Examiners' Report
Lead Examiner Feedback

January 2021

Pearson BTEC Nationals
In Aimal Management (31644H)
Unit 1: Animal
Management: 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

Awarding BTEC qualifications in 2022

Ofqual has set out their plans for awarding qualifications in 2022 and intend to return to a normal, pre-pandemic, approach to grading standards over by 2023. They have confirmed that 2022 will be a transition year, to reflect that we are in a pandemic recovery period and students' education has been disrupted.

Our guiding principle and approach to awarding BTEC qualification results in 2022 will be to ensure parity in relation to the approach being taken for GCSE and A level learners. BTEC courses have a different structure and design to academic qualifications - BTECs are modular qualifications (with assessments taking place throughout the course) compared to GCSEs and A levels which are linear (assessed and awarded at the same time at the end of the year), and therefore our approach needs to be different.

In 2022 we will return to the usual method of calculating BTEC qualification results, however adaptations including, U-TAGs and reduced internal assessment, are in place to provide a comprehensive package of support for students.

The basis of our awarding approach to BTECs this year is to ensure it is as fair as possible for all learners. We will use a range of evidence to set grade boundaries for the external units. Part of this evidence will be to closely monitor learner performance in all assessments that contribute to learners' final qualification grade, to ensure parity with A level and GCSEs.

Further information can be found on our website and via our Social Media channels.

31644H – unit 1 – Animal Breeding and Genetics

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

Introduction

This paper has been examined seven times now and many learners had used the available past papers to prepare for the assessment.
Most learners had researched the area of snake breeding comprehensively and could apply that research to the scenario presented in the paper. Using that research to come up with well-argued recommendations that referenced the different species of snakes they had researched.
Where learners had not researched well, they produced very generic answers and did not reference different species of snakes, producing 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

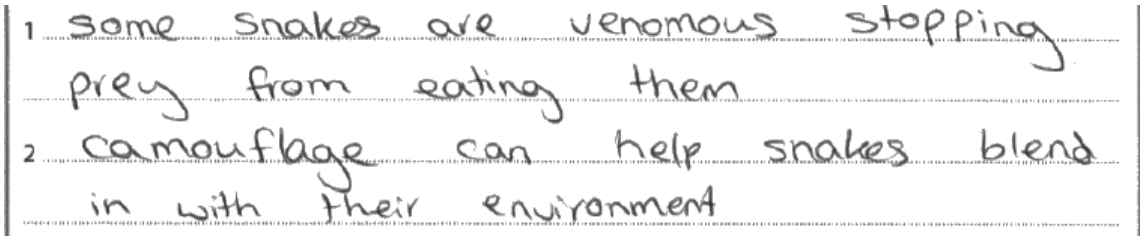
Overall, the paper performed well with some very pleasing performances at the distinction grade with well researched and applied responses. Even at the lower grades learners were producing creditworthy responses to the breeding areas of the paper, although struggling with the genetics questions.

Individual Questions

1

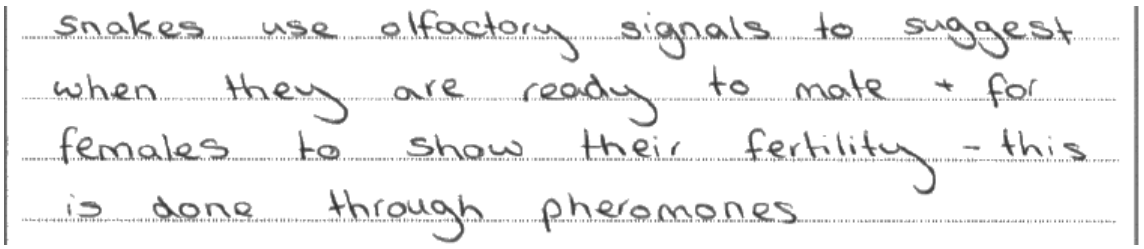
a) State two survival strategies that snakes use.

This question was well answered. The verb is 'state', and this response, although correct, demonstrates poor exam technique as the marks would have been gained by stating venomous and camouflaged, no expansion was required for a state question. Learners should be encouraged to take note of the verb in the question to prevent unnecessary writing and concentrate their time on the rest of the paper.


