



Examiners' Report/ Lead Examiner Feedback

Autumn 2016

BTEC Level 1/Level 2 Firsts in
Information and Creative Technology

Unit 2: Technology Systems
(20562_E01)

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 websites at www.edexcel.com or www.btec.co.uk for our BTEC qualifications.

Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

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: www.edexcel.com/teachingservices.

You can also use our online Ask the Expert service at www.edexcel.com/ask. You will need an Edexcel 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 students at: www.pearson.com/uk

July 2016

Publications Code 20562E_Version 1_ER

All the material in this publication is copyright

© Pearson Education Ltd 2016

Introduction

This report has been written by the Lead Examiner of Unit 2: Technology Systems. It is designed to help you understand how learners performed on this test. The report provides an analysis of learner responses for each question. You will also find example learner responses, with commentary.

The external assessment for this unit is an onscreen, on-demand test. A number of tests are live within the 'test bank' at any one time and learners are allocated tests randomly. It should be noted that this report refers to the Second test retired from the live 'test bank'. Whilst not all learners will have sat this particular test, the Lead Examiner's comments provide valuable feedback, relevant across different tests for this unit.

We hope this will help you to prepare learners for the external assessment for this unit.

Grade Boundaries

Introducing external assessment

The new suite of 'next generation' NQF BTECs now include an element of external assessment. This external assessment may be a timetabled paper-based examination, an onscreen, on-demand test or a set task conducted under controlled conditions.

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 (Distinction, Merit, Pass and Level 1 fallback).

Setting grade boundaries

When we set grade boundaries, we look at the performance of every learner who took the 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 should be for a particular grade.

When our experts set the grade boundaries, they make sure that learners receive grades which reflect their ability. We have awarded grade boundaries for the first time for our new next generation BTECs, so this means that a learner who receives a 'Distinction' grade on a particular test will have similar ability to a learner who has received a 'Distinction' grade on another onscreen test. Awarding grade boundaries is conducted to ensure learners achieve the grade they deserve to achieve, irrespective of variation in the external assessment.

Variations in externally assessments

Each test 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 test, because then it wouldn't take into account that a test might be slightly easier or more difficult than any other.

The grade boundaries for the second onscreen, on-demand test to be retired from the test bank are shown below.

Grade	Unclassified	Level 1 Pass	Level 2		
			Pass	Merit	Distinction
Boundary Mark	0	11	21	31	41

General comments

The test uses a variety of mechanisms to test learner understanding including autoscored items, which make use of multiple choice, drag and drop and other interactive mechanisms, as well as more traditional questions which require more open responses.

The test is designed to increase in demand as learners progress with earlier questions targeting Level 1 and Level 2 Pass, and later questions targeting Level 2 Pass, Merit and Distinction.

At Level 1 and Pass learners are typically required to recall facts, perform basic procedures and apply basic understanding to familiar topics and scenarios. As the test progresses learners are expected to apply more in depth understanding; questions at this level may require a learner to 'describe' or 'explain' their understanding which should prompt linked, in depth responses that show broader, deeper knowledge of the subject matter. Where appropriate learners should apply their response to a given vocational scenario. The final question of the test requires an extended response and is designed to differentiate at Pass, Merit and Distinction levels.

In this iteration of the test, most learners were able to respond well to questions earlier in the test, especially where questions related to more common, everyday computer use. Where learners' performances were less successful, some key characteristics were evident:

- i) Learners often did not respond in a way that was expected by the command verb. For example, responses to 'explain' questions often did not provide suitable linked expansions and demonstrated only a superficial understanding of the subject matter.
- ii) Many learners did not demonstrate sufficient breadth and depth of knowledge across the whole specification, particularly in relation to more 'technical' subjects.
- iii) Where contexts and scenarios were provided, learners often did not apply their knowledge appropriately and provided only generic responses that did not fully address the demands of the question.

Generally learners coped well with the onscreen testing mechanisms and were able to complete the test in the allotted time. However performance in some areas could be improved, particularly in questions where more open responses are required.

