



June 2018

**Level 3 National in Equine
Management
Equine Structure, Form and Function
(20108)**

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications come from Pearson, the world's leading learning company. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications website at <http://qualifications.pearson.com/en/home.html> for our BTEC qualifications.

Alternatively, you can get in touch with us using the details on our contact us page at <http://qualifications.pearson.com/en/contact-us.html>

If you have any subject specific questions about this specification that require the help of a subject specialist, you can speak directly to the subject team at Pearson. Their contact details can be found on this link:

<http://qualifications.pearson.com/en/support/support-for-you/teachers.html>

You can also use our online Ask the Expert service at <https://www.edexcelonline.com>
You will need an Edexcel Online username and password to access this service.

Pearson: helping people progress, everywhere

Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your learners at: www.pearson.com/uk

June 2018

Publications Code 20108K_1806_ER

All the material in this publication is copyright

© Pearson Education Ltd 2018

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>

Equine Structure, Form and Function (Unit 1) 20108K.

Grade	Unclassified	Level 3			
		N	P	M	D
Boundary Mark	0	9	18	35	52

Introduction

This was the first time that this exam had been sat. All questions were attempted by some learners, with some learners demonstrating a clear ability to apply the knowledge learnt from the specification. Responses from the learners generally showed good coverage of the unit specification and that good use of the Sample Assessment Materials and past papers had been made. There were numerous examples of learners using their knowledge in applied situations throughout the paper, indicating a good level of understanding.

Introduction to the Overall Performance of the Unit

This paper was able to evidence effective ramping of the questions, with there being an obvious drop off point where pass level learners struggled to access marks in questions which were targeted at merit or distinction learners. The 8-mark questions were also highly effective in discriminating the level of learner as the learners had to provide specific examples of disease prevention to obtain maximum marks.

One area of weakness was the learners ability to read and understand information provided in a graphical format

In questions which tested higher level skills, explanations and discussions were provided. Where learners did well, they had a good understanding of key areas and concepts and were able to relate these throughout the paper. The most able learners were able to apply the knowledge in a range of scenarios, including complex situations where a number of cognitive steps were required.

In the questions requiring an extended response, learners struggled to access higher marks, this was generally due to not understanding the question, i.e. learners discussed aerobic respiration rather than anaerobic respiration or discussed tissue types rather than cell shape and structure.

Finally, learners would still benefit from additional coaching on exam technique, in particular the way to structure answers for “explain” questions to ensure maximum marks are achieved as this continues to be where marks are unnecessarily lost.

Individual Questions

Question 1a

This was a labelling question worth two marks. Learners were provided with an image of an equine skeleton and were asked to label two of the bone (mandible and humerus). As a pass level question this was answered well with most learners being able to access both of the marks. A variety of answers were accepted including lower jaw and jaw. Where learners did lose marks it was generally due to them confusing the humerus with the sternum.

Question 1b

This was a one mark multiple-choice question where learners had to identify the area on the image which showed the spongy bone by placing a tick in the appropriate answer box. Most learners were able to access the marks for this question by correctly identifying the correct letter. There was no trend in the wrong answers provided.

Question 1c

This was a 4 mark question where learners had to explain two functions of bones. Most learners were able to state two separate functions (commonly protection and structure) but only merit learners were able to offer explanations and therefore access all 4 marks. Some learners wrote their answer in a way which included the same answer twice, for example structure and shape and as a result were not awarded the full range of marks. Explanations which were awarded marks include providing a specific example of bones which offered protection, i.e. ribs protect lungs.

(c) Explain **two** functions of bones. (4)

1 Bones protect the organs inside the body. For example, the rib cage protects the lungs.

2 They allow the body to move. The hip joint allows us to move our leg.

4 marks awarded. Two marks for each function (Protection and Movement) and two marks for each linked response, in case the examples

(c) Explain **two** functions of bones. (4)

1 One function of bones is that it moves the skeleton.

2 they protect the organs in your body.