1 some snakes are venomous stopping prey from eating them
2 camouflage can help snakes blend in with their environment

(b) Explain one system snakes use to recognise potential sexual mates.

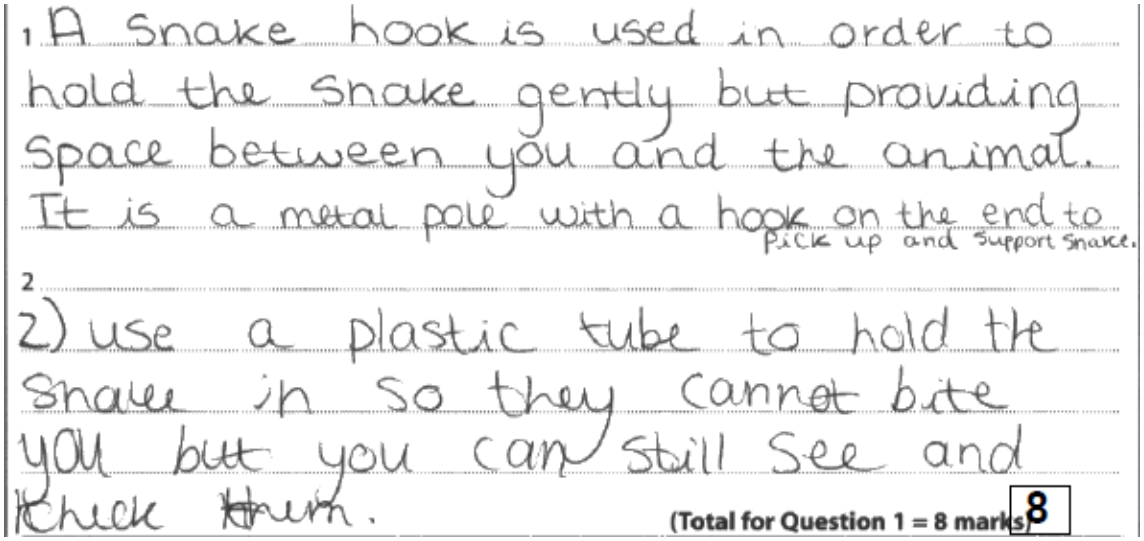
The verb is 'explain', one system is required and two marks are available. This response was rewarded for identifying the olfactory system then expanding it to say pheromones**.**


snakes use olfactory signals to suggest when they are ready to mate + for females to show their fertility - this is done through pheromones

(c) Describe two pieces of equipment used when handling a snake.

Learners used their research well to answer this question, and all the possibilities in the mark scheme were seen in learners' responses. An incorrect response by some learners was a description of pinning

snakes down by the neck. This may be a technique used when dealing with a dangerous situation, but it is a technique, not a piece of equipment. This response identifies two pieces of equipment, then makes another descriptive statement about that equipment, e.g., you can see through the tube to check the snake.


1 A snake hook is used in order to hold the snake gently but providing space between you and the animal. It is a metal pole with a hook on the end to pick up and support snake.

