L3 Lead Examiner Report 1901

January 2019

L3 Qualification in Animal Management: Unit 1 Animal Breeding and Genetics

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Grade Boundaries

What is a grade boundary?

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:

http://qualifications.pearson.com/en/support/support-topics/results-certification/grade-boundaries.html

Unit 1: Animal Breeding and Genetics

Grade	Unclassified	Level 3			
		N	P	M	D
Boundary Mark	**0**	**13**	26	42	58

Introduction

This is the second time this externally assessed unit has been examined. The context of the task element of the paper was assistance dogs for the hard of hearing. This series included a reduced amount of information in the pre-release material compared to the previous series.

This benefitted the higher achieving learners as this resulted in a greater application of the information they had researched to the scenario in the paper. Some of the lower achieving responses in questions 2b, which was based on the pre-release material appeared to struggle to gain marks because the learners did not have sufficient material in their notes about the pre-release scenario so they could not refer to them.

Introduction to the Overall Performance of the Unit

Overall the paper performed similarly to the last series with a slightly improved performance at the distinction grade. There was a slightly better performance on the questions that were about the practical aspects of breeding, and learners appeared to struggle more with the questions on the more theoretical aspects of genetics from the specification.

Individual Questions

1 (a)

State two body parts of a dog to be considered when body condition scoring.

Good response

1 Ribs → should be able to feel the last two.

2 Abdomial tuck (hips) should have a tuck inwards after the ribs.

The command term is state, the learner has accurately stated two body parts you would consider when body condition scoring. The learner has expanded the statements, this was not required by the question and learners should be encouraged not to spend time writing information beyond the requirements of the question. Two marks awarded.

Poor response

1 Teeth

2 Weight

In this response the learner has stated two aspects of a health check, not body condition scoring so no marks awarded.

1 (b)

Explain one reason why it is important to assess temperament when breeding dogs.

Good response

> Because it allows breeders to selectively breed dogs with desirable temperaments and to avoid producing offspring with undesirable temperaments (eg. aggressive or nervous)

The command term is explain. Two marks are available. The learner has identified that temperament can be inherited and given an expansion of aggression. Two marks awarded.

Poor response

> It is important to assess temperament of the dog you want to breed from because if a dog is disobedient and do not do as you tell it then that particular dog would breed of dog might not be suitable.

The learner has made a generic statement about disobedient dogs being undesirable but has not identified why that may be an issue for someone breeding dogs. A link to heritability, or a practical example of a problem it could cause during the process would have improved the answer. No marks awarded.

1 (c)

Explain two behaviours that would be desirable in hearing dogs for the deaf.

Good response

> 1 Obedient - will make the dog easier to train and will also ensure that it will be a reliable service dog which will always follow the owner's commands and provide suitable assistance.
> 2 Calm - having an aggressive or anxious dog will be problematic as they may be dangerous or fearful towards the owner or other people/animals, meaning they do not provide appropriate assistance (4)

The command term is explain two, for four marks. This response has identified two behaviours, calmness and biddable, and expanded these appropriately. Four marks awarded.
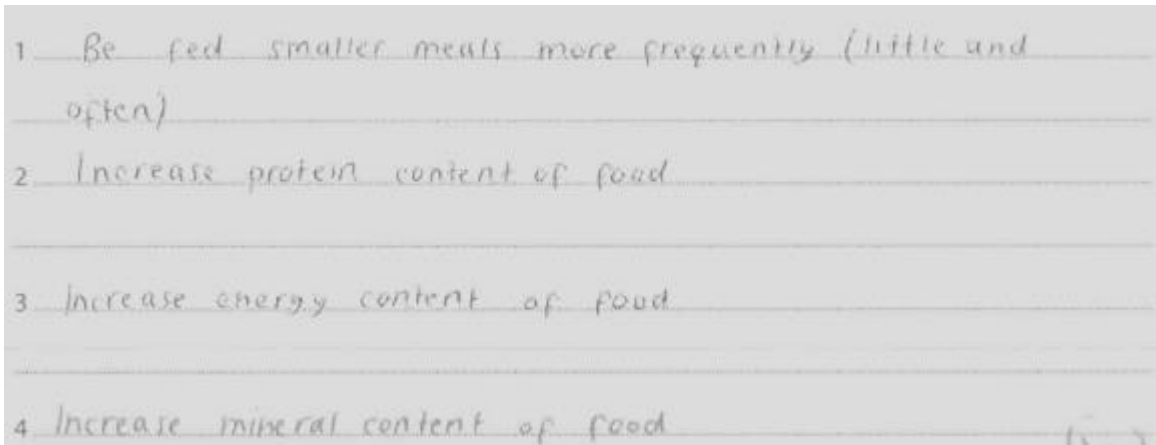
Poor response

