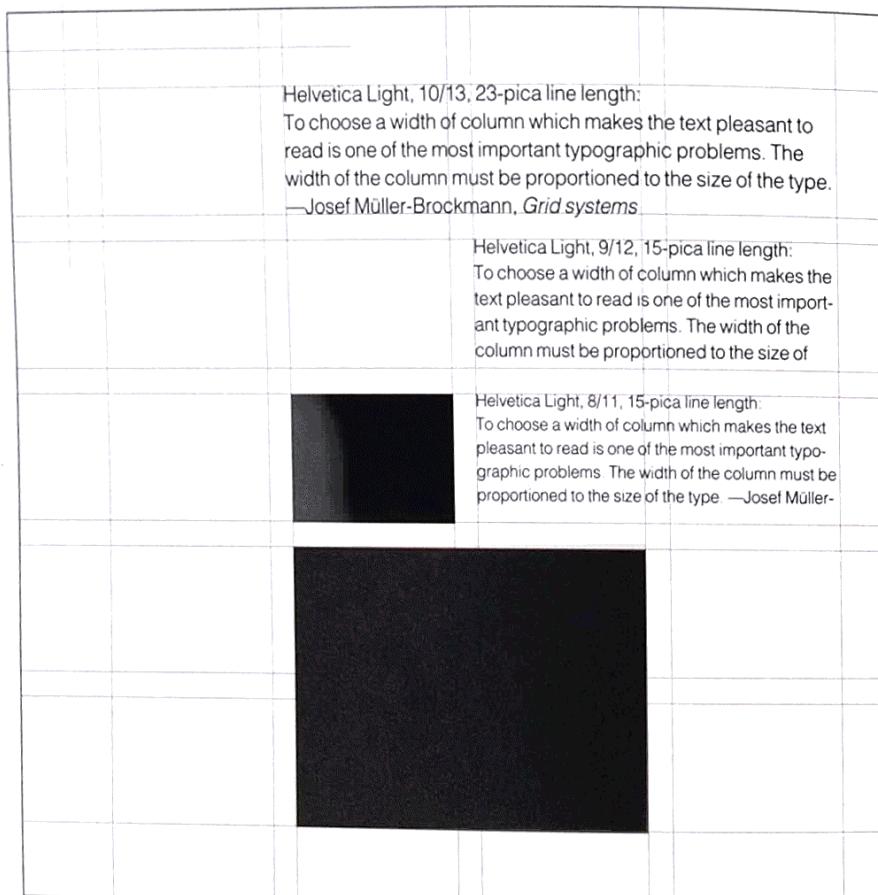


A basic grid is a regular subdivision of space into intervals and fields. Intervals are usually between one and two picas wide. The number of fields is generally determined by the amount of flexibility needed in layout—the more fields, the more flexibility. The aspect ratio of the fields can be determined either by a specific element to be included on the page, such as a photograph, or decided arbitrarily.

Minimum margins



3. Using the basic grid
As with all grids in the modern style, elements align at the top and left of grid fields. When possible, elements should be drawn or cropped and scaled to fit the grid. In the example below, the first diagram was scaled to fit a single grid field; the second diagram is slightly smaller than a grid field—it was scaled to match the first diagram because of their similarity and proximity.

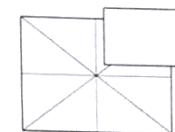
It is characteristic in the modern style to align the tops of text blocks and to leave the bottoms of the columns ragged, that is, to let information in columns end at a logical point rather than midthought. This is shown below. Were the bottoms of the columns aligned as well as the tops, a subhead would begin at the bottom of the first column.

Exercises

- Set up a basic 4-column grid on a standard 8 1/2-by-11 page. Show a range of possible text settings.
- Set up a second grid on an 8 1/2-by-11 page that will accommodate 3-inch square photos. Determine settings for readable text on this grid, and create 3 layouts, each of which includes 2 square photos and about 250 words of text.

1

Construction Basics



Construction requires no calculation—only a straightedge and a compass or software with the equivalent drawing tools. Construction techniques are useful in layout and design, especially for the traditional style. Before beginning to do the constructions on the following pages, review these basics.

Subdividing with Diagonals

Diagonals subdivide a rectangle evenly, whatever its proportion. Diagonals intersect at the exact center of a rectangle. Using diagonals to find a center is often faster than measuring, especially when a measurement is not evenly divided or requires rounding off.

