CHAPTER 5 ANIMATION ELEMENTS

Multimedia Communications by Marie Rutherford

Please visit the web version of Multimedia Communications (https://ecampusontario.pressbooks.pub/multimediacomm/) to access the complete book, interactive activities and ancillary resources.

Learning Outcomes

- Review principles of animation and its effective use in multimedia communication
- Explain how animation works considering common methods of development
- Explore computer generated animation
- Practice and Apply
- Key Terms and References

Animation and Multimedia

Animation is described as the act of making inanimate objects move or appear to move. Going further, animation is a process that brings still images to life by creating the illusion of movement. Animation can add interest, emphasize points, and guide the audience's attention throughout an presentation. While animations can make a presentation more engaging, they must be used with a level of caution as complex animations can distract the audience, complicate the message, and look unprofessional. This uses a concept called **persistence of vision**, whereby the brain retain an image for a fraction of a second longer than the eye sees it.

Types of Animation

There are several types of animation, each with its unique techniques and applications:

1. **Traditional Animation**: Also known as **cel** animation, this involves drawing each frame by hand.
2. **2D Animation**: This can be traditional or vector-based, where images are created using computer software.
3. **3D Animation**: Utilizes computer software to create characters and environments in three dimensions.
4. **Stop Motion:** Involves photographing physical objects frame by frame to create the illusion of movement.
5. **Motion Graphics**: Often used in multimedia projects, these are digital graphics that create the illusion of motion, typically used in advertising and title sequences

Use of Animation in Multimedia

Animation plays an important role in multimedia, enhancing the visual appeal and effectiveness of presentations, websites, and educational content. Here are some key uses:

- Education: Animated videos can simplify complex concepts, making them easier to understand and more engaging for students.
- Entertainment: From movies and TV shows to video games, animation is a cornerstone of the entertainment industry.
- Advertising: Animated ads can capture attention more effectively than static images, making them a popular choice for marketers.
- Web Design: Animation enhance the user experience through supporting a more interactive approach.

This chapter explores the inclusion and development of animation and how it is utilized in multimedia presentations.

Chapter Organization and Preview

- Twelve basic principles of animation
- Animation & Transitions in Presentations
- Explainer videos & Whiteboard animations
- Stop Motion Animation
- Explore, Practice and Apply
- Key Chapter Terms

Attribution & References

Except where otherwise noted, this page is created by Marie Rutherford, CC BY-NC 4.0

5.1 TWELVE BASIC PRINCIPLES OF ANIMATION

Principles of Animation

Disney's **twelve basic principles of animation** were introduced by the Disney animators Ollie Johnston and Frank Thomas in their 1981 book *The Illusion of Life: Disney Animation*.[1] (Thomas & Johnston, 1981). The principles are based on the work of Disney animators from the 1930s onwards, in their quest to produce more realistic animation. The main purpose of these principles was to produce an illusion that cartoon characters adhered to the basic laws of physics, but they also dealt with more abstract issues, such as emotional timing and character appeal.

 The book has been referred to by some as the "Bible of animation"(Allan, n.d.), and some of its principles have been adopted by traditional studios. In 1999, *The Illusion of Life* was voted the "best animation book[...] of all time" in an online poll done by Animation World Network (Animation World Network, n.d.). While originally intended to apply to traditional, hand-drawn animation, the principles still have great relevance for today's more prevalent computer animation.

The 12 principles of animation

Squash and stretch

Watch Squash & Stretch – 12 Principles of Animation (3 mins) on YouTube (https://youtu.be/haa7n3UGyDc)

The purpose of squash and stretch (Thomas & Johnston, 1981, p. 47) is to give a sense of weight and flexibility to drawn or computer-animated objects. It can be applied to simple objects, like a bouncing ball, or more complex constructions, like the musculature of a human face (Thomas & Johnston, 1981, pp. 47-51; De Stafano, n.d.d). Taken to an extreme, a figure stretched or squashed to an exaggerated degree can have a comical effect (Willian, 2006e). In realistic animation, however, the most important aspect of this principle is that an object's volume *does not* change when squashed or stretched. If the length of a ball is stretched

vertically, its width (in three dimensions, also its depth) needs to contract correspondingly horizontally (Thomas & Johnston, 1981, p. 49).

Anticipation

Watch Anticipation – 12 Principles of Animation (3 mins) on YouTube (https://youtu.be/F8OtE60T8yU)

Anticipation is used to prepare the audience for an action, and to make the action appear more realistic (De Stafano, n.d.a). A dancer jumping off the floor has to bend the knees first; a golfer making a swing has to swing the club back first. The technique can also be used for less physical actions, such as a character looking off-screen to anticipate someone's arrival, or attention focusing on an object that a character is about to pick up (Thomas & Johnston, 1981, pp. 51-52).

Staging

Watch Staging – 12 Principles of Animation (3 mins) on YouTube (https://youtu.be/u-SXLaQGg50)

This principle is akin to staging, as it is known in theatre and film (Thomas & Johnston, 1981, p. 53). Its purpose is to direct the audience's attention, and make it clear what is of greatest importance in a scene (Lightfoot, n.d.); Johnston and Thomas defined it as "the presentation of any idea so that it is completely and unmistakably clear", whether that idea is an action, a personality, an expression, or a mood (Thomas & Johnston, 1981, p. 53). This can be done by various means, such as the placement of a character in the frame, the use of light and shadow, or the angle and position of the camera (Thomas & Johnston, 1981, pp. 53, 56). The essence of this principle is keeping focus on what is relevant, and avoiding unnecessary detail (Thomas & Johnston, 1981, p. 56; Willian, 2006f).

