

A guide for making posters and infographics

Bachelor Earth Sciences

Version 1.0

Faculty of Geosciences
Utrecht University
2022

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Preface

Posters and infographics are a great way to communicate your research to a wider audience, both other researchers and non-academic audiences. These types of visual communication can simplify and present a large amount of information in an appealing, compact way, providing your audience with an understandable and succinct story. As with scientific writing, making posters and infographics is a skill that must be learned by repetitive practice of creating and revising. Throughout the Bachelor's programme of Earth Sciences, you will train your skills on visual communication.

This document aims to provide concise guidelines and instructions for content, structure, and style of posters and infographics. Some information holds for both infographics and posters, and some guidelines are split up for both types of products.

Students are encouraged to use this document to structure, evaluate and improve their work before submission. For teachers, this document may be useful to give consistent instructions, feedback and grades. Note that all instructions should be interpreted as guidelines and not as absolute laws; there may be good reasons to deviate from them. In such cases, it is advised to consult your supervisor. All guidelines come together in an example rubric at the end of this guide. This rubric can be used as a checklist for your product.

This guide builds on the Guide for Scientific Writing by Marcel van der Perk, input and feedback from Joris Veenhoven from Educational Consultancy & Professional Development (Onderwijsadvies & Training UU), Margot Stoete from Geosciences Communication and Marketing and from lecturers and professors of the Bachelor's programme of Earth Science at Utrecht University.

Elisabeth Addink and Tessa Deggeller
2021

2. Introduction

2.1. What are infographics and posters?

Both infographics and posters are ways to present knowledge in a visual way, and to simplify a large amount of complex information so the audience can understand it easily. However, there are differences in design and aim of the two types of products. The characteristics are summarised in table 1.

Infographics

An infographic is a contraction of “information graphics” and it combines icons, illustrations, data visualisations, and minimised text to create a powerful overview of your main message. Through an infographic you can simplify complex (and often quantifiable) information into a visual summary that is easily understandable by the audience. In the context of research, “infographics” can apply to any type and number of visual outputs such as presentations, visual reports, graphs, diagrams or other illustrations, including posters. Single data visualisations on their own (e.g., one graph or one picture) could therefore sometimes be referred to as an infographic as well. However, the definition used in this guide is a visual abstract: a combination of figures designed to make the data understandable at a glance, with limited amount of text. Infographics are usually made with as few assumptions about the viewers’ background as possible. To get an idea about infographics, take a look at the example in *figure 1*.

Posters

Scientific posters are a visual communication tool to show scientific research in a standard format, with a heading, name of the researcher and institute, text, tables and illustrations that show the results of the research. A poster comprises an introduction, the findings (which can be but don’t have to be: methods – results – discussion), and a conclusion. Posters are commonly used at conferences where multiple posters are presented simultaneously and the researcher can stand nearby to answer questions and provide additional information to the audience. Generally, a poster can contain more text than an infographic as the emphasis is more on qualities and storytelling rather than quantifiable data, yet graphics are still an important part of the poster. A poster has a more generic style than an infographic. For an example on academic research poster design, see *figure 2*.

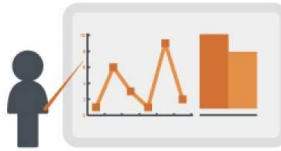
Table 1: Characteristics and differences of infographics and posters

	Infographic	Poster
Figures	One or more figures (often consisting of sub-figures) and use of icons	One or multiple figures supporting text
Text	Keywords or short phrases	Short text fragments, a few paragraphs
Set up	Title + message	Title, introduction, findings (e.g. methods, results, discussion), conclusion
Role of text and figures	Text supports visual information	Figures support text
Information depth	Abstract-like: short facts and conclusions	Includes substantiation and explanation of your statements.

INFOGRAPHICS

THE BENEFITS OF THEIR USE ONLINE

PRESENTERS WHO USE VISUAL AIDS ARE



43% MORE EFFECTIVE

IN PERSUADING AUDIENCE MEMBERS TO TAKE A DESIRED COURSE OF ACTION



90%

OF INFORMATION TRANSMITTED TO THE BRAIN IS VISUAL



40% OF PEOPLE RESPOND BETTER TO VISUAL INFORMATION THAN TEXT



TEXT = SHORT TERM MEMORY
IMAGES = LONG TERM MEMORY



Graphical Description

"A curved line with every point equal distance from the center"

Textual Description

IT IS MUCH EASIER TO SHOW A CIRCLE THAN DESCRIBE IT



USERS HAVE TIME TO READ **28%** OF THE WORDS ON AN AVERAGE WEB PAGE AT MOST
(20% IS MORE LIKELY)



79% OF USERS SCAN ANY NEW PAGE THEY COME ACROSS ONLY 16% READ WORD-BY-WORD



HIGH QUALITY INFOGRAPHICS ARE **30x** MORE LIKELY TO BE READ THAN TEXT ARTICLES



SOCIAL NETWORKS MOST POPULAR SITES RELY MAJORLY ON IMAGE POSTS INFOGRAPHICS CAN BE SHARED IN AN INSTANT



LOADING IS NO PROBLEM THEY CAN BE LOADED ON ANY DEVICE INSTANTLY

USE OF INFOGRAPHICS CAUSE A GROWTH OF **12%** IN SITE TRAFFIC ON AVERAGE



SOURCES:

"The Power of Visual Communication"

<http://www.billiondollargraphics.com/infographics.html>

"Infographic Effectiveness Statistics"

<http://ansonalex.com/infographics/infographic-effectiveness-statistics-infographic/>

"How Little Do Users Read?"

