

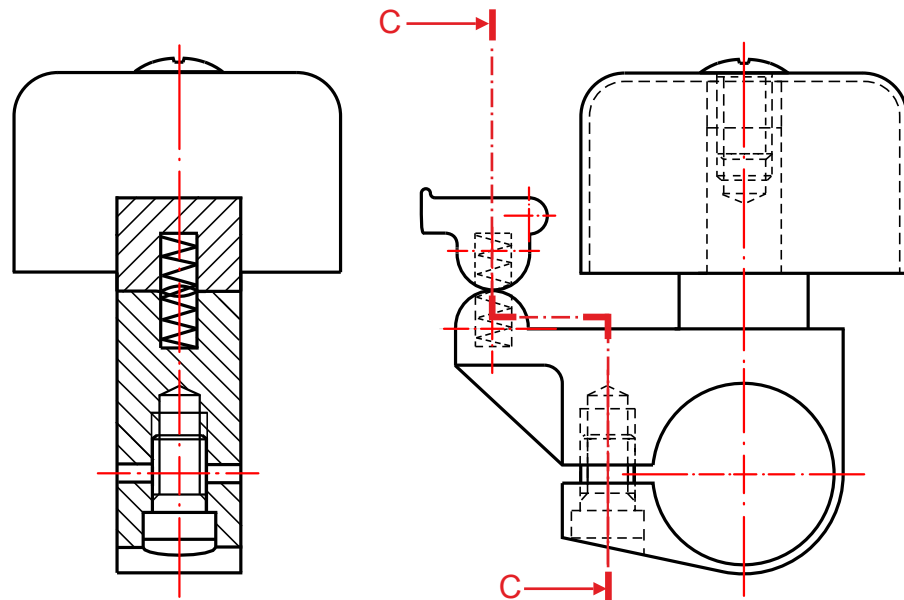
P24 - BS Q1: If the screw reached the top of the threaded hole it might not close the gap enough to tighten the clamp on the handlebar.

Q2: The counterbore has two main functions; To hide the head of the screw. To provide a horizontal face for the screw head to tighten against.

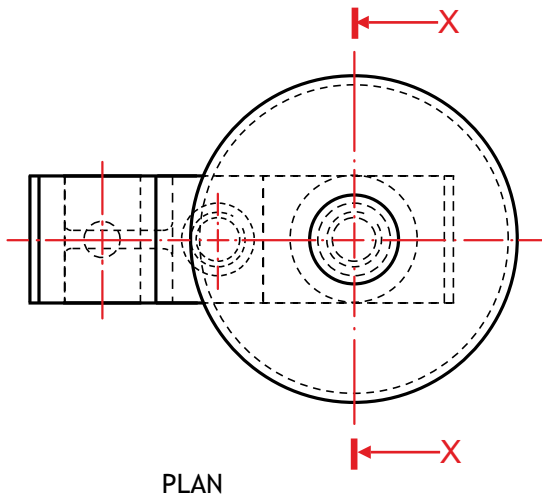
Q3: The 2mm gap has three functions; It allows the clamp to open so that it can slide onto the handlebar. It also allows the clamp to fit handlebars of slightly different diameters. It allows the clamp to tighten around the handlebar when the screw is turned.

Q4: Semi-circular faces allow the hammer to rock on the clamp. The small bump at the left end allow a finger to rock the hammer. The distance between hammer and bell is accurately calculated to ensure contact. The spring allows flexibility of movement and a stored energy to enable rapid movement.

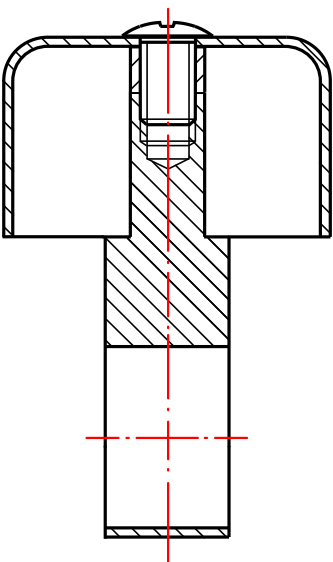
Q5:



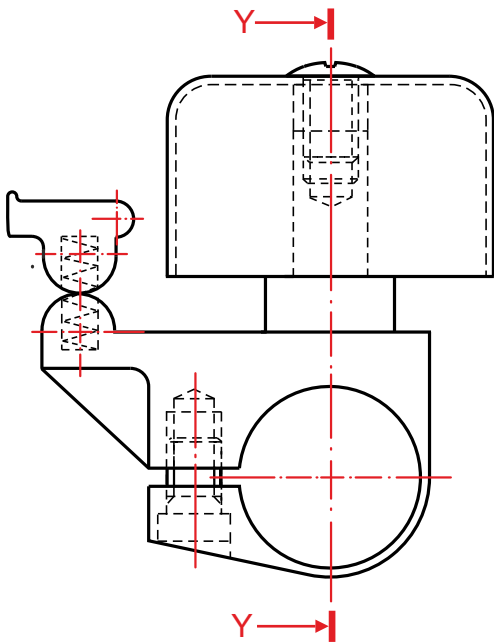
P25 - BS



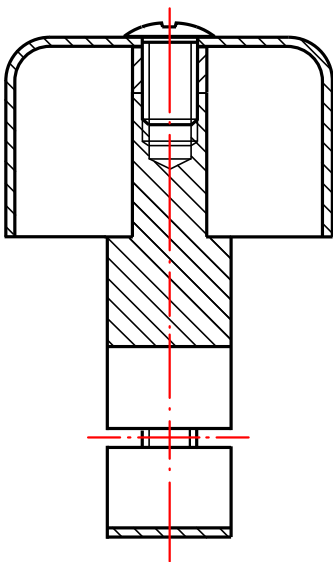
PLAN



SECTION Y-Y



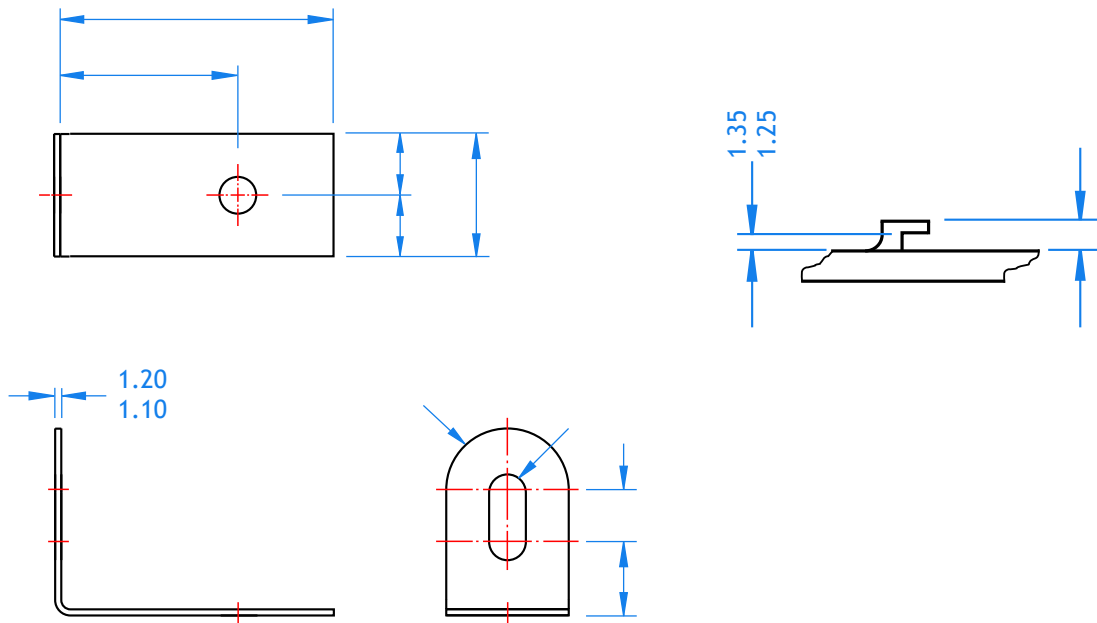
ELEVATION



SECTION X-X

P28-BS

Q1 solution as shown or similar



P28-BS

- Q2 Parallel dimensioning has been used to position of the hole and fix the length of the slides on the mudguard. is measured from the left end of the slides. This end of the slides is an important datum because the upright bracket must be clear of the left end of the slides when the holes in bracket and mud guard line up, otherwise the holes may not line up.
- Q3 The length of the slides (54mm) is non-functional. If this size was 2mm longer or shorter it would make little difference to the assembly.