Straight ahead action and pose to pose

Watch Straight ahead & pose to pose – 12 Principles of Animation (3 mins) on YouTube (https://youtu.be/v8quCbt4C-c)

These are two different approaches to the drawing process. Straight ahead action scenes are animated frame by frame from beginning to end, while "pose to pose" involves starting with drawing key frames, and then filling in the intervals later (Lightfoot, n.d.). "Straight ahead action" creates a more fluid, dynamic illusion of movement, and is better for producing realistic action sequences. On the other hand, it is hard to maintain proportions and to create exact, convincing poses along the way. "Pose to pose" works better for dramatic or emotional scenes, where composition and relation to the surroundings are of greater importance (Thomas & Johnston, 1981, p. 56-58). A combination of the two techniques is often used (Willian, 2006g).

In computer animation

Computer animation removes the problems of proportion related to "straight ahead action" drawing, but "pose to pose" is still used for computer animation, because of the advantages it brings in composition (De Stefano, n.d.e) . The use of computers facilitates this method and can fill in the missing sequences in between poses automatically. It is still important to oversee this process and apply the other principles (Willian, 2006g).

Follow through and overlapping action

Watch Follow through & overlapping action – 12 Principles of Animation (3 mins) on YouTube (https://youtu.be/4OxphYV8W3E)

Follow through and overlapping action is a general heading for two closely related techniques which help to render movement more realistically, and help to give the impression that characters follow the laws of physics, including the principle of inertia. "Follow through" means that loosely tied parts of a body should continue moving after the character has stopped and the parts should keep moving beyond the point where the character stopped only to be subsequently "pulled back" towards the center of mass or exhibiting various degrees of oscillation damping. "Overlapping action" is the tendency for parts of the body to move at different rates (an arm will move on different timing of the head and so on). A third, related technique is "drag", where a character starts to move and parts of them take a few frames to catch up (Lightfoot, n.d.).

These parts can be inanimate objects like clothing or the antenna on a car, or parts of the body, such as arms or hair. On the human body, the torso is the core, with arms, legs, head and hair appendices that normally follow the torso's movement. Body parts with much tissue, such as large stomachs and breasts, or the loose skin on a dog, are more prone to independent movement than bonier body parts (Thomas & Johnston, 1981, p. 59-62). Again, exaggerated use of the technique can produce a comical effect, while more realistic animation must time the actions exactly, to produce a convincing result (Thomas & Johnston, 1981, p. 60).

The "moving hold" animates between two very similar positions; even characters sitting still, or hardly moving, can display some sort of movement, such as breathing, or very slightly changing position. This prevents the drawing from becoming "dead" (Thomas & Johnston, 1981, p. 61-62).

Slow in and slow out

Watch Slow in & Slow out (2 mins) on YouTube (https://youtu.be/fQBFsTqbKhY)

The movement of objects in the real world, such as the human body, animals, vehicles, etc. needs time to accelerate and slow down. For this reason, more pictures are drawn near the *beginning* and *end* of an action, creating a *slow in* and *slow out* effect in order to achieve more realistic movements. This concept emphasizes the object's extreme poses. Inversely, fewer pictures are drawn within the *middle* of the animation to emphasize faster action (Lightfoot, n.d.). This principle applies to characters moving between two extreme poses, such as sitting down and standing up, but also for inanimate, moving objects, like the bouncing ball in the above illustration (Willian, 2006c).

Arc

Watch Arcs – 12 Principles of Animation (2 mins) on YouTube (https://youtu.be/I1_tZ9LhJD4)

Most natural action tends to follow an arched trajectory, and animation should adhere to this principle by following implied "arcs" for greater realism. This technique can be applied to a moving limb by rotating a joint, or a thrown object moving along a parabolic trajectory. The exception is mechanical movement, which typically moves in straight lines (Thomas & Johnston, 1981, p. 62-63).

As an object's speed or momentum increases, arcs tend to flatten out in moving ahead and broaden in turns. In baseball, a fastball would tend to move in a straighter line than other pitches; while a figure skater

moving at top speed would be unable to turn as sharply as a slower skater, and would need to cover more ground to complete the turn.

An object in motion that moves out of its natural arc for no apparent reason will appear erratic rather than fluid. For example, when animating a pointing finger, the animator should be certain that in all drawings in between the two extreme poses, the fingertip follows a logical arc from one extreme to the next. Traditional animators tend to draw the arc in lightly on the paper for reference, to be erased later.

Secondary action

Watch Secondary Action – 12 Principles of Animation (2 mins) on YouTube (https://youtu.be/MjBHWw1TbP4)

Adding secondary actions to the main action gives a scene more life, and can help to support the main action. A person walking can simultaneously swing their arms or keep them in their pockets, speak or whistle, or express emotions through facial expressions (Thomas & Johnston, 1981, p. 63-64). The important thing about secondary actions is that they emphasize, rather than take attention away from the main action. If the latter is the case, those actions are better left out (De Stafano, n.d.c). For example, during a dramatic movement, facial expressions will often go unnoticed. In these cases, it is better to include them at the beginning and the end of the movement, rather than during (Thomas & Johnston, 1981, p. 64).

Timing

Watch Timing – 12 principles of animation (3 mins) on YouTube (https://youtu.be/BarOk2p38LQ)

Timing refers to the number of drawings or frames for a given action, which translates to the speed of the action on film (Lightfoot, n.d.). On a purely physical level, correct timing makes objects appear to obey the laws of physics. For instance, an object's weight determines how it reacts to an impetus, like a push: a lightweight object will react faster than a heavy one (De Stafano, n.d.f). Timing is critical for establishing a character's mood, emotion, and reaction (Lightfoot, n.d.). It can also be a device to communicate aspects of a character's personality (Thomas & Johnston, 1981, p. 64-65).