<http://www.nngroup.com/articles/how-little-do-users-read/>



Read the full blog post @
kinocreative.co.uk/blog

Figure 1. Example of an infographic about infographics. Source: Kino Creative, via Visually, 2020.
www.visual.ly/community/Infographics/technology/infographics-benefits-their-use-online

Academic Research Posters: Strategies and Principles For Good Design

Albert Einstein, Department of Physics and Astronomy, University of Sheffield

Introduction

Academic research is often presented visually in the form of a research poster. This format of dissemination is a particularly effective way to get complex ideas across in a simple and accessible way and is commonly used as a method of networking for researchers at conferences and events. It can be a great way to present your research to a wider audience and to get it noticed by relevant specialists, policy-makers or the general public.

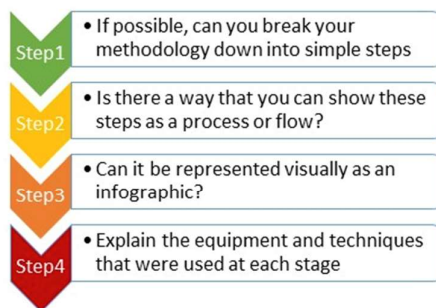
Aims and Objectives

Can you break down the aims and objectives of your project into some simple statements? If so, try presenting these as bullet points to make it easy for your reader to find them:

- **Produce a high quality academic poster**
- **Present my findings in an accessible and visually engaging way**
- **Raise awareness of my research among a wider audience**

Methodology

A brief objective description of the experimental approach, including equipment used and the protocol followed. Your methods should include techniques used both to generate and to analyse the data (i.e. which statistical methods were employed).



Bibliography:

Lippman, Doris Troth et al. "Designing a research poster with impact." *Western Journal of Nursing Research* 11.4 (1989): 477-485.
Rowe, Nicholas et al. "What impact do posters have on academic knowledge transfer?" *BMC medical education* 9.1 (2009): 71.

For further information, please contact: 301@sheffield.ac.uk

Figure 2. Example of a poster about research posters. Source: The University of Sheffield, 2020. Poster Presentations. www.sheffield.ac.uk/ssid/301/study-skills/communication/poster-presentations

Results/Findings

What are your key findings? Can you support these with graphical representations of your data? Think about simplicity and accessibility of the information and adopt a 'less is more' approach where possible.

Fig. 1: Delegate responses to the prompt: "Academic Conference Posters are commonly used with my professional field"

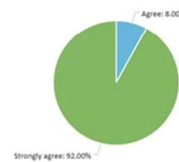
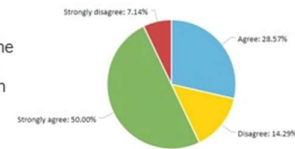


Fig. 2: Delegate responses to the prompt: "Catching viewers attention is reliant upon imagery and composition"

A lot of viewers of your poster will look at the images first (see Fig 2. above), so make sure they tell a story in their own right and are clearly annotated and labelled.

Analysis/Discussion

What does your data mean? How does what you have presented fit in with the existing literature? Do your findings support other published research, or do they challenge it? If so, why, or why not? You may also wish to include the following sections:

- **Limitations: were there any problems or issues with your research project?**
- **Key themes or findings from your research summarised as succinctly as possible**

Conclusion

What are the main take-home messages for your audience? Are there any recommendations, implications for practice, or is further research required to build a complete picture? If so, what are the next steps for you and/or other researchers in the field?

Acknowledgements:

Sir Isaac Newton, Professor of Mathematics
University of Cambridge
Brian Cox, School of Physics and Astronomy,
University of Manchester



2.2. Functions of infographics and posters

Scientists make posters and infographics to communicate their research results and findings with other scientists, experts, or a broader public from non-academic backgrounds. Both types of products are suitable for different uses.

Posters

A research poster can be used in multiple situations, but it is most commonly presented at conferences. This happens during a poster session, where multiple posters are presented simultaneously. The audience can walk around to look at different posters and to interact with the author. You will want to draw the audience to your poster by making it attractive. The poster should therefore present a brief but complete overview of your research and key message, where redundant details are left out. The function can be e.g. to share insights from your research to a wider public, or to make new connections with other professionals (networking).

