity to gain full marks.
- The specification and/or sample assessment materials (SAMs) located on the BTEC First qualification webpage located [here](#).

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