Cambridge Assessment International Education

Cambridge IGCSE™

INFORMATION AND COMMUNICATION TECHNOLOGY **0417/21**

Paper 2 Document Production, Databases and Presentations **February/March 2023**

MARK SCHEME

Maximum Mark: 70

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the February/March 2023 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

PUBLISHED

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Step	Document Production	Mark	
1	Document saved with the file name **stemnews**	**1**	EV
2	Automated page numbers left aligned Candidate name, centre number and candidate number right aligned	**1**	Doc
3	Screenshot evidence to show that the *ST-subhead* style has been defined Style name correct based on normal 1 mark sans-serif 14 centre 1 mark all capitals, bold single 0 9 1 mark	**3**	EV
4	Custom style names displayed as a list in the style manager/organiser	**1**	EV
5	ST-title style modified to meet specified formatting. Style modified and based on normal 1 mark sans-serif 36 centre bold, underline single 0 0 1 mark	**2**	EV
6	Subtitle text entered below title **Innovations in Science Education**	**1**	Doc
7	*ST-subtitle* style applied to the text entered in step 6	**1**	Doc
8	ST-bullet style applied to specified text	**1**	Doc
9	*ST-Subhead* style applied to each subheading	**1**	Doc
10	Page layout changed so that the subheading *Why is a STEM approach to learning important?* and all following text is displayed in **two** equally spaced columns 1 mark with **1** centimetre spacing between the columns. 1 mark	**2**	Doc
11	A new row inserted *above Chemistry* 1 mark This data entered into this row: **Biology | 50 |40** 1 mark	**2**	Doc
12	First row cells merged and the text centre aligned	**1**	Doc
13	*ST-table* style applied to the table. No data wrapped and table and gridlines fit within column 1 mark Gridlines show when printed 6-point space after the table 1 mark	**2**	Doc

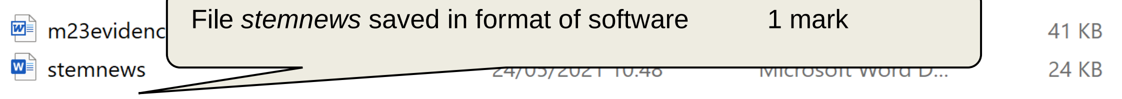
Step	Document Production	Mark	
14	The image **m23scientist.jpg i**mported and placed correctly	**1**	Doc
15	The image is reflected so that the flask is on the right.	**1**	Doc
16	The image is formatted so that it is resized to 2 cm height with aspect ratio 1 mark In correct paragraph aligned top of text and left margin with text wrap on 1 mark	**2**	Doc
17	Spell check and proofread the document.	**1**	Doc
		TOTAL	**24**

Step	Document Production	Mark	
18	File **m23tests.csv** is imported the field *English* not imported 1 mark Correct fields and data types used 1 mark *Registration_Code s*et as the primary key 1 mark	**3**	EV
19	The files **m23staff.csv** and **m23houses** are imported with correct field names and data types 1 mark The identified field set as the primary key 1 mark second primary key set 1 mark	**3**	EV
20	Edit a record (Freya Harris appears in report one if edited).	**1**	Report 1
21	One-to-many relationships created between the three tables	**1**	EV
22	A report produced which: Selects records where *Gender* is F and *Science* mark is 80 or more 1 mark *Class_Code* contains 6 1 mark shows only the fields *Family_Name, Gender Teacher_Name, Science, Maths, Computer_Science, Design_Technology, House_Name* and *Class_Code* in this order 1 mark sorts the data into ascending order of *Teacher_Name* and then descending order of *Science* 1 mark counts the number of students in the report 1 mark has the label *New science group size* to the left of the number 1 mark has a page orientation of landscape and fits on one page wide 1 mark **STEM Science Class for 2024** as a title displayed in a larger font size 1 mark has candidate name, centre number and candidate number in the footer of the report with no other items showing. 1 mark	**9**	Count formula in EV 8

Step	Document Production		Mark	
23	A report produced which: selects records where Class code is 5C 1 mark House_Name is Mars 1 mark shows only the fields *Gender*, *Family_Name, Given_Name, House_Name, Maths, Computer_Science* and *Teacher_Name* 1 mark sorts the data into ascending order of Gender 1 mark then ascending order of Family_Name 1 mark has a page orientation of portrait and fits on a single page 1 mark calculates the average *Maths* mark in this selection positions this number below the *Maths* column 1 mark displays this average mark with no decimal places 1 mark displays the label **Average Maths Scores** to the left of this value 1 mark has the title **Year Five Test Report for Mars** displayed at the top of the page 1 mark screenshot evidence provided to show the formula used to calculate the average mark for Maths. 1 mark		**11**	See EV 9
24	A report exported in pdf format 1 mark with the file name **YEAR 5** 1 mark		**2**	EV 10
			TOTAL	**30**

