Plastic Animation Paper

TUTORIALS

Questions & Comments about these tutorials can be send to support@plasticanimationpaper.dk

Also feel free to join the official PAP user forum at www.plasticanimationpaper.dk/forum

12 Lessons for users of Plastic Animation Paper 4.0

These tutorials will take you through the workings of Plastic Animation Paper (PAP) by practical examples. Basic knowledge of animation in general is assumed. This text is split up into lessons, which must be completed one at a time. If you are already familiar with the interface and basics of PAP you may skip ahead to Lesson 2 or Lesson 3. But be warned about skipping ahead - even very experienced PAP animators may miss some nifty little trick they didn't know of! (Well, maybe not in the first lesson!)

All lessons have been rewritten for PAP 4.0 (PAP:Home & PAP:Pro).

Here's a brief overview of the lessons:

- **Lesson 1** - Quick introduction to the **screen layout** and **basic drawing tools**.
- **Lesson 2** - Your first simple PAP animation. **Animating rough blue and planning red**.
- **Lesson 3** - **Zooming** and **Rotation** of the Sheet (display canvas).
- **Lesson 4** - How to do a **walk cycle**. **Timing with clones**, **light table**, **working in passes**.
- **Lesson 5** - Optimize your workflow using **Setup** and **marking menus**.
- **Lesson 6** - Using **Cutouts - basics**. Introducing the **Range**. Your cycle from Lesson 4 is going for a walk.
- **Lesson 7** - More **Cutout tricks**. And **animating a scene**! - starting with your cycle and adding on from there.
- **Lesson 8** - Working with **Layers**, running through the **Layer Functions**.
- **Lesson 9** - How to tweak your light table and layers - experimenting with **Light Setup**.
- **Lesson 10** - Alternative approach to the famous Bouncing Ball - using **advanced Cutout features**. (to come)
- **Lesson 11** - How to manage perfect sync with only key drawings. **Keys system** and **Slide Mode** explained.
- **Lesson 12** - Choosing optimal **Sheet Size** (resolution) and what's **beyond PAP** - exporting your animation.

Before you start you must of course have PAP installed successfully on your computer - as well as a working drawing tablet such as a Wacom board. Visit our website www.plasticanimationpaper.dk or our online users' forum www.plasticanimationpaper.dk/forum for downloading, help or general information.

With these tutorials you need 2 zip files listed to the right. Each unzippes as a PAP project folder containing animation, layouts etc. The animation (.PAP) files show the

For Lesson 4:
WalkCycle.zip

progress of a typical way of working with PAP – from the first key drawings to the cleaned up animation. These folders are not needed in the first three lessons, but they are referred to in the later lessons. **We recommend printing these lessons, so you can easily work inside PAP while reading.** (To make sure everything fits the pages, print as 'Landscape').

For Lesson 7: SitDown.PAP.zip

OK - Go ahead and launch PAP!

When you start PAP, you will be asked to register and pay, if you haven't done that already. Please support us by doing so. If you have chosen to not register, you may still run PAP to try it for as long as you like.

To get the most out of these tutorials PAP:Home or PAP:Pro are recommended. If you don't own a license, be our guest and download PAP from our site for free. (You will not be able to save until you choose to register and pay). PAP:Free users will find these tutorials helpful, but note that many of the features mentioned here are only available in PAP:Home and PAP:Pro.

A last note before we start: These lessons are designed to take you through most corners of PAP as well as give you some general pointers on the art of animating. It is of course *not* required that you produce exactly the same outcome as our examples. You should simply play around in your own tempo, drawing whatever you like, from really simple stick figures to a fully developed favorite character of yours. You could also choose to draw our little girl character called Paprika!

Now, - let's draw...

Lesson 1

Go to Top

Quick introduction to the **screen layout** and **basic drawing tools**

Sketch away!

What you see now is the main screen of PAP. It has the large white drawing area in the middle and the graphical user interface (GUI) around it. Go ahead, try the pen by doodling a little. Try pressing harder or softer and watch the line become darker or lighter.

How to erase

If you want to erase something, you can turn the Wacom pen around and use the eraser end. You can also click the **Toggle Draw/Erase** icon, which will switch between drawing and erasing every time you click it. A third alternative is to simply press [F5] on your keyboard.

By the way, every time you see an icon with a diagonal line through it, it indicates it's a toggle function. This means it will switch between the two modes every time it's clicked. So when you have erased what you wanted - go back to drawing by clicking **Toggle Draw/Erase** again.

Now let's take a little tour of the screen layout!

Tool bar

Layer Panel

To your right you have your toolbar. It is simply a column of square icons, called 'functions', and above them, pen sliders and layer panel. The layer panel at the top are representing the 6 individual animation layers of PAP (PAP:Pro edition only) - but never mind that! We'll get into using layers later (Lesson 8) - so don't touch it!

Pen settings

Below the layer controls you have your pen settings! The left of the two sliders controls the size of the pen - how bold you want your line. The right one controls the shading - how dark you want your line. Just below each slider you will find two check-boxes, each associated with a slider. They switch pressure on or off. So if you want, say, a pencil-like setting, set the size to quite small with its pressure check-box switched off and then the shading slider all the way to the top (black) with its check-box switched on. This will use the pen tip pressure to control the shading from nothing and all the way to the maximum value. The maximum

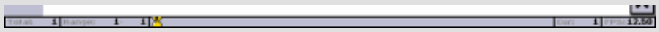
Clear the whole frame

value is whatever you set the slider to - in this case black.


Try different settings. Sketch a little. You **Undo** by pressing [u] or [ctrl z]. You can undo multiple times. Press [Shift u] or [Shift Ctrl z] for **Redo**.


If you filled up the frame with drawings and you want to erase it all, go ahead and clear the frame by clicking **Clear, making Blank** or pressing [Shift Backspace] on your keyboard. (Some icons are found in the user menus. With the default set up, you will find **Clear** within user menu U2. Click the U2 button or press [F2] to open the U2 window and get to the **Clear** icon. More about the user menus later.)

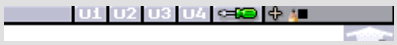
Time bar



Let's finish our short tour of the GUI. Take a look at the bottom bar. >From left, this shows info on how many frames you have in your animation (right now only 1), the range of frames you are working with, the time slider, the current frame number and the playback speed in frames per second (FPS). Of course there's not much to see at the moment with only one frame. Be patient. First things first!

Tech-note: Most animators want to, in general, animate "on two's" - which mean that your character moves on every other frame. In PAP you simply set the FPS to 12 for film, 12.5 for PAL (European) television or 15 for NTSC (American/Japanese). If you want to animate on one's (fast action) use 24, 25 or 30 FPS respectively. If you want any other rate just set the speed to what ever you like up to the maximum of 60 frames per second.

Help bar

The top of the screen is the help bar and shows various info. When you place your pointer above any icon you will, in the top bar, see the name, the keyboard shortcut and a brief description of that particular function.
In the right hand side of the top bar, you will notice 

some small icons. These are user window buttons, the GUI setup button (screwdriver) and to the far right - mode indicators. These indicators show things like which pen type you are using, if you have backlighting (onion skinning) or sound turned on and so forth.
All this will be explained in much more detail in the following lessons.

X-Strip

Now we only need to mention the X-Strip located on the left side of the screen. The X-Strip offers a good overview of your animation by showing you thumb nails of the current frame and the surrounding frames. But this is only relevant when you've actually created some!

So go on to lesson 2 for adding frames, roughing out with the blue pen, layout planning and more...