2

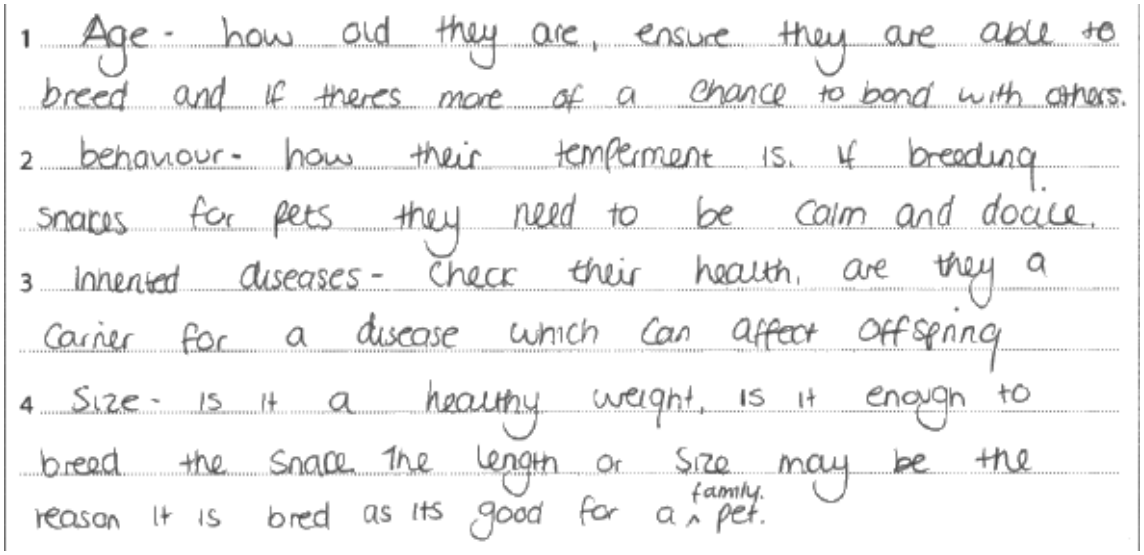
2) use a plastic tube to hold the snake in so they cannot bite you but you can still see and check them.

(Total for Question 1 = 8 marks) 8

2

(a) Give four factors that you would evaluate when assessing an adult snake to breed from.

This question is from section B2 of the specification, 'the evaluation of males, females and young animals.' There is an extensive list of factors there, learners had to ensure the ones they had quoted were applicable to snakes. The potential to be carrying genetic disorders was also added to the list form elsewhere in the specification as it is something that generally would be considered when breeding any animal. The verb is 'give' similarly to question 1a, four statements are all that is required, so this response would have earned the same marks by saying *Age, Behaviour, Inherited diseases and Weight*. The response would be appropriate for an eight mark, 'explain four' question. This is poor exam technique and learners should practice matching their response to the requirements of the question.


1 Age - how old they are, ensure they are able to breed and if theres more of a chance to bond with others.
2 behaviour - how their temperment is. If breeding snakes for pets they need to be calm and docile.
3 Inherited diseases - Check their health, are they a carrier for a disease which can affect offspring
4 Size - is it a healthy weight, is it enough to breed the snake. The length or size may be the reason it is bred as its good for a family pet.

(b) Discuss the factors that Jack should consider, and which species of snake would be most suitable to achieve his aims. You should take into account the desirable characteristics of the species that you have chosen.

This question is the one where learners can demonstrate their understanding of the research they have done. With this question there is no 'correct' answer, the response is a discussion and a recommendation of a particular species. The best responses supported their recommendation with evidence from their research, and often though it is not an absolute requirement they justified their choice by explaining why they had rejected other options. The poorer responses tended to focus on the husbandry requirements of snakes rather than answering the question asked and making a recommendation.
The mark scheme for this question is levelled based, not points based and answers are matched to the band descriptors, so there can be many ways of responding to the question that can be credited.

This response considers several species, why they would or would not be suitable and then makes a recommendation of corn snakes and explains why they have made that recommendation fully. A response in the top mark band.

As Jack wants to stock species with accomodation requirment suitbie for beginners he should be looking into the most popular beginner snakes. Corn snakes are one of the most popular beginner snakes as they only grow to about 150cm and only require a 20 gallon tank, this would be suitable for beginners as they do not grow to big and take up to much room. Boa constrictors are also classed as good snakes for beginners, allow they grow much bigger than a corn snake with the length of 13 feet, this would means the owner would have to buy an expensive larger tank which may not be suitable for a beginner in their home. Green tree pythons are another snake classed as good for beginners. They are a smaller snake being only 4-5 feet long.

This means they would not need a large tank, although they are aboreal and need space to climb and hang.

Jack is looking for a snake that is easy to handle. Corn snakes are the perfect breed for this as they are calm, docile, and none aggressive. Boa constrictors would also suit this as they tolerate being handeld although are alot bigger and unpredictable so may not suit a beginner. Whereas green tree pythons need a much more experienced owner as they can be aggresive when handeling.