2 marks awarded, functions of bone have been identified but not explained.

Question 1d

This was a 2 mark question where learners were asked to explain what a facet was in relation to bone. This question was not well answered, with only a very small proportion of learners accessing the marks by providing a correct explanation, indicating that the learners were not familiar with the term. It is important all technical terms within the specification are taught to learners to maximise access to marks.

Question 2a

This was a labelling question worth two marks. Learners were provided with an image of an equine eye and were asked to label two parts (retina and optic nerve). As a pass level question this provided a mixed response, most learners were able to access 1 mark by correctly identifying the optic nerve but the retina was incorrectly labelled by a number of learners resulting in only one mark being achieved.

Question 2b

This question was worth a maximum of 4 marks and asked the learners to explain two features of the equine pupil which aids vision.

learners at pass level often misread the question and provided generic answers about the eye and its location on the head rather than specifically about the pupil, as a result they did not access any of the marks, incorrect answers also discussed the function of the lens and the retina. Some pass learners were able to comment on the fact that the pupil changes size to control the amount of light let in but were not able to offer a second feature and therefore only accessed two out of the 4 possible marks.

(b) Explain **two** features of the pupil that aid vision in equines.

1 rods and cones, they help due to cones detecting change in colour and rods detecting change in light

2 retina, light hits this and it helps with focusing, this aids vision by helping the horse focus on objects and see more clearer.

0 marks awarded, the learner has discussed features of the eye, not of the pupil

Question 2c

This was the first describe question of the paper. Learners were asked to describe the role of the tapetum lucidum for 4 marks. This question showed a mixed response. A number of learners were not familiar with the term and as such provided a wide variety of incorrect roles. Where learners were familiar with the term they, provided detailed answers in the form of clear sentences describing what they knew about the tapetum lucidum and as a result were able to access between 2 and 4 marks.

(c) Describe the role of the tapetum lucidum.

(4)

The tapetum lucidum stills an important role. Horses are nocturnal animals, because of this, they have a tapetum lucidum. This acts as a natural resistance to glare, so the horse doesn't get blinded by the sun. It also reflects ^{only} light back into the eye allowing for ~~each~~ enhanced vision in low light, which helps the horse see potential threats in the dark.

4 marks awarded. The learner has recognised the role of the tapetum lucidum in night vision, discussing two functions (reducing glare and aiding night vision) and offering a brief explanation as to how they (work amplifying light)

Question 3a

This was a 2-mark question where learners had to explain one behavioural sign of oestrus in a mare

Virtually all learners were able to access 1 of the two available marks by identifying a behavioural sign of oestrus. Learners provided a range of answers including changes of temperament and visual queues. However very few learners were able to explain why sign occurred and as a result did not obtain full marks for the question.

3 (a) Explain **one** behavioural sign of a mare being in heat.

(2)

they attract male attention
because they are Squarting the
stallion can smell it and
know the mare is in season.

2 marks awarded, 1 mark for the identification of squirting and 1 mark for explaining why the behaviour occurs.

3 (a) Explain **one** behavioural sign of a mare being in heat.