Lesson 2

Go to Top

Your first simple PAP animation. **Animating rough blue and planning red**

Adding frames


Let us add some frames. This can be done in different ways. For now, just press [Insert] on your keyboard a couple of times. Watch the "Frms" (short for Frames) number increase, in the lower left hand corner of the screen. This is the total number of frames you have on the current active layer.


To flip through the frames, use the *arrow keys* or [1] and [2] (the ones above Q and W - *not* on the numeric keypad). As a general rule in PAP, all functions have an icon. However, some functions are not practical to activate by clicking their icons. With flipping - only use the keyboard!

Deleting frames

If you haven't got anything in your frames yet - then what are you waiting for?! :) Get busy! Draw! Animate! While you're at it, here's some more valuable info...


Removing a frame completely is easy by pressing [Shift Delete] or clicking **Delete Frame**.

Light-table


To clear a frame (without removing it) use [Shift Backspace], remember?

Since you are probably an animator you already know that you must flip back and forth constantly to check the movement from frame to frame as you are drawing. You

Alternative ways of adding frames:

- *Type in the number of frames you want in the "Frms" box in the time line.*
- *Drag down at the frame you want repeated in the X-Strip.*
- *Click the **Add Blank Frame** or the **Add Clone Frame** icons.* 
- *The keyboard equivalent to the above two functions is [Insert] and [+] on the numeric keypad.*
- *Create copies of your current range by cycling it with the **Cycle Range** function.* 

could also choose to turn on the 'light table'.

 Turn backlight on by hitting [Space] or clicking the **Toggle Backlight** on/off icon. It will now show you some frames before and some after the current frame. (The backlight intensity and other settings can be set in the **Light Setup**, but more about that later.)

Work rough with the blue pen

Generally it's a good idea to work very rough in the beginning and then refine the drawings as the animation evolves. This means that you should try to get a good flow and feel for the movement you are doing. Don't worry about drawing nice pictures - this will stop you. Work quickly and with basic shapes - like balls and sketchy lines. You should be thinking about all the traditional animation tricks, like timing, weight, line of action, squash & stretch and getting good arcs of motion.

 To help you do this, a blue pencil is available for sketching. Press [F6] or the icon called **Toggle Black/Blue** to switch to blue. Notice how the little pen color indicator turns blue in the top right corner of the screen.

Now do a little simple animation using the blue pen! Just sketches.

Layout sheet

 If you want a background for you animation, you can make use of the layout sheet. The layout sheet is an extra layer used to plan out your scene. It's a good place to draw key poses or lines used to assist you in different ways. To go to the layout sheet click the **Toggle Edit Layout** icon or press [Shift L]. Notice how the color of the pen is now red. This is because the layout layer is color-coded red to make it easy to recognize. To go back to the animation press [Shift L] or the icon again.

 Once you are back with your animation, you can toggle the red layout on or off with the **Toggle Layout** function or by pressing [L].

Playback!

 To play your animation at the correct speed - press [4] or the **Play Loop** function. This will start playing forward from the current frame and then loop to the beginning when it reaches the end. Over and over. Tap down with the pen, or hit [Esc], to stop.

 You may also choose to **Play Once** [5] instead.

 Once you are happy with your little animation so far, you can refine the lines with the black pen ([F6] or **Toggle Black/Blue** to get back to drawing black). In the next lesson you will learn how to work effectively with black and blue drawings.

Save your work

User Menus

So now all you need to do is to save your work!

 Find the **Save As** icon. Some functions are hidden in the user menus. Click the U4 button in the top bar or press [F4]. When you click **Save As** the file screen will come up. When you installed PAP a "PAP_Projects" directory was created. We recommend that you use this for your animation projects. By default you save into a folder called "anims" in the project called "Scratch". You could choose to save elsewhere, but for now do as we tell you (!) :) and just type a name for your animation and click Save. All your frames and your layout is now saved into one file.

Now take a coffee break or just lean back for a second - because soon we will be doing a complete walk cycle, bringing the X-Strip into use for timing and a lot of other cool stuff...

If you are a PAP:Pro owner, before we go on, we will just quickly go through the Zoom Menu...

Note: The user-menus or -windows are simply a collection of icons (functions). What is in them is completely up to you. In lesson 5 you will learn how to customize your user-menus and the rest of the interface. This way you can get rid of all the functions you don't need at the moment, so everything is nice and simple.

Tech-note: PAP has two proprietary animation file formats. The .pap format, which is the original one and holds one animation layer and the layout. In version 3.2 the .lap format was introduced (Layered Animation Paper). This holds all 6 animation layers, various settings, the layout and the sound.

Lesson 3

Go to Top

Zooming and **Rotation** of the Sheet (display canvas)

If you are a PAP:Home owner you might want to read the right margin note - or you can skip ahead to Lesson 4.

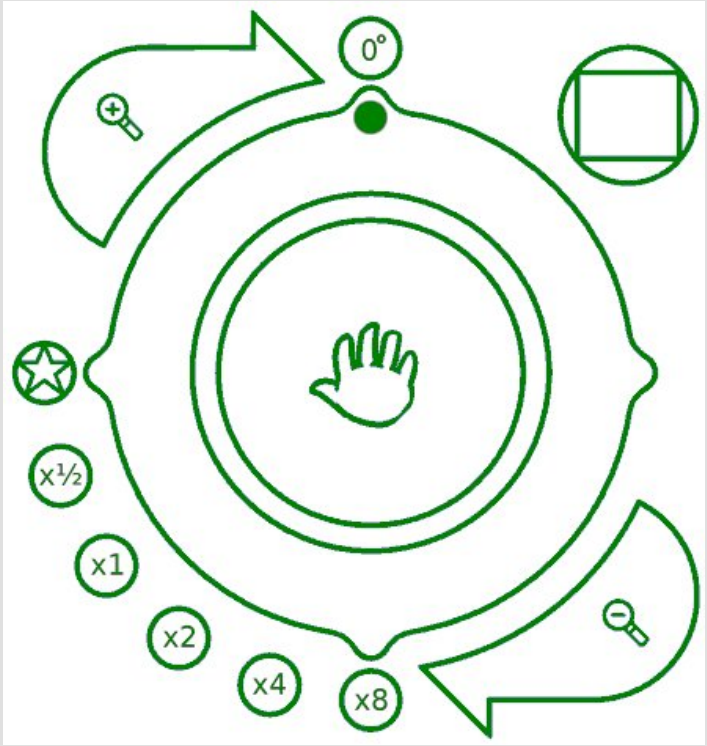
PAP:Home users! Be aware that a special offer is made to all of you. You can get PAP:Home+ for free,

This Lesson covers the PAP:Pro functions of the Zoom Menu.

which gives you zoom functionality. Press the round button when you launch your PAP:Home license to learn more.

Zoom Menu

Press and hold Z on your keyboard. As long as you hold the Z key you will see this green line interface...



This is called the **Zoom Menu**. It will pop up underneath your pointer, so you have very fast access to each of the clickable areas.

Note: Panning, Rotating or Zooming your sheet doesn't affect your drawings or animation as it is stored in memory. The Zoom menu is only a tool for displaying - thus helping you draw better at more relaxed angles or sizes.

Panning, Rotating & Zooming

Please make sure you have a couple of doodles on your sheet or an animation loaded, so you'll see how the zoom handles your drawings.

Now, let's run through each area of the Zoom Menu...

