Adding alternative text to complex diagrams and images

Alternative text (Alt text) provides a description that will be read out by assistive technology to help people with visual impairments understand what's important in images and other visuals. Normally this should be one or two short sentences that provide a summary of the key information represented in the image.

A complex idea can often be better conveyed as an image or diagram, but people with a visual impairment will struggle to access that content. Complex images contain substantial information that may be challenging to describe in a short phrase or sentence and visually impaired learners may not understand the images without a long description or supporting materials.

Examples of complex images include pie charts, bar charts, graphs, flowcharts, diagrams, illustrations and maps.

Making complex images accessible for everyone can often be achieved by providing additional information in a format that is more suitable for people with visual impairments. The format used will depend on the type of content and purpose, but could include written notes, bullet lists or audio descriptions. You may need to experiment with your teaching materials or consult with your students to identify the methods that work best for the types of images used.

- If you are using PowerPoint, you can add supporting information in the notes section of the slide. This information will be available to a student if you provide the presentation as a PowerPoint file or if you select the option to export the notes when creating a PDF version.
- Sometimes it may be easier and more effective to record a verbal description of the image and attach it as an audio file. Web pages, online learning platforms and many document formats will allow you to add an audio recording.
- You can provide links to other resources that provide more detailed descriptions or additional information.

Key guidance for alt text

- Write clear, concise, meaningful and accurate descriptions.
- You should avoid beginning the alt text description with "Image of..." (assistive software will automatically identify the object as an image), but it can be important to identify the type of image content (e.g. pie chart, graph, flowchart, etc).
- Focus on the key information rather than extraneous visual elements.
- Present information consistently and in a logical order.
- Include any important text contained in the image.
- If the image contains a lot of data information, present the data separately from the description of the overall image.
- Use words rather than symbols when writing scientific or mathematical expressions.

Example Solutions

- Determine the main point of the diagram and give a brief overview before including any important specific details.
- For images that cover a number of key details, organise the description in a linear fashion, moving left to right and top to bottom.
- For diagrams or illustrations with arrows, describe the arrow's function instead of the arrow itself. Use appropriate phrases, such as "leads to", "points to", "yields", "feeds on", "changes into" depending on the context.
- Use bullet points and numbered lists to clarify processes and procedures.
- Use a narrative to tell a story when the general concept is more important.
- Text descriptions and lists can be used together. Use descriptions to summarize the general concept and use lists for information in more detail.

Example
The supplementary information provided as a note could be:

This diagram illustrates the anatomy of the cardiac cycle. It shows a cross-section of the heart. Blood enters the heart through the inferior and superior vena cava, emptying oxygen-depleted blood from the body into the right atrium. The blood then travels to the right ventricle and is pumped to the lungs via the pulmonary artery. The pulmonary vein empties oxygen-rich blood from the lungs into the left atrium. This blood is then pumped to the left ventricle and is sent to the systemic circuit via the aorta.

1. In contraction (systole), the heart pumps blood out through the arteries.
2. In relaxation (diastole), the heart fills with blood. One complete sequence of filling and pumping blood is called a cardiac cycle.
3. Pressure in the atria exceeds ventricular pressure. The atrioventricular valves open and the ventricles fill passively.
4. Atrial contraction forces additional blood into ventricles.
5. Ventricular contraction pushes the atrioventricular valves closed and increases pressure inside the ventricle.
6. Increased ventricular pressure forces the semilunar valves open.
7. As the ventricles relax, pressure in the arteries exceeds ventricular pressure, closing the semilunar valves.

Data from pie charts and bar charts is best presented in a table or as a list.
- Begin with a brief description of what the chart represents and a summary of the data.
- If using a table format, remember to include a table title and column/row headers.
- For pie charts, list the numbers from largest to smallest regardless of how they are presented in the image.
This pie chart shows the percentage distribution of students registered as UK, EU or overseas, according to their fee status for the academic year 2019/20.

- UK: 64%
- Overseas: 26%
- EU: 11%

Generally, flowcharts show how steps in a process fit together and can be represented in a numbered list format.

Example

Sum of odd numbers between 1 and 100
The alt text for this image is:

Flowchart to calculate the sum of odd numbers between 1 and 100

The supplementary information provided as a note could be:

1. Start
2. Sum = 0, N = 1
3. Sum = Sum + N
4. If N is less than 99
   a. Increase the value of N by 2
   b. Go back to step 3
5. Print Sum
6. End

- State the type of graph and what it is about.
- Describe what the x-and y-axes represent.
- Write out the points in bullet form.
- Include the data points of the figure, the comma between the x- and y-coordinate (i.e. (5, 3)).
- Spell out abbreviated units (ft. = feet).
- Organise the description in a linear orientation from left to right, top to bottom.

Example
The line graph shows a parabola curve of the formula of $y = x^2 - 2x$. The vertex of the parabola is at $(1, -1)$.

- $x = -2, y = 8$
- $x = -1, y = 3$
- $x = 0, y = 0$  This is an x intercept.
- $x = 1, y = -1$  This is the vertex.
- $x = 2, y = 0$  This is the other x intercept.
- $x = 3, y = 3$