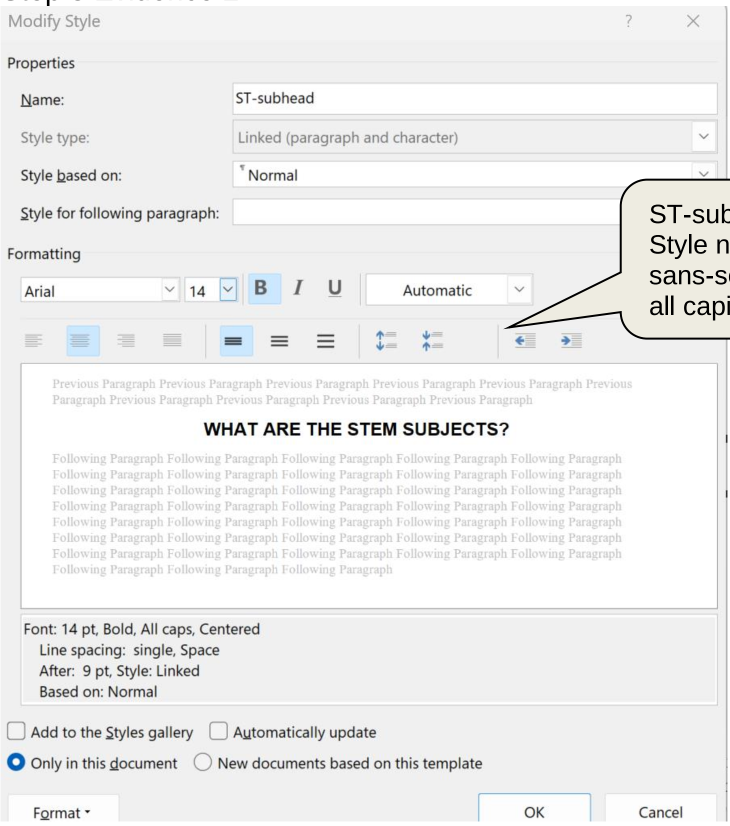
Step	Document Production		Mark	
25	A presentation created consisting of six slides in title and bullet layout		**1**	
26	Candidate details in same position on all slides		**1**	
27	Slide 1 Layout title and subtitle in centre and middle with no bullet		**1**	
28	Change layout of slide *Our top performing students* to a title and two place holders		**1**	
29	Vertical bar chart created from correct data Category axis labels displayed in full A legend is included girls / boys Values on tops of bars Chart has correct title	1 mark 1 mark 1 mark 1 mark 1 mark	**5**	
30	Chart placed on right and data from file as a table on left Format table with all gridlines visible Text in top row of the table formatted centre aligned Larger font Text in all rows vertically aligned	1 mark 1 mark 1 mark 1 mark 1 mark	**5**	
31	Print *Our top performing students* slide as full page Print the slides as handouts 2 to a page	1 mark 1 mark	**2**	
			TOTAL	**16**
			Overall total	**70**

Step 1 Evidence 1



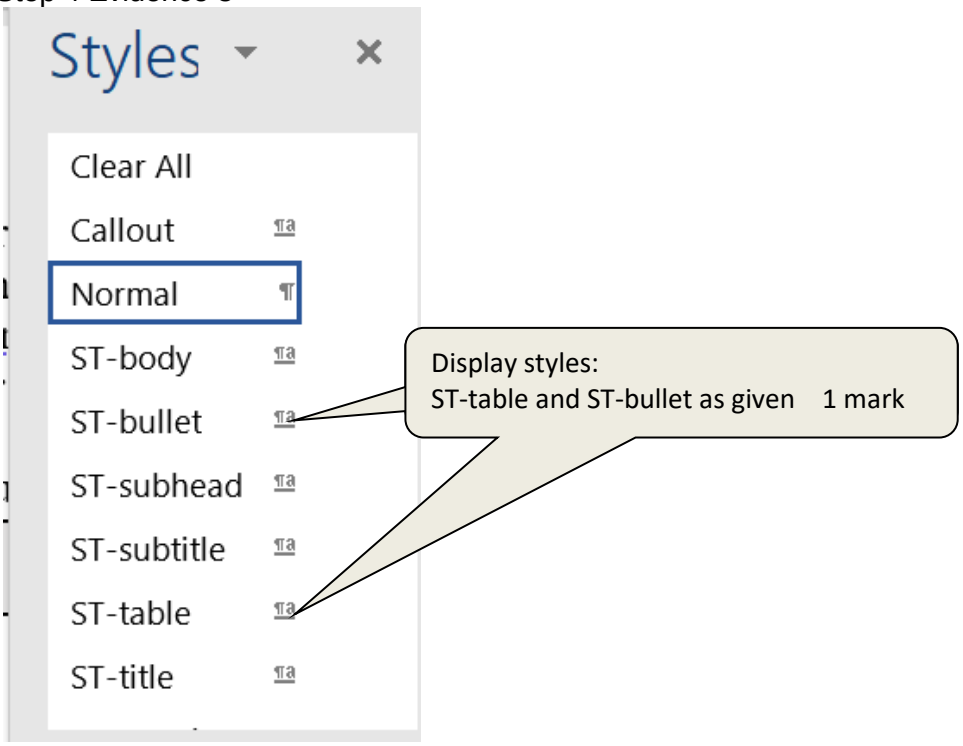
File *stemnews* saved in format of software 1 mark