- **Panning (Middle Circle with Hand-icon):** Click and drag the center area to move the complete sheet. When you get to the edge of the sheet (white drawing area), you'll see gray nothing. To pan over longer distances, you can release the pen, the menu will center, and then drag again.
- **Rotation (Large Ring with Green Dot):** Click the ring area to control the rotation of your sheet. Watch the green dot as it illustrates the angle. If you drag your pointer *outside* the ring you can make the dot snap to right angles (0, 90, 180 and 270 degrees). If you drag it *inside*, it will not snap.
- **Zooming (Outer Areas with +/- Magnifying Glass):** Click and drag towards the right to zoom closer to your drawing. Vice versa, - drag left to move away, revealing more of your sheet. Both areas work the same.
- **Reset View (Circle with Rectangle, top right):** Click this area to quickly go to 0 degree angle, middle of the sheet and 1x zoom.
- **Reset Angle (Small Circle at the Top):** Click this to return to the default 0 degree angle without touching the zoom factor. Drawing at the default angle is a bit faster, since PAP doesn't have to calculate the tilted display.
- **Zoom Presets (Small Circles at Bottom Left):** Click one of these circles to quickly go to a preset zoom factor, without changing the angle. Sizes are from x8, as the closest, to viewing the complete sheet (Star Symbol).

When you are finished with the Zoom menu, you simply release your Z key and it goes away, - allowing you to work in the new view setting.

Take a minute to play around with the Zoom Menu to get familiar.

Note: There's a function icon for the Zoom Menu.
Using the icon instead of the keyboard equivalent works slightly different: When clicking the icon you 'activate' the Zoom Menu. To get rid of it again, simply click outside menu areas.

Zoom to get higher quality

Zooming in closer is great for drawing very precise lines. Also rotating the sheet can be good for drawing lines at certain angles. Panning is essential when drawing at higher resolutions than what can be displayed 1:1 inside the PAP window and on your computer monitor. Also use panning for adjusting the sheet when zoomed in close.

That's all there is to say about the Zoom Menu! It is quick and simple, but you will be using it a lot!

Did you manage to take that coffee break yet? Be prepared for the walk...

Lesson 4

Go to Top

How to do a **walk cycle**. **Timing with clones**, **light table**, **working in passes**

So! Let's get serious and animate a walking character in a cycle.

WalkCycle.zip

If you haven't already got the WalkCycle files you need for this lesson - please download the above ZIP file containing all the necessary PAP project files.

After unzipping, place the complete directory structure in your PAP_Projects folder.

The different stages of this lesson is included as PAP files. The best way to go through this lesson 4, is to first read it once while loading our examples one by one following the procces. Then you know what to do and you can start over, from the beginning of this lesson, and draw your own walk cycle.

Use whatever character you like of your own favorite ones. Choose one you feel comfortable drawing. We used our little girl mascot Paprika.

In PAP, you can do things in many ways. The following explains one way of doing a walkcycle in PAP and it will take you through the next set of PAP functions. When you know all the functions of PAP you may develop your own special ways!

Just a general note on PAP-projects before we move on!

PAP Project

Set Project & New Project

Load

Whenever you start a new project, it's a very good idea to create a *project* in your PAP_Projects directory. PAP will automatically create folders for animation files, single frames etc. Also the file screen will open up inside your specific project folder every time you load or save. Read details about **New Project** and **Set Project** in the Function List at our site.

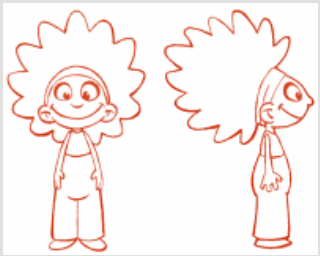
For this tutorial you don't need to create a new project, but simply point PAP to the existing one. Open user window U4 [F4] and click the **Set Project** icon. At the file screen select the project folder called "WalkCycle" and click OK.

*Note: If you want to import frames from other applications, simply click **Load**. At the file screen, PAP will automatically recognize a sequence of numbered frames as one animation - and import them color coded blue.*

OK, let's move on...

Model sheet

First of all it's a good idea to have your model sheet of your character present. Load it into the layout or draw one as a reference for when you are animating. Use **Load Layout** or **Toggle Edit Layout** [Shift L] to draw or edit it. (When you **Load Layout** notice how PAP goes into the current projects layouts folder automatically. In 'layouts' you'll find 'Paprika_model.tga'). Now, leave the Layout again with **Toggle Edit Layout** [Shift L].



Animation term: A 'Model sheet' shows how to draw the proportions and style of a character. It's the standard. Use a model sheet to make sure you don't drift away from the original design. Our Paprika model sheet is a very simple one. Usually you would want several facial expressions, body postures and angles.

Whenever you want to refer to it **Toggle Layout** on, by pressing [L]. You can also choose to leave it visible all the time.

Make sure the frame speed is 12.5 FPS.

FPS - lower right corner - remember?

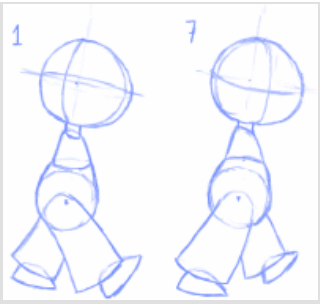
Now click **Load** and get the first animation called "Walk01.pap". In the rest of this lesson you can refer to the files as they are written in the left margin of this text.

Walk01.pap

Start by sketching your two opposite key drawings - using the blue pen. Use only simple geometric shapes. Don't do details yet. (Like the two drawings here on the right - each on its own frame of course).

Also plan out the character's stepping distance and foot spacing using the layout.

Reminder: The X-Strip is the vertical panel in the left side of the GUI - resembling a film strip.



Clone frames


Give each of the two key drawings 5 clone-frames. This is done by dragging down on the frame in the X-Strip. You should see some light brown copies of your original drawing - making the drawing pause for the amount of frames you made. Instead of dragging, you could also press [+] on the numeric keyboard (**Add Clone Frame**).

Dragging in the X-Strip


In the X-Strip, if you drag upwards on a clone you can remove the clones again. Don't worry about removing your originals - you can only delete clone-frames this way.

Originals / Clones

If you alter your original drawings, the clone frames will automatically update. On the other hand, if you draw on a clone it will itself become an original, making the next frames (below) become clones of this new original. This way you can time your animation very early in the process, easily adding breakdowns and inbetweens as the animation progresses.

Did you make 5 clones for each drawing - so you now have 12 frames in total? - Good. :)

*Note: If you accidentally make a clone into an original, use the **Clear, making Clone** function.*

Note: The little number in the lower right corner of the X-Strip originals, shows you how many of the same frames are there. I.e. how long the pause is (in frames).

Walk02.pap

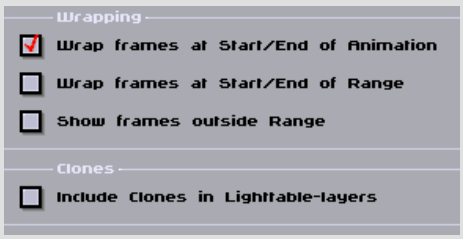

Go to frame 4 and **Clear, making Blank** [Shift Backspace]. This will give you a new original frame to make the breakdown (or passing position). Also clear frame 10 in the same way.

Breakdowns


Hit [Space] to enable the light table, while drawing the two breakdowns. First, though, you may want to adjust the settings of the lighttable.

Light Setup


Press [Shift Space] to go to the **Light Setup**. On this screen you can tweak how much you want the frames to "shine through". You can also save your settings as presets for later use and much more. We'll get more into the Light Setup later (Lesson 9). For now let's just set these options to this:



(Make sure that 'Wrap frames at Start/End of Animation' is checked ON - and 'Include Clones in Lighttable-layers' is OFF.)

Click the OK button or press [Shift Space] again. Finish sketching your two breakdowns at 4 and 10.


Like in lesson 2 you are using flip back and forward all the time (using the arrow keys or [1] and [2]). Also play your animation once in a while with Play Loop [4] ([Esc] to stop).