Exaggeration

Watch Exaggeration – 12 Principles of Animation (2 mins) on YouTube (https://youtu.be/HfFj-VQKiAM)

Exaggeration is an effect especially useful for animation, as animated motions that strive for a perfect imitation of reality can look static and dull (Lightfoot, n.d.). The level of exaggeration depends on whether one seeks realism or a particular style, like a caricature or the style of a specific artist. The classical definition of exaggeration, employed by Disney, was to remain true to reality, just presenting it in a wilder, more extreme form (Thomas & Johnston, 1981, p. 65-66). Other forms of exaggeration can involve the supernatural or surreal, alterations in the physical features of a character; or elements in the storyline itself (Willian, 2006b). It is important to employ a certain level of restraint when using exaggeration. If a scene contains several elements, there should be a balance in how those elements are exaggerated in relation to each other, to avoid confusing or overawing the viewer (De Stafano, n.d.b).

Solid drawing

Watch Solid drawing – 12 Principles of Animation (2 mins) on YouTube (https://youtu.be/7An0jukOkCI)

The principle of *solid* drawing means taking into account forms in three-dimensional space, or giving them volume and weight (Lightfoot, n.d.). The animator needs to be a skilled artist and has to understand the basics of three-dimensional shapes, anatomy, weight, balance, light and shadow, etc (Thomas & Johnston, 1981, p. 66-67). For the classical animator, this involved taking art classes and doing sketches from life (Willian, 2006d). One thing in particular that Johnston and Thomas warned against was creating "twins": characters whose left and right sides mirrored each other, and looked lifeless (Thomas & Johnston, 1981, p. 67).

In computer animation

Modern-day computer animators draw less because of the facilities computers give them (Lasseter, 1987), yet their work benefits greatly from a basic understanding of animation principles, and their additions to basic computer animation (Willian, 2006d).

Appeal

Watch Appeal – 12 Principles of Animation (3 mins) on YouTube (https://youtu.be/_SplEuWp0Yw)

Appeal in a cartoon character corresponds to what would be called charisma in an actor (Thomas & Johnston, 1981, p. 68). A character who is appealing is not necessarily sympathetic; villains or monsters can also be appealing. The important thing is that the viewer feels the character is real and interesting (Thomas & Johnston, 1981, p. 68). There are several tricks for making a character connect better with the audience; for likable characters, a symmetrical or particularly baby-like face tends to be effective (Willian, 2002a). A complicated or hard to read face will lack appeal or 'captivation' in the composition of the pose or character design.

Consider

Look up an episode or scene from a favourite cartoon.

1. How many of the twelve basic principles of animation can you identify in action?

Attribution & References

Except where otherwise noted, this page is adapted from "Twelve basic principles of animation" In *Wikipedia*, CC BY-SA 4.0. / Added video clips. Converted references to APA format to match textbook.

References

Allan, R. (n.d.). "Walt Disney's Nine Old Men & The Art Of Animation". Animation World Network. Archived from the original on November 2, 2013. Retrieved October 21, 2011.

Animation World Network. (n.d.). "List of Best Animation Books". . Archived from the original on September 3, 2009. Retrieved October 21, 2011.

De Stefano, R. A. (n.d.a). "Anticipation". Electronic Visualization Laboratory, University of Illinois at Chicago. Retrieved June 27, 2008.

De Stefano, R. A. (n.d.b). "Exaggeration". Electronic Visualization Laboratory, University of Illinois at Chicago. Retrieved June 28, 2008.

De Stefano, R. A. (n.d.c). "Secondary Action". Electronic Visualization Laboratory, University of Illinois at Chicago. Retrieved June 28, 2008.

De Stefano, R. A. (n.d.d). "Squash and stretch". Electronic Visualization Laboratory, University of Illinois at Chicago. Retrieved June 26, 2008.

De Stefano, R. A. (n.d.e). "Straight Ahead Action and Pose-To-Pose Action". Electronic Visualization Laboratory, University of Illinois at Chicago. Retrieved June 28, 2008.

De Stefano, R. A. (n.d.f). "Timing". Electronic Visualization Laboratory, University of Illinois at Chicago. Retrieved June 28, 2008.

Lasseter, J. (1987, August). "Principles of traditional animation applied to 3D computer animation". *ACM SIGGRAPH Computer Graphics*. **21** (4): 35–44. https://doi.org/10.1145/37402.37407

Lightfoot, N. (n.d.). "12 Principles". Animation Toolworks. Archived from the original on June 9, 2016. Retrieved June 27, 2008.

Thomas, F., & Johnston, O. (1997) [1981]. *The Illusion of Life: Disney Animation*. Hyperion. pp. 47–69. ISBN 978-0-7868-6070-8.

Thomas, F., & Johnston, O. (2002). "Animation Tips: Principles of Physical Animation". Frank and Ollie. Retrieved July 4, 2008.

Willian. (2006a, June 29). "Appeal". Blender. Archived from the original on December 1, 2008. Retrieved June 28, 2008.

Willian. (2006b, June 29). "Exaggeration". Blender. Archived from the original on February 7, 2009. Retrieved June 28, 2008.

Willian. (2006c, July 5). "Slow In and Out". Blender. Archived from the original on February 16, 2009. Retrieved June 28, 2008.

Willian. (2006d, July 5). "Solid Drawing". Blender. Archived from the original on July 19, 2011. Retrieved June 15, 2010.

Willian. (2006e, July 5). "Squash and Stretch". Blender. Archived from the original on February 16, 2009. Retrieved June 27, 2008.

Willian. (2006f, July 5). "Staging". Blender. Archived from the original on February 16, 2009. Retrieved June 28, 2008.

Willian. (2006g, July 5). "Straight Ahead Action and Pose to Pose". Blender. Archived from the original on May 4, 2007. Retrieved June 28, 2008.

Notes

1. The twelve principles have been paraphrased and shortened by Nataha Lightfoot for Animation Toolworks (Lightfoot, n.d.). Johnston and Thomas themselves found this version good enough to put it up on their own website (Thomas & Johnston, 2002).