Step 3 Evidence 2

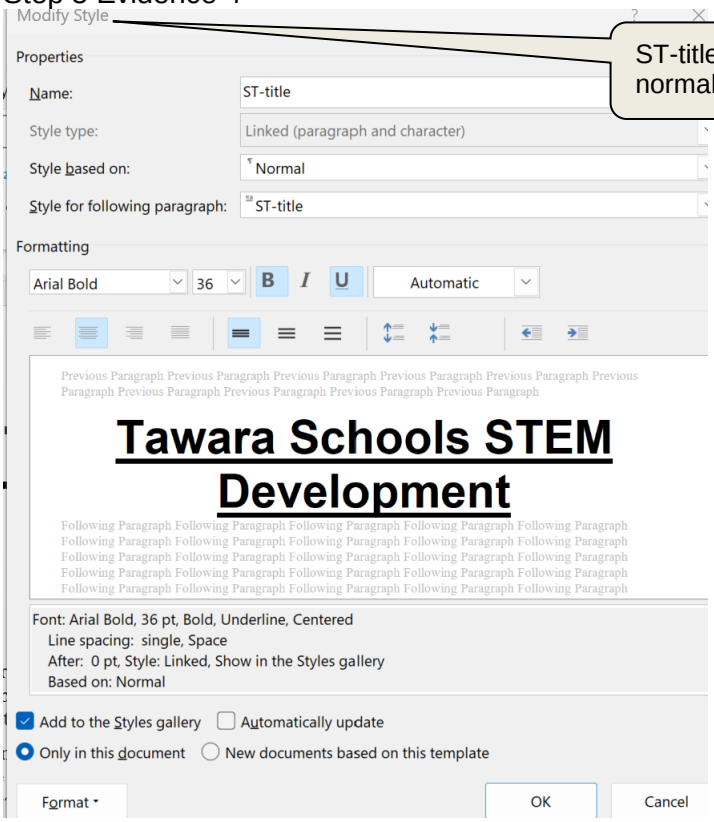


ST-subhead style
Style name correct based on normal 1 mark
sans-serif, 14pt centre 1 mark
all capitals, bold, single Ls, 0 before, 9 after 1 mark

Step 4 Evidence 3

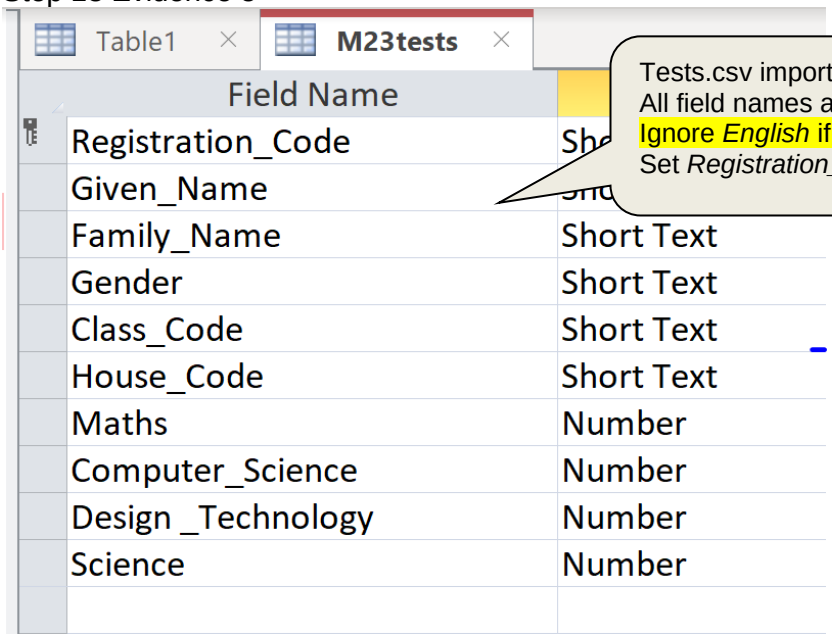


Step 5 Evidence 4



ST-title modified, name correct, based on normal / default 1 mark

Step 18 Evidence 5



Tests.csv imported without the field *English* 1 mark
All field names as given, correct data types 1 mark
Ignore *English* if imported No ID field
Set *Registration_Code* as the primary key 1 mark