P59 Construction DRG

- Q1 The waste pipes take waste from the kitchen and toilets. For this reason they are positioned beneath the kitchen and toilets (see floor plan page 60) They carry the waste to the main sewer under Hill St.
- Q2 So that the waste from the visitor centre matches the direction of flow in the main sewer.
- Q3 Three new (proposed) trees and one to be removed.

P60 Construction DRG

- Q1 He tucked them underneath and behind the stair well.
- Q2 So that the fixtures and fittings planned for the building can be added to the plan to check that they fit and leave enough room for visitors and staff.

P61 Construction DRG

- Q1 A 3D CAD model can be built and tested for energy efficiency using CFD software; computational Flow Dynamics (See page 103).

P62 Construction DRG

Q1 The small windows are hinged at the top.

Q2 The small windows face North West.

P63 Construction DRG

Q1 Symbols and conventions are used in order that:

1. They can be understood by all users.
2. They simplify the drawing process because they are simplified icons of complex features.
3. Standards and conventions help ensure clarity of communication; symbols have been designed to avoid confusion.
4. Universal Standardisation can help overcome language barriers.
4. Using standardised symbols ensures consistency of information.
5. Standardising symbols and conventions makes it easier for authorities to confirm that planning and building standards will be met.

P68 Sketching

Q1 It is a part, partial or local section.

P80 Graphics in society

Q. Printed media requires no power or broadband signal to read. It can have a very loyal reader base. Paper base publications are often supplemented by a website. They can be costly to produce and use lots of timber in production. Distribution is costly and damaging to the environment.

Digital media is instant but requires a signal and power source. It is increasingly accessible anywhere there is a signal. Publications that support business (catalogues etc) are easily accessed and orders placed remotely. Can be accessed via a range of devices; smart phones, laptop, IPad etc.

P82 Graphics in society

Q1 Design 'C' is the correct design

Q2 Design 'A' Figures do not have enough contrast or clarity (black text on dark colour fills).

Design 'B' Pastel shades should not be used (this leads to a lack of contrast)

Design 'D' Nutrients are in the wrong order.

## P82 Graphics in society continued:

- Q3 Pantone refers to a colour matching system using pre-mixed pantone inks (marker pens often use pantone colours). Pre-mixed printing inks are sometimes called 'spot colours'.
- CMYK (Cyan, magenta, Yellow, Key colour black) refers to the common printing system used in off-set litho printing. Often known as four colour printing.
- Q4 The label may be created in certain formats using pre-mixed pantone colours while it may also be mass produced on labels using CMYK colours mixed during the off-set lithography printing method.
- Q5 Contrast distinguishes the opposites (in this case opposing colours) from one another aiding clarity which is vital in these labels.

## P91 Computer Aided Design

- Q1 An STL (Standard Tessellation Language) file.
- Q2 It is normally quicker than getting an item made by traditional craft means. It is normally much cheaper than making a prototype by traditional methods. It quickly gives the designer an object to hold and feel. It may help to evaluate whether or not the design will function properly. It may be valuable in getting user feedback on the function or appearance of the design.

## P95 Computer Aided Design

- Q1 It is because both hatched areas are from a single component.
- Q2 It is a continuous thin irregular line and shows the limits of the partial enlarged view.
- Q3 It is normal to include the scale of the enlarged view.

## P99 CAD

- Q1 Move the shell command above the helix in the tree.
- Q2 Draw the lip profile and revolve the lip.
- Q3 Radial array the sketch and extrude and subtract the material prior to shelling.  
or  
Extrude and subtract the material and radial array the extruded feature prior to shelling.

## P102 CAD

1. The offset command is used to create an exploded assembly to space out (offset) each part so that each part is identifiable and occupies its own space.
2. The nuts and bearing were not created by the designer. These are standard components, downloaded from a CAD library and the spinner was designed around them.
3. The standard components provided key geometry for the body of the spinner and top-down modelling enabled the designer to capture this data instantly and accurately.