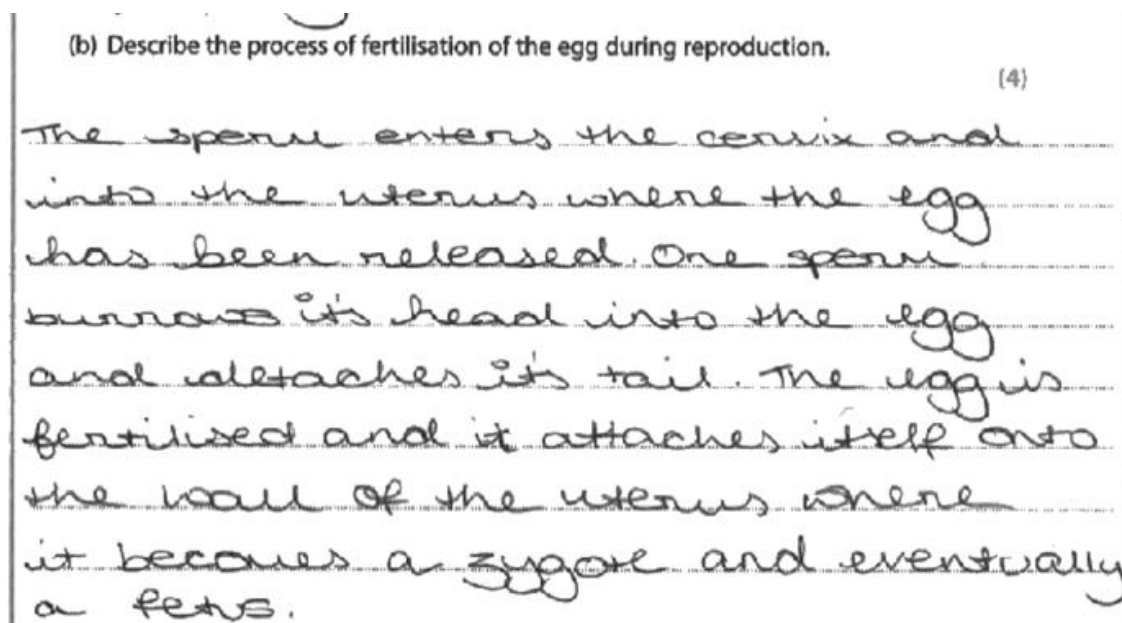
(2)

Squirting.

1 mark awarded, the learner has correctly identified a behavioural sign but has offered no explanation.

Question 3b

This was a 4 mark, describe question with learners being asked to describe the process of fertilisation during egg production. As a describe question it was generally well answered with learners providing detailed accounts. Marks could be awarded for the discussion of copulation, sperm release and travel and well as egg production and travel. However many learners lost focus and continued to describe what happens after fertilisation occurs, including embryo implantation and foetus development and therefore were not awarded any marks for this part of the discussion.



4 marks awarded. The learner has provided a detailed description of the fertilisation process, including the use of appropriate terminology. The have discussed the requirement for sperm and how this moves to the egg.

Question 3c

This was a 2 mark question where learners were provided with a graph showing the hormonal control of the reproductive cycle of a mare and asked to identify the two days when ovulation occurred.

Only a very small proportion of learners were able to access the marks for this question, they did not appear to understand or were not familiar with the graph. As the question asked for the two days when ovulation occurred the learners should have been able to recognise two days where the same hormonal actions were occurring even without any knowledge of the cycle, but they were not able to apply this level of logical thinking to the question

Question 3d

This was a 4-mark question where learners had to explain two effects that occur as a result of decreasing levels of oestrogen.

Only the more advanced learners were able to access any of the marks for this question by understanding the impact of oestrogen on the mare. For those learners who were able to read the graph they were awarded marks for stating what happened to the other reproductive hormones as oestrogen levels dropped. Those learners with knowledge of oestrogens role were able to discuss changes within the uterus or the mare coming out of season and how this affected the mare's behaviour. However many learners failed to access any marks for this question.

Decreasing levels of oestrogen can cause a number of changes.

(d) Explain **two** effects that occur as a result of decreasing levels of oestrogen.

(4)

1. The decreasing level of oestrogen causes the LH to also decrease.

2. It also causes the level of progesterone to increase.

2 marks awarded. The learner has provided two examples of other hormonal changes based on the graph but did not provide any further explanation.

Question 4a

This was a 2 mark question where learners had to describe the location of the pituitary gland. The question was generally well answered, with most learners achieving at least one mark. As a two mark response learners should have been aware that just stating “in the brain” would not be adequate to achieve both marks, and that additional information would be required (where in the brain). Marks were not awarded for “near the brain”.

4 (a) Describe the location of the pituitary gland in equines.

(2)

The pituitary gland is attached to the hypothalamus,
which is located at the base of the brain.