*Please notice: Holding [Shift] while flipping with [1] and [2] doesn't skip clones! They are alternatives to the keys Home and End. [Shift 1] and [Shift 2] are sometimes quicker because they are closer to **Play Loop** [4], **Play Once** [5] etc.*

Flip skipping clones


If you want to skip the clones while flipping, hold down [Shift] as you flip with the arrow keys. An easier way, is to turn on [Caps Lock], so you don't need to hold the Shift key all the time.

Jump to Start & End

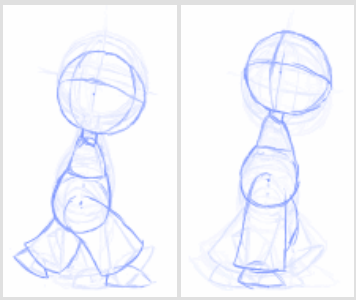

To go to the beginning or end of the animation press [Home] or [End] respectively.

Now, let's go ahead a little quicker. Remember: Keep the drawings precise, but yet simple and rough!

Walk03.pap

Do the 'extreme' drawings at 2 and 8. In our example 2 and 8 are Paprika's lowest positions.

Frame numbers 5 and 11 are the highest positions. Draw those too.



Walk04.pap

Now sketch in all the inbetweens at 3, 6, 9 and 12.

Walk05.pap

Refine in Black


When you are happy with the rough sketching you can switch to drawing black [F6]. Now refine your sketchy blue drawings by drawing on top of everything in black. Details you left out before, like facial features, arms, hair etc - can be put in now.

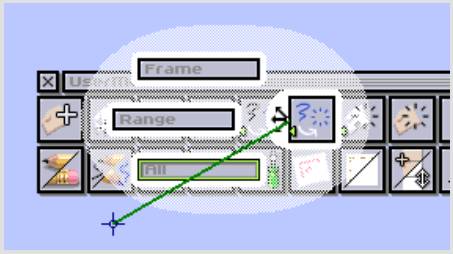
Clear the Blue lines


Once you have finished refining, you can get rid of the old blue lines with the **Clear Blue** function - leaving only the new black lines. (The **Clear Blue** icon is normally placed in userwindow 2 [F2]).

Note: Generally all functions which have options can be used without selecting an option. If you just click the icon, the least destructive (and often the most common) option is automatically selected.

Option Menus


An important note! As you may have noticed, some of the icons (like the above **Clear Blue**) have a small green triangle on them. Such a triangle indicates that the function has options. When clicking the icon, hold down the click for a second. Now a little options menu turns up. Drag to the side and select one of the options. With regards to the blue lines, get rid of all blue lines in the entire animation by selecting "All".




After removing all blue lines, you click and hold the **Black to Blue** icon - select "All" in the option menu. Now all your new black lines are converted to blue, and you have your detailed animation ready for cleanup.

Walk06.pap

Clean-up / Inking

If you are up to it, you can do the final cleanup/inking pass. Do this:

You could choose to draw the final line with an ink style pen. With the top right corner sliders, set your pen *size* (left slider) to about medium, with the pressure check-box ON. Then set the pen *shading* (right slider) to black, with the pressure check-box to OFF.

Pen Presets


PAP has some preset icons, so you can save different pen settings. It's a very good idea, especially with ink lines, to save the setting so you can get back to the exact same line again later. In the default GUI you have 3 **Save Pen Preset** icons and the corresponding 3 **Use Pen Preset** icons. They are numbered 1 through 3 and can also be reached at the keyboard with [Ctrl 1], [Ctrl 2] or [Ctrl 3].

Now trace everything with a nice steady black line. As usual keep checking with frames before and after.

Note: If you are a PAP:Pro user, remember to use the Zoom to help you do nice clean-up.

Walk07.pap


When you have finished inking, do another **Clear Blue** (all) and save your work.

Walk08.pap

That's it!

Exporting frames

If you want to take the animation further, doing coloring etc. you can save your animation as single frames.

To do so, click **Save As**, select which file format you want, like tga or tif, and

 then type in the base file name. - More about that in one of the later lessons.

Presentation Play

 Another way of playing back your animation is using **Presentation Play Loop** [9] or **Presentation Play Once** [0]. This will hide the PAP GUI while playing. As always, stop the playback by tapping down with the pen or hitting [Esc].

Note: Presentation Play will also show your complete animation as large as possible within your PAP window. If you have a TV resolution sheet in a larger window - PAP will scale it up while playing. Using PAP:Pro you are able to have large resolutions such as HD or film. If you 'Presentation Play' those in a small PAP window, your animation will be scaled down while playing in order to show the complete sheet inside your window. On the other hand using regular Play Loop or Play Once, will always play your animation in 1:1.

Well done! The next lesson will be about work flow and how to take control over the GUI!

Lesson 5

Go to Top

Optimize your workflow using **Setup** and **marking menus**

Fast & easy workflow - important!

A very important point when using PAP is the ability to set up your icons, so you can work efficiently. How you want your GUI depends on how advanced you are. 'Advanced' doesn't necessarily mean most of the icons all over the screen. It depends. It can also change from project to project. Sometimes you want one set of functions inside your 'reach' and sometimes other functions. Some, you may never use in your particular situation, so why let them pollute your view?

Tip: Beginners or teachers teaching students often like a very minimalistic setup to start with. As the rookie animator gets familiar with the common functions, new ones can be discovered and dragged into the GUI.

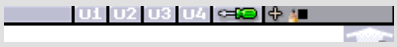
Presets & marking menus

Most experienced users, like to use presets a lot. They define presets for both the pen and the light-table. The cool thing is that you can put the presets right where you want them, since they are icons just like all the other functions of PAP. This philosophy is especially relevant when working with marking menus. They are part of a very speedy work flow. Let's take a look at the setup screen and let's turn on marking menus!

Note: More about Light Setup and light table presets in Lesson 9.

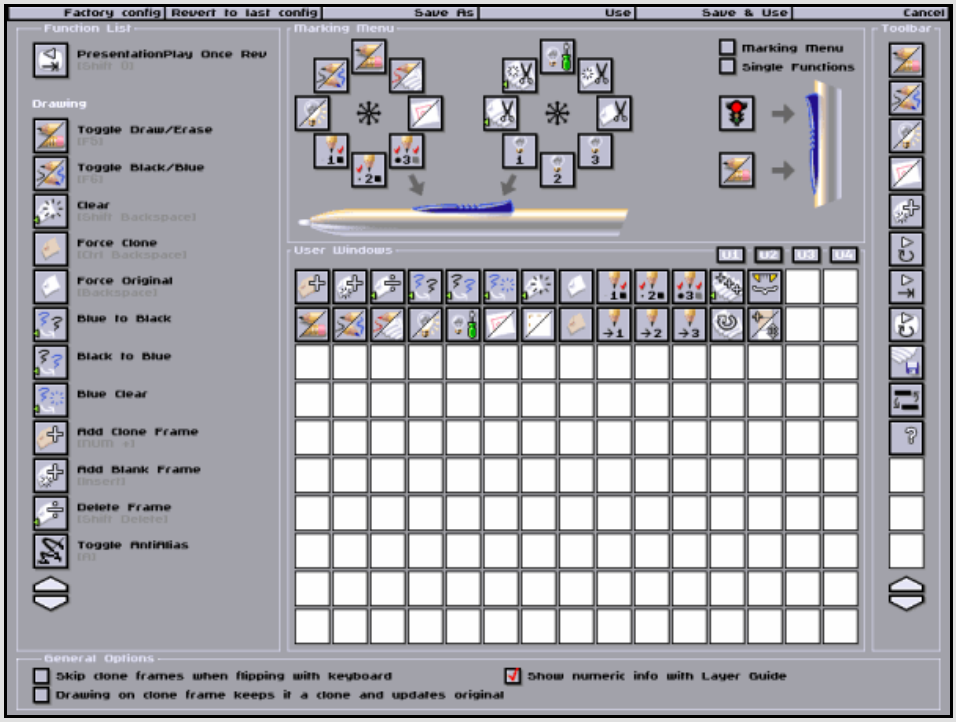
Setup screen

 Go to the **Setup** screen by clicking the screwdriver button at the top (or press [F10]).