> 1 The dog would need to easy to teach so their behaviour will need to be easy to teach
>
> 2 The dog will need to be well behaved and eager to please, a dog that isn't bothered about pleasing would not make a good guide dog.

This response identifies easy to train, but the expansion is a repetition of the point and the second point is the same answer in other words. One mark awarded.
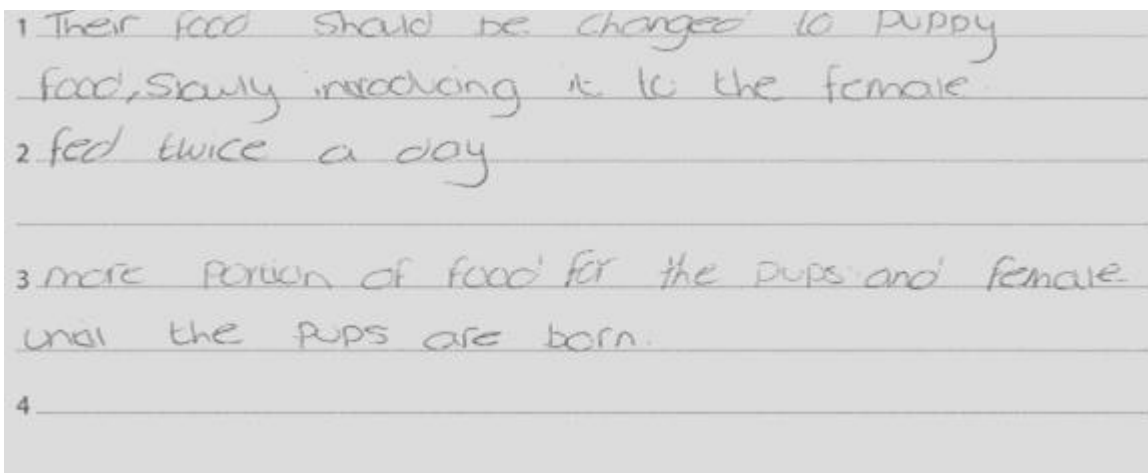
2 (a)

Give four ways a dog's diet schedule be changed during pregnancy.

Good response

The command term is give, the response accurately identifies four changes to the diet. Four marks awarded.

Poor response

The first point is not specific as to why puppy food may be introduced, the second point is incorrect as dogs that are not pregnant are generally fed twice a day, pregnant bitches should be fed more often. The third point is about after the birth so does not answer the question. No marks awarded.

2 (b)

Discuss the suitability of these **three** dog breeds and recommend a breed to use as hearing dogs for the deaf. You should provide reasons for your choice. Use your research notes to help you make a recommendation.

Good response

The Labrador retriever is a very common service dog. Generally this breed is very obedient which is needed for both training and working as a hearing dog. They usually very healthy but with smaller tight ears they are prone to ear infections without regular cleaning which would be an issue as an ear infection would inhibit their work ability. The standard poodle is a hypoallergenic breed much less likely to envoke an allergic reaction, good for a dog allowed where dogs usually are not. They are physically very healthy but can be picky eaters and may develop hypoglycemia is off their food so variety is key. People focused dogs and easily trained. The Afghan Hound is a thick long haired breed needing lots of grooming. They are working dog so may have too much energy to be stuck at people pace. They are obedient and easily trained. I would say that the standard Poodle would be most suitable as it is obedient, less energetic than the afghan hound, less prone to work effecting illness than retriever and compatable with the public.

