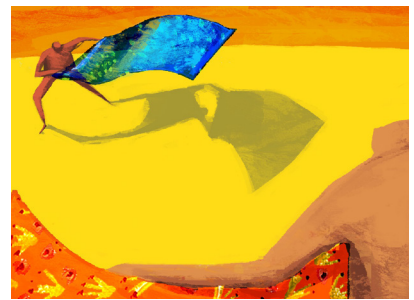
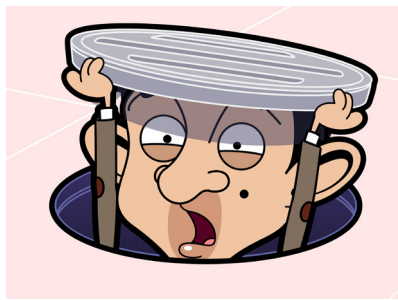


THE ART OF ANIMATION

Do you know what goes into the making of an animated film? It may be more than you think! This exhibition brings together never-before-seen work to reveal the inner workings of the production process.



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The 2D Animation Process

Animation studios use a workflow called the 'production pipeline', in which all tasks are listed and checked, step by step. The pipeline is usually divided into 3 main stages: pre-production, production, and post-production, however each 2d animation will have a slightly different pipeline.



Mr Bean, Tiger Aspect

Pre-production is where an idea is fleshed out: characters, story, setting, the aesthetics and overall vision of a project are established.

Production is where the stage is set, and the animators bring the characters to life.

Post-production is where all the separate elements are brought together and enhanced.

Here are the main steps involved in a 2d animation production:

Script

Writing a script is the first important step in the 2D animation pipeline and it can undergo many changes before it becomes finalised. In animation the script will often focus more on visual direction than on dialogue.

Storyboarding

The script is then visualised in the form of a storyboard. A drawn sequence of panels tells the story and provides some technical information, including early ideas of camera, staging, transitions, character poses and any vfx. The storyboard will be used as a visual guide throughout the project, tying together all the next production steps.

Concept art

Concept art is the earliest exploration of how the animation will look and is often used as part of a pitch to sell a project before production begins. Illustrations of dramatic moments from the story are created, which also serve as inspiration throughout the production.

Character, setting and prop design

It's the design team that brings the world to visual life. Sets, settings, characters, costumes, props and all the visual elements found in the script need to be designed and tested, then re-designed and re-tested. Once finalised, the designs are brought together to form a 'design bible', which acts as a blueprint for everyone to follow.

Animatic

The animatic allows a glimpse into the pacing of the final animation and is an essential tool to get a sense of how it is going to look and feel. The storyboard is timed out as a video, along with approximate sounds, dialogue and music.

Layouts

A layout artist takes panels from the storyboard and creates drawings that contain precise visual information on each shot, including all the features of the background, overlay and underlay. On a separate animation layer, the character layouts will be drawn as poses positioned within the scenes. Layouts link the storyboard with the animation production.

Audio

If there is dialogue, then it needs to be recorded before the animation begins. This is so that the animators can animate the mouths (lip-sync) and expressions of the characters, by creating a sound breakdown.

Background painting

The background layouts are forwarded to a background painter, who paints up the layouts according to the art style, colour palettes and lighting ideas in the design bible. These will become the world that the characters will inhabit.

Key animation

Key animators use the animation layout layer to start creating the scenes by drawing out the key poses that a character takes in each scene. A key animator is focussed on the character performance, animation timing and on using 'animation principles', according to the style of the production.

Effects animation

Some of animation is non-character animation. Elements such as smoke, rain, waves, fire, explosions, etc. are 2d special effects and some animators specialise in this type of work.

In-betweening

'In-betweens' are the drawings between the key frames which help to create the illusion of motion. In-betweeners make the movement look more fluid and realistic, bringing characters to life by having them do things like blinking and breathing!

Clean-up

When the rough animation is ready, it is time to clean up all the drawings. The clean-up artist traces solid and clean lines over the rough animation, which provides consistency and keeps the characters 'on model'.

Colouring

This time-consuming stage of the 2D animation production pipeline requires the opaque colour filling to be done for all the character and animated element drawings.

Compositing and Rendering

Compositing is the combining of all the visual elements from separate layers, creating the illusion that they are all part of the same scene. The compositor also creates camera moves, adding any effects required, including tones, highlights, and shadows. Once the compositing is complete, the final step is to render out the scene as a movie or an image sequence.

Final Edits and additional sound effects

Sound effects (foley) are crucial in helping to tell the story. A musical score also forms part of the film's soundtrack. Orchestral, instrumental, or choral pieces give cues that enhance the dramatic narrative and increase emotional impact.

At last, the animation is finished and ready to be exported.

The 3D Animation Process

A large team of people, each with different skills is needed to make a 3D animated film, and to push forward such a complicated process efficiently and affordably, a detailed framework is needed: the 3D animation pipeline.