Centres should seek to support learners and improve performance by considering the following three areas:

- i) Develop understanding of the requirements of particular command verbs including how structure appropriate linked responses.
- ii) Application of knowledge within a given/factual context.
- iii) Construction of responses for the final extended writing questions including selecting knowledge areas appropriate for the given scenario and linking chains of reasoning to provide evidence of deeper understanding.

Question 1

**Targeted Specification Area: Learning Aim A3.5
Computer hardware devices (multi-functional devices)**

The majority of learners were able to correctly identify that the tablet computer was the multi-functional device out of the group of four devices.

Question 2

**Targeted Specification Area: Learning Aim B2.2
analogue and digital data (conversion)**

Most learners were able to identify that Analogue and Digital were the two signal types required in the given diagram; most learners were able to place them correctly. Where learners typically did not achieve both available marks this was generally for placing the signal labels in the wrong order. It is advised that as well as learners being taught the signal types, they also explore them in contextual ways. In this test it was clear that many learners knew the names of the different signal types but were unable to apply them correctly.

Question 3

**Targeted Specification Area: Learning Aim A3.7 Computer
hardware devices (automated data capture)**

Performance of learners varied significantly here. While many were able to correctly identify input devices in the given diagram, where learners did not perform well there were two main issues that prevented learners from achieving marks:

1. Learners did not correctly read the question and provided the given example as an answer rather than 'two other' input devices as required by the question.
2. Many did not use the given diagram to help and provided input devices that, may be part of some systems they have experienced, were not in the image provided and so were not valid in this context.

Centres are encouraged to work with learners to develop sound exam techniques and to build the use of stimulus, such as diagrams and images in to their exam preparation.

Question 4

**Targeted Specification Area: Learning Aim C2.7/2.8
programming concepts (data types & data structures)**

4(a)

Performance on this part of the question was the stronger of the two with the majority of learners who gained credit achieving it on this question by correctly identifying the given data was an integer.

4(b)

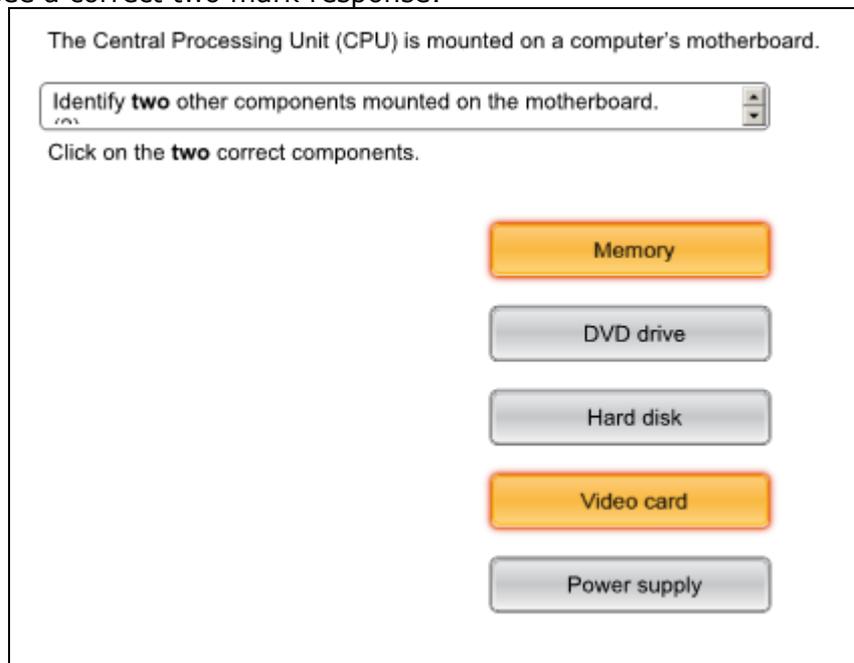
While this part was less successfully answered than part 'a', higher achieving learners were able to correctly identify that an array would be used to store the monthly sales figures.

Question 5

**Targeted Specification Area: Learning Aim B1 Internal
components of a computer**

Performance on this question was generally quite good with learners typically able to identify at least one component that could be mounted on to the motherboard.