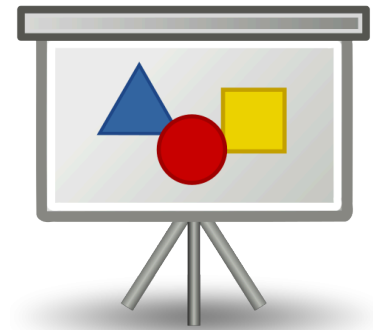# 5.2 ANIMATION & TRANSITIONS IN PRESENTATIONS

Introduction to Transitions

Slides don't have to be static. On this page we'll look at how to apply transition effects between slides; we'll explore animations, from making bullet points appear to making objects move and dance in the most elaborate ways. We'll also discuss the use of specialty apps such as Prezi.

Transitions are used to make the change between slides less abrupt. They can also serve to give you a bit of breathing space to help punctuate the points you're making.

Some of PowerPoint's transitions can look particularly whizzy, and it's very easy to make your presentation to look like a 1980s pop video. Other transitions may make your audience a bit seasick, You may want to stick to one or two subtle choices!

If you're presenting online, bear in mind that your frame-rate may be quite low, so what looks like a smooth transition on your computer might seem quite jerky and confusing through something like Zoom. You may be better off not using transitions and just having a simple 'cut' between each slide.

When applying a transition to a slide, that transition is applied to the appearance of that slide: its the effect that happens when you *go into* the slide, not the effect that happens when you leave it.

Graphic depicting a presentation on a fold-up screen. **Source:** Image by RRZEicons, CC BY-SA 3.0

Watch How to Add Slide Transitions in Powerpoint (5 mins) on YouTube (https://youtu.be/OaJFUJf0iyk)

Slide animation allows you to introduce, emphasize, and remove items from a slide. This can help focus attention on specific content.

Animation has long been a part of presentation, be it writing on a blackboard, using a piece of paper on an overhead projector to reveal more of a transparency, or using pop-up cards.

Watch Adding animations to Google Slides (4 mins) on YouTube (https://youtu.be/ AdsbPvOpGOo)

In slide software, an animation effect can be achieved simply by duplicating an existing slide and then adding or removing content. But there are also built-in animation tools that allow animation of elements to take place within a single slide.

An example: Animation created in PowerPoint

The animation below was constructed in PowerPoint. It uses 14 separate animation effects over two slides, with a "Morph" transition between (see below) to get the hedgehog across the road without too much messing about.
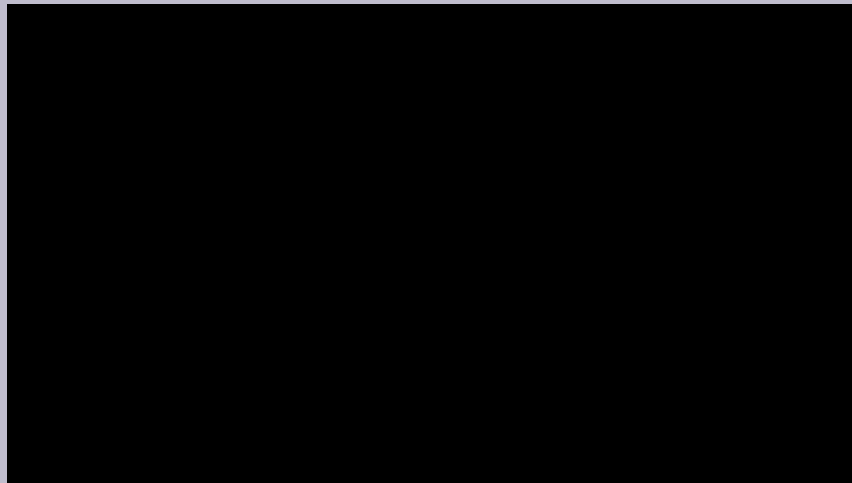
Here's a look at the first of the two slides:
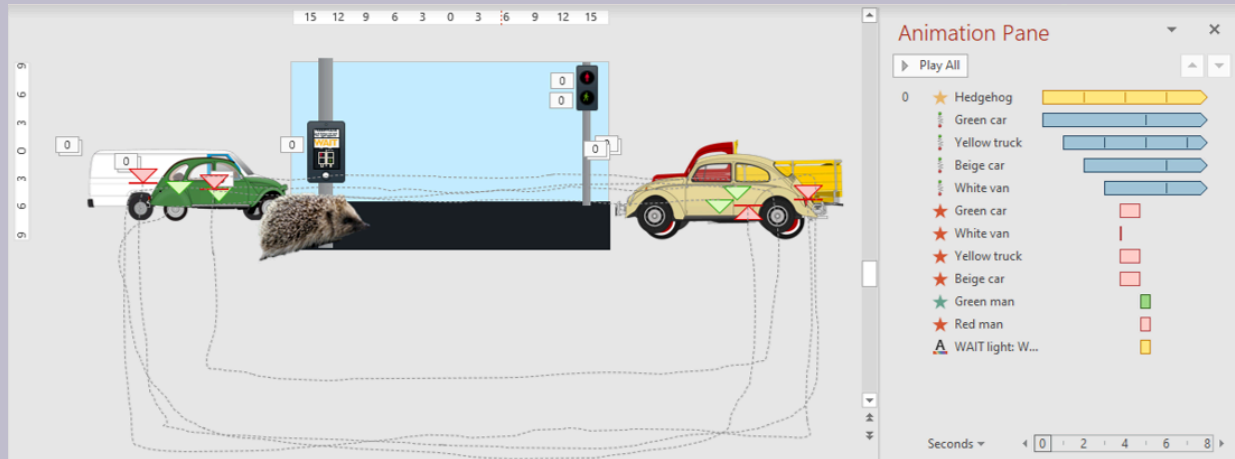
- The effects begin with the start of the slide (denoted by the "0" in the Animation Pane);
- First to happen is a "Teeter" effect on the hedgehog, which is set to repeat until the slide ends;
- Starting at the same time is the Custom Motion Path of the green car: it starts off the left edge of the slide, wobbles quickly across and off the other end, then moves in a square, far below the bottom of the slide, back to somewhere near where it started; This movement is set to take five seconds, repeating continuously;
- One second later, the yellow truck comes in from the opposite direction; its laps take only two seconds (making it a faster vehicle);
- In the next two seconds, the beige car and the white van also enter, each travelling at different speeds; again, the animation repeats continuously;
- Next up we have a series of "Fly Out" animations which cause any vehicles still on the screen to exit the slide (in the direction they're travelling); originally these were intended to be triggered by a mouse click, allowing the traffic to pass for as long as the speaker needed; in this example they're instead happening automatically, at 3.75 seconds into the slide (the white van's exit animation is shorter than the rest just because it was near the edge of shot at that time and so needed less time to get out of the slide);
- Another time point comes a second later, when the green man appears on the crossing signal, the red man disappears, and the WAIT light changes colour from amber to grey.