Welcome to the setup! A quick introduction of what is here:

What's in it?



To your left is the complete set of functions available in PAP. Scroll up and down using the arrow buttons or the arrow keys on your keyboard. Browsing this list is a

nice way of getting an overview of all functions, what they are called, and what keyboard shortcut they have.

In the lower/middle part of the screen you'll see a big field with the contents of the 4 user windows. Click the U1 - U4 buttons to switch between them.

To your right is the contents of the toolbar. You can scroll it to place icons below the edge of the screen if you need the extra icon spaces.

Pen buttons

Single Functions

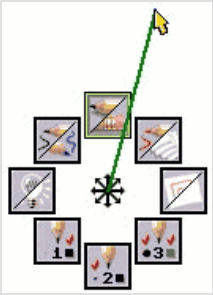
In the upper part of the setup screen, you have your marking menus. If your digitizer pen supports two buttons (like most Wacom pens) you have both menus available. As you can see, you can have up to 8 functions arranged in a circle - for each button. The two check-boxes control if you want marking menus at all and if you only want a single function assigned to each button. If you use **Single Functions**, the corresponding functions below will be activated immediately, when you press their buttons on your pen while working in PAP.

At the bottom you have some General Options. These are quite self explanatory.

Note: The screenshot above shows PAP:Pro. PAP:Home options varies.

Now, let's try the marking menus! Turn on the **Marking Menu** check-box and make sure the **Single Functions** check-box is off. Click **Save & Use** in the top bar.

How the marking menu works



Now you're back at the main screen of PAP. Hold your pen close to the board without actually touching it, now activate the marking menu by pressing and holding one of the pen buttons. The corresponding menu will pop up. Still keeping the button pressed you drag in any of the 8 directions. Notice the green "rubber band" stretching out from the middle. This line is the one you select the functions with, so you can drag it as far as you like. The function you are about to choose is highlighted. When you release the button the function is selected.

If you want to cancel the marking menu without selecting anything, just release the button *inside* the circle so no icon is highlighted.

Select without looking

When you get used to this concept and (in time) remember where each function is placed in the circle, you'll be able to select functions extremely fast without even looking! And remember you decide yourself which functions you want and where you want them!

Now go back to the setup screen to learn how you actually choose your icons.

Top buttons of the Setup screen

In the top bar of the setup screen you can save your setups (or 'configs'). This is only necessary if you use more than one config. Otherwise, you simply click 'Save & Use' and this will become your new standard which is loaded every time PAP is launched. If you mess everything up or just want to reset the GUI - click the button 'Revert to last config'. You could also go all the way back to the default setup with the button 'Factory Config'.

How to choose icons

In order to put a certain icon in the marking menu, one of the user windows, or the toolbar - you simply click the icon you want in the list, and then click again to put it down at the spot you want it to be in. If the spot is occupied already, the new icon will replace the old one. The old one will pop to your pointer instead.

Note: With the user windows it's actually possible to place your icons away from each other - or with some function missing, making a 'hole' in the window. It's up to you to decide the order and logic of your icon layout.

How to drop icons

To get rid of an icon simply put it somewhere which isn't a spot - just anywhere in the gray part of the screen.

Grabbing icons

If you see an icon you need already in one of the menus, just click it to grab it and move it to the desired spot. If you don't want it to be removed from the original spot and want to have it in two places, simply hold [Shift] while you're grabbing it.

Now, go ahead and do your own setup!

The next lesson will introduce Cutouts, which is used to copy and paste drawings and animation. You'll also learn about the Range - and you'll be using the cycle of lesson 4 and go on from there...

Lesson 6

Go to Top

Using **Cutouts - basics**. Introducing the **Range**. Your cycle from Lesson 4 is going for a walk

What is Cutouts?

Cutouts! In PAP you can cut out a piece of your drawing and reposition it in another place or frame. This way you can reuse parts - like say, a hand pose or facial expression - again, later down the animation. You are not limited to a single drawing - you can pick up a complete animation, or parts of it, and stamp it down again at other positions in time and place or even in another file. Cutouts can be saved and loaded, so you can build your own library of characters, poses, cycles, effects, etc, etc. While you have a cutout picked up or loaded, it will follow your pointer, making it very simple and fast to easily stamp it down where ever you want it. You can do all sorts of things with a picked up cutout - and that's what you'll learn in this and the following lessons.

Let's use the walk cycle animation you did in Lesson 4. Alternatively, use our Paprika character. If it isn't loaded into PAP already, please load it now (Walk08.pap).

Basically you can pick up a cutout in two ways: Leaving the original drawing intact (copy) or removing it from your drawing (cut). So let's just try it!

WalkCycle.zip

If you haven't already got the WalkCycle files you needed for lesson 4 - please download the above ZIP file containing all the necessary PAP project files.

After unzipping, place the complete directory structure in your PAP_Projects folder. For this Lesson we only use the file called "Walk08.pap".

Pick it up!


Press [C] on your keyboard and select an area containing your drawing. This is done with a 'lasso' - quickly draw the green line all the way around the part you want to cut out (you don't need to let the two ends meet completely). When you lift your pen slightly you will have the cutout picked up. Now it sticks to your pointer. This function is called **Copy StillCutout**. Tap down with your pen to stamp it onto the 'paper'. To get rid of it again - loosing it from your pointer - simply press [Esc].

Removing the drawing


The other way to pick up a cutout, is to press [X] for **Cut StillCutout**. This function does the same, but removes everything inside the lasso area as well. So this can be used for moving a drawing.


*Tip: A very effective way to erase large areas of your drawing or animation is to use the cutting Cutout functions. Simply press [X], mark the area to be erased, and press [Esc] immediately, to loose the cutout without using it. This can also be used for erasing areas in many frames at once, using **Cut AnimCutout** with [Shift X].*

To and from the Layout


Stamping down a cutout or cutting it from the paper can be undone by pressing [Ctrl Z] or [U].

Play around and try copying and cutting cutouts. You can also pick one up and stamp it down on the layout sheet or vice versa. Note how it gets converted to red line when you stamp it onto the layout.

Animation Cutouts


Now, the next step is to pick up and reposition the complete animation. These functions are called **Copy AnimCutout** and **Cut AnimCutout**. They work the same way as the single frame (still) versions, but you will have to make sure your lasso area surrounds your drawings in all the frames. You can flip through your animation, while you are selecting your area, to check this. So go ahead and pick up your animation! Use [Shift C] for **Copy AnimCutout**.


*Note: **Copy-** and **Cut AnimCutout** has options. If you click (and hold) the icon, you can choose between the options, which are **Forward**, **Backwards** and **Oscillate**. This determines in which order the frames are picked up.*

Flipping the Cutout


Once you have an animation cutout picked up, you can flip it backwards and forward by pressing [7] and [8] respectively.


Go to the start or end frame of your cutout using [Shift 7] and [Shift 8].

Note: Use the [7] and [8] keys on your main (alpha numeric) keyboard - not your numeric keys on the side.

The Range!

