**General Description:** This sheet includes links to additional resources for creating effective publications, presentations, and posters. The sheet starts with open-source illustrations links that can help in any format. The sheet is sorted by sections for publications, presentations, and posters; some links will be helpful for multiple applications. At the end, there is a guide for creating accessible figures including links to full guides for accessibility of figures, PDF, color schemes, and more.

**General Figure-Making Links/Resources:**

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| **Type of Resource** | **Link** | **Description** |
| Publication | [Hyperlink](https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1003833) | Publication describing some key steps to creating publishable figures. |
| Social Media Thread | [Hyperlink](https://twitter.com/Ella_Maru/status/1673405271786287124) | Thread on Twitter that describes a workflow for creating nice figures |
| Publication/Report | [Hyperlink](https://nrokh.notion.site/100-Research-Rules-f608ddf8760c430e82a9daa74b8b6100?pvs=4) | 100 rules of research, many of which provide guides on scientific visualizations |
| Website: PicWish | [Hyperlink](https://picwish.com/) | Quick AI photo editor that removes backgrounds from image |
| Blog Posts | [Hyperlink](https://mindthegraph.com/blog/#.Yq2STi8w0dU) | MindTheGap does blogs on designing graphics |
| YouTube Tutorials | [Hyperlink](https://www.youtube.com/c/LuminousLab) | The Luminous Lab has tutorials on Blender, an open-source software for 3D graphics |
| YouTube Tutorials | [Hyperlink](https://www.youtube.com/c/DataVisualizationSociety) | The Data Visualization Society has playlists and chats about creating illustrations |
| Blog Posts | [Hyperlink](https://www.sciencegraphicdesign.com/blog) | Science graphic designer group has posts on accessibility and more |
| YouTube Tutorials | [Hyperlink](https://www.cedricscherer.com/top/about/#presentations) | Workshops on how to use ggplot, a data visualization package for R |
| Tutorial | [Hyperlink](http://mfviz.com/hierarchical-models/) | Visualization technique for multiple linear modeling |
| QR Code Generator | [Hyperlink](https://www.geeksforgeeks.org/python-generate-qr-code-using-pyqrcode-module/) | Python code for quick and semi-permanent QR Codes for webpages |

**Open-source Illustration Links**

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| **Type of Resource** | **Link** | **Description** |
| Website: Undraw | [Hyperlink](https://undraw.co/illustrations) | Undraw has open source and customizable illustrations for a wide range of figures |
| Website: Phylopic | [Hyperlink](https://www.phylopic.org/) | Phylopic has silhouettes of different animals, humans, and other organisms for free download |
| Website: Datawrapper | [Hyperlink](https://www.datawrapper.de/) | Datawrapper is a free to use visualization tool and a good way to start looking at different formats for data |
| Website: NounProject | [Hyperlink](https://thenounproject.com/) | This website has 5 million open source icons of different nouns |
| Website: Wikimedia commons | [Hyperlink](https://commons.wikimedia.org/wiki/Main_Page) | Wikimedia commons has free images for several types of images |
| Website: Biorender | [Hyperlink](https://learn.biorender.com/) | Biorender allows for making bio-interfacing figures/media/etc |
| Website: SciDraw | [Hyperlink](https://www.scidraw.io/) | Science draw has drawings for researchers to use in publications for free downloads with DOIs |
| Website: bioicons | [Hyperlink](https://bioicons.com/) | Bioicons has nearly 2500 icons for use for different experimental types |
| Website: NEJM | [Hyperlink](https://illustrated-glossary.nejm.org/) | The NEJM has a glossary of images for different medical images and types |

**Color-Palette Links:**

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| **Type of Resource** | **Link** | **Description** |
| Website | [Hyperlink](https://coolors.co/) | Coolors (color palette generator with options to toggle color blindness) |
| Social Media Thread | [Hyperlink](https://twitter.com/moriah_taylor58/status/1395431000977649665) | Thread on Twitter that describes how to choose a nice color palette for your figures |
| Blog Post | [Hyperlink](https://blog.datawrapper.de/beautifulcolors/) | A blog post on how to think about color coordination for figures |
| Website | [Hyperlink](https://colorbrewer2.org/#type=sequential&scheme=BuGn&n=3) | Colorbrewer helps find colorblind accessible color schemes for categorical data |
| Website | [Hyperlink](https://color.adobe.com/create/color-wheel) | Adobe color wheel can make different colors for different formatting rules |