Area vs. Length

By drawing vertical and horizontal lines through the center of a rectangle we divide each edge length in half, but divide the area into fourths. A photostat at 50 percent yields the same result—original lengths divided in half, and original area divided in fourths.

Comparing Proportions

Rectangles whose corners fall on the same diagonal have the same proportions. We can compare the proportions of rectangles, no matter how different they are in size, by using diagonals. This is useful in layout, since we often need to block out a space that represents a photograph. By first finding the diagonal of the original photo, we can then draw a rectangle in our layout that has the same diagonal. Pantographs work on this same principle, and they are used in layout for this same purpose.

Because text is the most critical element on the page and has the most specific requirements, it is logical that a grid be built around it. This approach to grids is consistent with modern design philosophy in that it allows form (the grid) to follow function (readability) rather than the other way around. Once a typographic grid is established, additional columns may be added for flexibility, but only as many as necessary.

The procedure for establishing a typographic grid may seem burdensome at first, but once grids are established for a range of text settings they can be modified and reused for different applications.

Exercises

1. Find at least 6 examples of pages that you personally find readable. Once you have collected the samples, count the number of characters per line. Are there more or fewer characters per line than in the range specified here? Check your samples against the readability guidelines in book 2, chapter 4. How do your examples correspond to the guidelines?
 2. Following the procedure presented here, create a typographic grid for an 8-inch square page, based on the text of your choice at its shortest possible line length. The grid should have from 25 to 35 fields. Also create a grid based on its longest line length
 3. Using one of these grids, redesign a traditional page from a book with a page size no larger than 6 by 9. The page should include at least one image in addition to the text. Include all of the information that appears on the original, work in the modern style
 4. Choose a page from a mail-order catalog that has a page size smaller than or equal to the page size you used for your grids. Use a grid you set up to create 3 layout variations of the catalog page. Include all of the information that is on the original, but modify it to suit your design

1. Set sample text

Find or develop sample text that meets readability requirements. It should have an even texture and color appropriate for the design, but it need not have an ideal line length. Use the text specimens provided by a typesetter if available or set your own. Text from magazines and brochures can be used as well if their text specifications can be determined.

2. Determine a Name

Determine a line length range
Count characters in the specimen text as shown in the example below. Because we are seeking average line lengths, we determine the line length a little beyond 40 characters for a minimum line and 50 characters for a maximum line. Although 60 characters per line would be permissible on the basis of readability, longer lines are not as typical of the modern page, because they may require extra leading for readability. This means text will not be as compact.



Page structure provides a way of dividing space so that an infinite number of layout possibilities are reduced to a relative few. A structure of consistent subdivisions, consistently followed, provides an inherent balance between elements in a layout. The method we choose to use for creating structure affects, subtly or dramatically, the way the final page will look. Structure, no matter how simple or complex, is almost always apparent on the final page. Lack of structure is apparent as well. There are three key ways that we can subdivide the page. The simplest is segmentation, in which the page is subdivided into smaller areas. Within a segment there is no structure, and elements are placed at random within a segment. Segmentation assures a somewhat even distribution of elements. Segment lines are dividing lines. They do not provide specific positioning, but simply limit the area in which elements can be placed. Because segment lines define areas, these areas could be filled checkerboard style. While segmentation defines areas, it provides no exact position for elements. Positioning guides are another way to structure the page, and offer specific coordinates for positioning elements. Positioning guides, however, do not define space. The modern layout grid offers both segmentation and positioning. Segments called fields define space and are separated by intervals of space. The edges of the fields can act as positioning guides. It is most common to use the top left corner for positioning, but it is possible to use another corner as long as it is done consistently.

+50 characters: 16 picas

Helvetica Light, 8/12, FLRR

+40 characters: 12 picas

4. Divide the vertical space

3. Establish the page size.
Determine the page size, then define minimum margins based on how the page will be used. The page shown below is a right-hand page; the left margin is an inside margin. The left-hand page would be a mirror image of this page.

a field touches the bottoms of descending fields usually contain 4 to 6.

size, or leading will change the heights

An interval is the distance from the tip of the descender in the line of type above the interval line to the top of the ascender in the line of type below it. Study the diagram below to see how this works. The interval, then, is determined by the specific text and leading settings used rather than by an arbitrary width. Changing the typeface, point size, or leading will change the heights of fields and intervals.