Step 19 Evidence 6

Table1 | M23tests | M23houses | **M23staff**

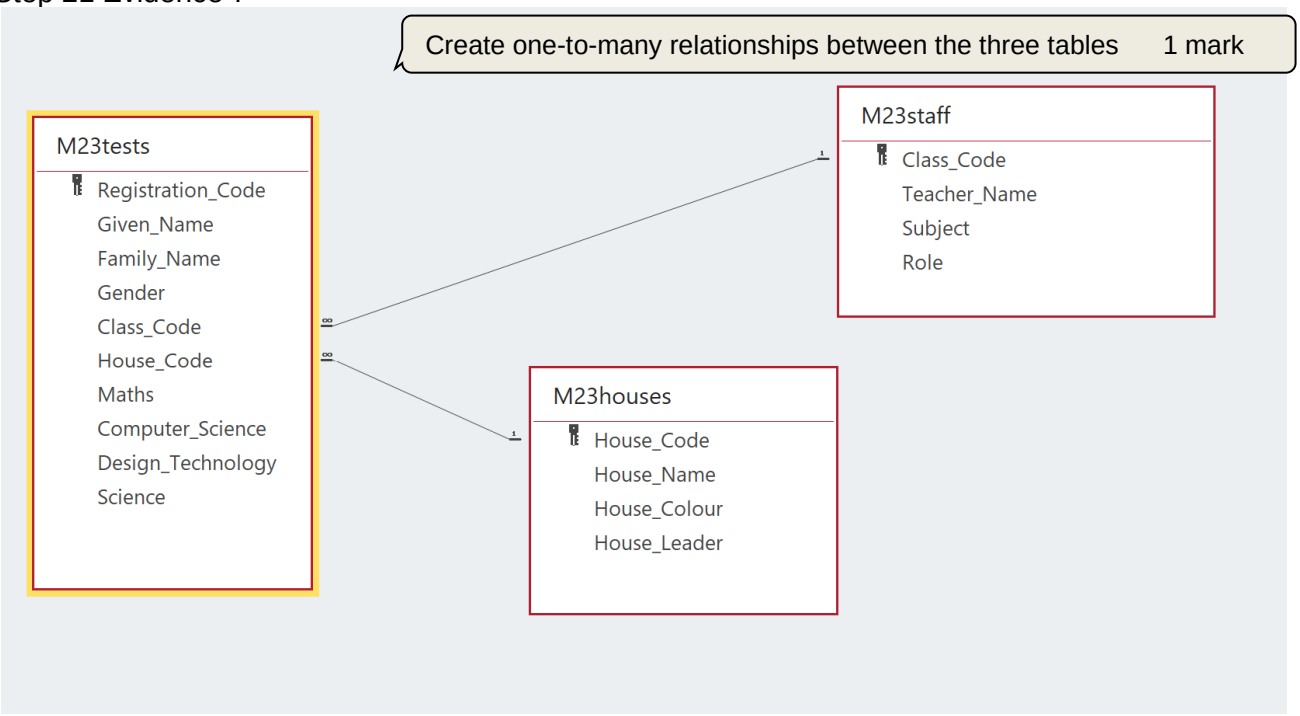
Field Name	Data Type
Class_Code	Short Text
Teacher_Name	Short Text
Subject	Short Text
Role	Short Text

Staff table - all field names as given, correct data types 1 mark
Staff table - Class_Code set as primary key 1 mark
Houses table - all field names as given, correct data types and correct primary key set 1 mark

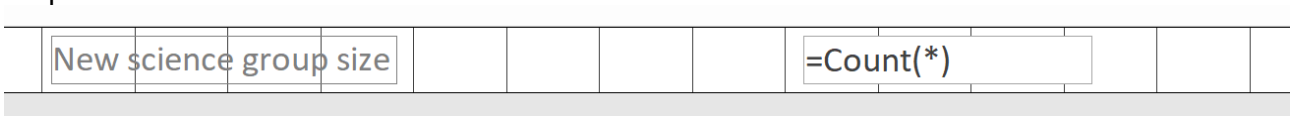
Field Name	Data Type
House_Code	Short Text
House_Name	Short Text
House_Colour	Short Text
House_Leader	Short Text

Step 21 Evidence 7

Create one-to-many relationships between the three tables 1 mark



Step 22 Evidence 8



Screenshot evidence of calculation count of records 1 mark

Step 23 Evidence 9

Screenshot evidence of calculation of average on *Maths* field 1 mark

Step 24 Evidence 10

File exported as PDF 1 mark
… PDF saved as YEAR 5 1 mark

ST-title style applied to title text 1 mark
Sans-serif, 36pt, centred, bold, underlined, single, 0pt before/after

Tawara Schools STEM Development

Innovations in Science Education

ST-subtitle text entered 100% accurate 1 mark
Supplied style ST-subtitle applied 1 mark

WHAT ARE THE STEM SUBJECTS?