The command term for this question is **Discuss** and twelve points are available. This is the question based on the learner's own research and this response shown a good application of knowledge. It should be noted that there is not a correct answer as to which breed is best, the learner is being marked on their ability to demonstrate accurate knowledge applied accurately to the scenario. The question asks for a recommendation and the learner has recommended the poodle and backed up their recommendation with a justification based on their research. This response was awarded twelve marks.

Learners performed better on this question when they had appropriate notes on the pre-release context which they then applied to the scenario in the question paper.

Poor response

The labrador retriever gives comfort and emotional support when needed. They are best to be trained as a ~~puppy~~ puppy, slowly introducing new things for the dog but more training when it's an adult as when it's a puppy, they usually are giddy and always want to be around you, but socializing the pup with other dogs from a young age will ~~keep~~ make the pup not aggressive. They are more reaiable as service dogs and can ~~keep~~ keep calm in any situation, ~~and the~~ Most service dogs are labradors.

The standard poodle ~~~~ is usually used as show dogs ~~sometimes they can be~~ Their traits are ~~to go~~ created to win competitions.

The Afghan hand desirable traits are hunting, by being a hound, and They can be aggressive towards other dogs by being a hunting dog and they are not reliable as a service dog. However they could be trained from a very young age to become a service dog as they are good at listening out for things.

This learner's response has described the three breeds accurately, however there is only limited reference to the scenario and the learner has not made a recommendation. This answer is in level 1, three marks awarded as there are elements of knowledge but limited reference and no recommendation.

3 (a)

Calculate the phenotypic probabilities of the coat colour of the expected pups using the dihybrid template.

Good Response

		Dog - Aakk			
		Ak	Ak	ak	ak
Bitch -	AK	AA Kk	AA Kk	Aa Kk	Aa Kk
	Ak	AA kk	AA kk	Aa kk	Aa kk
AaKk	aK	Aa Kk	Aa Kk	(aa Kk)	(aa Kk)
	ak	Aa kk	Aa kk	aa kk	aa kk

Phenotypic probability

Sable, brindle : 6/16   6

Sable, solid colour : 6/16   6

Black, brindle : 0/16   0

Black, solid colour : 4/16   4

The command term is **calculate**. The learner has demonstrated an excellent knowledge of the application of mendelian genetics to a dihybrid cross, the correct genotypes and alleles are shown, the cross is carried out accurately and the learner has then applied the possible genotypes to the possible phenotypes, accurately applying the information that the genotype for black and sable will have a black phenotype and calculating the ratios accurately. Eight marks awarded.

Poor Response

This response demonstrates a lack of understanding of the process. The genotypes are identified incorrectly, the cross is inaccurate and the phenotypes are not identified so no marks awarded.

3 (b)

Describe **two** congenital or hereditary conditions pups may be born with.

Good Response

1) Polydactyly - pup is born with extra digits on limbs (eg. an extra toe)

2) Atresia - a passage in the body is unusually narrow or absent. Pulmonary atresia is when the heart valves are unusually narrow, can result in blood clots and/or heart failure.

The command term is **describe two**, for four points. This response accurately identifies two conditions and then goes on to make several descriptive points accurately linked to the conditions. Four marks awarded.

Poor Response

Some pups are born with health conditions such as blindness, deafness, mobility conditions. Neither of these would be able to be a hearing dog for the blind.

The learner has identified some symptoms that dogs may be born with, although they are not identified with conditions that they may be born with and are too generic to even infer which conditions may be being referred to. No marks awarded.

4 (a)

Explain the use of **three** pieces of equipment or materials that keep new born pups safe and healthy.

Good Response

1. Heat source - whether a heat pad, lamp etc. Should be kept at 24-26°c in order to keep puppies at a suitable temperature for first week after birth as they will be unable to regulate their own body temperature properly.