## P104 CAD

## Manufacturing tolerance benefits:

1. It ensures a fit between parts after manufacture.
2. It allows the manufacturer leeway; it is impossible to mass produce parts exactly to size.
3. To enable interchangeability of parts

P123 - DTP

Q1 LH Layout: A drop shadow helps create emphasis and the cycling figure is fully cropped which also helps create emphasis.

Centre Layout: The group image has been cropped to a circular shape which creates contrast with the rectangular layout.

RH Layout: The rectangular image has been rotated (tilted) to create emphasis.

P129 - DTP

Q1 The leading has been reduced. This brings the lines of text closer together. If leading is reduced too much (as is the case here) it can be difficult to find the start of the next line when reading a longer paragraph.

P134 - DTP

Q1 Top right layout: The figure has been fully cropped so that another background image can be introduced.

Centre right layout: The eye image has been square cropped and the letters have has colour fills and colour outlines edited and a transparency applied. The impact is a grouping of harmonious colours that brings unity and subtlety to the logo.

Lower right layout: The text has been rotated and the outline is colour matched to the equipment. This creates a bold logo with only one main colour.

Lower left layout: Lines have been introduced (horizontal and vertical). The slogan is rotated and the colour reversed. The effects create a minimalist layout where contrast appears in the direction (vertical & horizontal)

P135 DTP

Q1 & Q2 Layout 'A' Font 4 CINZEL Modern and an elegant, feminine serif font.

Layout 'B' Font 2 28 Days Later. Modern grungy style aimed at teenagers and young adults.

Layout 'C' Font 5 Distant Galaxy. Modern sans serif reflects technological subject matter.

Layout 'D' Font 1 Times New Roman. Formal, traditional serif font suits formal business theme.

Q3 The Ravie typeface is a fun style and not suited to any of the target audiences or subjects.

## P141 - DTP

- Q1 Colour: green is used across both pages and the blue colour fills are matched across both pages.  
The header is the same on both pages.  
The blue oval colour fill near the bottom carries across both pages.  
An image of Kelly Green on both pages.
- Q2 Enables the reverse text to be read easily. It does not obscure the image behind, allowing continuity.
- Q3 Layering (placing one item on top of another) has helped create depth in the layout, example; the green scarf overlapping the colour fill. This process also helped create an informal layout that will appeal to the young target audience.
- Q4 Tilting (rotating) items e.g. the sub-head on the LH page and the pull quote on the RH page.  
The drop cap emphasises exactly where to begin reading.  
The exaggerated quote marks emphasise the quote and helps draw the reader in to the article.  
Drop shadows behind the images on the RH page make them stand out.  
Reverse text used throughout creates emphasis.
- Q5 Different textures can be employed to create contrast; textures of the green hat, LH page, contrasts with the smooth colour fills in the backgrounds. The ragged edges of the colour fills behind the sub-head and 'Kelly's passions' contrasts with the smooth fills elsewhere.
- Q6 The 2 column structure, LH page, reduces the length of line the reader has to deal with. This makes it easier to find the start of the next line down. The single column, RH page, is already reduced in width and performs the same function as those on the other page
- Q7 Kelly Green heading; a script style font is informal and modern. The body text is a serif font which makes the copy easier to read because the serif 'flicks' help the eyes flow between letters and words. The sans serif sub-head, LH page, has impact (it is a chunky sans serif) and creates contrast with the more traditional serif body text.
- Q8 Cropping the images in the 'Kelly's passions' section allows them to (appear to ) be scattered informally as floating items. This 'scrap-book' approach is used often in magazines aimed at younger readers. Tilting (rotating items) also creates an informal and youthful look.
- Q9 The busy layout could become confusing if too many colours are introduced; restricting the pallet helps avoid such confusion. The two main colours, green and blue, are used on both pages and this creates unity between the pages.
- Q10 Her solo career is dealt with in the main article on the LH page. The new album is dealt with in the interview in the single column on the RH page. This is almost a sub-article within the main feature. Magazines use this technique frequently to make the feature more interesting and allow younger readers to dip-into the article when they have time. Shorter or self-contained sub-items lessens the effort required by (younger) readers.