2 marks awarded. The learner has provided a descriptive response about where in the brain the pituitary gland is located.

Question 4b

This was a 4-mark question where learners were asked to explain two links between the pituitary gland and reproduction.

This was a more advanced question, requiring learners to understand what the pituitary gland was and which hormones it controlled in relation to reproduction.

Only distinction level learners were obtaining more than 1 mark for this question as were able to identify specific functions rather than just identifying it as hormone control. There were also a number of learners who confused the pituitary gland with the pineal gland and therefore provided incorrect answers.

(b) Explain **two** links between the pituitary gland and reproduction.

(4)

1. It secretes LH which is a hormone used to bring the mare into season and helps the follicles to grow.

2. It also secretes FSH.

3 marks awarded. Produces LH (1 mark) to help follicles grow (1). Produces FSH (1 mark)

Question 4c

This was a 4-mark question where learners had to describe how Anti Diuretic Hormone (ADH) helps maintain water balance in equines

The previous questions had been about hormonal control of reproduction and despite the question clearly asking about water balance a significant number of learners provided an incorrect answer relating to reproduction and therefore did not access any of the marks. However some learners provided very detailed accounts of the role of ADH and were able to access full marks.

(c) Describe the effect of antidiuretic hormone (ADH) in equines. (4)

ADH is released when the brain needs to tell the kidneys to release or absorb water. If there is too much urine in the ~~kidneys~~ ^{kidneys} ~~in the body~~, ADH is released by the pituitary gland to the ~~absorb~~ ^{absorb} more water, because it is very concentrated. The urine is then removed from the body (by toilet) and will show as a very strong yellow to brown ~~color~~ ^{colour}, which should indicate that you need to drink more water. So the kidneys can reabsorb, and your body is rehydrated again.

(Total for Question 4 = 10 marks)

4 marks awarded. ADH produced in brain (1) and acts on kidneys (1). Increases the reabsorption of water (1) results in concentrated urine (1)

Question 5

This was the first 8-mark question of the paper where learners had to discuss anaerobic respiration.

As a banded question there were 3 marks available for pass learners and these were obtained through basic statements including the process not involving oxygen, the process causing a buildup of lactic acid and occurring during times of high demand (e.g. exercise). Pass level learners were not able to access additional marks with a greater depth of knowledge. A number of learners did not obtain any marks as a result of confusing aerobic and anaerobic respiration.

Anaerobic respiration is the respiration without oxygen. It will occur when the horse becomes exhausted. The word equation for this is = oxygen + glucose \rightarrow lactic acid. This will occur once the horses muscles are creating so much lactic acid it cannot be effectively removed. The lactic acid will begin to build up. This will only occur once the horse is exhausted, fatigue is the horses inability to continue work at the same intensity, exhaustion is the inability to continue work at all. The spleen can release more red blood cells to help transport oxygen quicker. It will occur when the inhibition of oxygen does not meet the requirements of the muscles, the muscles will be producing too much waste for the body to effectively remove and will require more oxygen than it can supply.

(Total for Question 5 = 8 marks)

8 marks awarded. A detailed and thorough account of anaerobic respiration with accurate information provided throughout. There is a clear link between the oxygen demand and the muscle function and the consequences of anaerobic respiration.

5 Discuss the process of anaerobic respiration.

anaerobic is when the air is leaving - its the lungs releasing releasing breath and sending out the carbon dioxide through the gases exchange.

So you breath in the air goes down into the lungs into the alveoli and the gases exchange happens the air exchanges and diffuses into the blood while the carbon dioxide diffuses into the alveoli the makes the journey up the bronchioles and up through the Bronchi then the trachea and up and out the nostrils.

0 marks awarded. The learner has discussed the movement of oxygen through the body during aerobic respiration.

Question 6a

This was a 1-mark question where learners were asked to state the location of gliding joint

Many learners provided generic answers such as "leg" and as the leg contains many joints this was not accepted as a correct answer.