2. Supply of puppy milk - in case mother rejects pup, puppy is unable to latch on or mother dies during parturition. Ensures the puppies can be fed and have the essential colostrum within 24 hours of birth to provide immune protection.

3. Towels - provide a soft surface for puppies to stay, absorb liquids in order to create a more hygienic environment and help puppies to remain a suitable temperature. Can be used to clean pups if the mother does not lick them herself.

The command term is **explain three** for six marks, there are two marks available for each item identified. This learner has accurately identified three materials or pieces of equipment and then expanded on the identifications appropriately. Six marks awarded.
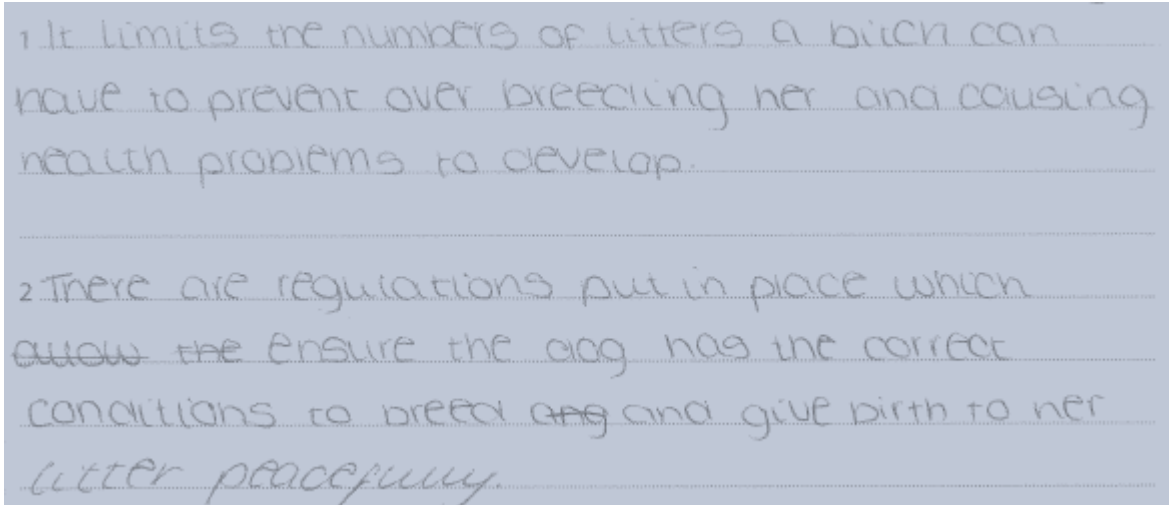
Poor response

A whelping box has been identified accurately and the expansion is correct, however a suitable room and record keeping whilst desirable in themselves are not pieces of equipment or materials so therefore are not rewardable in this context. Two marks awarded.

4 (b)

Describe **two** ways legislation ensures the welfare of breeding dogs.
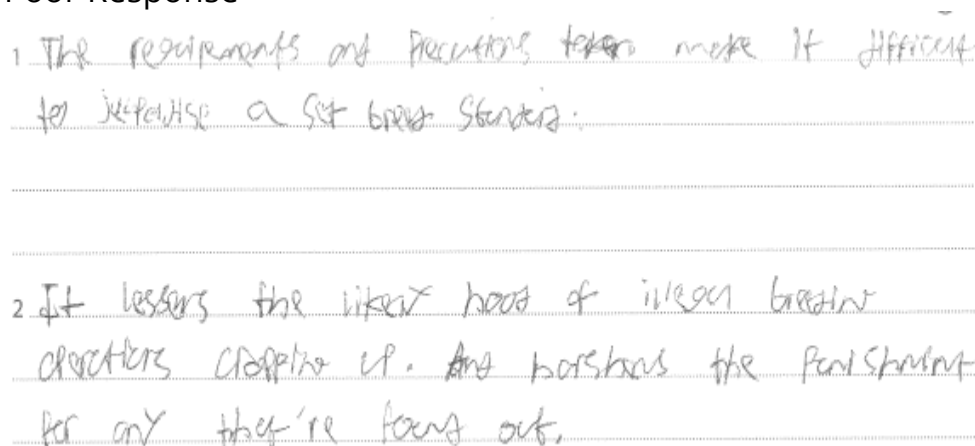
Good Response

> 1 It limits the numbers of litters a bitch can have to prevent over breeding her and causing health problems to develop.
>
> 2 There are regulations put in place which allow the ensure the dog has the correct conditions to breed and and give birth to her litter peacefully.