Infographics

Infographics have a broader use than posters. Anywhere where you would want an audience to quickly find a message in a story or data, infographics could come in handy. For example, they can be presented live, published in magazines or on websites, or distributed as a separate handout or flyer. Also, newspapers often use infographics to clarify complex stories. The function is always to provide your specific audience with easy-to-understand information, with a key message that is clearly presented in graphics and text.

2.3. Plagiarism, scientific misconduct and copyright

When doing research, you will often build on the available knowledge of researchers in your field. You might also want to use graphics that someone else created. Presenting other people's research and work in your own products is possible, as long as you do it correctly. The main issues to keep in mind are plagiarism, scientific misconduct, and copyright. More information, further explanation, and examples of fraud and plagiarism can be found on the university's website¹ or the plagiarism.org website^{2,3}.

Plagiarism

Plagiarism encompasses copying of someone else's work or ideas without proper reference and present it as an own piece of work. It is considered as academic misconduct. To avoid plagiarism, do not literally copy any phrases from source materials (article, book, or report) and always give a proper reference to the original source from which you borrow insights and knowledge.

DO...	DON'T...
<ul style="list-style-type: none">• ... write in your own words and refer adequately to the literature• ... keep track of your sources throughout the process	<ul style="list-style-type: none">• ... copy entire phrases/paragraphs from existing texts• ... leave making the reference list for last, as you will have forgotten where exactly you got which information from

¹ www.students.uu.nl/en/practical-information/academic-policies-and-procedures/fraud-and-plagiarism

² www.plagiarism.org

³ www.uu.nl/en/organisation/copyright-information-point/copyright

Scientific misconduct

Scientific misconduct is broader defined as *intention or gross negligence leading to fabrication of the scientific message or a false credit or emphasis given to a scientist* and includes, besides plagiarism, data manipulation and fabrication. It should be obvious that in the academic community, any form of scientific misconduct is considered to be a very serious offense and will be treated as such.

Copyright

An issue you must (in Dutch: auteursrecht). Copyright is a right to control how a work is used, and it is automatically assigned to the owner/title holder of the original work. This can be a person, group of people or company, which has the exclusive rights to reproduce, distribute and adapt the work. "Work" can refer to any product or publication such as music, illustrations, films, computer programmes, and graphics.⁴

When searching for material, always check if it is free-to-use, needs crediting, or if it is copyrighted. Free-to-use material can be found on several websites, listed by the Copyright Information Office⁵. If you want to use copyrighted work, you will have to seek permission from the owner, or check if particular use is permitted by a licence. There are different types of licences, which explain how the work can be used, credited and distributed.

DO...	DON'T...
<ul style="list-style-type: none">• ... use license-free or your own material. Give credit when this is due	<ul style="list-style-type: none">• ... copy material without checking for copyrights

⁴ www.uu.nl/en/organisation/copyright-information-point/copyright

⁵ www.uu.nl/en/organisation/copyright-information-office/licence-free-visual-material

3. Step by step

When creating a poster or infographic, it is good practice to first elaborately plan your product by defining your audience and key message, finding the scope of your narrative, and then sketch and create your poster or infographic.

Alongside the poster or infographic, you are often required to hand in a process report to substantiate your decisions. This “meta” report contains the goal of your product, your intended audience, an outline/sketch of the structure in which you specify which graphics and which information you will present. Furthermore, a first draft should be submitted to your teacher. A template for this process report can be found on Blackboard and at the bottom of this document.

3.1. Planning your infographic/poster

3.1.1. Define the audience and aim of your product

First, check what the requirements are for your assignment (e.g. a predetermined target audience or specific course instructions). You will then have to specify what message you want to convey, and what topic you will use to translate this message. Once you know your specific topic, you need to know who your audience will be, and what their background knowledge is. Think about answers to the following questions.

- What are the specific requirements for your project, as defined in your course?
- When and where will your poster / infographic be presented?
- What do you want your audience to know or feel about your topic?
- What does the audience need to do with the knowledge you provide?
- Should the audience come into action?
- Should the audience use your findings in their own research?
- Should the audience work together with you?
- Do you want to raise awareness or advertise something?

When you know what you want to achieve with your product, you can make your narrative more efficient.

When you know the (variation in) backgrounds of your audience, you can decide how in-depth you can make your story and what knowledge gaps you first will have to bridge. For example, when you write a scientific paper, your audience consists primarily of other researchers in your field of study. In that case your text will be detailed, complex, and include specific terminology. In the case of posters and especially infographics, your audience might be broader. They might have less background knowledge about your specific research topic and will not be familiar with the field-specific jargon. Therefore, avoid using jargon, and if you must use jargon, then be as clear as possible to make it understandable.