The 'Kelly's Passions' section is self contained in the RH column. It is mainly images with captions and is more visual than the other sections. The designer has lessened the effort of the reader again and has created a light-hearted, fun section. Unity is maintained by using the same colours throughout and by overlapping items across the three sections.

## P154 - Design Elements &amp; Principles

- Q1 Rhythm has been created through repetition; the bulleted list and the square colour fills behind the small images are repeated and spaced evenly to create a visual rhythm.
- Q2 The main image has been cropped to introduce another (non-rectangular) shape into the layout. Cropping emphasises the shape of the product. It also emphasises the strong perspective of the image. Cropping also allows it to overlap the flashbar and suggest depth in the layout. This would be tricky if the image was still inside a rectangular background.
- Q3 The title is a sans-serif font that is modern (supporting the image of the product). It is also bold without being over-bearing.
- Q4 The line acts as an underline to emphasise the title. It is used to establish alignment in the layout with the small square colour fills at its RH end. It separates the title from the main advertising layout. It leads the eye across the layout, left to right.

## P155 - Design Elements &amp; Principles

- Q1 The designer creates contrast in scale with a large image and a small image. Contrast in depth, near and far and contrast in aspect with horizontal and vertical colour fills.
- Q2 Contrast, when done correctly, can make a layout or features in a layout more eye-catching. It can help ensure the items or features are emphasised or stand out from other items.
- Q3 The designer established depth by using scale to suggest distance; the large module appears closer while the small one appears further back. The use of layering including placing the main images overlapping background flashbars creates the illusion of something behind and something in front. It makes the layout look less flat and more 3D. The strong perspective of the exploded image also suggests depth.
- Q4 The main images are not aligned with anything; this makes them stand out as floating items. Alignment occurs in the background colour fills. The lower edges of the horizontal and vertical colour fills align as do the right edge of the fill and the right edge of the box. These alignments are important in suggesting that the layout is organised.
- Q5 Cropping: The product, a shelving unit, has an interesting shape that ensures it stands out in the layout. This is maximised because it has been fully cropped.

Colour fill: Red has been used in the colour fills and the fill style is graded to create a softer fill at one end. The colour fills are simple rectangular shapes because the shelving units are complex forms and the designer is careful to ensure the colour fills do not compete with the shelving units.



## P156 - Design Elements &amp; Principles

- Q1 Thee red fill appears closer to the viewer because red is an advancing colour while pale blue is a receding colour and appears further away.
- Q2 Pantone colouring equipment, like marker pens, provide ready mixed colours often in a very large range of tints and shades. Pantone colours come in a standard colour matching system that can be reproduced when printing i.e. designers know the colours they use can be matched at printing.

## P157 - Design Elements &amp; Principles

- Q1 The purple flashbar extends across the layout and is directly behind both of the shelving products. This creates a (physical) connection between those items. A more subtle connection between items in the layout is achieved using alignment; the slogan at the foot of the layout is aligned with the left edge of the flashbar and establishes a visual connection between those items. Also, the title and its red underline align with the slogan creating a visual connection between those items.
- Q2 Diagonal lines or shapes used in a backdrop often dominate a layout and should be used carefully. These diagonal lines are contained within the flashbar and create a texture or (random) pattern without dominating the layout. The designer tried this layout both with and without the lines and felt they brought a subtle pattern without dominating the layout. You should try these techniques yourself in your own layouts.

## P158 - Design Elements &amp; Principles

- Q1 Colour matching the red items creates unity. The colour fill (flashbar) which passes behind both chairs creates a connection (unity). Aligning the title, circles and footer at the LH side creates visual unity. The layering of items where one item physically overlaps another (title and flashbar and the signature and the red line, creates unity between those items.
- Q2 The title mixes a modern sans serif font and a script style serif font to create contrast making this important feature more eye-catching. The body text is a serif typeface again to contrast with the sans serif title and for ease of reading (the serif flicks lead the eye along the line). The signature is a script style and is tilted to create more contrast and draw attention to the designer's name.
- Q3 A cool colour features in the blue flashbar. It creates the effect of appearing more distant (it is also a receding colour) and helps to push the products (chairs) forward in the layout. It also creates contrast with the red items.
- Q4 The justified body text creates a strong geometric (rectangular) shape in the layout. This is important because most of the items in the layout are rectangular other than the chairs which are pictorial and angular making the chairs stand out most in the layout; as they should. The alternative would be a left aligned body text which would leave an untidy, 'ragged right' edge; the designer tried both and opted for the neater, justified text.