The hedgehog crossing the road happens via a "Morph" transition, and its waddle out of shot happens in the next slide, using a repeated "Teeter" effect at the same time as a "Fly Out" to give the illusion of walking.

# Easy animations with the "Morph" transition

PowerPoint has a special transition called **Morph** which creates an animation based on shared content between two slides. It allows you to generate really quite elaborate animations without the messing about normally required in the Animation Pane.

 The above example is a three-slide animation created using the following method:

1. A slide is created (slide 1) and a red triangle shape is drawn onto it;
2. The slide is duplicated (copy/paste, or right-click and **Duplicate Slide**);
3. On the duplicate slide (slide 2), the shape is modified: it is repositioned, rotated, resized, and given a new fill colour;
4. The "Morph" transition is applied to slide 2 from the **Transitions** tab;
5. The "Morph" transition identifies the triangle in the two slides as being the same object (albeit having undergone some modification) and generates an appropriate animation to bridge the two states;
6. In the case of this example, slide 1 has then been duplicated again (as slide 3), again with a "Morph" transition, thereby returning the triangle to its original position (the same effect would happen simply by transitioning backwards and forwards between slides 1 and 2, but we needed to save this animation as a GIF).

Morph is only available in PowerPoint 2019 or later. But many of the Morph effects are backwardly compatible, so they will work to some degree or other on earlier versions of PowerPoint.
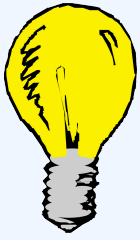
Tip: Morph

The more elaborate your Morph, the more strain it will put on your computer. If you're going to be presenting on a lectern PC, bear in mind that it may not have as much processing power as the computer you used to make the slides in the first place.

Prezi Presentation Tips: Dos and Don'ts

Prezi (http://www.prezi.com/) is a visually based presentation software that supports a non-linear storytelling approach to presentations. With many affordances, including the ability for the audience or presenter to zoom in and zoom out of the screen, Prezis can be powerful but they can also be problematic.

You may have used or seen a Prezi presentation. In case you're not sure, Prezi is a presentation tool, that instead of following a linear format (slide after slide), it uses zoom and pan to connect the frames, changing not only the dynamics of a presentation, but also changing the way the audience makes connections between the ideas presented. Or at least, that's what's supposed to be the main advantage of using Prezi over other tools. However, as you may have seen, the zooms and pans are used by presenters only as fancy transitions between frames, with a lot of us in the audience left wondering, "What's the point in all of this? All of this coming in and out of the screen, it's so confusing. Should've just stuck to the good old slides."

Below are some tips to support creating effective Prezi Presentation.

Choosing Presentation Software

What many presenters don't realize is that, when choosing one presentation tool over another one, you have to make the most of what it has to offer. Prezi's strength is in its non-linearity, but that doesn't mean that the frames should be displayed randomly on the screen. The non-linear flow allows for seemingly unrelated concepts to come together by making new meaningful connections between them. Meaning through visual metaphors can be created by significant (hierarchical for example) spatial positioning on the screen and differentiation or similarity of concepts can be achieved by exploring design elements (colors and shapes). The biggest lesson is to use less text and bullet points, and let the visuals and transitions tie in the concepts of your presentation.

Before starting work on your presentation, consider the following questions and concepts.

Consider

1. What are the main goals of the presentation and what's a good visual metaphor to represent it. This will be your main layout, which can be a path, map, tree, etc.
2. What kinds of connections are there between your ideas and design the frames in relation to the layout.

   a. Where on the layout does it make the most sense to place each frame?
   b. How does it connect with the frame immediately before and after it?
   c. How does it connect in general with the other frames?

3. Think about your presentation with a view of the whole in your mind, because at many times the audience will be able to see all the frames, and you want to draw the eye towards focus points.
4. Think about what visual/temporal patterns you're creating with your presentation and how that's going to influence the pattern of thoughts and learning process in the audience.

For a visual summary of these ideas and more tips for Prezi (made with Prezi!), please refer to this Prezi and video below it that walks through it.

Watch Prezi Presentation Design Tips – by Ethos3 and Prezi (15 mins) on YouTube (https://www.youtube.com/watch?v=xYFws1GvP3k)

Attribution & References

Except where otherwise noted, the content on these pages is adapted from A practical guide to presentations: Animation, sound & video by University of York, CC BY-NC-SA and from Prezi Presentation Tips: Dos and Don'ts In *Scarfe Digital Sandbox* by Teacher Education Program & PDCE, UBC, CC BY-NC 4.0 . / Streamlined content, removed copyright protected video and added Prezi content.

