The Fundamentals of Animation by Paul Wells

‘The art challenges the technology and the technology inspires the art”

 John Lasseter: PIXAR Animation

*May you think of some examples that prove the statement above?*

“Animation is one of the most prominent aspects of popular culture worldwide. It informs every aspect of the visual area that surrounds us every day.”

*Where is it present? Here are some possible answers*

1. In films produced by Disnay, PIXAR, Dreamworks and Ghibili, and television sit-coms
2. In every ad break where it shows its versatility.
3. In the computer games industry.
4. On the world- wide web, most sites have some form of an animated figure or banner
5. Animation also embraces new applications in science, architecture, healthcare and broadcast journalism.

*May you give some other applications of animation? May you think of international, domestic or local festivals and competitions that promote the art of animation?*

“Animation is a cross-disciplinary and inter-disciplinary art and craft, embracing drawing, sculpture, model-making, performance, dance, computer science, social science etc. It has a distinctive language that enables it to create the art of the impossible. Whatever can be imagined can be achieved.”

*What are the various ways to make animation? There are three main forms:*

* **d……. or c…… animation**
* **3D s……. -m……. animation**
* **c……. -g……. animation**

Here is a table presenting the animation process

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|  The Animation Process |
| 1.Concept: The exciting idea(independent project, studio project, commercial commission)2. Schedule of work (budget, timeframe)3. Reviewing resources ( technique, equipment)4. Research ( facilitating the idea)5. Story ( narrative, dramatic scenario, comic events)6. Preparatory visualization ( sketches/ models)7. Storyboard8. Script ( description, dialogue)1. Animatic
 | 1. Vocal performance / initial soundtrack
2. Vocal performance / initial soundtrack
3. Layout ( cinematic considerations)
4. Dope sheet
5. Backgrounds, sets
6. Animation sequences ( movement tests, blocking decisions)
7. Post-production analysis
8. Final mix/ edit
9. Output to chosen format
10. Exhibition / screening
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| It is important to recognize that this is **not a strict linear process**. Many aspects of the production process overlap and become subjects to ups and downs of a creative process.**Ad.1, 2, 3.** **Pre-production stage** begins with the preparation of the essential resources and materials to make and complete the project ( from the initial idea, through a clear understanding of where the budget will come from, how much time there is, how the work will be conducted, to the translation of the idea into a high-quality original animation.)**Ad.1 Concept.** What follows, is a range of starting points for ideas. Some examples and comments are given by Driessen, the acknowledged master of animation:1. *Here is a fragment which tells how Driessen records his initial inspirations. Complete the text with the missing words. Choose the words from the box:*
 |
|  | vaguely, doodling, storyboard, afterthoughts, definite, draughtsmanship |  |
|  |  |
|   |

“ I do not draw my stories at this stage, but write them down. I can \_\_\_\_\_picture in my head what it will look like, but there is no \_\_\_\_\_ image yet. Writing is abstract. I`m not hampered by design. Writing also goes much faster than drawing and one can insert \_\_\_\_\_\_\_ and correct flaws, without spending time on \_\_\_\_\_\_\_\_\_\_\_, however sketchy. But it does depend on how your mind works, the kind of stories you write, your style and experience within that approach. Some people need \_\_\_\_\_\_, need to see images to find clues and directions. Eventually, I do make a\_\_\_\_\_\_\_\_\_\_. It suggests the look of the film and defines, more or less, the various shots, the progress and order of the action”.

B. Using your personal background – personal experiences and memory, sense memories.

C. Using iconic images – our contemporary culture is a visual one.

D. Using oppositions and comparisons – a dramatic conflict generates ideas.

E. Using and revising traditional stories.

*What is your answer to the problem presented above?*

**Ad.4 Research**

Here Ellen Poon, one of the senior animators, talks about ongoing research process in the development of ‘Jurasic Park’:

“ We built some dinosaurs that we could scan into the computer […] We did some animation of T-Rex, and there was a strong sense that these were real animals moving around. You can combine these computer-generated elements with live-action in the computer environment so they seem wholly realistic and indistinguishable.[…] The animators studied a lot of live-action footage of animals running around- maybe feeding and hunting- just studying the movement to get some idea of the spirit and character of the animal.[…] We did a lot of research on skin movement ( and texture) in animals. We shot a lot of the live- action scenes with objects moving around in the environment, so we could create lighting diagrams, which helped us to make sure that everything looked right when the dinosaurs moved in or out of shade; basically that they were never anything but part of the environment.”

