

MULTIMEDIA LEARNING AND SLIDE DESIGN

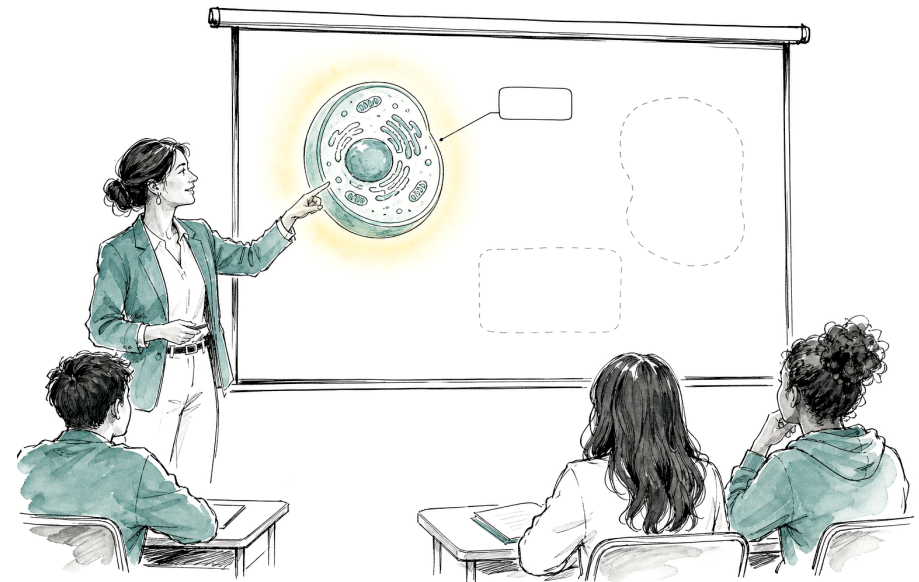
Should you build a slide up, or show it all at once?

A university eye-tracking study from Japan, translated for classroom slide design.

When you put a slide up, do your learners' eyes go where you want them to, or wherever they land first?

In one line

A single experiment found that revealing a slide's images piece by piece, in time with the narration, helped Japanese university learners learn more and look at the relevant image sooner and longer than learners who saw the whole slide from the start, but it is one small study with adult learners, not yet tested in school classrooms.



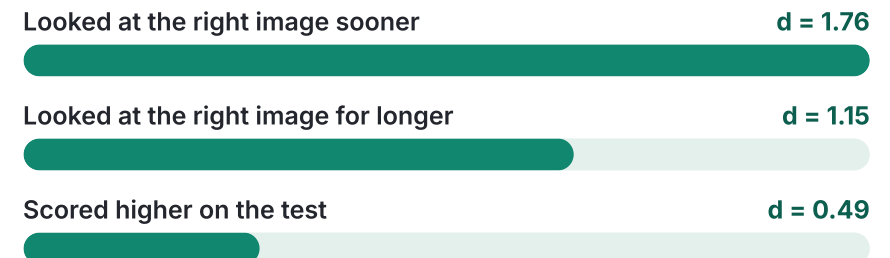
Timing the reveal to the narration changed where learners looked, and what they learned

Forty Japanese university learners sat a short pre-test, then watched a biology lesson slideshow narrated by a teacher. On one version of the slide, each image appeared one at a time, exactly as the narration reached that point (a “cumulative presentation,” built within a single PowerPoint slide). On the other version, every image was already on the slide before the narration began (a “whole-slide presentation”). Eye movements were tracked throughout, and everyone sat the same test again straight after the lesson.

- ✓ **Learning outcomes were higher for the built-up slide** · Statistically significant difference on the post-lesson test, Cohen's $d = 0.49$
- ✓ **Learners looked at the matching image sooner** · Fixated earlier on the visual element that matched what the narrator was saying, $d = 1.76$
- ✓ **They also looked at it for longer** · Longer fixation duration on that same matching element, Cohen's $d = 1.15$
- ✓ **This is one study, on one lesson, once** · Not yet tested with school-age learners, across a term of lessons, or replicated by another research team

How big were the differences between the two slide styles?

Cohen's d for each comparison (built-up slide vs whole slide shown from the start).



Cohen's d shows the size of the difference between the two slide styles: around 0.2 usually reads as small, 0.5 as moderate, 0.8 or higher as large. The two attention numbers here are unusually large for a study this size, which itself is a reason for some caution (see page 4).