5.3 EXPLAINER VIDEOS & WHITEBOARD ANIMATIONS

Introduction to Whiteboard Animations and Explainer Videos

A popular technique to create videos, often referred to as *explainer videos* or *whiteboard animations.* It is completed by recording the process of visualizing an idea, through **sketching**. There are many ways to accomplish this, and although it helps to have some drawing experience, it is by no means the most important skill. As with most multimedia projects, it is the story being told that will have the most impact on the audience. How clearly you can tell that story and provide the information is the challenge you need to consider.
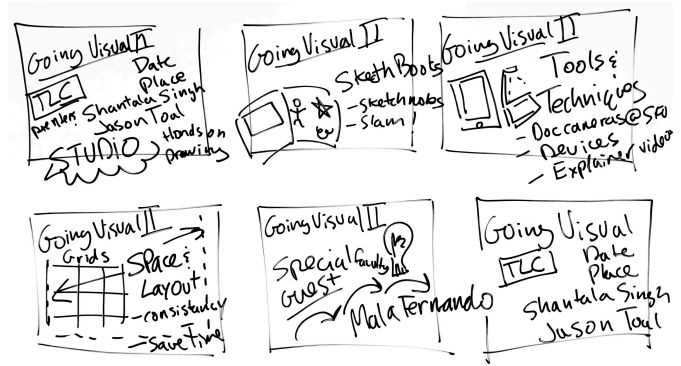
Consider: Sketchnoting Principles

1. What principles did you learn in the section about sketchnoting that could be used for explainer videos or whiteboard animations?

We went through a very typical process from script to storyboard to final production, and documented the promotions.

How did we make it?

Storyboard rough for planning our syllabus "explainer video". **Source:** Teaching through whiteboarding, CC BY 4.0.

1. First, we talked about what we wanted/needed to communicate to planned out the idea quickly using a storyboard. You can of course make your video on Educreations (https://www.educreations.com/) by starting with the app itself, but we find it's always easier to rough out our ideas first. Here is the one we used for our video:

2. We then fleshed that storyboard out with a script so that we'd know what to say. This we spoke out naturally and made quick bullet point notes so our dialogue would feel natural.

3. Finally, we fired up the app. It took four takes of about 4 minutes each until we got something we liked. We both tried making one to get practice.

Other types of "Doodle" videos

Watch Doodling in Math Class: Connecting Dots (8 mins) on YouTube (https://youtu.be/v-pyuaThp-c?list=PL8jZua1akijoyaY8MhHk6Y_OkV7O7DmZ6)

A collection of videos called "Teaching & Learning by Sketching (https://www.youtube.com/playlist?list=PL8jZua1akijoyaY8MhHk6Y_OkV7O7DmZ6)", was created to showcase the wide variety of videos that have been created in this way.

As you can see, there are many examples in this list that do not look like they were created by a visual artist, and they are still awesome!

Watch Sketcho Frenzy: The Basics of Visual Note-taking (3 mins) on YouTube (https://www.youtube.com/watch?v=gY9KdRfNN9w) for some tips on using your visual powers more effectively is this from,

Consider: Explainer Videos

1. Can you think of opportunities where an explainer video might be helpful?
2. In your future administrative role can you think of when might you want to make or use explainer videos?

Attribution & References

Except where otherwise noted, this content is adapted from Teaching through whiteboarding by Jason, CC BY 4.0.

5.4 STOP MOTION ANIMATION

Stop motion animation demonstrated by the use of a Lego character, holding a wand. The creator combined 9 images to demonstrate how they animated the wand movement. **Source:** Image by BRICK 101, CC BY-NC 2.0.

What is Stop Motion?

Stop motion is an animation technique which allows static objects to appear as if they're moving, by taking individual pictures which are eventually run together like the frames of a film. Between pictures, slight adjustments are made to the objects, creating the illusion of movement. Examples of stop motion used in education include Slowmation (http://slowmation.com/) and blackboard animations. Stop motion is a good choice if you want to create a small number of videos conveying complicated physical processes.

Stop motion can be extremely time-consuming: a video shot on a video camera usually runs at 24 fps (frames per second). Each photo taken for a stop motion project is one frame. If each photo takes 30 seconds, creating a five-minute 24 fps video will take 60 hours. While 24 fps is a much higher frame rate than you have to use—2 fps will work well in most applications—stop motion projects take a long time to create.

On the positive side, stop motion animation doesn't require a video camera, can be done with almost anything, and allows for a fine degree of control over the subjects of the video. It's also naturally engaging: people love watching inanimate objects come to life!

Stop motion is just one way to create engaging video. Stop motion animation may be useful for:

- Illustrating processes that can't be seem by the naked eye.
- Highlighting action and impact when telling a story. The example below illustrates this.

Stop motion animation using found objects

Animation is a great way to explain a complex process—learners can see it happening right in front of them. However, most forms of animation require a lot of time and training. To create even relatively simple animations, requires huge investments in time and effort: you have to learn animation software, and then

create the animation, to say nothing of the cost of the software. While stop motion is still time-intensive, it doesn't require anything more than the ability to take pictures and edit video. This video, created by Dr. Rosie Redfield, quickly and effectively explains how influenza cells take up DNA, using candy and construction paper.

Watch Dr. Rosie Redfied's Uptakemovie+audio.mp4 on cell animation (3 mins) on YouTube (https://youtu.be/1-MKZpuiW_s) for an example of illustrating processes that can't be seen with the naked eye.

Stop motion animation using paper cutouts

Making the perfect objects for your stop motion project can be as easy as breaking out the pencil crayons and scissors. The video below from the Digital Tattoo project explains data mining using a whiteboard and paper cutouts. If you don't feel like drawing, printed images would work, as well. Visit the UBC Wiki for more a complete explanation of their process (http://wiki.ubc.ca/ Documentation:Digital_Tattoo_Student_Orientation/Stop_Motion_Video).

Watch TBYI: Data Mining (4 mins) on YouTube (https://youtu.be/FHs5wbN_XY0)

Creating Stop Motion Animation

Consider: Audience & Approach

- What do you want your audience to learn while watching your presentation?
- What approach is best suited to support that learning (i.e. a narrative, an

explanation, an animation, etc.)?