Posters

At a poster session during a conference, you will have competition for the audience’s time: a successful poster will capture their attention and communicate your message succinctly and engagingly. It should encourage the audience to stop and discuss your work with you. Detailed information can then be shared during the conversation, or as a handout that you have prepared.⁶

⁶ www.personal.psu.edu/drs18/postershow

Infographics

The aim of an infographic can be more flexible. For example, maybe you want to:

- make a comparison,
- market a product or idea,
- show a process to indicate a method,
- explain a concept,
- entertain,
- persuade viewers to take action.

The options are endless, but defining the aim is the crucial starting point to designing your infographic.

DO...	DON'T...
<ul style="list-style-type: none">• ... clearly define the audience• ... keep your end goal in mind• ... adjust your language to your audience	<ul style="list-style-type: none">• ... use field-specific jargon when the audience is broad

3.1.2. Gather information within the margins of your aim

When you know who your audience is and what you want them to know or do after they have seen your work, you can mold your story into a suitable narrative. For this step, it is important to develop an *information hierarchy*: define the key points and what you need to support your key points. This scope should be narrow, to make sure you can create a story around this core message. Throughout the whole process of creating your poster or infographic, keep this key message in mind, otherwise your product lacks focus and looks messy.⁷

Good information is at the base of any good poster and infographic. Although the content seems short, you will need a surprisingly large amount of information to create a thorough and complete poster or infographic. For your research, use quality sources: make sure they are up to date and original source instead of work that refers to other sources.

When you have all your information, you can plan your *framework*: make summaries of the information you want to include in every section. For research posters, you will usually want stick to the general format: background information, methods, results, and discussion/conclusions. Your results section should be the most prominent and visually appealing section of your poster. For infographics, this format usually consists of an introduction/attention catcher, a body, and a conclusion. In both cases, make an effort to find a unique or unexpected angle to present your topic. This will help to get your audience's attention and to let your message stick in their memory.

Again, narrow it down: too much information will be overwhelming to you and your audience, and therefore distract from your main message.

DO...	DON'T...
<ul style="list-style-type: none">• ... determine your key message or focus and keep to your scope• ... use original, quality resources• ... try to find a unique or unexpected angle to present your topic	<ul style="list-style-type: none">• ... include too much information, this will overwhelm the audience• ... use indirect citation if this can be prevented

⁷ www.clips.edu.au/infographics

3.2. Creating your infographic/poster

3.2.1. Sketch

Once you are happy with your content (step 2.1), you can start designing. First, make a detailed sketch of your layout. This should be the skeleton of your product. In your sketch, consider the size of your poster/infographic and plan what information will go where. Include a title, the “hook” or attention catcher, a problem statement (if applicable), a body with most of the information, and a conclusion.

For inspiration, look at existing posters (e.g. from the UU⁸) and infographics⁹ related to your topic: what appeals to you and what doesn't? What are different ways to display information? Using a sketch will allow you to see if your information flows nicely. It is important that the viewer can follow the flow of your story and find the key take-home message with as little effort as possible. This can be achieved by using numbers and arrows. Furthermore, think visually: if you can show something graphically rather than with text, always do so. Also, bullet point lists are more appealing than a long piece of text.

Posters

For posters, the framework will often be of a standard format. The title goes in a banner at the top of your poster, you start with an introduction, then you show and tell your findings, after which you end with a conclusion. Depending on your topic, you might or might not follow the IMRAD (introduction, methods, results and discussion) structure. In your sketch, decide how many columns and how many rows you need. Consider how much text goes in each block, what information goes where, and how much space your graphics will need.

For the sequence of your material, take into account the top-to-bottom and left-to-right reading flow of your readers. Choose the right order: the title is in the top centre. Next, the audience will look at the upper left part: write an introduction that states your research question and why it is important. Then, say what you did and how you did it. End with your conclusions. In between, guide your audience visually through your information. Keep items that belong together close to each other: place an illustration near the text where it is discussed.

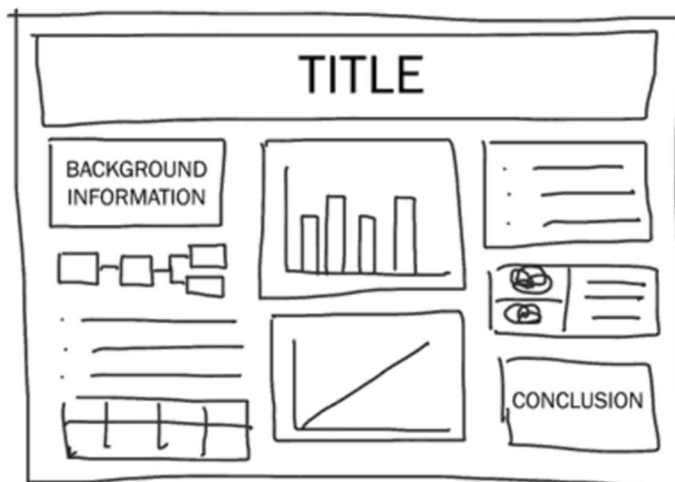


Figure 3. Example of a poster sketch. (Source: www.clips.edu.au/posters)