Here we see a correct two mark response:



The Central Processing Unit (CPU) is mounted on a computer's motherboard.

Identify **two** other components mounted on the motherboard.

Click on the **two** correct components.

Memory

DVD drive

Hard disk

Video card

Power supply

The screenshot shows a digital interface for a question. At the top, it states 'The Central Processing Unit (CPU) is mounted on a computer's motherboard.' Below this is a text input field containing the prompt 'Identify two other components mounted on the motherboard.' Underneath the input field is the instruction 'Click on the two correct components.' To the right of the text are five buttons, each representing a computer component: 'Memory', 'DVD drive', 'Hard disk', 'Video card', and 'Power supply'. The 'Memory' and 'Video card' buttons are highlighted in orange, indicating they are the correct answers. The other three buttons are grey.

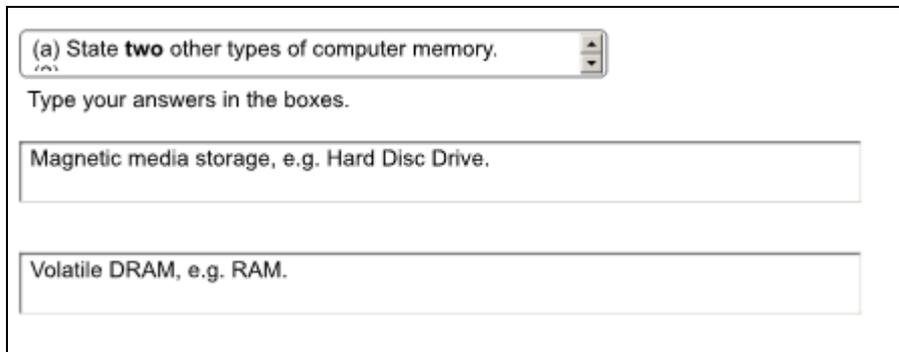
Question 6

Targeted Specification Area: Learning Aim B1.3/1.6 Internal components of a computer (memory and storage)

6(a)

Many learners were able to correctly identify at least one type of memory, typically RAM. However on the whole the performance on this question was quite disappointing with many learners failing to gain marks. The main issue for many learners appears to be a shortfall in understanding of basic terminology with many not understanding the difference between memory and storage.

In this example we see that the learner's answers do not fully understand the difference between memory and storage and has provided an example of each. One mark is awarded out of a possible two:



(a) State **two** other types of computer memory.

Type your answers in the boxes.

Magnetic media storage, e.g. Hard Disc Drive.

Volatile DRAM, e.g. RAM.

6(b)

Learners did markedly less well on this part of the question than on part 'a'. Where learners were successful they typically were able to identify that Flash memory was non-volatile. However, many learners were unable to provide a suitable answer and often either repeated the examples given in the question which did not achieve the marks.

Question 7

Targeted Specification Area: Learning Aim C3.8 Operating Systems (factors to consider when upgrading)

7(a)

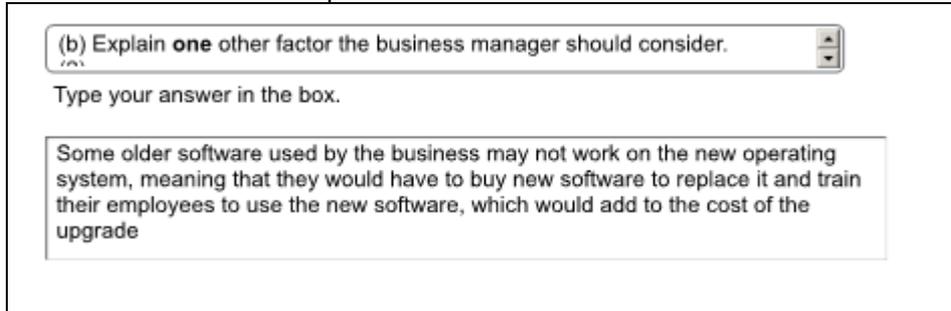
Most learners were able to achieve a mark here for successfully identifying a cost related to the upgrade of an operating system.