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5. Determine field width

The grid on the page below is based on a 15-pica line length—the longest line that can be used to fit 2 columns on the page area shown within minimum margins. The grid on the next page is based on a minimum line length of 12 picas. Both use the text developed in step 1. Longer lines of type tend to create a horizontal stress on the page; shorter lines create a vertical stress.

6. Add columns as necessary

Once text requirements are met, additional columns can be created by subdividing text columns. In the example below, 4 columns have been created from a 2-column text grid; 1 column is just under 7 picas wide. In the example on the next page, 2 text columns were subdivided into 4 columns; the area within the minimum margins was wide enough to allow a fifth column to be added.

7. Adjust the aspect ratio

When a specific aspect ratio is desired, a grid can be adjusted by subdividing text columns or by adjusting the number of text lines per field. These options in combination will produce a wide range of aspect ratios. The aspect ratio of a single field is not the same as that of multiple fields, so the relative size of the desired aspect ratio should be considered when making these adjustments.

**Structuring the page**

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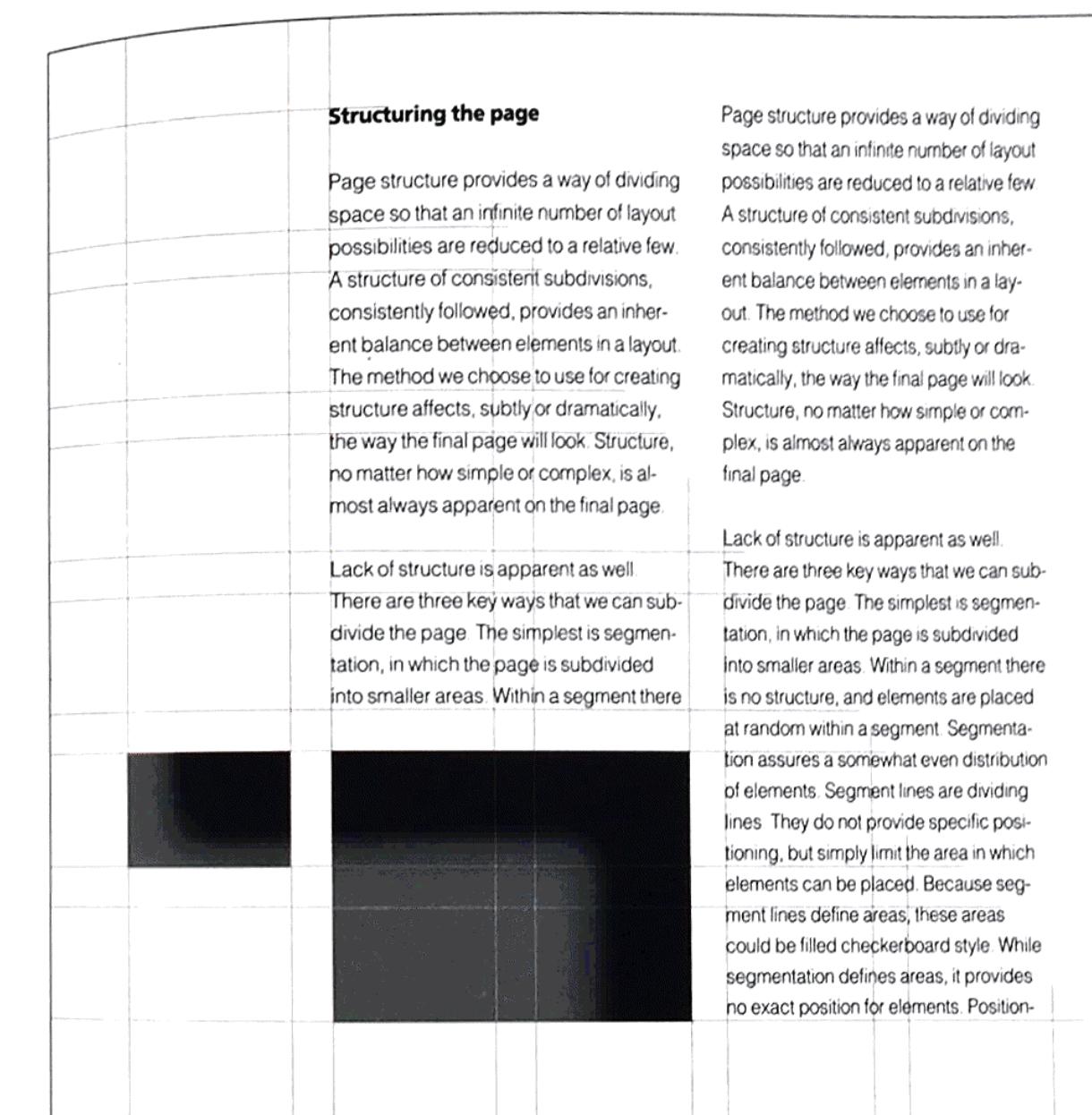
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Comparing these grids