⁸ <https://www.uu.nl/en/organisation/faculty-of-geosciences/research/research-posters#1>

⁹ <https://lemonly.com/blog/best-infographics-right-now>

Furthermore, be aware of your use of white space. It can help to keep things separate or together and can be used to focus the viewers' attention. It is a common mistake to fill all the white space, in enthusiasm to include as much information as possible. However, open space is important to find information easily and to make your poster inviting rather than intimidating. A rule of thumb for a good lay-out is that it should leave 35% empty space and include 35% graphics. Also, limit the use of boxes and lines. Although it might seem as a convenient way to separate parts of your poster, it is better to use white space to achieve an orderly poster. Boxes and lines will stop the viewers eyes from scanning smoothly, and it becomes more difficult to scan the entire poster.¹⁰

Tip when making your sketch digitally: start with choosing the right size setting! Posters for academic conferences are generally A0 (84.1 cm x 118.9 cm). It is important to size your poster first, because this cannot always be done afterwards. When you present at a poster market for a conference, the poster board on which you attach your poster will more often be portrait than landscape orientated. Before finalising your poster, print it as an A4, hang it on your wall and step away. Are you satisfied with the relative amount of text and white spaces, and figures?

DO...	DON'T...
<ul style="list-style-type: none"> • ... keep enough empty space around your text and images • ... start with choosing the right size of your poster if using software 	<ul style="list-style-type: none"> • ... use boxes and lines to separate parts of your poster if it does not help to clarify your setup • ... place images far from the text that they belong to

Infographics

For infographics, you are free to choose your own framework. There are different types of infographics. They are used for different aims and include different visual tools to display information. Each type is therefore facilitating the flow of reading through the information in their own way. The flow, or chronology of your information can for example be along a (time)line or arrow, clockwise in a circular format, or in top-to-bottom or left-to-right blocks, using numbers, or even a combination of those. Eight commonly distinguished types of infographics used in science are:

- Timeline infographics
- Geographic infographics
- Process or flow chart infographics
- Informational infographics
- Statistical infographics
- Comparison infographics
- Hierarchical infographics
- List infographics

More information about these types of infographics and examples can be found online. For example: www.venngage.com/blog/9-types-of-infographic-template

DO...	DON'T...
<ul style="list-style-type: none"> • ... choose an appropriate framework for the type of information you present 	<ul style="list-style-type: none"> • ... start working without a plan to guide the audience's reading chronology

¹⁰ www.personal.psu.edu/drs18/postershow

3.2.2. Write text content

The text content will be very different for posters and infographics. For both, it applies that you should keep your audience in mind to write at the right level for them, and that you should avoid irrelevant information: extra noise will reduce the impact of the point you are trying to make.

Posters

The text on your poster should balance between completeness and compactness. The writing style for a poster is different than for a research paper. While you can be elaborate in a paper, a poster should be concise and to the point. Engage your audience with clear and easy to understand sentences, and only include information that is essential to communicate your key message. The word limit for your poster and the poster sections is not written in stone, yet generally, do not exceed 800 words overall and 200 words for one paragraph.¹¹

DO...

- ... use bullet point lists rather than long pieces of text

DON'T...

- ... use more than 10 sentences for one uninterrupted piece of text.
Alternatively, intersperse with a graphic

Infographics

On an infographic, the text content will be separate words and sentences rather than a block of text. With the knowledge level of your audience in mind, “pitch” your content. The visuals will tell your main message, and the text is there to support and clarify it. Think carefully about your word choice: as you don’t have many, every word should be clear and define exactly what you mean. Check that your words cannot be misinterpreted.

DO...

- ... let your text support the message rather than contain it

DON'T...

- ... include long pieces of text on an infographic

3.2.3. Data visualisation

To convey your message in a clear and appealing way, you need to visualise your information. Choose the right figure types¹² for your data visualisation, such as maps, tables, bar graphs, pie charts, histograms, line charts, tree diagrams, mind maps, network diagrams, and scatter plots. This choice depends on the type of data and the variables. A variable can be:

- Continuous (e.g. temperature)
- Discrete (e.g. number of birds)
- Categorical (e.g. blood type)

For most data visualisations, the independent variable, which is the one you control or manipulate, is placed on the horizontal direction (x-axis) of your graph, and the resulting dependent variable on the vertical axis (y-axis).

At all times, make sure your data is *truthful*! Your choice of appropriate data visualisation must ensure that your data doesn’t suggest correlations or trends that are actually not there. Clearly distinguish which data comes from experiments or observation, and which parts are interpolated or interpreted. For example: use straight lines between observations, rather than smooth lines as you suggest more data than you actually have. Also, don’t distort axes to make a trend (e.g. a “small” increase from 50 to 52) look more spectacular: show the full range including the origin,

¹¹ <https://www.clips.edu.au/posters/>

¹² <https://www.boostlabs.com/10-types-of-data-visualization-tools/>

and if needed insert a zoom in on the small increase for a detailed look. The internet is full of tips for data visualisations^{13,14,15}.