The command term is **describe two**, for four marks. There is no requirement in the question to identify particular pieces of legislation, what is needed is how legislation protects dogs in breeding kennels. This response identifies two way, limiting litters and providing appropriate equipment and then goes on to expand on the answer appropriately. Four marks awarded

Poor Response

> 1 The requirements and precautions taken make it difficult for [to] justify a set breed standard.
>
> 2 It lessens the likely hood of illegal breeding characters cropping up. And harshens the punishment for any they're found out.

The learner has discussed the consequences of not following legislation, not how the legislation protects the breeding dogs. No marks awarded.

4 (c)

Explain **one** reason the inbreeding coefficient is important when breeding pedigree dogs.

Good Response

alot of pedigree dogs have inbreeding in their lineage to promote the occurance of desired phenotype the inbreeding coefficient shows how similar the dogs DNA is, and can be used to predict if too closely related for healthy offspring

The command term is **explain** one for two marks. The response identifies that that it is a measure of the degree of relatedness and therefore the likelihood of genetic diseases. Two marks awarded.

Poor Response

Inbreeding Coeefficient is important when breeding Pedigree dogs as you wont to breed to Pedigree dogs togeather to get the some blood line + the some DNA

The response repeats the question then inaccurately identifies the use of the coefficient.

4 (d)

Explain **one** way that reproductive technology can be used to prevent heritable conditions.

Good Response

Gene therapy involves using techniques to make changes to the organisms genome to try and **(Total for Question 4 = 16 marks)** corrrect genetic disorders. One way this is done is by inserting functioning genes where the animal's own genes are faulty. Another way is by inactivating faulty genes. Unless the changes are made to sex cells (germline gene therapy), these genetic changes will not be inherited by offspring.

Reproductive technologies are section C1 of the specification and it is expected that learners are familiar with the technologies identified there. The command term is **explain one** for four marks. The response identifies gene therapy, and then goes on to explain it accurately. Four marks awarded.
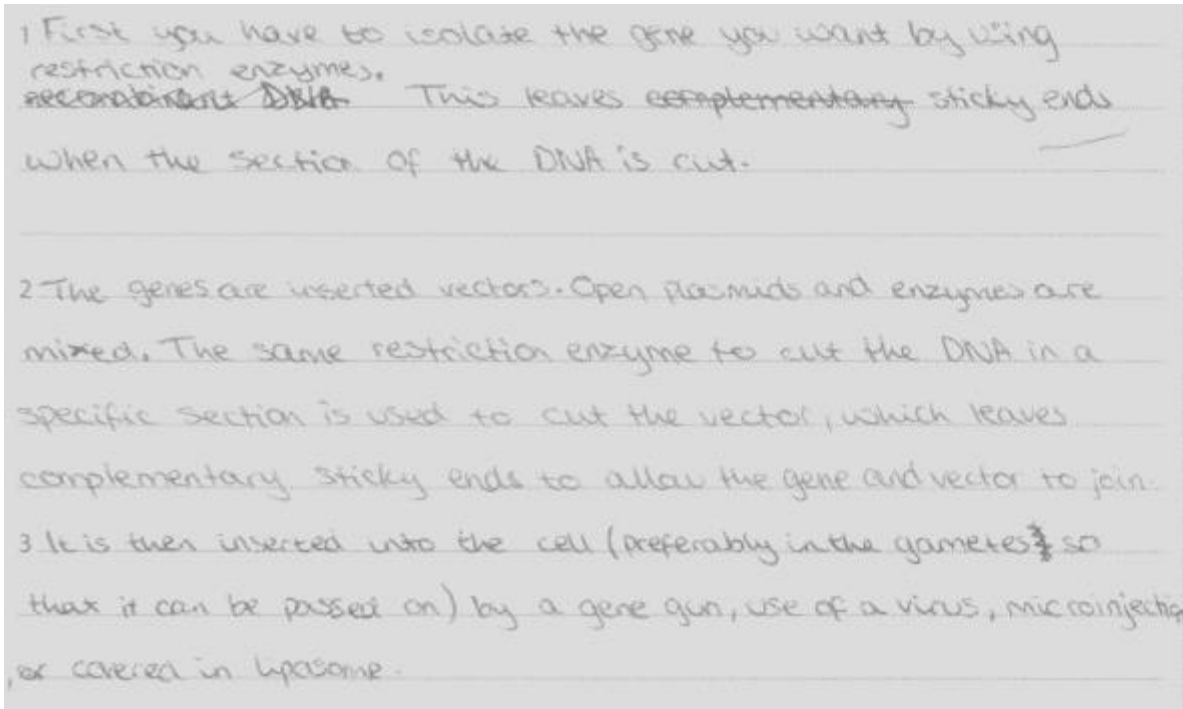
Poor Response