The acronym STEM stands for Science, Technology, Engineering and Mathematics. The[illegible] subjects have always been a part of the educational curriculum; so, what is different about the STEM approach? Instead of studying each "subject" in isolation, the STE[illegible]ulum seeks to integrate learning across these areas through, for [illegible]lied approach.

Change page layout from here to end to two columns 1 mark
Two equal columns with 1 cm space 1 mark

ST-subhead style applied to 7 subheadings and match EV2 1 mark

[illegible]based learning prog[illegible] and careers in those fields. STEM educat[illegible]s a newer model of blended l[illegible] hands-on activities. This model aims to give students th[illegible]tunity to experience different ways of learning and problem-solving.

WHY IS A STEM APPROACH TO LEARNING IMPORTANT?

ST-bullet style seen in EV3 and applied to correct text
(square bullets aligned to left margin serif 11pt in single line spacing) 1 mark

[illegible] requirements that many more jobs will require digital skills [illegible] in their workforce and many traditional jobs done by humans will be replaced by machines or AI. Currently 75 per cent of jobs in the fastest growing industries require workers with STEM skills. To be competitive, the Tawaran workforce needs people who can adapt to a changing workplace.

The continual advances in technology are changing the way our students learn, connect and interact each day. STEM empowers those people with the skills to succeed and adapt to the changing world.

INTEGRATED STEM FOR ALL

While science subjects have been viewed in many places as the ones most suited to boys, the gender gap is narrowing as girls are encouraged to develop their interest and skills in the STEM subjects. This does not mean that girls are channelled into the natural sciences while boys take up the majority of computer science or physics/maths routes. The STEM subjects are for all and may develop some of these broader skills:

- working in teams
- logical thought
- critical thinking
- problem solving
- project management
- developing own solutions.

This style of learning focusses on higher level thinking rather than on tests and memorisation. These skills will help them to succeed in any field, even if they do not pursue a career directly in a STEM field of work.

WHY IS STEM SO IMPORTANT?

Another reason why STEM is important is thanks to emerging opportunities in organisations and the industry which address the lack of ethnic and gender diversity. Events such as the Robogals Conference, hosted earlier this year at the University of Sussex, are designed to encourage more women and girls into engineering.

1

Footer page number left aligned, candidate details right aligned 1 mark

Candidate name, number and centre number

ENCOURAGING GIRLS TO TAKE STEM SUBJECTS

The STE
integrate
perceptio
to lose c
perceptio
choices.
what girls

Our schools aim to empower girls from an early age, challenging those myths and misconceptions. We plan to raise the participation of girls in the core STEM subjects to realise the potential of all our pupils.

Current participation of our year 10 in these subjects		
Subject	*Girls (% of year group)*	*Boys (% of year group)*
Maths	*50*	*90*
Physics	*10*	*80*
Biology	*50*	*40*
Chemistry	*10*	*80*
Design Technology	*15*	*45*
Computer Science	*5*	*75*
ICT	*90*	*25*

We show them
change the wo

While girls a
performance i
matter of perce

There are mor
in astronomy a
Your students can research some of these distinguished female scientists. They may also study women working in everyday science related roles.

Import the correct image and place in correct paragraph 1 mark
Reflect the image so that the flask is on the right 1 mark
Resize the image to 2 centimetres high with aspect ratio maintained 1 mark
Align top of text and left margin with text wrapped 1 mark

Row 1–3 columns merged and text centred 1 mark
Insert a new row above Chemistry 1 mark
Enter data for Biology into this row 1 mark
ST-table style seen in EV3, applied to rows 2 to 9 only 1 mark
Serif, 11pt, italic, left, single, 0 before/after
No data wrapped, gridlines fit within column, 6 pt space after table 1 mark

OPPORTUNITIES IN THE DIGITAL WORLD OF WORK

In the UK, less than 10 percent of women make up the engineering workforce, while in the US, only around a quarter of those in STEM occupations are women. Similar statistics are reported across the world in male-dominated industries such as engineering and technology.

Will the gender disparity in male-dominated industries ever change? The answer seems to be yes – but gradually. Helping to speed up the process are various organisations offering scholarships for women preparing for careers in male-dominated industries. Often, the funding is accompanied by additional support, including mentorship and special events or workshops.

As the world of work develops, there are few career fields that will not require some interaction with digital processes either directly or indirectly. It is vital that everyone prepares for this new world of work, whether through a familiarity with ICT or more specialised subjects such as computer science and the use of technology in a vast range of study subjects. No one should get left out through lack of choice or opportunity.

MOVING INTO WORK OR HIGHER EDUCATION

The broad, integrated approach to learning provided through a STEM
e young people for many paths in life. These may include
practical, on-the-job learning and skills development.
many routes through higher education in the vast range
udy at undergraduate or post graduate levels. Look them
ed at the career paths you could choose.