Another general rule to take into account, is that graphics should be easy to interpret in *black and white*. Of course, colours can be used to make it look appealing and as extra clarification, however it should not be a crucial aspect of your data visualisation. Forms of expressions that can also be identified in black and white are size, greyscale, shape, thickness, and direction. These can be combined, and assigned to points, lines and areas. Legends are preferably incorporated as labels in the graphics rather than placed separately.

Posters

The graphics that you use for your poster should look different than those you would see in a report. They have to be free from clutter and details, and highlight the most important information. Avoid unnecessary coloured backgrounds, gridlines, different data mark types, confusing colour use, and separate legends. Furthermore, text in your figures should be the same size as the body text.

● Figures on a poster can never stand alone: they should always be referred to in the text, and they therefore always need a figure number and title. This title can be descriptive or assertive: a descriptive title tells what the figure is displaying but does not explicitly identify the trend (example: “effect of indigenous plant species on insect numbers”). An assertive title states the trend/relation to help the audience to understand the key message (example: “indigenous plants cause an increase in number of insects”). However, be careful that your assertive title does not mislead or overstate your results.¹⁶

Infographics

Infographics can be seen as one big data visualisation, such as a timeline or a map, consisting of multiple sub-graphics. You have a lot of freedom in your design. However, try to stick to the three important principles in data visualisation: accuracy, clarity, and consistency.¹⁷

- Accuracy: present the data correctly and without distortion, with the appropriate type of visualisation.
- Clarity: streamline your design and only show crucial information. Make sure you highlight the trend or message in the data, and don't distract the viewer with unnecessary details. For example, you can use design principles like contrast to highlight main points or include a summary of the trends rather than a figure legend, or label data points directly with the value or name.
- Consistency: use the same formatting, scale and style throughout your infographic. This makes it easier to read and facilitates easy overview and clear comparison of different graphics.

DO...	DON'T...
<ul style="list-style-type: none"> • ... add titles and captions the graphs and images • ... use the appropriate type of data visualisation 	<ul style="list-style-type: none"> • ... suggest trends or correlations if they are not there

¹³ <https://www.geckoboard.com/best-practice/data-visualization-tips/>

¹⁴ <https://www.columnfivemedia.com/25-tips-to-upgrade-your-data-visualization-design>

¹⁵ <https://interactions.acm.org/archive/view/july-august-2018/the-good-the-bad-and-the-biased>

¹⁶ www.clips.edu.au/displaying-data

¹⁷ www.clips.edu.au/infographics

3.2.4. Lay-out

Lay-out is a very important part of your product. It can help with creating a certain atmosphere (serious, professional, happy, sad) and if it is used purposefully, it can facilitate quick understanding of your information by the audience and keep them engaged. Also, your information hierarchy can be clarified, e.g., by use of colour and fonts.

Sometimes you have complete freedom of choosing your own design, but if you make a product for a company, it often must follow a prescribed corporate identity (Dutch: huisstijl). For Utrecht University, this corporate identity is explained on the website (<https://www.uu.nl/organisatie/huisstijl/huisstijlelementen>). Here you will find examples, specific colour codes, rules for icons, and downloadable templates for posters and PowerPoints.

Common software for making posters and infographics are PowerPoint (easy-to-use), Adobe Illustrator (moderately complex, but very good for making clear graphs and drawings) or InDesign (more advanced options but more complex to use). All can be used freely via Utrecht University.

Graphics and icons

Apart from your actual data points, you might also want to use other images to clarify something or make your product more engaging. For example, a picture of your methods/experiments, or an image to illustrate your topic. Be careful not to let your images distract the viewer from the research findings. Graphics should highlight your key points, and not just used as place fillers (i.e. if you cannot refer to your figure in a logical way in the text, the figure should not be there). Note that photos used as background images rarely look good. The image often overpowers the text, and it makes the poster/infographic hard to read¹⁸.

Images that you see online may look good on your screen but might be pixelated when printed. Pay attention to the *resolution* to avoid this. There is an inverse relationship between resolution and print size (if you increase the print size the resolution decreases and vice-versa)¹⁹. If you use images from the web, make sure you are not breaking copyright laws (see paragraph 1.3).

To facilitate an easy reading “flow”, *icons* can be used to help the viewers understand and localize the different topics. Especially in infographics, but also on posters, using icons can communicate your story more efficiently and engagingly than with text. Use them carefully and properly, as viewers can interpret icons differently. Three types of icons are:

- **Literal** icons represent exactly that what they depict. Examples: a pen, country borders of the Netherlands, a plant.
- **Indicative** icons suggest a concept without literally depicting it. Examples: stripes indicating heat of a mug of tea, or speed of a car.
- **Symbolic** icons suggest a concept without being visually related to it. Examples: a dove suggesting peace, or a light bulb suggesting an idea.