Snail and the Whale, Magic Light

Pre-production begins much the same as in 2d animation, involving research, story, design, and the planning of the entire 3D project. The more thorough the pre-production phase, the easier the production will be. The main difference in a 3d project is that there will need to be more technical testing and problem solving, often called 'R&D' (research and development), alongside the creative work.

Here are some of the steps required after the idea has been developed:

3d animatic (or blocking)

Much like building a set, a 3d production requires the visualisation of its 3d world, according to the storyboard. The 3d animatic shows the basic 3d elements, such as the characters' size, shape and environment, including a simple animation of the characters.

3D Modelling

3D modelling is the sculpting of geometric forms using a specialised 3D software, such as Maya or 3Ds Max. Artists usually create these models in a basic, flat colour, like grey. They are modelled according to how they have been visualised during the design process and by what they must physically do, according to the needs of the story.

Texturing

Artists create and apply colours and surface details to the model. This is normally done through a process called 'UV Unwrapping', which is the art of taking a 3D model and translating it into a 2D map. This is similar to the unfolding of the sides of a cardboard box and it allows texture to be applied. Shaders are also used to affect a surface's colour, texture and tone by determining how light interacts with the surface of the model.

Rigging

Here the artists develop the internal structure or "skeleton" of the 3D models, allowing the animation of different parts of the 3d model. A bone structure is put in so that the animators can move different parts of the geometric object (like arms and legs in character rigging, for example), as quickly and efficiently as possible, much like how a puppeteer uses strings to move a puppet.

Animation

Animators then animate the models, moving them according to the needs of the story. This is a crucial, yet time-consuming part of producing a 3D animation. Although technically the process is different from 2d animation, the same animation principles are applied, to generate strong character performances with animation timing.

VFX

For some elements like hair, fur, water, fire and clothes, animating them would be too difficult or even impossible. These elements are created during the VFX component of the pipeline, although some visual effects, such as sparks, dust, raindrops, etc., are more easily achieved in a 2D. All the effects are then mixed with other layers at the compositing stage.

Lighting

Once created, the environment and models need to be lit in the same way as a physical set. Lighting is practical and also artistic; we not only need to see the characters and environment, but scenes also need to be lit for mood and atmosphere as well.

Rendering

In the 3D pipeline, rendering at this stage means exporting video sequences, but each element – the environment, the characters, the props, everything – is rendered separately, to be brought back together in post-production.

Compositing

All the rendered 3D elements are brought back together using a compositing software. This software has the capability of working in 3D space, as well as importing and manipulating 3D models.

Colour grading

Colour grading is the last adjustment to a 3D animation in the pipeline. This step enhances each shot and makes the whole project look more consistent.

Final Rendering

At the end of the pipeline, it's time for the final render for delivery. Phew!

Stop-motion Animation

Sometimes called 'stop-frame', sometimes 'puppet animation' or 'claymation', the stop-motion animation technique has its own way of doing things. For a start there are all those puppets, props, and costumes to make. Then there are sets to build and paint!



Wallace and Gromit, Aardman

Even though each production differs, any stop-motion film consists of the same 3 phases as 2d and 3d animation:

These are:

1. Pre-production: script, storyboarding, design, puppet making, prop making, set building, testing.
2. Production: shooting the scenes.
3. Post-Production: sound: voice-overs, music, and sound effects, VFX, rig removal, compositing and colour grading, editing, and exporting the final piece.

Stop motion is like traditional animation in that it's also a frame-by-frame process but instead of drawings, it uses photographs that become the animation. Typically, 12 frames are equal to a single second on video.

The basic stop motion production process is:

- The scene is modelled in real life with props, objects, and materials.
- The characters are all created, along with their different positions and facial expressions and set in their scene.
- The scene is lit and composed and then it's ready to be photographed.
- The characters and scenes are then adjusted slightly, and another photograph is taken.
- This process is repeated, adjusting the characters and scenes every time until the animation is complete.
- All the photographs are then put together in the compositing process, while special effects, colour grading and sound are added at the final stage.

There are other ways of making stop motion: stop motion with live actors is called 'pixilation', while stop motion of flat materials, such as paper, fabrics or photographs is called 'cut-out' animation.

You can also use Lego, household objects, plasticene, food and almost anything to make stop motion animation and it's lots of fun to do.

So, what are you waiting for?

Animation Timing

'Timing' in animation is what makes the movement convincing and appealing. Movements that are closer together will slow down the action, while movements that are farther apart will speed it up. By using combination of slow and fast movements, we can make it more realistic, just like in the real world, where things sometimes move quickly or slowly, and sometimes don't move at all. Good animation observes and exaggerates these movements, playfully pushing the laws of physics and the rules of logic.

Sound Design for Animation

A good music track and voice recordings add great value to the animation. It doesn't need to be over complicated, what really matters is choosing the appropriate sounds to complement the animation. A musical score has a huge impact, cueing the changes of mood, involving the audience in the story world. To get the sound design right, animators collaborate with the experts: musicians, actors, and sound designers.