*Decide if the statements below are true or false:*

1. They started their work with making models of the animals.
2. They observed animals living in the wild.
3. Animal research was carried out.
4. The lighting was based on shooting scenes with live animals and moving objects in the environment.

*What do you think research may also involve?*

**Ad.6 Preparatory visualization**

Drawing underpins the process of visualization. It records the act of observation and sometimes it is an act of memory. It works as a core research in developing a vocabulary of human movements and gestures; an understanding of environments; the invention of fantastical figures and places; or, simply, the expression of line, shape and colour.

**Life drawing** – Master animator Joanna Quinn discusses how she works, giving an example of good practice. Read the text and fit in the verbs expressing movement *.*

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|  resting, leaning, doubled, hung, slumped, pulled |

“Life drawing is an essential part of my animation [..] I carry a sketchbook with me and draw at every opportunity. […] Yesterday I sketched a man reading his newspaper in the doctor`s surgery. The pose looked a familiar one i.e. \_\_\_\_\_ over, \_\_\_\_\_\_forward with the paper, arms \_\_\_\_\_ on legs. When I looked closer, I couldn`t believe how hunched over he was and his head \_\_\_\_\_\_\_so low his torso that he was almost \_\_\_\_\_\_\_ up. His feet were interesting too, one foot forward and the other \_\_\_\_\_\_ back under his chair. If I had drawn this pose from my imagination I would never have exaggerated it as much, which is exactly why it is so important to draw from life.”

*Now watch the film where Joanna Quinn describes the process of working on drawn animation. Answer the questions:*

1. Why has she become a successful master of drawing?

2. What is the name of the tool she sticks to her animation desk?

3. What does she focus on while drawing?

4. What is the purpose of in-between drawings ( positions)?

5. What do you have to do to check the movement?

6. Why does she exaggerate the drawings?

7. What is the mirror used for?

<http://hand-drawn-animation.blogspot.com/2011/02/inspiration-master-animators-at-work.html>

**Ad. 7, 8 Storyboards and Narrative**

The key aspect of the visualisation process is storyboarding. Although it is related to the script and soundtrack, it is also a logical continuity to the drawing and design process. It is also related to narrative - literally telling the story in pictures.

There can be three stages to the story boarding process:

1. The thumbnail version – created by one or more animator`s developing sequences.
2. The reference version – has a provisional but agreed structure, more detailed, larger drawings.

3. The fixed version – the final structured storyboard that is used in the ‘animatic’ or ‘story reel’, it corresponds to the provisional soundtrack .

Pete Doctor, Director and Lee Unkrich, Editor of PIXAR Animation Studios explain aspects of the storyboarding:

 Doctor: “ We work off a ‘ beat board’. As we are developing the story, we ‘ pin’ a number of story ‘beats’ – basic scene ideas, images, exchanges- on a board and shuffle them round until we really get the essence of the story, what is the basic ‘plot’. Sometimes we use blue cards to signal various character points - character attributes that we want to nail down. As we are doing this we are writing things down – developing a treatment, and beginning a script, just like you would do in a live action. This is just a starting point. But the key thing is fixing the storyboards, and then a story reel ( animatic). Our Head of Story will ‘pitch’ various sequences from this material to the staff and we will film it on a video .[...] Storyboarding also offers the possibility of creating provisional camera positions and achieving specific effects i.e. a visual ’gag’, an emotive close-up”.