Step 1: Plan

- Search for existing content on your topic. *(Do you need to create or can you curate from existing content?)*
- Identify potential impact. *(Why am I doing this? Who will benefit? What will it change?)*
- Define objectives. *(What will people learn?)*
- Develop an assessment plan. *(How will I know if I achieved my goals?)*
- Gather equipment. *(See the* What Do I Need? *section)*
- Create a test file to practice using the software.
- Export test file formats and import in editing software to ensure you can work with the files.
- Determine what the timeline is.

Planning Resources

- Scripting for explainer videos (http://diy-media.sites.olt.ubc.ca/plan-it/) by Lee Lefever at Common Craft (http://www.commoncraft.com/videolist)
- Basic storyboarding for explainer videos (http://www.commoncraft.com/explainer-tip-creating-simple-storyboards/) by Lee Lefever at Common Craft (http://www.commoncraft.com/videolist)
- Plan Your Project worksheet [PDF] (http://wiki.ubc.ca/images/5/5a/PYP.pdf)
- Storyboard Outline worksheet [PDF] (http://wiki.ubc.ca/images/f/f5/Storyboard_outline.pdf)
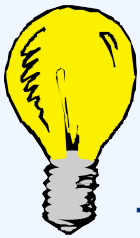
Tips – Planning

- **Consider the aim of the video** and limit yourself to what's possible in a 3-5 minute time frame.

- **Consider what your viewers will need** in order to obtain the message or story the video is sending.
- **Plan out** the timeframe for scripting, recording, and editing. Allow a an additional 20% to account for unexpected delays or issues. **Assuming you're familiar with the software and tools**, a good rule of thumb is to allow 3-4 minutes of pre- and post-production work for every minute of footage.
- **Test out your equipment** beforehand to ensure that recording goes smoothly. Make and narrate a five-second video. You might catch computer, audio, or file format issues which you can solve before recording, as well as ensuring that you have all the required equipment, and that it all works properly.

Step 2: Script & Storyboard

- Chunk your content into 3-6 minute segments.
- Review principles for learning, instruction and multimedia development.
- Create a script and storyboard
- Design your slides for presentation.
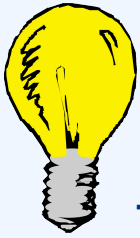
Tips – Scripting & Storyboarding

- **Try to keep to the 3 minute mark per concept** with a total video length of not more than 6 minutes.
- **Planning will save time later.** Take time to prepare a script which include slide transitions.
- **Keep it simple** and remember your objectives.

Step 3: Take pictures

- Gather your equipment
- Set up your recording environment

- Take your pictures
- Source any additional content you'll be editing in
- Record your audio
- Familiarize yourself with copyright resources and guidelines.
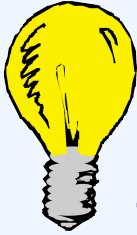
Tip – Taking Pictures

- **Make sure that you control your lighting!** Subtle changes over time will show up very clearly in your video.
- **Use your storyboard!** You'll have a much easier time if you avoid improvisation.

Step 4: Edit

- Make sure your audio is clear and balanced throughout, with good pacing.
- Check the pace and flow of your video: is it too fast? Too slow?
- Ensure all graphics, sounds and effects are necessary.
- Eliminate any extraneous information.
- Review against design principles for effective multimedia for learning.
- If possible, get feedback on a rough cut of your video.
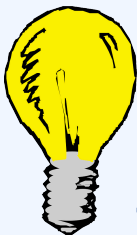
Tips – Editing

- **Don't use too many transitions:** especially flashy ones.
- **Use the 'remove noise' filter** in your editing software to take out background noise.

- **Try to stick to one piece of editing software:** the fewer programs and file formats you have to deal with, the better. Don't be afraid to handle audio in one program and video in another, but as a rule of thumb, the fewer programs, the easier you'll find things.
- **Learn the basics of color correction:** lighting, sunlight or your model of camera can make your images look red, blue, or green. Most video editing software should have features to allow you to adjust, or correct, for this.
- **Ensure you have enough computing power** and hard drive space for editing.

Step 5: Publish

- Consider reach. If you want a wide reach for your audience, choose an open hosting environment (like YouTube).
- Consider privacy. If you need a certain amount of protection around your content, choose a locally hosted option (Kaltura, Microsoft Stream, etc).
- Consider usability – if your presentations are long and learners need to be able to search key words

When you've finished recording, editing and exporting your content to an acceptable file format, you'll need to publish it so that you can embed it where you like. You can publish your content on:

- Your own website.
- YouTube (http://www.youtube.com/) is an option if you don't require privacy or security settings for your videos. YouTube enables you to share your video with the world, reach a wide audience, and students don't need an account to view it. Set up your own YouTube account to save all of your projects.
- Soundcloud (https://soundcloud.com/) for audio files.
- another free content hosting service.

Tip – Review & Publish

- **Review your video** with colleagues and double check if your video is delivering the message or story you would like it to.
- **Seek audience feedback** about the resources you produce and use it to evaluate and improve.
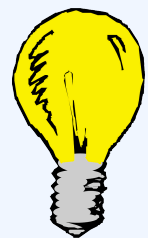
Further Information

New York Film Academy has resources on how to create a stop motion video. (https://www.nyfa.edu/student-resources/stop-motion-animation/)

Attribution & References

Except where otherwise noted, this page is adapted from Stop Motion Animation In DIY Media by Centre for Teaching, Learning and Technology at UBC, CC BY-SA 4.0

5.5 EXPLORE, PRACTICE AND APPLY

Overview: Explore, Practice and Apply

Activities found on this page are designed to provide opportunities to explore, practice, and apply concepts presented in chapter 5.