7(b)

Many learners were able to identify an additional factor of upgrading, most commonly, issues identified were related to compatibility with current systems. While many learners did achieve one mark here many were unable to provide a suitable linked response to gain the second mark. Centres are encouraged to work with learners on developing exam technique in terms of how to construct responses that meet the demands of the given command word. For example in this case, the

command word 'Explain' requires a point/fact to be identified to achieve the first mark; the second mark is achieved by expanding the point.

Here we see a two mark example:



(b) Explain **one** other factor the business manager should consider.

Type your answer in the box.

Some older software used by the business may not work on the new operating system, meaning that they would have to buy new software to replace it and train their employees to use the new software, which would add to the cost of the upgrade

"...older software...may not work" (1) "meaning they would have to buy new software" (1)

Question 8

Targeted Specification Area: Learning Aim C1.3 Software (hierarchical structure of a computer)

Learners generally did well here with most able to gain at least one mark of the possible two and many able to gain all available marks.

Question 9

Targeted Specification Area: Learning Aim C3.6/3.7 Operating systems and applications (productivity applications)

9(a)

This was typically answered well with the majority of learners able to identify that a desktop publishing package would be used to produce a magazine advert.

9(b)

This part was answered less well than part 'a' with many learners unable to identify a benefit of using suites of productivity applications.

Question 10

Targeted Specification Area: Learning Aim B1.12 Internal components (how memory affects performance)

This question was generally not answered well with only a relatively small number of learners accessing marks. A large number of learners were unable to access marks due to limited technical vocabulary; many learners for example provided answers relating to storage rather than memory which did not gain them marks.

Where learners did access marks typically learners gained only one of the two marks available.

Here we see a 1 mark response:

Explain **one** reason why a higher memory specification would improve Anthony's game playing experience.

Type your answer in the box.

The more memory that a device has, the faster that it will process data. So if Anthony upgraded his phone's memory, then the phone would process the game's data faster, and reduce the loading times.

'...the faster it will process data' (1) – This would be just enough to gain credit, although it does not provide a reason for the increase there is enough understanding of the impact of the higher memory specification to gain a mark. The response could be improved by providing a linked reason for the increase processing speeds (e.g. data can be retrieved from RAM more quickly (than secondary storage))

The second part of the learner response 'would process data faster, and reduce loading times' is a valid response but is in essence a repeat of the point already made, which has already been credited, so does not gain second mark

Here we see a two mark response:

A higher memory specification could either mean that his friend's phone has more memory or has faster memory. Having more memory would help Anthony store more data in the phone's RAM there for the phone would have to load data from its slower main storage less. This would reduce the number or duration of his loading screens. Having faster memory would also have a similar effect, by reducing the time it takes for the data to be read off the memory by the CPU it would reduce the duration or frequency of the loading screens.

Question 11

Targeted Specification Area: Learning Aim B1.9 Internal components (features of the CPU)

11(a)

This question was generally answered well with the majority of learners able to achieve a mark typically for identifying that a processor with more than one core means the processor could process more instructions simultaneously.

Where learners did not achieve marks this was typically due to responses that relied on generic answers. Typically learners who did not achieve a mark provided

responses such as 'makes the processor faster', or similar responses related to speed which were not valid.

11(b)

Learners were typically able to identify at least one feature of the CPU that would affect its performance. However many learners were prevented from achieving again, due to poor understanding of technical concepts and vocabulary, with many giving responses that were either not features of a CPU or presenting them in such a way that it was not possible to identify any understanding of the topic. Centres are encouraged to work with learners to develop core technical vocabulary

Question 12

Targeted Specification Area: Learning Aim B2.4 Analogue and digital data (binary representation)

Learners generally gained at least two of the available three marks. Where learners did not achieve all three marks this was often due to incorrect responses in part 'c'; where learners were unable to identify the amount of memory required for an 8 digit binary number.

Question 13

Targeted Specification Area: Learning Aim A 3.4 Computer Hardware (storage devices)

Learner performance on this question was generally quite poor with many not gaining any marks. Where learners did not gain marks this was, as in other questions, due to reliance on generic responses (e.g. faster) without any clear understanding of the given subject matter.