The 4-column grid (the grid on the previous page) can hold more words. Contrast and asymmetry are more difficult to achieve with a 4-column grid than with the 5-column grid below. The 5-column grid reserves space which will assure a minimum amount of contrast and asymmetry. The 4-column grid has fields with a horizontal stress, which will add to an overall horizontal feel to the page; the 5-column grid has a more vertical stress.

Leading restrictions

A typographic grid is based in part on leading. Leading must remain consistent throughout the text. No additional points of leading can be added between paragraphs. Instead, paragraphs can be indicated by a blank line between them, by the way in which lines end short, or by indents. Of these options, indents are the least modern. Grid, text, and leading are a whole, and one cannot be separated from the other.

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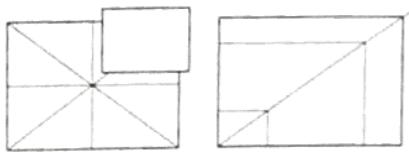
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Any grid can be used a variety of ways without breaking the basic rules for using a grid. Differences in the use of a grid arise because of the way in which the designer interprets emphasis, hierarchy, the relationship between elements, the grouping of elements, and the flow of information. All six layouts shown below and on the following pages use exactly the same grid and information (with the exception of the heading number, which changes in sequence with the variation.)

1



Construction Basics

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divide each edge length in half, but divide the area into fourths. A photostat at 50 percent yields the same result—original lengths divided in half, and original area divided in fourths.

Comparing Proportions

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The first four variations are modern; the last two show traditional typography used on the same (modern) grid. Although the typeface is traditional, it is set to fit the grid. These are only a few of many layout variations possible with a single grid. An even wider diversity can be generated by making minor changes to the grid, such as altering the proportions of the fields.

Variation 1 (opposite)
The number and diagrams have dominance because they are isolated at the top of the page. The number acts as a graphic element, as well as being informational. Both the diagrams and the number are a single grid field high. The layout is nonlinear: the viewer can begin at the number and either scan across the top of the page or read down to the heading and across to the text.

Variation 2
This page has a diagonal emphasis that is achieved primarily because columns are broken so that they become progressively longer. The strong diagonal emphasis tends to direct the eye from the number at the top left to the diagrams at the bottom right rather than to the first column of text.

2

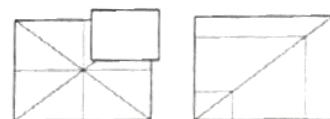
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Variation 3

This layout is very linear in nature. The introductory text has been separated from the descriptions and placed in a box with the number and heading, both of which have been given considerably less emphasis than in the first 2 variations. The descriptions, as defined by the subheads, are fit into a single column.

An additional but perhaps unnecessary diagram has been added for consistency, and each diagram is aligned to the grid near the text that describes it. A conflict arises if linearity is to be preserved, each diagram must align with appropriate text. If the grid is to be preserved, however, each diagram must align with the grid. This is an example of how linear layout conflicts with the structured modern page.

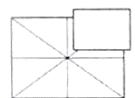
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Variation 4

In this layout, the heading contrasts so much with the other elements and the page that it is likely to be the first element you see, even though it is last in sequence. The eye is also attracted to the bottom of the page because the diagram is located there.

In variation 3 a diagram was added, in variation 4, diagrams have been combined into a single diagram. It is about the width of two grid fields. The wide left margin helps keep the layout asymmetrical even though the text, diagram, and heading are compactly grouped.

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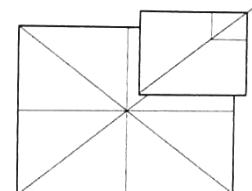
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**4****Construction Basics**

Variation 5

Positions for the heading and text were determined by the grid. The diagrams have been placed by their relationships to the text rather than by the grid. Because each is one grid field high, and the height of the grid fields corresponds to the text leading, they fit easily into the text.