Jack wants to breed unusual patterns that will attracked collectors. Corn snakes have many different morphs such as albino, strawberry snow and striped. However it is difficult to breed these morphs. Green tree python also have attractive colours such as blue, green and yellow. Boa constrictors on the other hand do not have many attractive colours as they are mostly found in tan, cream, yellow and green, which may not be unusual enough to sell to a collector. Overall, I think that jack should stock corn snakes as they are the perfect beginner snake being one of the smaller breeds of snakes, non-venemous and easy to handle, making them easy to house, breed and sell as pets. They also come in a large number of morphs to improve interest in them from both collectors and people wanting pets. Corn snakes are also particuarly easy to breed, and breeding can start at 18 months of age unlike the green tree python who are difficult to breed and can only start at 3 and a half years of age.

3

a) Calculate the phenotypic probabilities if a male python that is heterozygous for both genes is crossed with a female albino snake that is heterozygous for the pattern gene.

This is a standard question on this paper, many learners had been well prepared and answered it accurately, the response below demonstrates this. A common issue seen was where learners had learnt a specific type of cross, typically a heterozygous cross giving a 9;3;3;1 ration and tried to make this cross fit that pattern, rather than applying their knowledge to the information given.

(8)

		male			
		PC	Pc	pC	pc
female	Pc	PPCc	PPcc	PpCc	Ppcc
	Pc	PPCc	PPcc	PpCc	Ppcc
	pc	PpCc	Ppcc	ppCc	ppcc
	pc	PpCc	Ppcc	ppCc	ppcc

Phenotypic probability

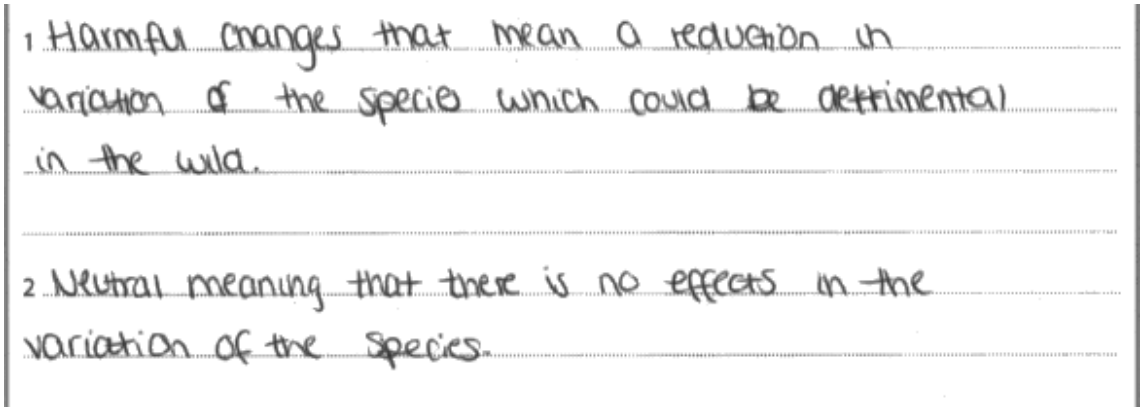
normal brown : normal albino : pinstripe brown : pinstripe albino

++++ ++++ | ++++ ++++ | ++++ | ++++

6 : 6 : 2 : 2

3 : 3 : 1 : 1

(b) **Explain two effects of mutations on variation in a** population.
Effectively there are three possible effects on variation, it increases, decreases, or does not change. Many learners tried to over complicate their answer or wrote about specific types of mutation and tied themselves in knots trying to apply it to variation.
This is a good response demonstrating what was required, harmful mutations reduce variation, neutral mutations do not affect it. The third response that would follow this pattern would have been beneficial mutations increase variation.