Where learners did gain marks this was typically when they were clear about the specific advantages of each of the given drive for example that the SSD has faster load times so would be best for storing the operating system and core programs.

Here we see a three mark response:

He can put the important files, that he needs to access quickly, like the operating system and possible games, onto the SSD. This means that the computer should boot faster and the performance and loading times of games will be increased due to the speed of the SSD. He can then put the less important or smaller files on his HDD, which will free up space on his SSD. Documents such as pictures and music do not really need to be stored on an SSD as the load times are fast enough to begin with, so there will not be a noticeable advantage if you put them on an SSD.

'...important files...like the operating system...on the SSD' (1) 'This should mean the computer should boot faster' (1)
'...less important files on his HDD, which will free up space' (1) this is just enough for a mark against the mark point for splitting data and OS on to different drives, the expansion provided for this point does not provide a valid reason for splitting the data so does not gain the final mark.

Question 14

Targeted Specification Area: Learning Aim C1.1 Operating systems (hardware management - drivers)

Learners did not perform well on this question with many unable to provide answers that gained credit. Where learners did gain credit they were often restricted to one of the two marks available for providing responses that identified that the driver allowed the computer to communicate with or control peripherals.

Here we see an example of a 2 mark response:

One way device drivers assist in the management of peripheral devices is by telling the computer how to interpret an input from a peripheral or how to send the correct output. This is especially important in specialist devices such as highend mics (which input sound at a very high bit rate) as the computer may not normally understand what to do with the input data.

'tell a computer how to interpret input from a peripheral' (1) 'to send the correct input' (1) – The response shows enough understanding of the process of providing a link between devices and providing control instructions to gain the marks. Although a key word (peripheral) has been spelt incorrectly it is clear what the learner means so credit is still given.

Question 15

Targeted Specification Area: Learning Aim C2.5 Computer programming (terms used in computer programming)

15(a)

This question was generally not answered well with very few learners able to explain the purpose of a declaration statement. Where learners did achieve marks typically only one of the two marks were achieved with few learners able to provide a linked response.

An example one mark response:

Declaration statements are used to start a variable or constant that can contain values represented by characters.

'used to start a variable' (1) – the learner has provided enough to gain a mark but does not provide a linked explanation.

15(b)

This question was answered well in comparison to part 'a' but again overall performance on this question was disappointing with many learners not able to gain marks. Where learners did gain marks the majority were able to provide responses that gained one of the two marks available. Typically answers focused on programmers not needing to rewrite code but a deeper understanding was not generally demonstrated.

Question 16

Targeted Specification Area: Learning Aim A4.1 Computer networking (types of network - PAN)

16(a)

Performance on this question was quite disappointing with surprisingly few learners able to identify the diagram as an example of a Personal Area Network (PAN).

16(b)

Many students were able to identify an advantage of Bluetooth; typically that it is less prone to interference than other wireless connections. However few learners were able to provide a suitable, linked expansion.

Question 17

Targeted Specification Area: Learning Aim C1.6 Software (Characteristics of High level programming languages)

This question was often not answered well, with many learners unable to provide a suitable advantage of using pre-written libraries. Where learners did achieve marks this was typically for identifying that using prewritten libraries helps reduce development time/speeds up the process of creating a programme.

Here we see a one mark response:

Explain **one** reason why this is an advantage of using a high-level language.

Type your answer in the box.

It means that the programmers are less likely to make mistakes as it is written perfectly for them in advance.

The learner provides just enough understanding to be awarded a mark for the code having been pretested. To gain the second mark the response would need to provide a clearer, more accurate, response that the code used would have been tested by others therefore it would result in more reliable code.

Question 18

Targeted Specification Area: Learning Aim A3 computer networking

The extended writing questions provide learners with an opportunity to demonstrate depth and breadth of knowledge on a given area by deconstructing a given scenario/subject and providing numerous factual points and linked chains of reasoning.

Most learners made a good number of individual points, such as identification of benefits of wireless over cabled in terms of portability of the devices used in the network, but did not provide appropriate expansion, explanation or reasoning and as such were restricted to mark band 1.