Certain eggs and sperm can be selected that do not have the genes of diseases or disorders. This is usually done by IVF as they are analysed before inserted into the mother.

Although 'sperm sexing is an identified technique it is not used to prevent inherited diseases, generally animals suffering from sex linked disorders are not bred from, and even if they were the learner has not attempted to make that link. Genetic analysis of gametes followed by IVF is a procedure rarely used with humans, not with dogs.

5 (a)

Describe **three** of the stages in the process of genetic modification of plasmids.

Good Response

1 First you have to isolate the gene you want by using restriction enzymes. ~~recombinant~~ DNA. This leaves ~~complementary~~ sticky ends when the section of the DNA is cut.

2 The genes are inserted vectors. Open plasmids and enzymes are mixed. The same restriction enzyme to cut the DNA in a specific section is used to cut the vector, which leaves complementary sticky ends to allow the gene and vector to join.

3 It is then inserted into the cell (preferably in the gametes so that it can be passed on) by a gene gun, use of a virus, microinjection, or covered in liposome.

This question is describe three for six marks. It is from section C8 of the specification. The learner has accurately identified and described three stages, six marks awarded.

Poor Response

> 1. ~~The~~ The DNA is cut up into shorter chains using a restriction enzyme, leaving unmatched sections of DNA called sticky ends
>
> 2. RNA transcribes the DNA. The desired gene is inserted into the DNA strand,

This response generically describes two aspects of the process but does not accurately describe three of the stages involved in genetic modification. No marks awarded.
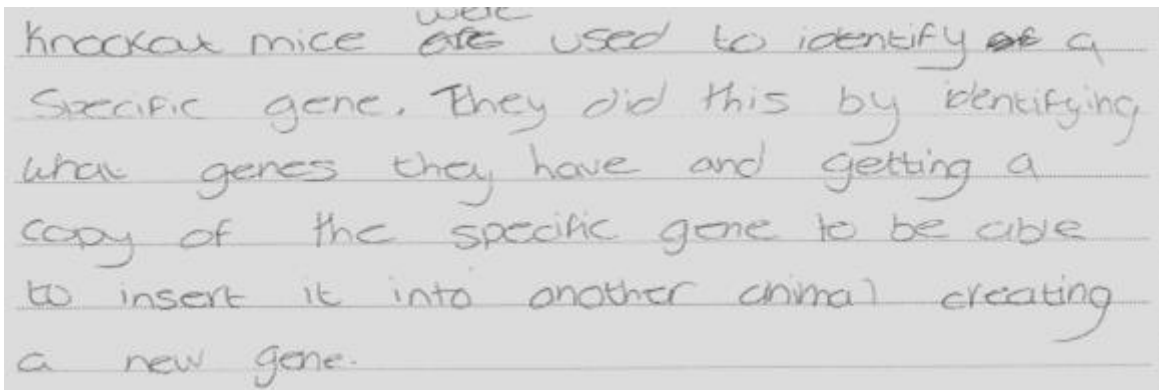
5 (b)

Explain how knockout mice are used to identify the action of a specific gene.