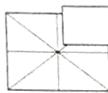
Contrast and asymmetry have been minimized, and details such as the small caps help give this layout a traditional flavor despite a modern structure

5 : Construction Basics

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Variation 6 (opposite)

This layout is based on the same grid as used for the previous layouts, and the same traditional typeface and size has been used as in variation 5. An even texture was difficult to achieve because text was justified on a short line length. The text and heading are positioned on the grid, but the diagrams have been centered within the text columns without regard for any other structure except the writing.

Exercises

1. Evaluate each of these 6 variations on a scale of 1 to 10 (10 being the best) on each of the following criteria: visual interest, readability, appropriate hierarchy for the information, easiest to scan for information, easiest to associate text with appropriate diagram, best application of design principles
2. Create your own set of at least 4 variations on the grid you developed for topic 9, exercise 2. Evaluate your variations on the criteria listed in exercise 1.
4. Collect a set of at least 12 variations for a single category (e.g., tables of contents, chapter openings in novels, technical specifications for cars or electronic products, etc.) Evaluate them in terms of structure and style
5. Find related printed pieces (e.g., data sheet and product brochure). Determine whether they use a grid and whether it is the same grid.
6. Apply what you have learned about using grids from this series of exercises to the redesign of a page from a textbook or technical journal. Be sure to include all of the information presented on the original page.

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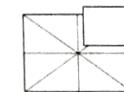
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The following two examples both use the same information presented in the previous six examples, but the page shape has been changed to more traditional proportions, and the structure has been changed to traditional constructed margins. These two examples show traditional and modern typography on a traditional structure; linearity is an integral part of such a structure.

Variation 1

This traditional typography has a characteristic light color and even texture, which is reflected in the diagrams, subheads, and headings. The only contrast on the page is provided by the wide margins and the initial cap marking the beginning of the text.

The unity achieved on a traditional page is fragile: if the texture is broken by uneven leading or spacing, if elements are too large or too bold, or if the diagrams are placed out of balance with the page's symmetry, for example, the effectiveness of the style is lost. No page structure exists for positioning elements except margins and text.

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Variation 2

Although the structure of this page remains traditional, the typography is modern, with characteristically tight leading and kerning. Headings are bold and the right margin is ragged. As the structure offers no guidance for the placing of diagrams, spacing between elements is adjusted by leading or simply

by eye. The text is broken into groups by the extra space that has been added before the subheads. This space in conjunction with the bold type provide contrast on the page. Nevertheless, the subtle spacing and proportioning provided by a grid is missing; the page remains relatively passive.

Exercises

- Find at least 6 examples of traditionally structured pages, and determine whether the type used on them is modern, traditional, or a combination of the two.
- Find a traditional page with traditional type and redesign it with modern type. Use the same structure and page size as on the original.
- Find a page of modern type and redesign it with traditional type. Use the same structure and page size as the original.
- After completing exercises 2 and 3, answer the following: Which is more space efficient, modern or traditional typography? Why? Which was easier for you to work with, modern or traditional? Was it easier because you liked it better, because you were already familiar with it, or because that style is just naturally easier to use?

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Graphic elements serve not merely to decorate the page, but to direct the eye and to help us differentiate levels in a hierarchy. When adding graphic elements we must strike a balance between unity and variety—too much unity and graphic elements do not attract the eye; too much variety and they serve to distract the eye rather than to direct it.

All of the variations shown here have exactly the same type and layout; the only elements changed are the graphic elements. All of these graphic elements could be created with typesetting equipment, and they are only a few of many variations possible without modifying the size and position of the type itself. It is useful to think about the graphic elements when planning the type, however, so that appropriate leading is established.

Exercises

- 1 Evaluate each of these variations on a scale of one to ten (ten being the best) on how well the graphic elements reinforce the relative importance of headings, direct the eye, enhance communication, and use modern design principles. On the basis of this objective evaluation, which is best? Does this agree with your subjective judgment (taste)?
- 2 To which of these variations could you easily and logically add a third hierarchical level higher than those levels shown? Lower than those levels shown? To which of these variations would it be difficult or impossible to add more levels?
- 3 Which of the examples shown here could be readily adapted to a multiple-column page? Which ones could not?
- 4 Apply one of these variations to some other text. Compare it to the original, and look for differences in the width and length of the graphic element and the proximity of that element to the type. What changed? Was the change intentional, and if so, why?
- 5 Add a third hierarchical level to the same text you used in exercise 4 and add graphic elements to all three levels to reinforce the hierarchy. Use either one of the variations shown here or develop your own graphic elements.