## P159 - Design Elements &amp; Principles

- Q1 The blue colour in the disc behind the amp and the line underneath the body text have been colour matched to the control knobs on the guitar and amp to create visual unity. Blue also contrasts with the main colour of the guitar. The neutral colours in the background fills create a suitable backdrop without dominating the guitars. The red title is thematic and colour matched to the guitars again to create unity.

## P160 - Design Elements &amp; Principles

- Q1 Unity has been created through using colour matching in the title 'eyes' and the two colour fills in the layout. Alignment of title, body text and the lower colour fill establishes a visual connection. The text wrap around the image creates unity between the text and the image. The horizontal lines at the top and bottom of the layout bleed off opposite sides of the page. These appear to contain the other items between them.

## P161 - Design Elements &amp; Principles

- Q1 Significant parts of the product are white and would be lost on a white or pale background. While these white areas would stand out against a dark backdrop the orange and black parts would not. A balance is struck between the colour values in the product and the backdrop to ensure the product is presented clearly and effectively. A mid-tone grey does the job.

## P162 - Design Elements &amp; Principles

- Q1 It can be easier to create usable space to one side when the main image is positioned off-centre, rather than placing the image in the centre and having a very narrow spaces on either side to work with. It helps maintain visual interest when an asymmetric layout is used; it can create contrast and visual tension to give the layout a less formal feel. This informal, asymmetric style is appropriate when the target audience is young. An asymmetric layout can make good use of the 'Rule of Thirds' and the 'focal points' within the rule of thirds. These contribute to a more effective layout by positioning important items on, or close to, the focal points. See page 163.

## P163 - Design Elements &amp; Principles

- Q1 In this layout structure is implied through several methods. The use of alignment between the title, body text and the lower line suggests there is a column structure. The underline at the top of the layout identifies a clear space for the title; this again suggests a structure. The line at the foot of the page suggests that the space beneath it is set aside as a footer space. In your own layouts, which may contain only a few items, it can be difficult to suggest an organised structure. It is easy to fall into the trap of appearing to place items randomly. Try some of the methods you see in this book to help imply structure in your own layouts.
- Q2 The body text in the final layout has two paragraph breaks. This breaks up the text making it less daunting to read. It also breaks it up visually. The body text becomes less dominant compared with the two examples above it.

## P164 - Design Elements &amp; Principles

- Q1 Floating items are items (often images or pull quotes) that are placed outside the column structure (see page 123). Placing floating items in this way creates a less formal layout because they appear not to fit inside a column. Items can be given dominance or emphasis in a layout when they are positioned in this way.
- Q2 The large drop capital at the start of the text emphasises the starting point of the article. The red sub-headings emphasise the content of each section. Using pictorial images makes them appear 3D and helps to project the images forward creating emphasis.

## P165 - Design Elements &amp; Principles

- Q1 The lamp is red which is an advancing colour and appears to be nearer the viewer. The background is a pale blue. In colour and tone (blue and pale) is a receding colour and appears more distant. The combination of these two factors ensure that the lamp stands out most in layout 1.
- Q2 The layout is rectangular in shape. The circles bring a contrasting shape into play and they become eye-catching because of the contrast. The fact that they are placed in linear patterns (rows) means that they can function as a line would. They are included in the layouts alignment for instance. The repeated circles in a line can also indicate a technological theme suggesting that the lamp is modern.
- Q3 Unity is achieved in layout 2 by colour matching the title and line with the colour of the lamp. The white items (line and web address) also achieve this to a lesser extent.
- Q4 Layout 3 makes use of contrast by including both vertical and horizontal text. The informal wavy division line also contrasts with the formal rectangular shape of the layout.