Good Response

> Using knockout mice allows actions of specific genes to be learnt as only one section of the will be removed or replaced and the effects can then be monitored. Its done in controlled conditions with observations so specific effects can be noticed for specific genes instead of removing random sections.

The command verb is **explain** and is from section C7 of the specification. The learner has identified that a gene is replaced, the mouse is observed and changes in the mouse noted to identify the specific effects of the gene four marks awarded.
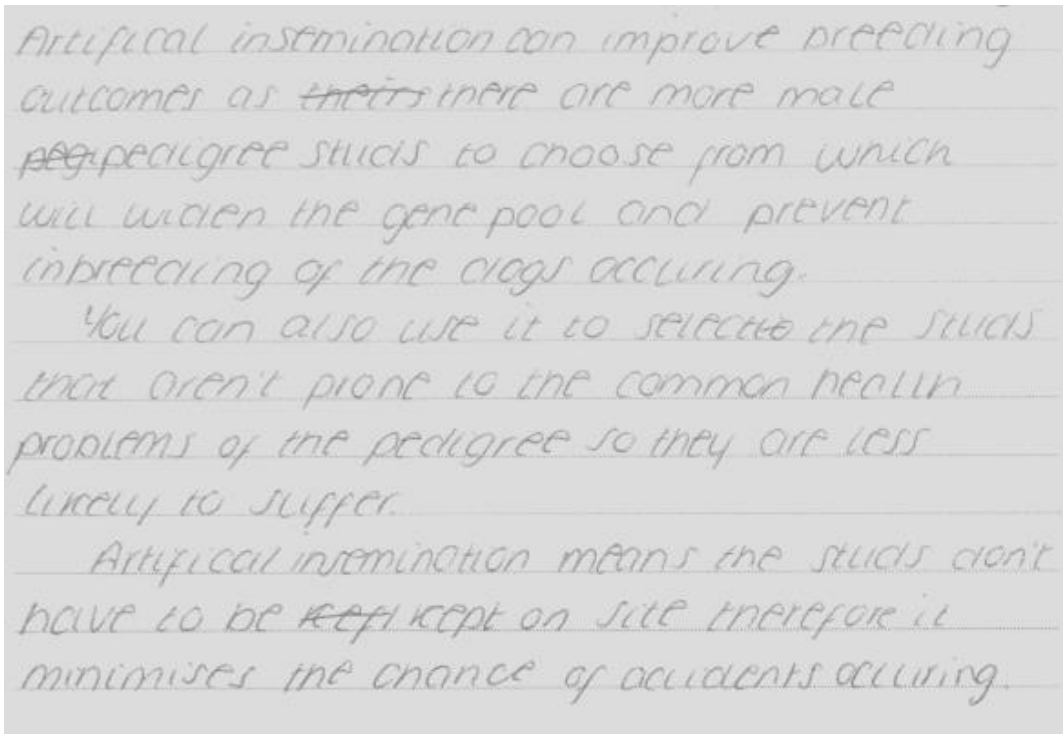
22

Poor Response

The learner has mentioned that the process is to identify the action of a gene but the rest of the answer is incorrect. One mark awarded.

6 (a)

Discuss the use of artificial insemination to improve breeding outcomes.

Good Response

> Artifical insemination can improve breeding outcomes as there there are more male pedi pedigree studs to choose from which will widen the gene pool and prevent inbreeding of the dogs occuring.
> You can also use it to selecte the studs that aren't prone to the common health problems of the pedigree so they are less likely to suffer.
> Artifical insemination means the studs don't have to be keep kept on site therefore it minimises the chance of accidents occuring.

The command term is **discuss** for six marks. The mark scheme is levelled so the answer is being judged on the quality of discussion and application of knowledge. This response has demonstrated accurate knowledge, with coherent reasoning. The learner has applied accurate knowledge accurately to the context of the question and have demonstrated good organisation. Six marks awarded.