While many learners did provide some context and explanation of some of their identified point and as such moved to mark band 2 very few learners were able to provide sufficient evidence for performance at mark band 3. Overall however, the number of learners producing responses suitable for bands 2 and 3 were very disappointing.

Again as in earlier parts of the test, many relied on generic response such as 'a wired network is fast' but provided very little context or explanation to demonstrate understating of the topic. Learners' core technical vocabulary and understating was often very limited and as such learners were unable to express anything other than surface knowledge.

While quality of written communication, in terms of spelling, punctuation and grammar does not affect the mark awarded to responses (marks are allocated based solely on quality of content), the quality of the structure of the answers could be improved in order to access higher marks. Responses are often not logically linked and reasoning, explanations and expansions are often superficial or not appropriately linked to the given scenario.

At the lower mark band levels, there are often errors in the use and application of technical vocabulary and basic technical knowledge, which often hamper demonstration of understanding.

Here we see a response that is placed at the top mark band 2.

James owns a successful kitchen design and installation business.
The business has six designers, an administrator and two buyers.

All staff currently use stand-alone desktop computers.
James is considering networking the computers in his showroom and administration office.

Discuss the impact on the business and its staff of networking the computers.

Linking the computers in the business through a network would have many benefits to the company, the first of these is that resources such as scanners and printers can be shared between all of the computers, which would save James money as there only needs to be one printer and scanner in the business rather than one per computer.

Connecting the printers using a network also allows all information to be stored in one central location, allowing all employees to access whatever data is necessary for their work. This would improve the efficiency of the business as it allows any employee to share and collaborate on project without the need to share data through removable storage devices such as USB flash drives. Employees could also work on the same version of a document shared over their network rather than having to work on an out-of-date version.

James would also be able to save money by only needing to install new software on the network rather than on every computer, as every computer attached to the network could use the network's software.

A network of employee computers also allows the employees to easily communicate using methods of communication such as instant messaging, which would improve working efficiency as employees at James' business do not have to move around to communicate, allowing them to get more work done.

However, as all the data is stored in one place James would need to consider extra security measures, as the information stored on the network would be more susceptible to hackers than if it were stored on a standalone computer, he would be advised to consider anti-virus software and firewalls to protect sensitive and potentially damaging information if his competitor's were to obtain it, which would remove his competitive advantage.

He may also wish to consider access levels to protect data within the network as inexperienced employees could damage or steal data, access levels would only allow users access to what is necessary for their job.

In conclusion, it would be good for James to set up a network of his company's computers as the benefits and competitive advantage gained from the ability to share information and resources outweighs the potential risks, which could easily be avoided by careful counter-measures.

The response covers a range of points and in most cases provides a suitable expansion or justification for each. The learner's section on the advantages of networking is very good and covers a range of valid points that link ideas well.

The section on the disadvantages has been done less well. The point regarding data being more susceptible to hackers because it is on a network is not entirely valid and the learner does not justify or clarify this point. The need for a firewall is valid, but the point made about this protecting data if it has been obtained by competitors, again is not valid.

Overall a range of points have been described but the response is unbalanced. Therefore the response clearly meets the descriptor for mark band 2.

Summary points:

Based on their performance on this test, candidates are offered the following advice:

- Improve the range of knowledge of key terminology to ensure the requirements of the paper are understood, questions can be accessed, and responses can be presented in a clearer and more accurate way.
- Ensure that where contexts are provided responses make use of the given information to demonstrate deeper understanding of the targeted content.
- Develop exam technique to fully address the demands of questions in particular, understanding the requirements of command verbs.
- Open response questions, such as those that use explain, describe, etc. as the command verb (and extended questions) require responses that link chains of reasoning.
- In the final question that requires a more extended response, ensure examples are clear, concise and are appropriate for the given scenario.

Further copies of this publication are available from
Edexcel Publications, Adamsway, Mansfield, Notts, NG18 4FN

Telephone 01623 467467
Fax 01623 450481
Email publication.orders@edexcel.com

Order Code 20562E_Version 1_ER Summer 2013

For more information on Edexcel qualifications, please visit
www.edexcel.com/quals

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