Unkrich: “ A story reel is effectively a ‘ rough draft’ of the movie. We take all the storyboards and combine them with temporary dialogue that we record, and we put sound effects and music, and edit things together so that we create our ‘movie’ “

*Both animators use a professional jargon and animation vocabulary. See if you can match the words with their definitions.*

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| --- | --- |
| 1. a beat board
 | 1. characteristic features
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| 1. a plot
 | 1. a joke, funny story
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| 1. attributes
 | 1. a moving shot that tightly frames a person displaying the most detail
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| 1. to nail down
 | 1. the first general version with temporary dialogue/sound effects and camera angle
 |
| 1. treatment
 | 1. to place, assign
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| 1. story reel / animatic
 | 1. scenario, intrigue
 |
| 1. to pitch
 | 1. to identify
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| 1. a visual gag
 | 1. a big board where basic ideas or images- ‘beats’ are pinned
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| 1. an emotive close-up
 | 1. a written story outlining the plot, characters and action for a screenplay ( script) but not including certain elements such as camera directions and dialogues
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**Storyboards – Composition - Frames**

The organisation of elements within the picture field , screen space or space within the frame is central in communicating the intention of the maker and the meaning of the work to the viewer. An effective composition directs the viewer`s eye towards those aspects that the maker wants them to see.

*How do you think the space may also be organised within the frame and effective composition achieved?*

**The appearance of reality**, **off- screen space** and **the illusion of depth** are the categories that establish the framework for composition. *Match the words with their evaluations or definitions:*

1. It is what the viewer physically cannot see, but believes exists beyond the limits of the visible frame. An object that is partially seen, extends beyond the parameters of the frame. This can be also achieved through sound , dialogue between characters entering and exiting the screen space.

2. The set, scene or background is an integral part of the composition and has to be arranged in a way that will support the theme, main character etc. It also communicates to the viewer that the space has a“textural” depth, and is not a merely a backdrop for action to take place in.

3. The “ look” and the “ texture “ of reality that enhance the concept.

**The frame space and framing of individual shots:**

In most cases the picture field will have four “borders” and these act as parameters of the space frame.

The framing of the individual shots should not rely on one fixed viewpoint or that the action principally takes place in the foreground. One approach to discovering the range of images possible in storyboard drawings is to assume that your eye functions as a film camera. That is has the facility to track, pan , zoom, use high and low angles to record action and utilise a range of shots and lenses that include long, medium, close-up and wide-angle camera techniques. Another technique is the use of tonality to direct attention to a given event or subject. Every picture has a range of tone, levels of brightness alternate with areas of darkness. It is important to constantly remind yourself how the scene is lit and where and how the light falls on the various elements within a shot.

*Make sure that you understand all the technical terms underlined above.*

**Character and movement**

Andrew Selby, an award-winning illustrator and a lecturer at Loughborough University, UK, says:

‘Successful character development starts off with acute observation –[...] for a creatively visual student being observant is minimum requirement. It is widely believed that Nick Park`s character- Gromit the dog is a parody of his own mother. In this particular example, the feat is even more astounding because Gromit has no speech or dialogue with other characters, instead Park uses now famous facial expressions and subtle gestures to illustrate the pet`s feelings.[....]

Animator`s sketchbooks are an essential reference tool that are used over and over again, recycling imagery by changing features, profiles and adding weight to characters.’

**Ad. 9 Animatic**

At its simplest, an animatic is a series of still images edited together and displayed in sequence with rough [dialogue](https://en.wikipedia.org/wiki/Dialogue) (i.e and/or rough soundtrack added to the sequence of still images (usually taken from a storyboard) and combined with camera angle to test whether the sound and images are working effectively together.

**Ad.10, 11 Layout ( cinematic considerations)**

**Layout** is essentially the technical version of storyboarding in which camera movement, effects work, and specific design elements to enhance action and performance are discussed. In the layout the artist creates the settings and architectural environments of the scenes which must consider time, place, scale, mood, atmosphere, dynamics of the proposed action, lighting and the overall style.

During the ‘Golden Era‘ of animation- from the late 1920s to the mid-1940s- the Disney Studios established an ‘industrial’ model of production, which survives with some technological modifications till now. One of the most important stages of production was ‘ layout’ – the stage-by-stage appearance of the film, taking into account the staging and dramatisation of the narrative; the blocking of characters (i.e. their movement and action in a scene); and the most effective camera shot/angle to support the animation in sequence.