1 Harmful changes that mean a reduction in variation of the species which could be detrimental in the wild.

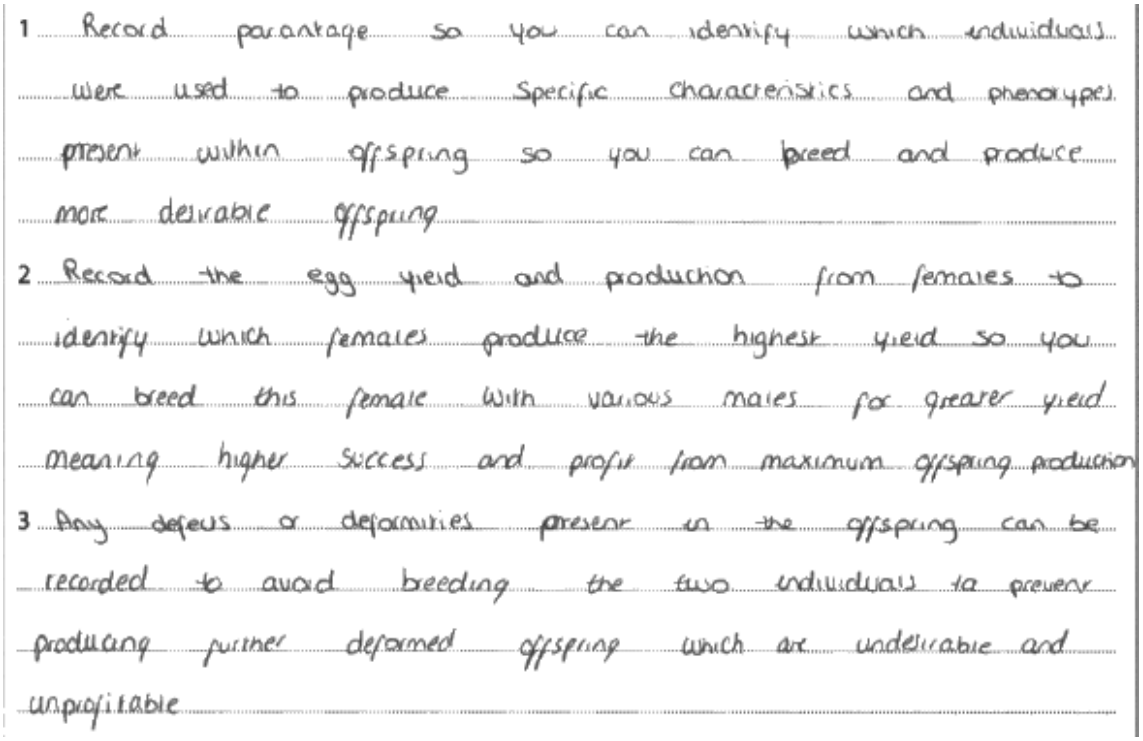
2 Neutral meaning that there is no effects in the variation of the species.

4

a) Explain three reasons for keeping records when you breed snakes.

This question references section B3 of the specification directly. Responses had to be applicable to snakes, and learners had generally tried to ensure that they did apply to snakes. Some learners had mentioned frequency of egg laying, this is not an issue with snakes, it is more appropriate for poultry.

This response demonstrates this, the number of eggs laid by snakes is determined by species and the female's health and weight more than by genetics/past performance.

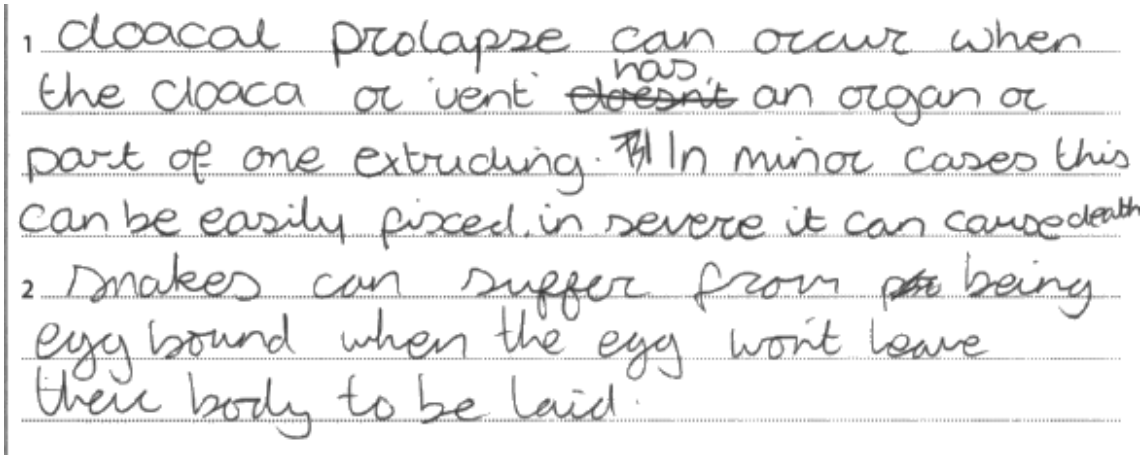

1 Record parentage so you can identify which individuals were used to produce specific characteristics and phenotypes present within offspring so you can breed and produce more desirable offspring