Another concept you need to know about, before we move on, is the "Range".

Range functions - and their shortcuts:

Range play back

The Range is a part of your animation, a number of consecutive frames, which are enclosed by the Range Start and Range End markers. You use the Range for many different things. When you play back your animation with say, **Play Loop** [4], PAP will only play the frames inside the Range. This is so you can have a very long animation


***RangeStart Back** [Shift F1]*


***RangeStart Forward** [Shift*

loaded, but only watch the small part you are working on at the moment. - You don't want to have to look through all animation leading up to what you need to check. So use the Range for that.

The Range is also good for marking frames that you want to manipulate with functions. Functions you already know by now, such as **Black to Blue** and **Clear** - but also lots of other functions. This way you can do stuff with only some frames - and are not forced to do it generally.

Marking the Range

So how can you change the Range? There are several ways of doing it. You can click and drag the little yellow range markers in the time bar (bottom) or in the X-Strip (left). Some times it is easier to move them one frame at a time using the keyboard - or pop them to your current frame, etc. (See functions and shortcuts to the right).

If you need to quickly mark a smaller part of your animation with a range, another good way of doing so is by turning your pen around and using the eraser end to drag across the thumbnails in the X-Strip - marking frames as you would mark text in a text editor.

Go ahead and try changing the Range. Drag the yellow markers and use [Shift F1 to F4]. Also try the Eraser-end-in-X-Strip way.

 Fine. Now reset the Range to span the entire animation again. The fastest way is to hit [Page Up] and [Page Down] on your keyboard.

F2]

 ***RangeEnd Back*** *[Shift F3]*

 ***RangeEnd Forward*** *[Shift F4]*

 ***RangeStart to First*** *[PgUp]*

 ***RangeEnd to Last*** *[PgDown]*

 ***RangeStart to Current*** *[Shift PgUp]*

 ***RangeEnd to Current*** *[Shift PgDown]*

 ***Copy Range to Current*** *is worthy of mentioning. You use it by marking a Range of frames you want to copy. Then click in the X-Strip, outside the Range, to find the frame where you want to insert the copied range. Now simply click this function - and the Range is copied and inserted at the current position in one go.*

 ***Cycle Range***

 ***Stretch Range*** *(On 2's, 3's or 4's)*

Range gets picked up

So now you know about the Range. But there's one more very relevant point to know about the Range. You use it for marking the range of frames to pick up - when picking up animation cutouts!

Enough already!

Alright - enough introduction! Let's take our walk-on-a-spot cycle from Lesson 4 and use it for a walk across the screen!

Just reload it (Walk08.pap) if you made a mess - playing around with Cutouts and Ranges...

Let's use the Cutout!

 So! Start by picking up your 'baby'! Use [Shift X] and make sure you get everything by including plenty of space around your character. For this exercise it is not important which frame becomes the first one in the cutout (since it's a cycle), so never mind where you are in the timeline.

When you have your animation safely on your pointer, type in 50 in the "Frms" field down in the lower left corner. You could do this in other ways, but just make sure you end up with 50 blank frames!

 If you see a few "leftovers" in your frames, do a **Clear, making Blank** with the **All** option - to make sure all 50 frames are completely blank.

Note: An Animation Cutout gets picked up from the current frame and forward. It will loop around when it reaches the end of the Range and end where it started. So normally you would examine your frames by stepping back and forth, while holding the cutout-lasso, to make sure everything is included. Then press [Shift 1] or [Home] to jump to the first frame of the Range - and then let go of the lasso to let the cutout be picked up from the first frame.

Save Cutout

 Because you need this Cutout again in the next lesson, you should save it now. Use the **Save Cutout** function.

Alright. You are now ready to put your walking character back onto the 'paper'!

 If you accidently pressed [Esc] and lost your Cutout, you can get it back by pressing [B]. No problem.

What's the plan?

See, the plan is to have her come in from the left side of the screen and walk straight across and out the right side of the screen.

You basically want to keep an eye on her feet and place her frame by frame - making a complete walk from left to right.

Grab Handle

But wait a minute! - When you pick up a cutout you grab it in the center - meaning you hold the cutout with your pointer right in the middle of your cutout. To be able to let your character come in from the left, you will have to move the "grab handle" to the right side of the cutout, so you can stick her out the left side of the screen. To do so, press [g] (**Move GrabHandle**) and then click and drag your pointer just to the right of her. When you let go, you are now controlling your cutout with an offset.

Stamp down - frame by frame

Now go to the first frame (with [Shift 1] or [Home]) and place your character just outside the frame. Let's leave the first frame blank. So step to frame 2 and stamp down your character just entering the frame - we should only see a little part of her. Now look at her feet. Align the cutouts foot, that's on the ground, with the same foot on the paper. When you are ready, step to frame 3 and stamp her down again. Every time you stamp down, PAP will automatically step to the next frame in the cutout. Then you align the feet - step the animation one frame forward - and stamp down again.

Tip: Sometimes you want to be able to very precisely position your cutout. This can be done using your keyboard. Put down your pen, hold [Ctrl] and use your arrow keys! This moves your cutout one pixel at a time. To move it in bigger steps hold both [Ctrl] and [Shift].

You repeat this all the way across the screen, keeping your focus on her ground foot, which will be alternating between her left and right foot as she walks. To assist you keeping track, you can toggle on the light table [Space] and maybe you will need a ground line too - drawn on your layout.

When you reach the right side of the screen you must offset the GrabHandle to the left side of your Cutout.

The Paprika character takes just about 50 frames to get across the screen, but of course this will depend. - Maybe your character needs more or less frames according to the size of your character and how big the steps are.

Finished

When you are finished, play the animation, lean back and admire your work!

Remember to save it with a new name.

In the next two lessons you will learn how to manipulate your Cutouts - rotating, scaling, and other cool Cutout maneuvers...

Lesson 7

Go to Top

More **Cutout tricks**. And **animating a scene**! - starting with your cycle and adding on from there

Start over

Go ahead and nuke everything using **New**. For the time being we just need a clean sheet.

Later in this lesson you will use your walkcycle once more - but this time you will extend the animation and do a complete scene. You can choose to skip the animating of this lesson and just play around, trying the Cutout functions which are introduced. But you could also take this opportunity to do some more nice animation - it's up to you.

The only new functions you need to know about, for this lesson, is some of the things you can do to manipulate your cutouts. Things, like scaling, rotating and mirroring.

Need a sketch

So do a little sketch of a character or an object - or just load in your original walcycle again (Load as animation, - not Cutout).

Pick it up

Now, let's test what happens with the different Cutout functions...


Pick up your sketch as a Cutout!

Cutout Functions...

With the Cutout picked, open up the U3 menu [F3], where you will find the cutout tools (if you are using the default setup).

Mirror


Now click **Mirror Cutout Horizontally**. As long as you don't have your pointer over a function icon, you can see that your Cutout has been mirrored horizontally.


Now try vertically too. It is maybe easier to use the keyboard shortcuts, which are [H] and [V].

Those two functions are very simple. Now let's go one step further.

Rotate


With the Cutout still picked, select **Rotate Cutout** or just press [R]. Now you are in rotate mode. Simply drag your pointer to rotate your Cutout at any angle. When you let go, the new rotated Cutout will be calculated and ready to stamp down anywhere.


Note: The Grab Handle [G] will be the pivot of the rotation. So move it if you need to.

Scale


Scale Cutout [S] works the same way. You can scale your Cutout smaller or bigger. When it is scaled down it will usually be nicer looking, since all the smaller lines are more precise and detailed. This is why it is a good tip to generally try to draw as big as possible and then scale down later - of course keeping track of your line weight so everything will look consistent after down sizing. On the other hand when you scale up you will loose resolution and things will get a little blurred. But scaling is a very usable tool, if things get too blurred just use it as your rough (make it blue) and then clean it up later.