Question 6b

This was a 4 mark question where learners were asked to describe how the structure of a joint allows movement. There was a good response for this question many learners accessing the full 4 marks by providing a detailed description of the shape of some joints and the movement they allow. However a number of other learners provided no information on the structure of the joint, just repeating the question that they allow movement.

(b) Describe how the structure of a joint allows movement.

(4)

a joint comprises of a place where two bones meet and perform a movement.

There's different type such as ball and socket or sliding. Each have cartilage and synovial fluid which lubricate the joint so it doesn't grind on bone. Allowing easy movement.

They also have tendons and ligaments with nerve impulse which tell the joint where to move.

4 marks awarded. The learner have discussed the presence of synovial fluid (1) and its role (1) and then the presence of cartilage (1) to prevent grinding (1)

(b) Describe how the structure of a joint allows movement.

(4)

Joints are a ball and socket so you can bend. Different joints move differently to others to allow different movement.

0 marks awarded. While the learner has stated 1 type of joint they have incorrectly identified its action and made no reference to the shape of the joint.

Question 6c

This was a 4 mark question where learners were asked to explain how antagonistic muscles function to provide movement. There was a mixed response to this question with most learners being able to access a minimum of 1 mark by stating that the muscles worked in pairs. However some learners lost focus and discussed sliding filament theory rather than paired muscle action and as a result lost marks.

(c) Explain how antagonistic muscles function to provide movement.

(4)

Antagonistic muscles move in pairs, when one muscle contracts to move a bone, the other muscle contracts to put the bone back in place.

3 marks awarded. Muscles work in pairs (1), one contracts to move a bone (1) another contracts to move the bone back (1). The final mark was not awarded as there was no discussion of the fact that while one muscle contracts the other must relax.

Question 6d

This was a higher level 4 mark question where learners had to compare the structure and function of ligaments and tendons. The question was well answered with learners being clean on the role of tendon and ligaments and how they differ. Very few learners confused the function of tendons and ligaments.

(d) Compare the structure and function of ligaments and tendons.

(4)

Tendons are used to connect muscle to bone. Ligaments are used to connect bone to bone. Ligaments have more elastin in them than tendons. Tendons are tightly bundled, where as ligaments are not so tightly bundled.

4 marks awarded. 2 marks awarded for discussion of roles, 2 marks awarded of discussion of structures.

Question 7a

This was a 2 mark recall question where learners were required to state two behavioural changes seen when a horse becomes too cold. This was a very well answered question with most learners achieving the full two marks. A range of correct answers were provided.

7 Effective thermoregulation is essential for equines.

(a) State **two** behavioural changes that may be seen when a horse becomes too cold.

(2)

- 1 A horse may attempt to stand close to other horses or objects that produce heat
- 2 They may move around more to warm up

2 marks awarded. Stand close to others (1), move around (1). Had this question been an explain question the learner would have been awarded the linked response marks as they have provided clear explanations as to why the behaviours occur.

Question 7b

This was a 4 mark question where learners had to explain how vasodilation helps maintain a constant temperature, while most learners knew something of the process they often gave a brief overview of vasodilation and vasoconstriction rather than providing a detailed explanation on the workings of vasodilation only, and as result often struggled to get about 2 marks.

(b) Explain how vasodilation helps maintain a constant temperature.

(4)

As the blood vessels dilate, they radiate more heat from the surface of the skin to help cool down if the temperature is too high. If the temperature is too low, they constrict to prevent heat from radiating out and therefore warm up the horse.

4 marks awarded. Blood vessels dilate (1) heat radiates (1) from the surface of the skin (1) cooling horse down (1)

(b) Explain how vasodilation helps maintain a constant temperature.

(4)

The blood cells expand or contract to help maintain heat or release it.

0 marks awarded, no correct information provided.

Question 7c

This was a 4 mark question where learners had to discuss the role of hair in maintaining an equine's temperature. This was a very well answered question with learners accessing most of the marks. Marks were awarded for discussing seasonal coat changes as well as piloerection allowing a number of ways of answering the question.