DO...	DON'T...
<ul style="list-style-type: none">• ... mind all possible interpretations of an image: choose wisely• ... use images that actually aid clarification of your key message	<ul style="list-style-type: none">• ... use pixelated images. Printed images should have a resolution of >300 dpi and >120 ppi²⁰• ... use images as background as this can be distracting

¹⁸ <https://libguides.uccs.edu/c.php?g=117491&p=1486785>

¹⁹ <https://guides.nyu.edu/c.php?g=276826&p=1846156>

²⁰ <https://en.99designs.nl/blog/tips/ppi-vs-dpi-whats-the-difference/>

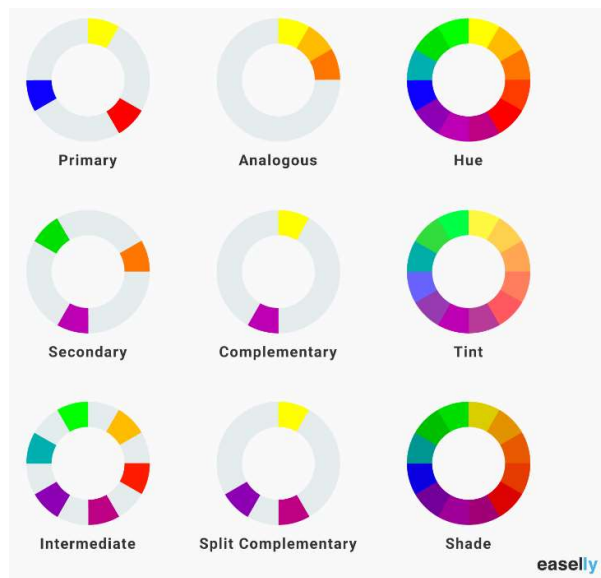


Figure 4. Examples for colour themes. (Source: www.easel.ly/blog/tips-picking-colors-infographic)

Colours and backgrounds

Colours can be used thoughtfully to enhance the look and clarity of the poster or infographic. Usually, three colours are enough, and make sure not to use clashing colours. For example, you can use different shades of the same colour, or use three matching colours, or have some similar colours and one colour stand out to use for accents.

It is important to keep in mind that quite some people have a form of colour blindness. For example, red and green might be clearly distinguishable for you, but not for part of your audience. However, there are different types of colour blindness – you can be unable to see red, green, or blue light – so it might be tricky to find a combination that is clear for everyone²¹. Therefore, make sure your message does not rely solely on colour by adding symbols or patterns.

The colour for your text should always be simple and easy to read, preferably a dark text on a light background.

Posters

Your background should be white or a pale shade of a neutral colour. When you make it too dark or too bright, your text will be less legible, and your graphics won't stand out. Research posters should look professional, so withhold from bright confetti colour palettes. Also, cool tones are more appropriate than warm tones.

Infographics

Infographics are often more colourful than posters. However, it is still important to keep to a colour scheme. A common use of colour is the 60-30-10 method: 60% of your infographic is your main colour, 30% is a secondary colour, and 10% is your "accent" colour. Note that you are free to use more than three colours, just think carefully if it really adds to the appeal of your infographic. And of course, different types of infographics need different numbers of colours.

²¹ <https://www.tableau.com/about/blog/2016/4/examining-data-viz-rules-dont-use-red-green-together-53463>

Text fonts

Your texts should be easy to read. Using a font that viewers are familiar with and that improves reading speed and comprehension. You can choose between serif fonts and sans serif fonts (figure 5). Serif fonts have small finishing strokes that guide the eye and make character recognition easy and are therefore often used for body text as well as headings and titles. On the other hand, sans serif fonts are more suitable for titles and labels, due to their simplicity and clarity. They can be more difficult and tiring to read, so avoid using them for long texts. In graphics, always use sans serif. These letters are equally thick everywhere and are still readable in small font sizes. Generally, you can use one of the common serif fonts for body text, and either a bold sans or a bold version of your serif font in the headings. Take care to combine the right fonts. The website www.fontpair.co gives you many examples of good combinations for heading and body fonts.

You can use a combination of uppercase and lowercase letters to add impact to specific parts of your product. Just as with serif fonts, lowercase letters aid easy word recognition, reducing the effort of reading a text. Lowercase letters have distinctive shapes as some letters have strokes above or below the letters (figure 5). However capital letters are more difficult to read as they all have the same rectangle shape. Capital letters are therefore not suitable to use in abundance of for longer pieces of text, but they can add emphasis and impact when used for short phrases like titles.