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| **Golden layout rules of the Disney veterans** |
|  **1**.One quick look is all the audience gets- keep it simple, direct, like a poster; it must sell an idea. |
| **2.** Fancy rendering at a later date cannot save a poor original conception |
| **3**.Always keep screen direction clear. This will be your biggest headache- don`t overlook it |
| **4.**Keep informed on: art history- architecture, costumes and landscapes |
| **5**.Keep informed on: styles, media, textures, surfaces, composition, and drawing |
| **6**.Keep informed on: technical information- effects given by different lenses, ground glass, filters, gel etc. |
| **7**.Mood can be established by timing and movement |

**Sound and Sound advice**

 Music and animation can be thought of as separate practices with independent techniques, it is within the establishment of relationships between these art forms that we begin to recognize contemporary animated film.

When developing a project, try to establish the idea and map out the sound and animation strategies, and the relationship between sound and image in the pre-production stage. If there is a script, it is a good idea to test it by undertaking a sample recording before deciding on a final version; certain constructions that look good on the page just don`t work in practice. Likewise, voicing the script will help to ensure that the right ‘voices’ for characters will develop in the film. Think about the properties of sound you will have in the film and how these will relate to the environments used. It is a good idea to work out which sounds should be recorded ‘dry’ in a sound studio and processed digitally, and which should be recorded on location. When working with music, decide how this will affect the editing decisions and how this will work with such ideas as anticipation, tension and relaxation in the film`s structure. After compiling the sound material and working it into the dope sheet, clarify the strategies for working with or against the images: what occurs; how, where and when?

**Ad.12 Use of Dope Sheets**

 Arril Johnson, an animator and writer, talks about the role of dope sheets: ‘In the industry, camera instruction sheets are often called “dope sheets” from the early 1900s slang use of “ dope” to mean “ information”. Dope sheets relating to any given scene or shot are kept in a production folder along with the layout and drawings or final artwork required for that shot.

[…]Basically dope sheets represent a vertical timeline running from the top of the page to the bottom.[…] Typically, each sheet holds four seconds of screen time. The sheets that are used on projects to be shown at the film speed of 24 frames ( exposures) per second have spaces representing 96 frames running down their length. Narrowly-spaced horizontal lines represent each frame of film the animation will be using. The top of the dope sheet provides spaces for information; the sheet number appears on the top right and is consecutive. Reading from the left, the other information provided is the title of the production and episode, the number of the sequence, the name of the animator, the duration of the shot in whole seconds with remaining frames, the total frame count, and the length of the shot in feet. This last item relates to film and the way animators were often paid. In one foot of 35mm film there are 16 frames. If you were making animation drawings to be filmed at two exposures per drawing, you would have to produce eight drawings to create a foot of filmed animation. If you were being paid a set rate per foot you would have a fairly clear idea of how productive you would need to be to make a living.’

*Compare the above description of a dope sheet with the included diagrams.*



**Lip- synching**

It must be done so seamlessly, syllable by syllable, that the audience doesn`t notice. Animator Bill Plympton explains:’ The minimal approach to “ lip-synch” is all about money and time- four drawings with four different mouth positions. With those four drawings I got two minutes of animation out of it. And the secret is to work with the soundtrack to make sure all the mouth positions work for you. What I do is say the words in front of mirror- basically a slow motion version of the words like – “ the se-cret of li-fe”- and find appropriate mouth positions first. The famous Warner Bros. animator Preston Blair told me that people don`t actually close their mouth after they say something. The mouth remains open. So I leave the mouths open for about half a second longer, and it makes it more natural, makes more real.’

Sound breakdown was often done on separate sheets called bar sheets made by the editor, and given to the animator who would transpose them to his dope sheet.

**Ad. 15,16,17 Post-production** isessentially defined by the technique employed. Special effects, sound mixing and compositing etc. are usually ‘final’ aspects of a production process, but in the digital era they are increasingly absorbed within the production process itself. **Film editing** is a technical part of the [post-production](https://en.wikipedia.org/wiki/Post-production) process of film making where the raw footage is worked with, selected and combined into sequences. A **film screening** is the displaying of a film.