2 Record the egg yield and production from females to identify which females produce the highest yield so you can breed this female with various males for greater yield meaning higher success and profit from maximum offspring production

3 Any defects or deformities present in the offspring can be recorded to avoid breeding the two individuals to prevent producing further deformed offspring which are undesirable and unprofitable

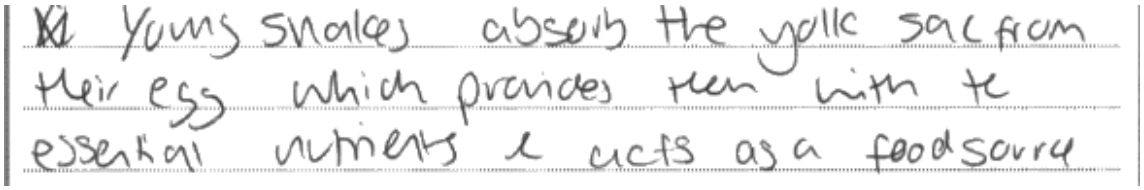
(b)Explain two breeding problems snakes can suffer from.

This response correctly identifies two issues that can affect snakes and expands that identification. Some learners had identified lack of calcification of the eggshell as an issue, this is relevant to birds, not snakes and reptiles that have a soft, leathery shell.


1 cloacal prolapse can occur when the cloaca or vent ~~doesn't~~ has an organ or part of one extruding. In minor cases this can be easily fixed. in severe it can cause death
2 Snakes can suffer from ~~the~~ being egg bound when the egg won't leave their body to be laid.

(c)Explain why young snakes do not need to feed immediately after they have hatched.

Many learners answered this accurately like the response below. Where they had not, they often seemed to suggest the youngster ate the egg, or similar. To gain marks they had to be specific about the yolk providing sufficient nutrition.


Young snakes absorb the yolk sac from their egg which provides them with te essential nutrients & acts as a food sourc

(d)Explain two effects of poor hydration in snakes.

Those learners who gained marks on this question usually referred to problems shedding, some answers did refer to constipation or impaction. A common issue was learners referring to a humid environment rather than the hydration of the snake itself. This response demonstrates a correct reference to shedding and then a correct response about egg formation, this response was not seen often and was awarded under 'any other valid response'

1 Can lead to dehydration, which can lead to dermatitis - retained shed due to inability to produce oily secretion which lubricates and releases old shed.

2 Can lead to SWG eggs- female does not have enough fluid to create eggs which she stores ~~to form~~ during vitellogenesis ~~that~~ and the formation of chorion, amnion and allantois of the egg.

5

(a) Describe three genetic manipulation techniques.

These techniques are listed in section C7 of the specification. As a rule learners had revised them, as in the response below, or they listed three things they could remember about genetics generally.

1 Polymerase chain reaction (PCR) is a laboratory technique used to amplify DNA sequences. used to build duplicate DNA strands.

2 Producing recombinant DNA, B its when DNA molecules are formed by a laboratory methods of genetic recombination that bring together genetic material from multiple sources, creating sequences that would not otherwise be found in the genome Isolation of gene.

3

3) restriction endonuclease, this can cut out a section of DNA including the gene, in a cell.

This response demonstrates how many learners approached this question; this response could be credited for the cloning but the rest of the response is not related to the manipulation techniques asked for.

1 Sex influenced - depending on the temperature of incubation can dap determine sex.

2 Cloning.

3 IVF

(b) Explain positive and negative assortative mating.

This question was well answered, this is an example of the good responses we saw, and it could be credited full marks.