Typography Workshop

A principal element with which graphic designers work, typography functions both as the visualization of language and as a design element. This workshop offers a progressive series of projects and exercises to help students define and work with typography, including structured and unstructured typographic layouts, experimental letterforms, readability issues, and typographic expression.

Enrollment

The workshop begins October 17th. For more information, call University of California Santa Cruz Extension at (408) 429-2971.

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One of the more common reasons given for compromising style and design is to fit more text on the page. Traditional pages with overly narrow margins and modern pages with no white space are often the result. In addition to rethinking a layout when fit is a problem, text can also be modified in a number of ways to save space. Although the amount of space saved in a single column may seem minimal, it may make a considerable difference over the length of a document.

Each of the eleven paragraphs in this series reflect differences in text setting and show the relative effectiveness of each on the overall length. The specification noted at the top of each column is the only variable that has been changed; each text column has a different look because of that change.

Exercises

- 1 Which of these paragraphs is the most unlike the others? What is different about it? In which style would you classify it?
- 2 Read segments from each paragraph, then choose the 2 that you find the easiest to read. Which 2 are the most difficult to read? Which factor—typeface, kerning, leading, or point size—do you consider the most critical to readability based on these examples?
- 3 Copy a page from your favorite novel. Using the traditional style, set it at least 3 different ways, changing only 1 specification at a time. Which specifications did you find most appropriate to change?
- 4 Set the same page at least 3 different ways again, this time using the modern style. Which specifications did you find most appropriate to change?
- 5 In your judgment, which of the 11 columns of type in this series look the most like the typesetting in old books and which looks the most like modern typesetting technology?

Original:

The English visitor to Rome, if he has any familiarity with letter forms, cannot fail to be struck with the consistent quality of the architectural lettering which he sees on many of the late 16th, 17th and 18th century buildings. It is a letter which fits his preconceptions about roman lettering in a way that may not at first be easy to define. The proportions are close to those of the one ancient inscription with which he has more than a vague acquaintance: the tablet on the base of the column of Trajan in the same city. This will not strike him as unusual, for the teaching of lettering in England has for many years tended to suggest that the Trajan inscription is at once a representative and a supreme example of the inscriptive lettering of ancient Rome. It is only when he examines inscriptive lettering elsewhere in Italy and Europe that it may occur to him that it is only in 20th century England and 16th century Rome that the lettering on the Trajan column has been selected as a standard roman letter. (James Mosley)

This sample text is the point of departure. Each typesetting modification introduced in the 10 examples that follow will reduce the amount of space used by this text to a greater or lesser degree. Each will have some impact on the color, shape, proportion, texture, and readability of the text.

Specifications:

Janson text, 10/15, FLRR, unkerne, 15 picas wide, 31.25 picas deep.

Kerning:

The English visitor to Rome, if he has any familiarity with letter forms, cannot fail to be struck with the consistent quality of the architectural lettering which he sees on many of the late 16th, 17th and 18th century buildings. It is a letter which fits his preconceptions about roman lettering in a way that may not at first be easy to define. The proportions are close to those of the one ancient inscription with which he has more than a vague acquaintance: the tablet on the base of the column of Trajan in the same city. This will not strike him as unusual, for the teaching of lettering in England has for many years tended to suggest that the Trajan inscription is at once a representative and a supreme example of the inscriptive lettering of ancient Rome. It is only when he examines inscriptive lettering elsewhere in Italy and Europe that it may occur to him that it is only in 20th century England and 16th century Rome that the lettering on the Trajan column has been selected as a standard roman letter. (James Mosley)

Kerning reduces the spaces between letters so more letters fit on a line. The typeface, the length of the line, and the way in which words break will influence how much effect kerning has overall. Kerning that is too tight often impedes readability by obscuring the rapid and automatic recognition of the letters.

Specifications:

Janson text, 10/15, FLRR, kenne, 15 picas wide, 28.75 picas deep.

Leading:

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Leading saves a significant amount of space but changes the color and texture just as significantly. Overly tight leading may interfere with readability. Shorter lines of type can be leaded more tightly than longer ones.

Specifications:

Janson text, 10/13, FLRR, unkerne, 15 picas wide, 27 picas deep.