Spellcheck and proofread the document 1 mark
Document complete/paragraphs intact, landscape, styles retained, no widows/orphans, split list or table, columns balanced at top, consistent spacing, no blank pages

2

Candidate name, number and centre number

STEM Science Class for 2024

Family_Name	Gender	Teacher_Name	Science	Maths	Computer_Science	Design_Technology	House_Name	Class_Code
Flynn	F	Bostock	99	69	61	94	Neptune	6B
Abbott	F	Bostock	98	82	64	84	Jupiter	6B
Hammond	F	Bostock						6B
Nelson	F	Bostock						6B
Archer	F	Bostock						6B
Hart	F	Bostock						6B
Murphy	F	Bostock						6B
Williamson	F	Bostock						6B
Watts	F	Lean	96	70	70	60	Mars	6L
Pickering	F	Lean	96	79	88	64	Jupiter	6L
Howells	F	Lean	96	65	60	91	Saturn	6L
Kent	F	Lean	94	98	72	80	Neptune	6L
White	F	Lean						6L
Tomlinson	F	Lean						6L
Allan	F	Lean						6L
Rowe	F	Lean	88	81	75	69	Mars	6L
Thornton	F	Lean	87	65	64	93	Saturn	6L
Whitehead	F	Lean	86	61	61	77	Jupiter	6L
Crawford	F	Lean	86	69				6L
Fuller	F	Lean	85	67				6L
Turnbull	F	Lean	85	87	93	69	Mars	6L
Connolly	F	Lean	84	67	87	70	Neptune	6L
Townsend	F	Lean	83	90	87	69	Saturn	6L
Joyce	F	Lean	82	88	89	81	Mars	6L
Howarth	F	Lean	81	71	77	97	Neptune	6L
Robson	F	Lean	80	90	60	76	Mars	6L
Harris	F	Torville	98	99	82	61	Saturn	6T
					New science group size	27		

STEM Science Class for 2024 -larger font size, top of page, fully visible 1 mark
Selects records where *Gender* is F and *Science* mark is 80 or more 1 mark
Class_Code contains 6 1 mark
Specified fields, correct order, headings match the data, displayed in full 1 mark

Sort ascending order of Teacher_Name then descending order of *Science* 1 mark

Label left of calculated value 100% accurate 1 mark

Harris edited Class_Code is now **6T** 1 mark

Has a page orientation of landscape and fits on one page wide 1 mark
Name, centre number and candidate number in page footer with no other items showing 1 mark

Candidate name, centre number and candidate number

Title larger font, top of page, fully visible	1 mark
Class_Code is 5C (i.e. teacher Cook-Abbott)	1 mark
House_Name is Mars	1 mark
Specified fields, correct order, headings match the data, displayed in full	1 mark

Year Five Test Report for Mars

Gender	Family_Name	Given_Name	House_Name	Maths	Computer_Science	Teacher_Name
F	Connor	Madeleine	Mars	68	79	Cook-Abbott
F	Harris	Harriet	Mars	83	65	Cook-Abbott
F	Kelly	Laura	Mars	65	77	Cook-Abbott
F	Power	Amelia	Mars	91	74	Cook-Abbott
F	Sykes	Lydia	Mars	97	75	Cook-Abbott
M	Bartlett	Sebastian	Mars	61	79	Cook-Abbott
M	Gibson	Hayden	Mars	62	82	Cook-Abbott
M	Hall	Harvey	Mars	67	81	Cook-Abbott
M	O'Sullivan	Evan	Mars	89	71	Cook-Abbott

Average Maths Score 76

Data into ascending order of *Gender*	1 mark
… then ascending order of *Family_Name*	1 mark

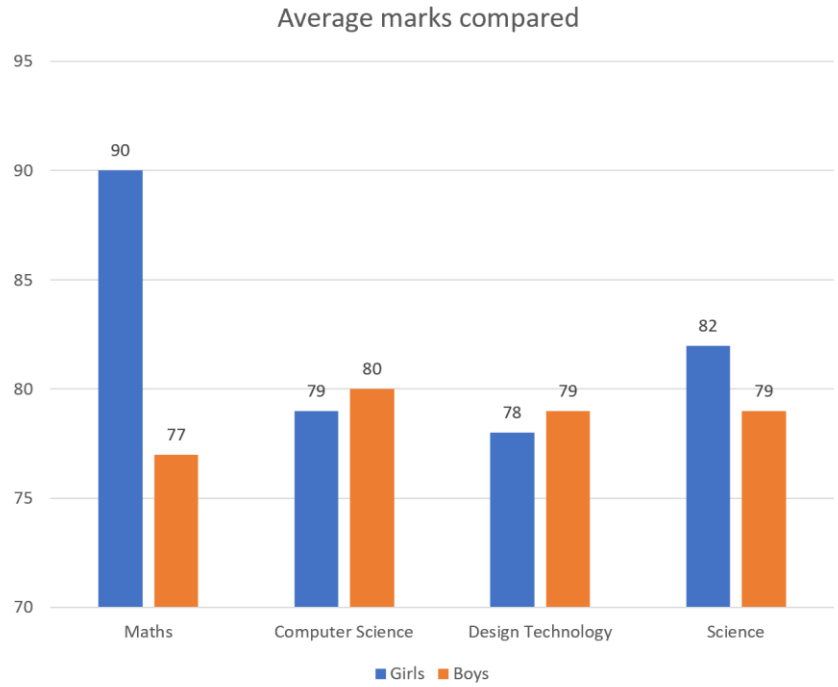
Average Maths mark positioned below the Maths column	1 mark
Display this value with no decimal places	1 mark
Correct label to the left of this value	1 mark