Explore

Explore Activity 1

Select two of the tools listed here. Search and locate a link for each. Explore the features available with both tools. Consider why you may choose to use these tools to create animation for a multimedia project.

- **Blender 3D**: For 3D animation.
- **K-3D**: Free 3D animation software.
- **OpenToonz**: A free animation tool.
- **Pencil2D**: For hand-drawn animation.
- **Plastic Animation Paper**: Basic animation.

Explore Activity 2

Animated icons can enhance a multimedia presentation. Navigate to the websites listed below this section and explore the icons available in the sites. Now locate 2-3 animated icons. Select and practice downloading these free, animated icons. For these icon collections, you must provide attribution to the source if you want to use them. Try adding the icons to a word document or a slide deck. Then, review the attribution requirements posted with the icons and practice inserting that information into your document/slides.

- Icon8 (https://icons8.com/)
- Flat Icon (https://www.flaticon.com/)

For more info on free web content and related license requirements, review the Openly Licensed, Public Domain, and Free to use section in Chapter 10.

Explore Activity 3

Explore animation use in advertising. Watch an animated advertisement (commercial or product ad).
Write a brief reflection on how animation was used to convey the product message. Did the animation make the ad more engaging? Why or why not?

Explore Activity 4

Navigate to the website GIPHY (https://giphy.com/) and explore the gifs available. Locate the create your own gif feature and explore how the creation tool works.

Practice

Practice Activity 1

Create an Animation Concept. Imagine you're tasked with explaining a scientific process or historical event using animation.
Write a brief concept for a 2-minute animation. Decide on which type of animation (2D, 3D, stop-motion, etc.) would best suit your topic, and explain why.

Practice Activity 2

Working in small groups of 2-3 select a topic to create a brief slide presentation. Create a short

presentation of 3 slides on the topic selected. Add text to your slides. Select and add 1 animated icon and 1 animated gif to add to your presentation. Think about the timing and placement of the animated features. Consider these questions:

1. Why were these animations selected?
2. How do these animated features enhance the presentation?
3. Did the group have any challenges navigating these animations?

Prepare to share you presentation with your peers.

Practice Activity 3

Comparison of Animation Techniques. Choose two types of animation (e.g., 3D vs. Stop Motion) and compare them.
Write a short paragraph for each technique explaining its process, strengths, and typical applications in multimedia projects.

Apply

Apply Activity 1

Create a Short-Animated Clip. Use a simple animation tool (like Canva or PowToon) to create a short animation explaining a concept or telling a story. Make the animation 30-60 seconds long, focusing on integrating visuals and movement effectively.

Apply Activity 2

1. **Choose a Scenario:** Select a scenario or process to illustrate. This could be a historical event,

a scientific process, a business workflow, or a creative story.

2. **Outline a Storyboard:**

   - **Scenes:** Break down the scenario into 5-6 key scenes or steps.
   - **Content:** Write a brief description of what happens in each scene.
   - **Visuals:** For each scene identify images, icons, and text

3. **Animations: Identify which animations you would use or develop for the activity**
4. **Sequence and Timing:**

   - **Order:** Arrange the animations in a logical sequence to match the flow of the story.

5. **Present and Reflect:**

   - **Share:** Present your animated storyboard to a peer
   - **Feedback:** Gather feedback on the effectiveness of your animations and narration, and make any necessary improvements.

Attribution & References

Except where otherwise noted, this page is created by Marie Rutherford, CC BY-NC 4.0

5.6 KEY CHAPTER TERMS

Chapter 5 Terms

Acceleration:

Increase in the speed of an object or animation over time.

Animation

The process of creating the illusion of motion through a sequence of images or frames.

Animation Pane

A feature in presentation software for managing and controlling animations within a slide.

Anticipation

A principle of animation that prepares the viewer for the main action, making movements appear more realistic.

Appeal

The visual quality that makes a design or animation attractive and engaging.

Curate Content

Organization and selection of relevant content to meet the needs of specific purposes or audiences.

Custom Motion Paths

User-defined paths along which an object moves in animations, often used in presentations.

Deceleration

The decline in speed of something-an object, an animation-over time.

Exaggeration

A principle of animation that allows movements or features to be blown out of proportion for dramatic or comic effect.

Explainer Videos

Short videos designed to simplify complex concepts into understandable materials, usually through animated means.

Frame-by-Frame Animation

A technique of traditional animation in which motion is achieved by drawing each frame of the animation individually.

Frame-rate

The number of frames of animation or video displayed per second which shows the smoothness of the movement.

Mechanical Movement

Movement that is stiff and repetitive, such as can be seen in animations involving robots or machinery.

Morph Transition

An animation effect where one object changes smoothly into another.

Overlapping Action

A principle wherein some parts of a character or object move at different speeds, which adds to the reality of the action.

Parabolic Movement

Motion that follows a curved, parabolic path, often utilized in physics-based animations.

Processing Power

Computational capability regarding the potential of a system to render animations or other tasks efficiently.

Secondary Action

Supplementary movements that added to the main action can create depth and make the scene more realistic.

Slide Transitions

Animated effects used between slides to produce visual continuity in a presentation.

Slow In

Gradual acceleration of an object's motion, giving a more natural feel to the animations.

Slowmation

Simplified form of stop-motion animation with fewer frames, useful for educational reasons.

Spatial Positioning

Objects are arranged in space that produces depth or focus in animations.

Staging

The way elements are presented to guide viewers' attention and clearly communicate the action that takes place.

Stop Motion Animation

A process by which objects are moved frame by frame and then photographed to produce an illusion of movement.

Timing

The tempo or pace of events in an animation that helps determine interest and credibility.

Whiteboard Animation

Videos where the animation emulates hand-drawn illustrations that could be used for telling stories or teaching.

Attribution & References

Except where otherwise noted, Terms and definitions are adapted from the pages and original sources cited within chapter 5, CC BY-NC 4.0.