Tip: Draw big - scale down and match up!

Blue/Black in Cutout


These three functions are equivalent to the blue/black conversion functions you already know. They just do the same, blue lines to black, black lines to blue and clearing the blue - in your Cutout.

Scaling Options

Squash & Stretch


Another thing about the **Scale Cutout** function: As you may have noticed, it has options. They are **Free**, **Proportional** and **Squash**. Go ahead and try them out to see what they do. Squash is the most advanced. It can be used to do squash & stretch - it will always keep the volume of your character or object the same. So if you animate a character falling and hitting the floor, you could use a one drawing Cutout and then stretch it while it is falling and squash it as it hits the floor. You can keep on squashing and stretching the same Cutout (or for that matter using other ways of scaling, rotating etc.) without loosing its original, picked up, resolution.

*Tip: When using the keyboard to invoke scale mode [S], PAP will by default be using the **Proportional** method. Hold down [Shift] to change it to **Free** or [Ctrl] to scale with **Squash**.*

So try, like described, to squash a bit, stamp it down, squash a bit more, stamp on the next frame, and so on. Of course you will need to refine the drawings afterwards, because the stamped down drawings will all be based on the same deformed pose, - but this is a very useful trick to get some footage very quickly. Afterwards do the refinement, drawing correct poses, overlapping action etc. on top.


You can always get the original picked up Cutout Back by hitting [B].


And, as you've learned, to loose the Cutout from your pointer - hit [Esc].

Shear


Also check out the **Shear Cutout** function, which can be used to aid leaning poses or say, shadows on the ground.

Now it's about time you do some more animating!

SitDown.PAP.zip

Get Busy!

Start by re-using your walk cycle by loading your previously saved Cutout. Now stamp it down frame by frame - like you did in the last lesson. But this time you stop half way across the screen and make her go on to another action - what ever you feel like.

SitDown.pap

You can download and use our Paprika character 'sitting down' animation as inspiration. Also use our Paprika background sketch on the Layout or draw your own.

Use Cutouts freely to 'cheat' where ever you can and want. Copy heads, hands, complete poses or even several frames at once. Use rotating and scaling and the black & blue line tools also.

Tip: Try animating big and then scale the whole thing down in the end. Try connecting more cycles or other clips of animation this way.

It's really up to you now! Remember: Do the rough blocking first, refine and add details later. Use the blue and the black pen. Use cutouts to reposition or cheat. Use all the tricks of the trade. If you are just starting as an animator, keep in mind that animators are a special breed - you need to be artistic *and* technical at the same time, as well as having a good patience.

Now. Go ahead! Animate! Enjoy...

Save frequently

Alright. That's it, for this lesson. While you are working, remember to save once in a while.

We will get back to complete the Cutout business in Lesson 10 by doing the classic bouncing ball in an alternative way.

For now, however, we will change the subject to Layers! Read on...

Lesson 8

Go to Top

Working with **Layers**, running through the **Layer Functions**

As you know by now, your black pencil is always drawing on top of your blue lines. This works this way, because your blue pencil is considered your rough sketching tool and your black is meant for refining and cleaning up. The black pencil is always considered the most important one.

In PAP:Home you can use this as if they where two 'layers'. When you import frames from other applications, you will get them loaded into the blue 'layer'. You can now draw on top of that with your black pencil. This is good for drawing on top of rendered 3D animation, on top of video or for doing masks or other sorts of rotoscoping.

Erasing Blue Lines Tip

Painting Blue Lines Black (and vice versa)

Like you have also learned, it is easy to get rid of the blue lines by using Clear Blue. But here's a little tip: If you want to erase blue lines manually, bit for bit, and still keep the black lines, you can easily do that. Using the eraser while holding down [Shift] - will leave the black lines untouched and erase blue lines only. Please go ahead and try it out for your self!

Also it is useful to know that you can hold down [Shift] when drawing black with a bold

pen, to color your blue lines black. Or paint your black lines blue in the same way, while using the blue pen with [Shift].

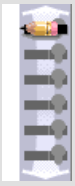
What you can't do, however, is to erase black lines and get your old over-drawn blue lines back, since the blue and black lines are essentially one combined drawing - one layer.

Note: An option in the Light Setup will let you set any of the layers to be red & black instead of blue & black. This means you now have the opportunity to have animated red 'layouts'. More on layer settings and the Light Setup in Lesson 9.

Professional animators and studios like to keep characters on different layers. Even separate one character into several layers - holding say, a moving arm on a still body, a shadow, highlights, etc.

So! That's why you need real Layers! Layers is a PAP:Pro only feature. PAP:Home owners may now skip ahead to Lesson 9.

Let's have a look at the interface for the layers:



Layer Panel

Active Layer

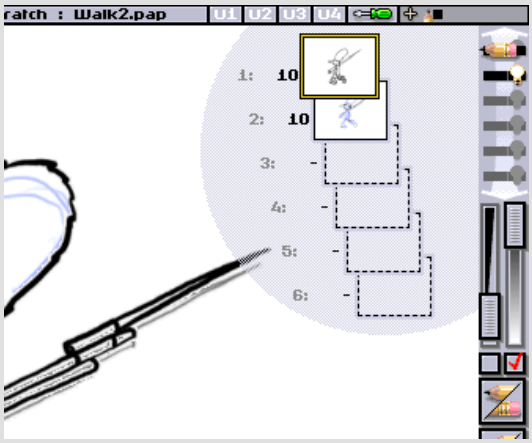
The primary layer controls are located in the *Layer Panel* - at the top right part of your main PAP window. The *Layer Panel* is really a representation of the 6 individual animation layers. The most basic usage of this panel is turning each layer on or off, as well as selecting which layer to work on. The one you work on is called the *active layer* and is the one with the pencil icon.

Layers are on top of each other

Furthermore it shows you the order of the layers. The top layer is the one which is displayed in front (on top) of all others. The layer represented at the bottom, the one with the lowest priority, will be partly covered by all the others, since it is at the bottom. Very straight forward.

Layer Guide

Go ahead and place your pointer above the *Layer Panel*. You'll notice that an area with 6 thumbnails will pop up to the left. This is called the *Layer Guide* and is purely a visual aid. It can help you recognize which layers are used and what is on each of them. If you had any animation on any of your layers, you'd see that the thumbnails of the *Layer Guide* are animated.



You only work on the Active Layer

The Layer Guide will disappear as soon as you leave the *Layer Panel* area again. (More about the *Layer Guide*, later in this lesson).

Anyways! - Pick another layer, by clicking the left side of one of the little bars in the Layer Panel. The pencil icon will pop to the selected bar - thus indicating that this is now the *active* layer. Everything you do, - drawing, erasing, adding/deleting frames, picking up or stamping down cutouts, etc, is only done on the active layer.

Go ahead and draw some quick doodles.

Various ways of picking a Layer (making it Active)

Now go back to the first layer again, by clicking it, or use the function called **Last Active Layer**. This function activates the previous active one again. So use this to pop back and forth between two layers. **Last Active Layer** is very easy to hit, since [Tab] is the keyboard shortcut.

Draw some quick doodles again, so you have drawings on both (or more) layers. Jump back and forth and watch your layered drawings exchange.

Another way of making a layer the active one, is to use the **Go To Layer (1-6)** functions. Simply hit keys [1] to [6] on your numeric keyboard.

... Or you can step up or down through the layers, using **Go To Layer Above** and **- Below**. Shortcuts are [Alt Up] and [Alt Down].