**Poster Links & FAQs:**

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| **Type of Resource** | **Link** | **Description** |
| Social Media thread | [Hyperlink](https://twitter.com/iamscicomm/status/1532895329045168133?s=20&t=SvvDSnZi8jLzBf7m7ryq3A) | A Twitter thread on how to create nice poster visualizations |
| Publication | [Hyperlink](https://www.science.org/content/article/how-prepare-scientific-poster) | Science article with interviewed scientists describing posters |
| Blog Post | [Hyperlink](https://www.animateyour.science/post/how-to-design-an-award-winning-conference-poster) | Blog post that goes through fonts, images, and more of making a poster |
| Blog Post | [Hyperlink](https://www.biorender.com/blog/top-5-tips-for-designing-a-scientific-poster) | Tips and tricks for designing and creating a poster in BioRender |
| Blog Post | [Hyperlink](https://astrobites.org/2020/02/28/fixing-academic-posters-the-betterposter-approach/) | Description of the #BetterPoster movement and some tips for how to implement it |
| YouTube Tutorial | [Hyperlink](https://www.youtube.com/watch?v=SYk29tnxASs) | YouTube tutorial on creating a better poster in less time |
| YouTube Tutorial | [Hyperlink](https://www.youtube.com/watch?v=TzlwpCjM-Uk) | YouTube tutorial on science infographics on poster creation |

**Poster FAQ: What programs can you make your poster on?**

Answer: Many people use Microsoft PowerPoint, but you can also use Adobe Illustrator; however, this program is not free. Other free software includes Inkscape as well as BioRender for creating posters.

**Poster FAQ: How large do I make the poster?**

Answer: For presenting a poster at a conference, always check the conference website, as it should include specific guidelines for size and spacing of maximum/minimum poster size. This can then be set on your program for the length (L) and width (W) dimensions.

**Poster FAQ: How do I design my poster?**

A: There are several formatting guides for making a poster. We have included links to creating your poster. Additionally, there are YouTube guides and tutorials for posters. Finally, remember that your poster will likely be hung up without you there to present it, so it should be interpretable on its own as well.

**Presentation Links & FAQs:**

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| **Type of Resource** | **Link** | **Description** |
| Publication | [Hyperlink](https://www.cell.com/trends/molecular-medicine/pdf/S1471-4914(23)00092-8.pdf) | Cell article on the science of storytelling for scientific presentations |
| Publication | [Hyperlink](https://arxiv.org/abs/1606.07772) | The arcs of telling a good story; this approach can be used in presentations |
| Blog Post | [Hyperlink](https://www.synthego.com/blog/scientific-talk-tips) | Creating a fantastic scientific talk |
| Blog Post | [Hyperlink](https://www.skillsyouneed.com/rhubarb/presentation-skills-ted-talks.html) | 10 lessons on presentations from TED talks |
| Publication | [Hyperlink](https://www.nature.com/articles/d41586-018-07780-5) | Guide on how to give a great scientific talk |
| Publication | [Hyperlink](https://www.nature.com/articles/d41586-021-03603-2) | Telling a compelling scientific story |
| Blog Post | [Hyperlink](https://medium.com/edge-of-innovation/how-to-give-the-best-scientific-presentation-ever-c87e202718cf) | Satirical article on the 12 do-NOTS for presentations |

**Presentation FAQ: How long should a presentation be?**

A: Most conferences list presentation time, which likely includes both the presentation and question time. If not, be sure to ask the organizers. Thesis presentations typically have a 1-hour time slot, where normally 15-20 minutes is reserved for questions.

**Presentation FAQ: How do I minimize technical difficulties?**

A: A common issue is playing videos: using GIFs instead of video is more reliable, but they will be of a lower resolution. Always be ready to troubleshoot presentation vs. presenter view.

**Presentation FAQ: How do I minimize difficulties when using a Mac and Keynote?**

A: Check the presentation room beforehand to make sure you have the right connection cable type, and always keep an extra converter with you. If presentations need to be uploaded beforehand, be sure you have a backup PowerPoint file, saved onto a USB drive.