Positive

breeding Similar phenotypes and features so its guaranteed they'll traits be passed down to offspring

Negative

breeding animals with different phenotypes so it can increase variety and genetic diversity. decrease ~~inherit~~ inherited diseases.

6

(a) Evaluate the use of inbreeding for specific characteristics.

This is a question with a levelled mark scheme and learners could approach it in different ways. Many responses were in the context of snakes, an area where inbreeding is used regularly, but some excellent responses about dogs, for instance, were seen and could be credited as the question does not ask for a specific type of animal to be discussed. The response below demonstrates a good awareness of both the benefits and drawbacks of the approach, although the evaluation is inferred rather than explicit and could be improved by a more explicit evaluation. This response is in level 3, but not right at the top because of the inferred evaluation.

Inbreeding is where animals who are closely related are bred together. This can be useful when wanting to pass down traits that are already dominant in the family. This ensures down the family line they will always inhibit that specific characteristic. For instance, grandparents and grandchildren have the same unique pattern, so breeding them togethers creates a larger possibility the off spring will have a unique pattern too. However, inbreeding can cause heredity diseases which rise major problems in animals. The genetic diversity decreases therefore there is no new gene pools as its bred within.

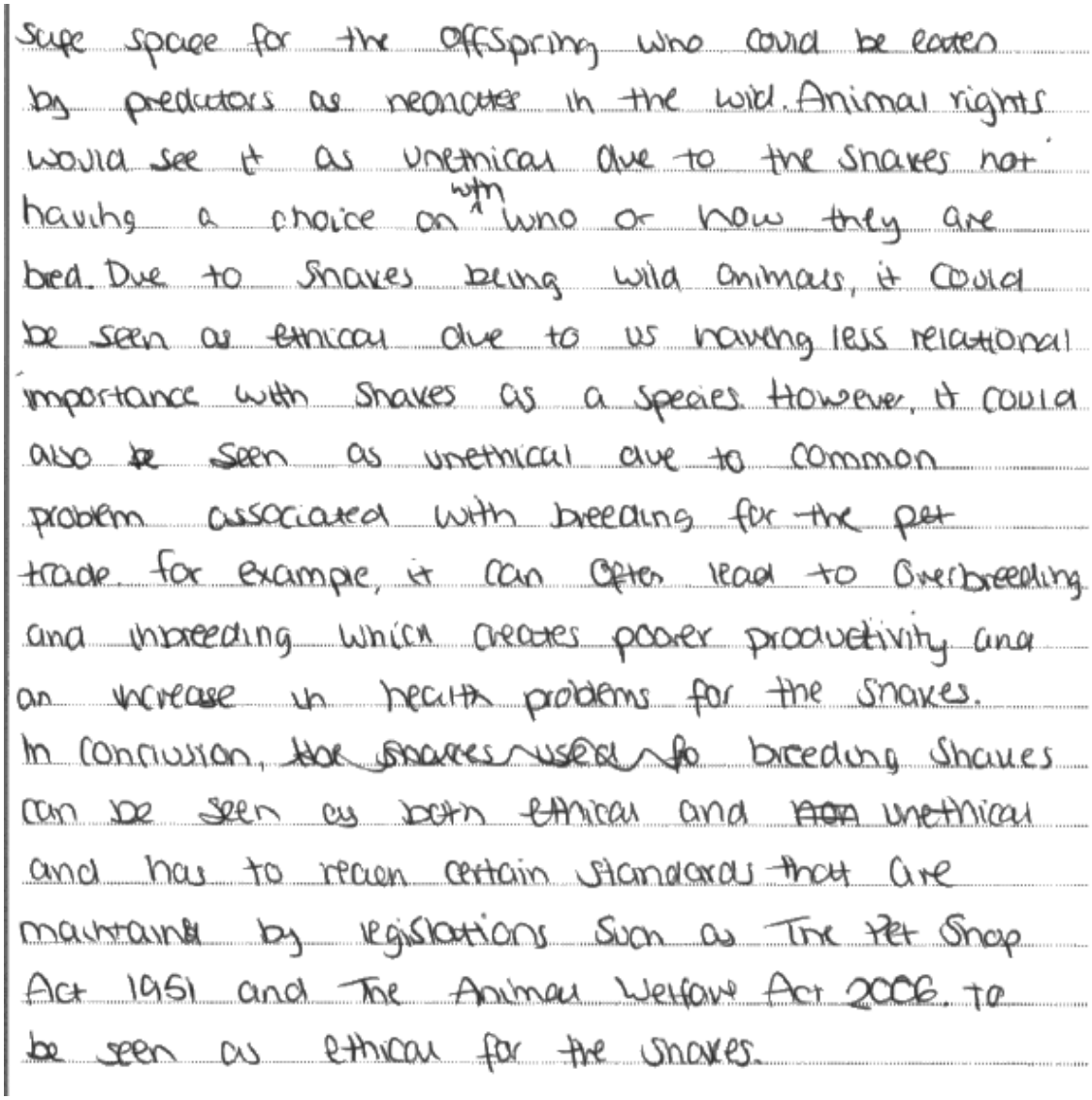
Inbreeding for specific characteristics is a cheaper and efficent way of ensuring the trait shows up however, recessive genes can be passed into offspring meaning other characteristics can show up. Inbreeding can be classed as unethical due to the risc of higher heath problems and unnecessary culling if some offspring dont ~~let~~ inhibit the specific traits.