Name, centre number, candidate number

Orientation is portrait and fits on a single page	1 mark

Our top performing students

Year	Subject	Top Boy	Top Girl
Five	Maths	Callum Walters	Lydia Sykes
Five	Science	Henry Barlow	Abbie Day
Six	Maths	Taylor O'Connor	Freya Harris
Six	Science	Anthony Wyatt	Poppy Flynn



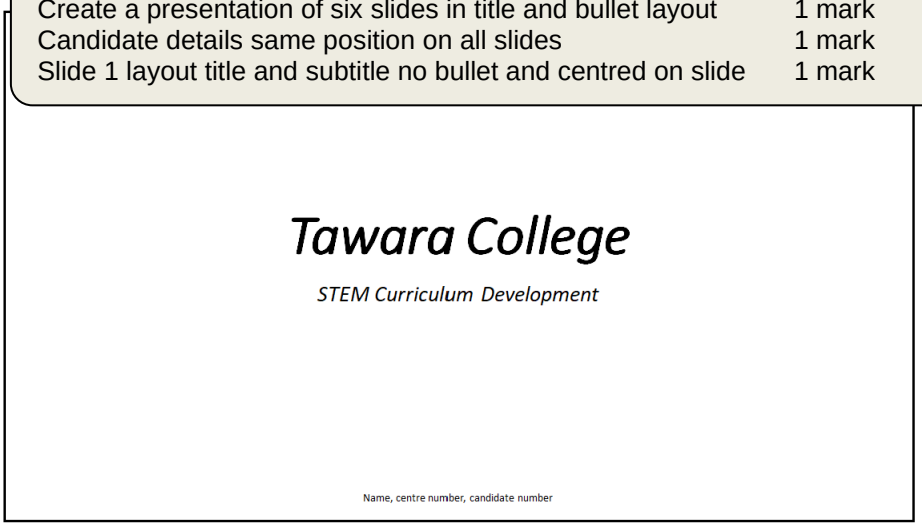
Vertical bar chart created as shown	1 mark
Subject names in full on category axis	1 mark
Legend to display Boys / Girls	1 mark
Values on tops of bars	1 mark
Title as shown	1 mark

Name, centre number, candidate number

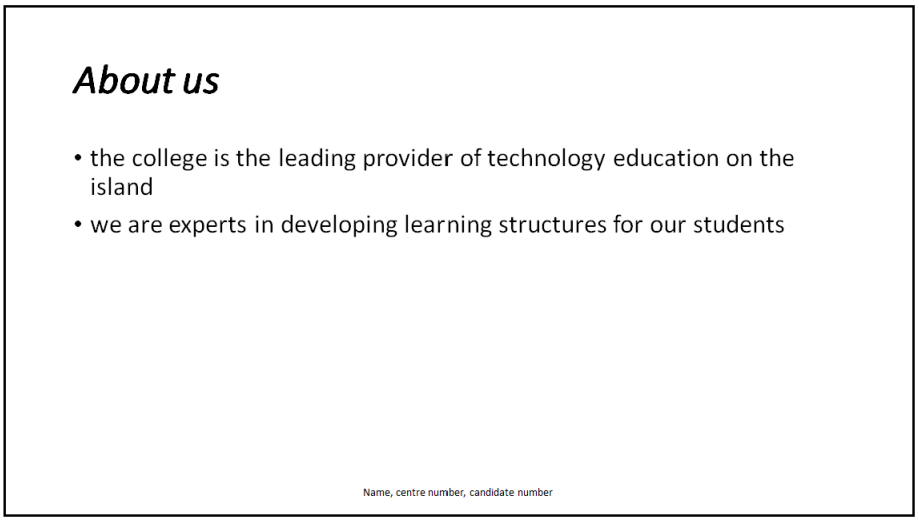
Slide layout title and 2 placeholders - chart on right and table on left	1 mark
Table – text as given, all gridlines visible, no shading	1 mark
Top row centre aligned horizontally	1 mark
Top row larger font	1 mark
All rows centre aligned vertically	1 mark
Rows 2-5 left aligned consistently	1 mark