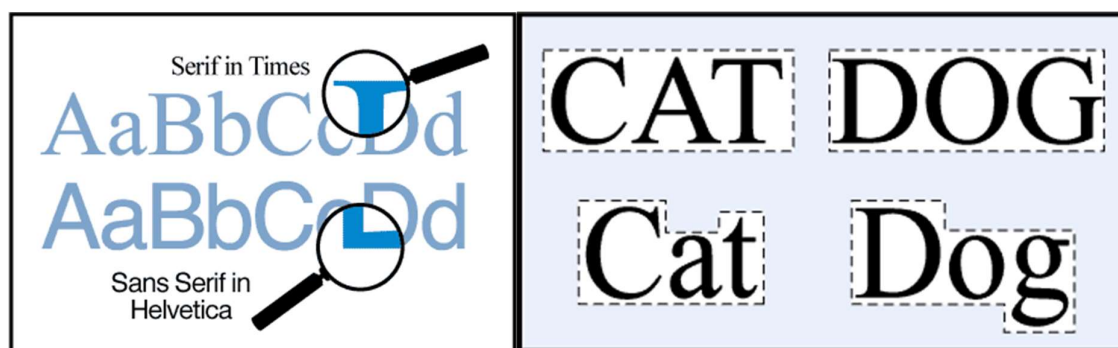


Figure 5. Serif and sans serif fonts (left), and capital and lower-case letters (right).
(Source: www.personal.psu.edu/drs18/posterhow)

Posters

Make sure your title is readable from a distance of 3 meters. As a starting point, you can set your title to 90 pt and your headings to 60 pt. The body text on a poster should be around 24 pt font, columns should be 45-55 characters wide. This makes it readable from at least 1 meter.

Infographics

Text on an infographic is usually limited, and often sans serif fonts are used throughout the whole infographic. This makes it look consistent and clean. Depending on the mood you want to set, you can also use 'display fonts' rather than sticking to the basic Arial, Helvetica and Verdana. Display fonts are the more alternative, playful fonts.

DO...	DON'T...
<ul style="list-style-type: none">... create clear information hierarchy using different fonts... use a serif font for body text and either bold serif or bold sans serif for headings	<ul style="list-style-type: none">... use more than three fonts (including bold and italics versions) except when it is really necessary for clarity

3.2.5. Literature references

All works that have been consulted in the production of a scientific text should be included in the reference list and should also be cited in the text or figure. The style of referencing and citation differs between fields of science and publishers. Nevertheless, the style is always consistent throughout the entire poster or infographic. For example, you can follow the APA or ASA style with authors and publication dates in the text, or you can use footnotes. This depends on the number of references, your personal preference, and possible course specific requirements. For text references, the source will be included the sentence where the information is presented. Sources for visual content can be referenced in the corner of the figure, or at the end of the image footer (see figure 5 for an example).

All works cited throughout your poster or infographic should appear in the reference list on your poster/infographic, alphabetically arranged according to the first author's surname. For citing different types of work (secondary sources, papers, books, websites, films, etc.) use e.g. www.mendeley.com/guides/citation-guides.

DO...	DON'T...
<ul style="list-style-type: none">• ... be transparent: cite all the sources you've used• ... for websites add the date last visited	<ul style="list-style-type: none">• ... use indirect and outdated sources• ... write down secondary sources as if it is a primary source

4. Checklist

To check if your poster or infographic meets the requirements, you can go through the rubric. A short general checklist, based on the rubric, is given below:

1) Plan of approach:

- Concisely describes the core message that fits the goal of the product and is relevant to the subject matter. In addition, it matches the requirements set in the corresponding task;
 - *Infographic*: presents a clear layout of the graphical components (words, images, lines) to be included through which the message and its importance are conveyed;
 - *Poster*: presents the layout of the main components (introduction, findings, conclusions). In addition, each of the components is broadly developed.

2) End product:

- The core message is clearly presented in words and/or images in a manner understandable to the target audience;
 - *Infographic*: the core message can be derived by the reader from the data and/or arguments presented;
 - *Poster*: the core message can be derived by the reader from the text, graphics and image information blocks that are provided;
- The relevant concepts and theories have been used in the correct manner (i.e. in line with the requirements set in the task by the course or client);
- All information directly supports the core message or its substantiation and, in addition, is of sound scientific quality;
- The infographic or poster grabs the viewers' attention through a combination of design elements and layout features;
 - *Infographic*: the graphical elements used fit with the type of data and core message;
 - *Poster*: can be read from a distance of about 3 m;
- All text is linguistically correct;

- There is a short title that fits with the core message. In addition, the name of the authors and study programme/educational institution are listed;
- All sources are mentioned in accordance with the corresponding rules and regulations.

5. Rubric

The rubric for making posters and infographics is provided in a separate document. The rubric is aligned with the manual (in particular the checklist on the previous page). Please make sure to check the rubric before you start designing your poster or infographic.

6. Template for process report

Name:

Topic:

Audience:

Goal of the product:

Key message(s):

Title:

Outline

Structure:

Data visualisations:

Additional information:

Graphics/images/icons:

Sketch (include headings, locations of information and graphics):