## P166 - Design Elements &amp; Principles

- Q1 The small photographs are carefully positioned. The content of the images is moving (they are live action pic's) as opposed to static as in the main photograph. This creates contrast (moving and still). The small pic's are also glossy photographs and are set in front of a textured background. This introduces both texture and contrast. The images have been tilted to give the appearance of being scattered randomly. They haven't of course, but in rotating them the designer creates emphasis. The drop shadows behind these images also creates emphasis by appearing to lift them off the page.
- Q2 The neutral browns in the background images are intended to look rugged, worn and natural, especially considering the textured, parchment style of the background. The colour brown provides two things in the layout; it picks out the sandy colour in the main photograph and it provides a suitable colour to sit the small photo's and the tour dates on because it aids clarity and does not compete with these items for dominance.

## P167 - Design Elements &amp; Principles

- Q1 The function of the layout is to promote the product; the Blue Demon guitar. The guitar has a shiny, smooth texture and looks modern. The textured background has been used to contrast with the guitars. Against the textured background the modern guitars look even smoother, shinier and more modern.

## P168 - Design Elements &amp; Principles.

- Q1 The use of layering (placing one item on top of another) gives the designer options to create depth in layouts by having a foreground and a background. In layout 2 the top layer (the large product image) becomes the dominant item and stands out.
- Q2 Depth has also been created by using two images of the product; one large and close up, the other smaller and more distant.
- Q3 Advantage: Justified text can bring a clean geometric shape to a layout. This can add to the visual quality of a layout. Disadvantage: Justified text can alter the spacing between words and become more difficult to read.

## P169 - Design Elements &amp; Principles

- Q1 A pull quote is designed to bridge the gap (visually) between the title and the body copy. It also gives the reader a flavour of the article and normally uses some controversial comment from the story to entice readers into the article. It can also be used as a visual item to add detail or visual interest to a layout.
- Q2 Rotating the smaller images created emphasis by drawing attention to them. Using drop shadows behind the title's colour fill creates emphasis, the drop cap at the start of the body text creates emphasis and the reversed questions in the interview create emphasis.

## P178 - Go2 project

- Q1 Comparison of the draft and final layouts:

**Unity:** There is strong evidence of unity in the final Layout. The background is two shades of the same colour. Several items cross over both of the background fills. The body text wraps around the main image The body text wraps around the product image. All are examples of unity in the layout. The draft layout includes too many colours that fight against each other.

**Dominance:** In the final layout the main image of the earbud winder is the large enough to dominate the space. The drop shadow pushes the product forward. The headings are also big and bold. The rule under the title helps emphasise its importance. The draft layout has similar dominant features but it is a much more cluttered layout and impeded the dominance of the important items.

**Alignment:** In the final layout the small images in the 'user instruction' section have been boxed and carefully aligned. The text in the instruction section is also carefully aligned with the images. This cleans up the layout and is key to promoting ease of understanding. The same section in the draft layout has a cluttered appearance and is not as easy to follow.

**Rhythm:** The final layout uses rhythm in the user instruction section to organise the images. The result is a section which sees equi-spaced images and text that is easy to follow and visually pleasing. The draft layout lacks this structure and organisation and suffers for it.

**Typeface:** The final layout uses contrasting typefaces in the title; an informal script font and a modern sans serif. These fonts are repeated in the user instructions section. The result is a strong, eye-catching contrast and a combination of fonts that should appeal to a young target market. The draft layout uses two different sans serif fonts that work quite well but don't have the youthful factor of the fonts in the final layout.

## P179 - Go2 Project

Q1 A non-functional dimension is a dimension that is not critical to the functioning of the product once the parts are assembled.

Normally the tolerance applied to non-functional dimensions is found in the title block on a production drawing

Q2 Functional dimensions are dimensions that ensure that manufactured parts can be assembled or that the 'fit' of manufactured parts allows the assembly to function properly. The tolerance on a functional dimension is likely to be tighter (smaller) than those on non-functional dimensions. The tolerance on functional dimensions is always added directly to the dimension on the production drawing.

Q3 NB The tolerances do not need to be exactly the same as those shown as long as:

- the max outside distance across the slots is greater than the max distance across the bracket.
- The minimum inside spacing between slots is smaller than the minimum inside spacing inside the bracket.
- The minimum width and height of the slots is greater than the maximum height and thickness of the bracket clips.