**Publication Links & FAQs:**

|  |  |  |
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| **Type of Resource** | **Link** | **Description** |
| Publication | [Hyperlink](https://www.science.org/doi/10.1126/scirobotics.abn1724) | Science Robotics paper on making an effective graphical abstract |
| Blog Post | [Hyperlink](https://nrokh.notion.site/things-you-should-know-before-writing-code-fc825c32eab0415889e955fc076974f1?pvs=4) | Things to know before writing code that is shared publicly |
| Website | [Hyperlink](https://b.nanes.org/figures/) | Guide for making publication-quality figures and specific tools |
| Publication | [Hyperlink](https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1003833) | PLOS Computational Biology paper with ten rules for better figures |
| Publication | [Hyperlink](https://journals.sagepub.com/doi/full/10.1177/15291006211051956) | A review of what works in data visualization techniques for publications |

**Publication FAQ: What are the limits to size, number of figures, or color for a publication?**

A: Check the publication website. For instance, if you are submitting a paper to Journal of The Royal Society Interface, there is an “[information for authors section](https://royalsocietypublishing.org/rsif/for-authors)” which provides information for size, format, etc. for figure files. Expectations may be different between review and publication.

**Publication FAQ: How can I be sure that my publication figures will not be blurry in print?**

A: There are two ways to ensure this. Always work in lossless formats. Additionally, when you receive your proofs for the publication, make sure you print it out and double-check the resolution in actual print.

**Publication FAQ: Do I need to make visualizations in the Supplement look nice as well?**

A: Many publications have strict page length requirements, which means there will be a large Supplemental section. Ensure that you are—at least—creating figures that are interpretable, legible, clear, and cohesive, so that all readers are able to interpret your work.

**Accessibility Links:**

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| **Type of Resource** | **Link** | **Description** |
| Website | [Hyperlink](https://dis.acm.org/2023/creating-accessible-figures-and-tables/) | Overview guide on creating accessible figures and tables |
| Website | [Hyperlink](https://colourcontrast.cc/) | Tool to check contrast between text and background for different colors |
| Website | [Hyperlink](https://www.levelaccess.com/color-contrast-checker-new/) | Color contrast checker for different RGB or HEX colors |
| Website | [Hyperlink](https://projects.susielu.com/viz-palette) | Colorblind-friendly visual palettes for *colorbrewer*, *cologroical*, and *chroma.js* |
| R Package | [Hyperlink](https://www.rdocumentation.org/packages/colorblindr/versions/0.1.0) | R package to simulate colorblindness when using R studio for data visualization |
| Website | [Hyperlink](http://hclwizard.org:3000/cvdemulator/) | Colorblindness emulator for uploaded images and photos |
| Blog Post | [Hyperlink](https://medium.com/nightingale/writing-alt-text-for-data-visualization-2a218ef43f81) | Post about how to create alt-text for data visualizations |
| Website | [Hyperlink](https://help.twitter.com/en/using-twitter/picture-descriptions) | Blog post on making images accessible using alt-text |
| Website | [Hyperlink](https://helpx.adobe.com/acrobat/using/create-verify-pdf-accessibility.html) | Adobe guide on creating and verifying PDF accessibility |
| Website | [Hyperlink](https://accessibility.huit.harvard.edu/pdf) | Harvard guide on how and why accessible PDFs are important |
| Website | [Hyperlink](https://www.bdadyslexia.org.uk/advice/employers/creating-a-dyslexia-friendly-workplace/dyslexia-friendly-style-guide) | Style guide for dyslexia-friendly fonts and font resources |
| Blog Post | [Hyperlink](https://www.fullfabric.com/articles/how-to-design-visual-learning-resources-for-neurodiverse-students) | Designing visuals for neurodivergent individuals |
| Blog Post | [Hyperlink](https://www.neurodiversity.design/font/) | Good versus bad fonts for neurodivergent readers |
| Website | [Hyperlink](https://opensource.org/osd/) | The 10 rules of what a truly open-source tool is |

**Accessibility FAQ: Why should I make my figures accessible?**

There are a few reasons why this is important. Accessible PDFs enable optical character recognition (OCR) which reads out PDF content for individuals with vision impairment. Colorblindness and neurodivergent diagnoses are prevalent, and crafting figures that are as close to universally accessible is a core mission of science. It’s the right thing to do!

**Accessibility FAQ: Can I pick an easy-to-read font for publications?**

Unfortunately, journals typically enforce their own standardized fonts for the peer-reviewed and published versions. However, if you post your paper on a pre-print server, there are normally no font rules and therefore you can use more accessible fonts in those submissions.