Poor Response

> Artifical insemination means that before inserting the sperm into the bitch, DNA can be altered. It can mean we can use 'Deletion' which means base pairs are lost from DNA sequence. Out breeding means breeding Translocation means sections of DNA can be swapped to create the desirable characteristics. Duplication also means a section of DNA is repeated

This response has misunderstood the term artificial insemination and mistaken it for the insertion process. This is an example that shows the importance of reading questions accurately and checking back on work at the end of the exam. The learner has learnt the process well but it does not answer the question. No marks awarded.

6 (b)

Discuss why breeding pedigree dogs, such as French bulldogs, may affect their health and long-term future of the breed.

Good Response

French bulldogs are selectively bred for their physical appearance (short nose, bulging eyes, etc). ~~The breed is a~~ Pedigree dogs are a result of selective inbreeding, which is a problem as due to the dogs having been bred with relatives, there is poor genetic variation which makes them more susceptible to disease and health problems. It also increases their chances of being born with congenital diseases. They are a brachycephalic dog breed, meaning they have a shortened trachea and nose. This often causes them to have breathing difficulties due to having reduced air flow into their lungs. This makes them unable to do much exercise as they struggle to inhale enough oxygen to support their body, often resulting in the dogs being overweight. ~~This can~~ As well as French bulldogs, most pedigree dogs suffer from health problems due to their appearance, or as a ~~are susceptible to puppies~~ byproduct of their desirable traits. Irresponsible breeding has also resulted ~~~~ in dogs with genetic diseases being bred, resulting in their offspring also having the disease. As time progresses, ~~dogs~~ pedigree dogs will become more and more interbred in order to amplify their desired traits, leading to even more prominent health problems and hereditary diseases. ~~~~ Reproductive techniques and genetic modification can be used positively to rule out genetic diseases, but can also be used negatively to further amplify visually appealing traits, resulting in poor welfare of the dogs.

This is a **discussion** for twelve marks. The mark scheme is levelled. This is the last question on the paper and is the opportunity for the learner to demonstrate their knowledge and understanding of the unit overall. This learner has demonstrated accurate and thorough knowledge and understanding. There are links to the individual health of the dog and the overall effect on the breed. Their knowledge is applied to the scenario and is sustained throughout the answer. There is a conclusion to the discussion. Twelve marks awarded.

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Poor Response

Breeding french bulldogs may affect their health because they have breathing problems by their face being ~~squished~~ that flat that it's harder for them to breathe and in the future, if they keep being bred it will cause them more problems than they already have now with their breathing.

However not breeding pedigree dogs, they are not closely related which reduces ~~the~~ inherited diseases, but they dont have variation or different traits, they are being bred that much that they are having difficulties, but if they was bred with a none-pedigree dog there would be variation and may be better to survive and their offspring will have both variations from the mother and father. There would be more of a selective breeding, which the breeder chooses what traits they want the offspring to have and what they want it to look like.

There is some isolated knowledge but a lot of the answer is about outbreeding to reduce issues, which does not answer the question asked. The relevant knowledge that is demonstrated is unbalanced as it is only about the dog's individual health. As such there is limited reference to relevant evidence and the conclusion is unfocussed and underdeveloped

Summary

- Learners should ensure that the notes they bring in to the assessment areas detailed as they can be in the constraints of the space limit.
- Learners should refer to their notes and apply them to the specific scenario in the exam paper.
- Each question has a command term that gives information about how the question should be answered, exam practice with specific feedback form teachers linked ot these command terms would help learners structure their answers.
- Where technical terms are used, especially on questions on the genetics section of the specification, these refer to the technical terms as detailed in the specifications and centres should ensure learners are familiar with these technical terms.
- In the short answer questions, especially those with the command terms give and state, learners should endeavor to be succinct. Many learners write answers more suited to an explain question for these, which takes time away from questions requiring a more extended response.

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

Rewarding Learning