What “cumulative presentation” actually meant in this study

THE MOVE

WHAT IT SOUNDS LIKE AT SCHOOL (OUR EXAMPLE)

WHAT THE STUDY DID

Reveal images as you talk, not before

“Watch this label appear as I explain the first stage, then I’ll click through to the next one.”

In the “cumulative presentation” condition, visual elements were incrementally revealed alongside the narration, within a single PowerPoint slide. Learners in this condition fixated on the matching image sooner and learned more.

SL GUIDANCE Do it well, for every learner: build progressive reveals (basic “appear” animations or paced clicks) instead of pasting a whole diagram onto one static slide.

Don’t load the whole slide first

“Here’s the full diagram, now let me talk you through it.”

This was the weaker, comparison condition: all visual elements were presented simultaneously, before narration began. It produced slower fixation on the relevant image and lower test scores.

SL GUIDANCE Do it well, for every learner: if a slide currently shows everything at once, consider whether splitting it into a build sequence would help learners look where you want, when you want.

Match the image to the moment

“As I say “the nucleus controls the cell”, this part of the diagram lights up.”

The core design synchronised each visual element’s appearance with the matching part of the narration; that synchrony, not simply showing less at once, is what the study measured and credits for the effect.

SL GUIDANCE Do it well, for every learner: check that each image or label you reveal lines up with the sentence you are saying at that moment, not a beat earlier or later.

One slide, built in stages

“Same slide, three clicks: first the outline, then the labels, then the summary.”

The technique was built within a single PowerPoint slide, not spread across several slides. The content used was a biology lesson, narrated by a teacher, similar to a typical explainer slide.

SL GUIDANCE Do it well, for every learner: this needs no new software, just click-to-reveal animations already available in PowerPoint, Google Slides or Keynote.

The honest fence: where this evidence stops

One small study, not yet replicated

This is a single experiment, published online in June 2026 with no independent replications yet. The specific “build up one slide bit by bit” technique has not been confirmed by another research team.

University learners, not school-age learners

The 40 participants were adults studying at a Japanese university, not primary or secondary-age learners in a school classroom. Applying this to a school classroom is a translation of the finding, not a repeat of it.

Only the abstract was verifiable to us

The full paywalled article sits behind a bot-check we could not get past. We can confirm the effect sizes reported (0.49, 1.76, 1.15), but not the underlying test scores, confidence intervals, or exact p-values.

A single lesson, a single sitting

Learners experienced one narrated biology lesson, once. The study does not show whether the benefit holds across a whole term of lessons, or with other subjects.

Two very large effects in a small sample

The two attention measures ($d=1.76$ and $d=1.15$) are unusually large for a study of this size. Very large effects in small samples often shrink once a study is repeated with more participants.

Unclear whether learners saw one style or both

The abstract does not spell out whether each learner saw only one slide style or both. We read it as most likely one style per learner, but this is our reading of the wording, not a stated fact.

● Early signal

A well-designed but small, brand-new, unreplicated finding, verified only at abstract level, from university learners rather than a school classroom. Independent replication, full-text verification, and a version of this study run with school-age learners would raise this grade.

Worth testing: does building your slide up, piece by piece, help learners look and learn better?

The pattern worth borrowing is not the biology content or the university setting, it is the structure underneath: reveal one visual element at a time, timed to match exactly what you are saying, rather than putting the whole slide up before you start talking. That is a basic click-to-reveal animation technique, already built into PowerPoint, Google Slides and Keynote, and it costs little more planning than building a static slide.

1

Build, don't dump

Before your next slide-heavy lesson, turn one dense, fully-loaded slide into a build sequence: one image or label per talking point, revealed as you reach it.

2

Match the moment

Time each reveal to the sentence you are saying, not a beat before or after, so learners' eyes land where your words are pointing.

3

Watch where they look

Notice, informally, whether learners seem to find the relevant part of the slide faster once you switch from a full slide to a built-up one. That is the effect this study measured with eye-tracking.

Early signal, so run it as an experiment: pick one lesson this week with a dense, information-heavy slide. Split it into a build sequence timed to your narration, and watch whether learners seem to look at the right thing sooner, and whether a quick follow-up quiz on that content nudges up compared with your usual results.

Why not try? Planning a slide sequence that matches your narration, point by point, is easier with a structure to build it from. Open a free account to plan your next lesson at app.structural-learning.com.