Justification:

The English visitor to Rome, if he has any familiarity with letter forms, cannot fail to be struck with the consistent quality of the architectural lettering which he sees on many of the late 16th, 17th and 18th century buildings. It is a letter which fits his preconceptions about roman lettering in a way that may not at first be easy to define. The proportions are close to those of the one ancient inscription with which he has more than a vague acquaintance: the tablet on the base of the column of Trajan in the same city. This will not strike him as unusual, for the teaching of lettering in England has for many years tended to suggest that the Trajan inscription is at once a representative and a supreme example of the inscriptive lettering of ancient Rome. It is only when he examines inscriptive lettering elsewhere in Italy and Europe that it may occur to him that it is only in 20th century England and 16th century Rome that the lettering on the Trajan column has been selected as a standard roman letter. (James Mosley)

Justification reduces the length of a column by using all the space on every line of type. If a line length is too short, justification may cause an uneven texture or excessive hyphenation, both of which affect readability.

Specifications:

Janson text, 10/15, justified, unkerned, 15 picas wide, 30 picas deep.

Typeface:

The English visitor to Rome, if he has any familiarity with letter forms, cannot fail to be struck with the consistent quality of the architectural lettering which he sees on many of the late 16th, 17th and 18th century buildings. It is a letter which fits his preconceptions about roman lettering in a way that may not at first be easy to define. The proportions are close to those of the one ancient inscription with which he has more than a vague acquaintance: the tablet on the base of the column of Trajan in the same city. This will not strike him as unusual, for the teaching of lettering in England has for many years tended to suggest that the Trajan inscription is at once a representative and a supreme example of the inscriptive lettering of ancient Rome. It is only when he examines inscriptive lettering elsewhere in Italy and Europe that it may occur to him that it is only in 20th century England and 16th century Rome that the lettering on the Trajan column has been selected as a standard roman letter. (James Mosley)

Because typeface designs vary so much in their proportions, a change of typeface may significantly add or subtract from the overall length of text.

Specifications:

Goudy 10/15, FLRR, unkerned, 15 picas wide, 30 picas deep

Point size:

The English visitor to Rome, if he has any familiarity with letter forms, cannot fail to be struck with the consistent quality of the architectural lettering which he sees on many of the late 16th, 17th and 18th century buildings. It is a letter which fits his preconceptions about roman lettering in a way that may not at first be easy to define. The proportions are close to those of the one ancient inscription with which he has more than a vague acquaintance: the tablet on the base of the column of Trajan in the same city. This will not strike him as unusual, for the teaching of lettering in England has for many years tended to suggest that the Trajan inscription is at once a representative and a supreme example of the inscriptive lettering of ancient Rome. It is only when he examines inscriptive lettering elsewhere in Italy and Europe that it may occur to him that it is only in 20th century England and 16th century Rome that the lettering on the Trajan column has been selected as a standard roman letter. (James Mosley)

A smaller point size fits more characters per line. This example uses only one point size smaller, yet makes considerable difference in length. Because new designers, particularly those using desktop technology, tend to set or specify type considerably larger than it needs to be for readability, point size can generally be reduced without losing readability.

Specifications:

Janson text, 9/15, FLRR, unkerned, 15 picas wide, 27.5 picas deep.

Line length:

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The impact of changing the line length will depend on how many line breaks change, which depends on the text. Often changing the line length by only a few points will shorten a column considerably. Often the reader will not even be aware of such changes.

Specifications:

Janson text, 10/15, FLRR, unkerned, 16 picas wide, 28.75 picas deep.

Kerning and leading:

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The tight kerning and leading have squeezed all of the extra space out of the text, making the color considerably darker and the texture considerably denser. Such compactness is best set on a short line length.

Specifications:

Janson text, 10/12, FLRR, kерned,
15 picas wide, 23 picas deep.

A typeface with a smaller letter design can be set on tighter leading without the text seeming crowded or dark. Each combination creates a different color. Often changing the leading only a point will make a significant difference.

Specifications:

Goudy, 10/13, FLRR, unkerned,
15 picas wide, 26.25 picas deep.

Point size, leading, and justification:

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All specifications:

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In combination, typesetting variables have dramatic effects. Each combination of specifications creates a different texture, color, and shape, which affects the appearance of the page. If the differences are extreme, the layout is affected as well. The paragraph above, for example, looks considerably different than the original and would cause the layout to look considerably different as well.

Specifications:

Times, 9/12, justified, kерned,
16 picas wide, 17.75 picas deep