Single slide printed	1 mark

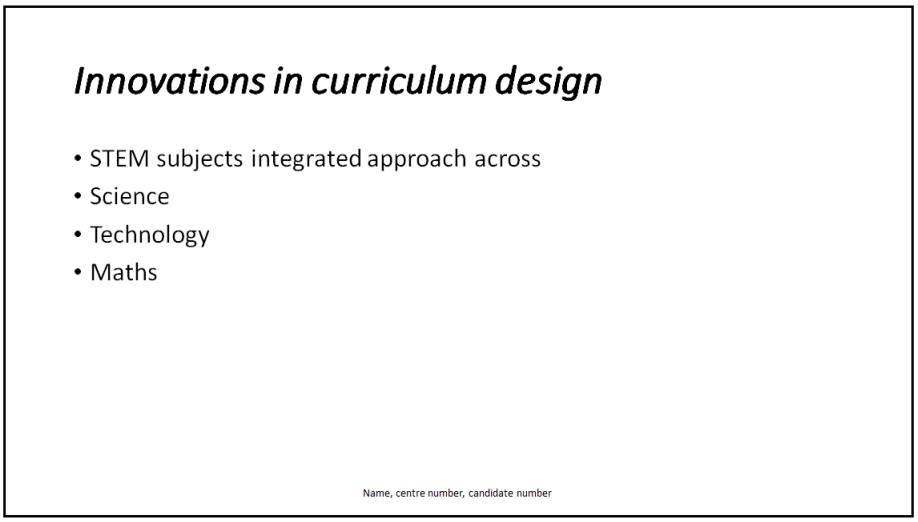
Create a presentation of six slides in title and bullet layout	1 mark
Candidate details same position on all slides	1 mark
Slide 1 layout title and subtitle no bullet and centred on slide	1 mark



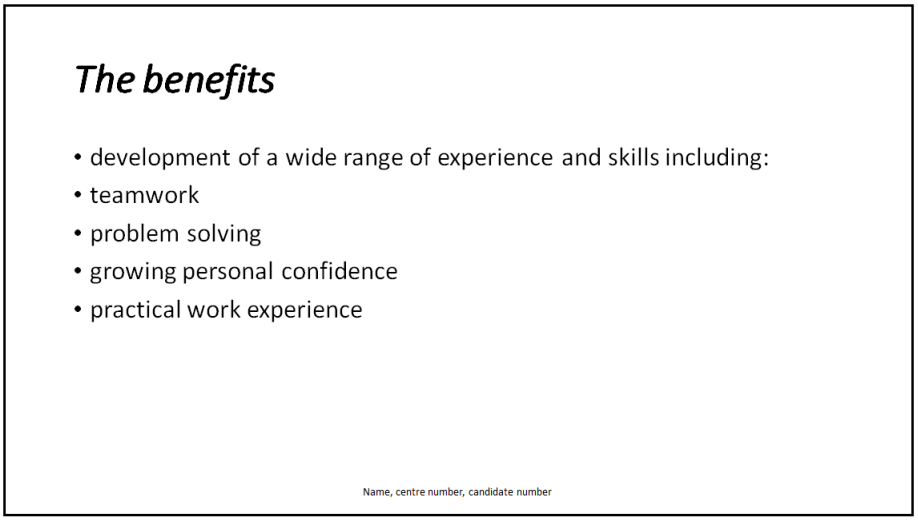
1



2


Innovations in curriculum design
• STEM subjects integrated approach across
• Science
• Technology
• Maths
Name, centre number, candidate number

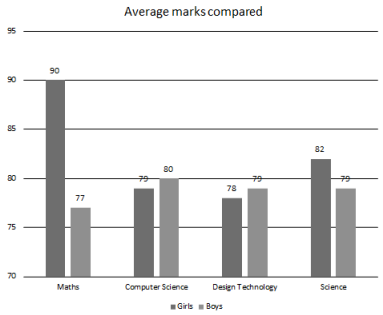
3


The benefits
• development of a wide range of experience and skills including:
• teamwork
• problem solving
• growing personal confidence
• practical work experience
Name, centre number, candidate number

4

Our top performing students

Year	Subject	Top Boy	Top Girl
Five	Maths	Callum Walters	Lydia Sykes
Five	Science	Henry Barlow	Abbie Day
Six	Maths	Taylor O'Connor	Freya Harris
Six	Science	Anthony Wyatt	Poppy Flynn



Name, centre number, candidate number

5

Our vision

- to raise awareness among young people of the huge range of potential careers in STEM
- to raise confidence to meet new challenges
- to help girls in particular to realise their potential in the world of work of tomorrow

Print all slides two per page as handouts 1 mark

Name, centre number, candidate number

6