(c) Describe the role of hair in maintaining an equine's temperature.

(4)

Handwritten answer on lined paper:

Hair is very important. In the cold, the hairs will stand up in order to trap air and keep the horse cool. It also grows thicker in winter to trap air. If it is too hot then it will shed and become thinner or lay flat so warm air cannot get in.

4 marks awarded. Discussion of piloerection and its ability to warm a horse up and cool it down (3 marks) and Seasonal coat change (1 mark).

Question 8

This was an 8-mark question where learners were asked to discuss how the shape of cells are related to tissue function.

This was a more advanced question and while the answer is banded distinction learners were gaining 3 or more marks by making a clear referenced to cell shapes and their function. Many lower learners were discussing tissue types rather than cells and therefore not accessing the marks as a result the average mark achieved for this question was low.

An equine body comprises millions of cells, forming different types of tissue.

8 Discuss how the shape of cells are related to tissue function.

Cuboidal cells have a spherical nucleus, and line the kidney tubules, whilst also being found in glands, to allow the function of synthesising hormones and secreting waste.

Blood is a connective tissue. It contains red blood cells, which contain haemoglobin, and have no nucleus to allow room for carrying oxygen. The circular shape allows the oxygen to be carried to respiring tissues, and contained. Blood also contains white blood cells, which have a low surface area in order to ingest pathogens and create antibodies to fight off infection.

Columnar cells have an elongated nucleus, to stretch and line the stomach and intestines. The long and thin shape allow the cells to expand to maintain the lining.

Squamous cells have a horizontal nucleus, and make up the outer layer of skin, so that the skin can expand and absorb water.

Nervous tissue is made up of nerve cells, which have a low surface area in order to conduct electrical signals around the body, and to make up the CNS - brain and spinal cord.

(Total for Question 8 = 8 marks)

Nervous Tissue

Skin

Blood =

Connective

WBC

RBC

Cuboidal → spherical, glands & kidney tubules.
Columnar → elongated, line stomach & intestine
Squamous → horizontal, main, heart, blood vessels.

TOTAL FOR PAPER = 80 MARKS

8 marks awarded. A detailed discussion of a range of cell shapes has been provided with a good depth of knowledge demonstrated. There are clear links between the structure and function of each cell type.

The shape of cells relates to tissue functions in a few ways. Different tissues are for different things so need to be shaped differently for their job for example the ~~head~~ wings have many different sections that need more tissue than other parts of the body. Larger parts of the body have more cells to create larger area of tissue whereas smaller parts of the body need less cells because there is not as much tissue. The amount of cells also is affected by how strong the tissue is. The stronger the tissue, the more cells. The amount of cells can also be affected by the ~~the~~ organ's job is, if it is flexible and needs movement like the heart, then it will need ~~less~~ more cells to give it that flexible way about it so it can pump blood around the body.

0 marks awarded. The learner has discussed the role and structure of tissues, not individual cells and the information provided is vague.

Summary

Based on their performance on this paper, learners should:

Carefully read the question and keep the answer focused on what the question is actually asking. i.e if the question is about vasodilation information on vasoconstriction will not obtain marks, if the question is about the process of fertilisation then any processes after the point of fertilisation will not be rewardable.

Avoid answers which are similar to other answers provided for the same question i.e structure and shape.

Tailor their responses based on the command word in the question, eg. explain will require an expansion of a point, discuss requires looking at both possible points/arguments, evaluation will require some form of conclusion.

Ensure any information contained within the question is not provided as part of the answer.

Develop a greater depth of knowledge on the eye.



Llywodraeth Cynulliad Cymru
Welsh Assembly Government



For more information on Edexcel qualifications, please visit
<http://qualifications.pearson.com/en/home.html>

Pearson Education Limited. Registered company number 872828
with its registered office at Edinburgh Gate, Harlow, Essex CM20 2JE