(b) Discuss the ethical issues of breeding animals such as snakes.

Many learners enjoyed answering this question, it is a subject they are interested and have opinions on. Unfortunately, this led to many answers being very one sided with little mention of the positive aspects of breeding animals even though the stem suggested conservation as a possible discussion point, it was a common opinion that if an animal species is dying out, they should be left to without any converse argument. Many responses such as the one below quoted a source about escaped snakes changing the ecosystem by eating the wildlife, without any critical thought about the likelihood of that in the UK. A vast majority of responses painted the pet breeding trade in very dark terms, assuming they are all 'puppy farmers' only interested in money and with no care for animal welfare. This is a very one-sided view of the situation and answers would have been improved by a more balanced consideration of the trade in breeding pet animals.

This response discusses different aspects of animal breeding accurately and thoroughly but generally from a negative point of view. There is reasoning and a logical discussion, so it is a level three response.

Breeding animals such as snakes can be seen as ethical as they can be bred for conservation purposes. This protects the snakes as a species and allows them to breed safely. It also benefits and protects endangered species that would go extinct otherwise. However, it can be seen as unethical due to religion. Some religions such as Christianity believe we should not mess with Gods creation therefore we should not captively breed snakes. On the other hand, human-centred would believe it to be ethical as we can use the snakes to breed for the pet trade and create a profit from them. The breeder would have to correctly meet the 5 needs of the Animal Welfare Act 2006 for it to be seen as ethically correct in terms of animal welfare. It could also have unknown knock on effects to the rest of the snakes. It may affect the ecosystem if too many snakes are bred and released back into the wild which is unethical. It could be seen as ethical as it protects the snakes from pain, suffering, injury and disease that they may encounter in the wild whilst attempting to breed. Furthermore, it also creates a



safe space for the offspring who could be eaten by predators as neonates in the wild. Animal rights would see it as unethical due to the snakes not having a choice on who or how they are bred. Due to snakes being wild animals, it could be seen as ethical due to us having less relational importance with snakes as a species. However, it could also be seen as unethical due to common problem associated with breeding for the pet trade. for example, it can often lead to overbreeding and inbreeding which creates poorer productivity and an increase in health problems for the snakes. In conclusion, the snakes used for breeding snakes can be seen as both ethical and unethical and has to recieve certain standards that are maintained by legislations such as The Pet Shop Act 1951 and The Animal Welfare Act 2006. to be seen as ethical for the snakes.

Summary

- Learners should ensure that their notes are detailed based on the information in the prerelease material
- Learners should apply their notes to the scenario they are presented with, there were instances seen where learners had used their notes to write a description of how to look after snakes, that did not answer the question asked.
- 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.
- Conversely, learners often write single statements where 2 or 4 marks are available for explain or describe questions and then lose the opportunity to gain full marks

- The specification and sample assessment materials (SAMs) are located on the BTEC National qualification webpage located here.