Visualizing Science: Tips & Guidelines

Why: Visualization is a type of communication that can be used to **engage - inform - inspire** a science-savvy, but not specialized, audience.

When: Visualization can be used when images tell the story more efficiently and effectively than complicated descriptions, when the visual helps to clarify a concept, or when a direct and immediate comparison is useful. It can also be used as an engaging tool: a beautiful, eye-catching visualization is an open door to learn more about the science behind it.

How: A. Photography tips | B. Motion tips | C. Graphics or Illustration tips

A. Photography tips

Choose your subject: Science happens on all scales, from macro to micro, and macro-macro and micro-micro! Photographs can show the process of science, what science helps to address, who does science, whom science serves, and, through the photographer's lens, how we feel about this fantastic world we live in.

Compose for impact: Become familiar with the rule of thirds, which is the most basic guideline for photographic composition. Straighten horizons, focus sharply on your main subject, and avoid cutting objects and people off at awkward positions, such as at the ankles. Once you understand the rules, play with them to surprise viewers.

Feature your main subject: Direct viewers to your subject by filling the frame with it, positioning it at intersecting thirds (see above), or focusing sharply on it while allowing other objects to be out of focus.

Capture a moment: Snap a shot at the height of the action. Often candid shots, in which people in the frame are not playing to the camera, are more effective than posed or group shots. They show an authentic, unscripted moment in time.

Tell a story: Photograph defining moments and events, such as the first or last of something. Stories within photographs can also exist within the frame, not within time, and often photographs are complex, conveying multiple messages in a single frame. Ask yourself what story your photograph tells.

Stay true to your viewers: Use photo editing programs to enhance but not fundamentally change your image. Altering contrast and exposure, and adjusting color balance to make a scene closer to how we see it with our eyes, can enhance a photograph. Removing, moving, or otherwise altering specific elements of photographs in ways that look "real" misleads the viewer.

Stay true to the scene, yourself, and the viewers. If the photograph is altered beyond what the eye sees (e.g. processed satellite imagery or colored microscopic images), these manipulations must be noted in the caption. If the image is significantly altered, it becomes and should be categorized as an illustration.

B. Motion tips

Plan ahead: Taking the time to really think through your video at the beginning of the process will save you a huge amount of time later. A treatment, storyboard or outline will go far to help you focus and figure out what you need. A simple way to make an outline is to make two columns; list the narration or main points on the right with potential corresponding visuals on the left.

Identify your message: Define exactly what your goals are, what your core message is, and what story you want to tell. Don't try to say it all. What is your big idea? What do you want the public to learn, to remember, to be intrigued about, and to potentially take action on?

Get to the point: Let us know quickly what the video is about, to keep our interest. Imagine we turned it off after 15 seconds. Would we get anything out of it? Would we know what it is about?

Compose for impact: Photography composition applies to basic video and animation composition as well; see above. A good visual will go far. In fact, sometimes a good visual is all you need.

Keep your audience in mind: What information or message would be most interesting to the audience you'd like to reach? What do they care about, what do they already know? Choose simple vocabulary and use analogies. You may need to add annotations to a visual to help a public audience understand what they are seeing.

Beware the talking head: If you have someone on camera talking about something, make sure you have lots of accompanying visuals. Use the medium--if all people need to do it listen, this could be a radio program! Reward your audience for watching.

Write for broadcast: Writing for video is different from writing for print. If you are reading from a script, keep language simple and sentences short. Read it out loud before recording to see if it feels natural, flows, and makes sense.

Keep it short: Try to keep your video to 2-3 minutes, and definitely under 5 minutes, unless your production quality is professional. You'll get more views and keep your audience's attention. If you're producing a visualization, 30 seconds (or less) may be all you need. Sometimes less is more!

C. Graphics or Illustration tips

Think it through: Taking the time to really think it through at the beginning of the process will save you a huge amount of time later.

Identify your message: Define exactly what your goals are, what your core message is, and what story you want to tell. Don't try to say it all. What is your big idea? What do you want the public to learn, to remember, to be intrigued about and want to dig deeper into?

Organize your data: Start with a rough layout on a page with the title, the labels, the subheads, and some graphic to help streamline the process. If the organization is solid the design will flow better within it.

Keep your audience in mind: In a peer-to-peer situation, jargon can be used within a specific context and be very efficient. But not for an outsider! Your goal is to clarify your science, not dumb down the content. Short sentences, public-friendly vocabulary, and limited use of numbers are tricks to keep in mind. Also, consider that visual conventions common within your field may not be familiar to non-experts.

Design it: Find the right tools for your story (have a look at some of the examples below). Minimize the number of colors you use, play with the diversity of ranges within the same color, think about your background color and where you want the attention to go.

Tools: Examples of some online data visualization tools:
D3.js Data Drive Documents // CARTO // Timeline // RAW // Story Maps - ArcGIS

Inspiration:
Visualising Data // FlowingData // Information Aesthetics // infographics | GOOD Magazine // Brain Pickings // Tabletop Whale

Counter inspiration:
WTF Visualizations