You may have to go to the **Setup** Screen [F10] to find all these icons - or you could just use the keyboard for now.

Various ways of turning on Layers

But how do you make your layers (drawings) visible at the same time?


To make an in-active layer visible you switch on its light bulb at the right side of the little bar in the Layer Panel. This way you can toggle each layer on or off.

You also have function icons that do this...


These are called **Toggle Layer (1-6)** and have [Shift 1 - 6] on you numeric keyboard as your shortcut.


Easily switch all visible layers off by hitting **Toggle Layers** [Shift Tab]. This function remembers which layers were on, so when you hit it again only the correct ones will turn visible again.

Note: The active layer (with the pencil icon on it) will always be displayed on top of all other layers in the drawing area - no matter which is on or off and what priority it really has. Once it is not the active layer anymore - it will pop back in order, as well as being switched on or off according to its light bulb status.


*Tip: Use **Toggle Layers** after starting PAP as a fast way of switching on **all** layers from the beginning.*

Reordering Layers

When a layer is on top of others it is partly covering the ones below it. To change which layer is on top of which, you can move it up or down - reordering the layer priority.


Try this by clicking the **Move Layer Up** [Alt PageUp] and **Move Layer Down** [Alt PageDown] functions.

Dragging features of the Layer Panel

A more intuitive method of doing the exact same, is by *dragging* your layers up or down the layer panel. Again, - the top layer will be above all others and so forth down to the lowest layer, which is represented at the bottom.

Go ahead and click-drag a layer up or down. Notice how your pointer changes its appearance.
As long as you are holding and dragging - your pointer will alternate between two images (modes). One is for dropping your layer between two others  (move layer) - and the other is for merging layers  .


When you **move**, you simply reorder the layers. The one you are dragging can be moved up or down the layer stack.

Merging Layers


When you **merge**, you take one layer and mix it with the other. - The other then has the combined lines of both in it. The first layer (the one you clicked and dragged) will be left as it was.

Try doing a merge. Of course you'll need two layers with drawings or animation in it to see the result.

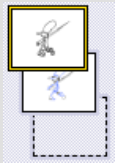
Tip: To 'copy' a layer - which is really copying all frames from one layer to another - you 'merge' with an empty layer.

Animated Layer Guide

Notice how the *Layer Guide* is animated to show what you are going to do. Again it alternates between *merging* and *moving*, as you are dragging upwards or downwards.

More about Layer Guide

By the way, the thumbnails of the Layer Guide will have a dotted frame if the layer is empty, a full frame if it holds any animation and a yellow frame if it is the *active layer*.




Layers are always numbered 1 to 6 from the top. These Layer numbers, and how many frames each layer holds, can be turned on (or off) at the options part of the **Setup** screen [F10]. The check-box is called "Show numeric info with Layer Guide".

Deleting frames of a Layer


After the merge, you may not need the drawings/animation of the first layer anymore. If that is the case, you simply **Clear** or **Delete** all frames. You know how to do that (use the "all" option if you have several frames), but remember to make sure you have the correct layer active! You are always messing with frames of

*Tech-note: **6 Layers - no more, no less!***
In order to keep the high general speed of PAP, you have a fixed number of layers available. The

Play around

the *Active Layer* - nothing else.

Now you can take the opportunity to rough out a little animation and play around testing Layers.

ones you don't need, you just don't use. You can not remove a layer, you just delete the frames in it. Layers which are not switched on will not steal any CPU power. Layers which have no frames will not steal any RAM.

Load animation into a Layer


You could also load a couple of old .pap files into a separate layer for each. You simply do this by picking the layer you want to load an animation into (making it active) and load a .pap file. Then go to another layer and load a new .pap file.

A Range for each Layer

Notice how each Layer has it's own number of frames and own Range settings. In the next lesson you'll see how you can extend a layer in time beyond its last frame, so you can make one layer loop while another is playing straight ahead.

Finishing off

That's almost it for this Lesson! Only one thing you need to know before we wrap this one up...

The LAP format

Since version 3.2 of Plastic Animation Paper, we introduced the new file format called LAP. This format is now the default format and holds *all layers*, as well as your *Layout* and your *sound* in one convenient file. You can still use the older file format PAP, which is good for saving or loading a single layer. Also use the PAP format when exchanging animation between older versions or the other editions which doesn't have layers (PAP:Home or PAP:Free).

*Note: LAP is short for **Layered** (Plastic) **Animation Paper**.*


Note: After finishing an animation you want to export your frames for coloring and compositing. You save as you are used to - but as a frame-stack of single image files, one layer at a time. More about exporting in Lesson 12.

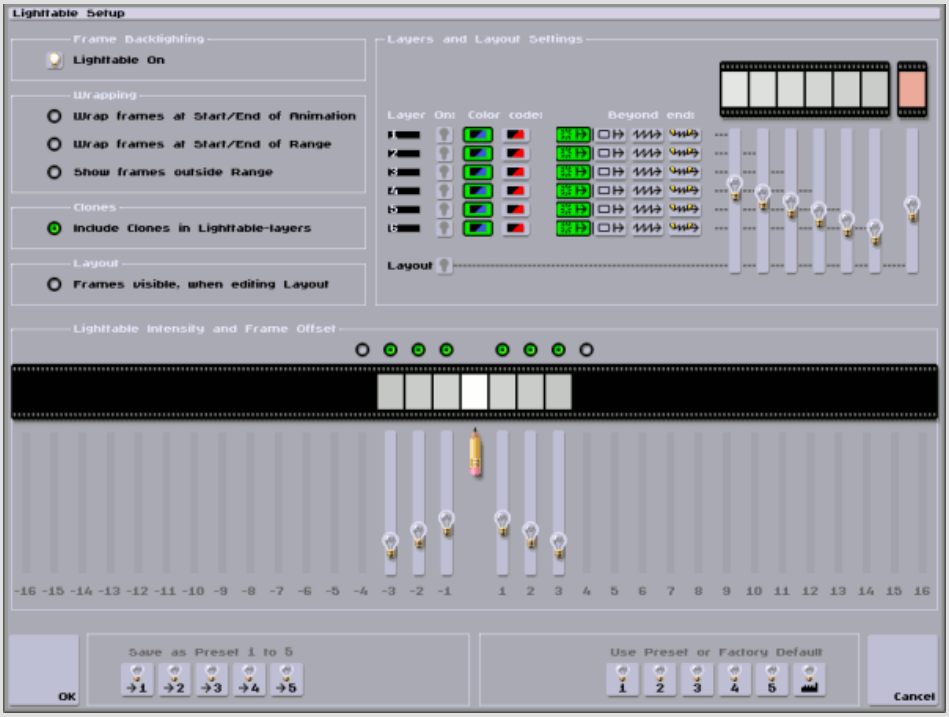
Now, more on Layers and details of the Light Setup screen...

Lesson 9

Go to Top

How to tweak your light table and layers - experimenting with **Light Setup**


Now, go to the **Light Setup** screen by pressing [Shift Space] or click the icon.



Note: If you are a PAP:Home user the Layers options are not available.

The **Light Setup** screen looks like this!

The options in the top left quarter of the screen are quite self explanatory.

But let's just quickly mention the 'Wrapping' part: Those three options let you control which frames you see shining through your lighttable when you are at the beginning or end of your animation (or Range). That is, beyond the range. Go ahead and try these options for your self (or you can save it for later). Of course you only see the effect when you have an animation loaded. Alright. Now, moving on!

On the right side of the screen you have your Layer settings. This is for PAP:Pro users. However the Layout setting is available in PAP:Home too. Let's wait a little while with that stuff for now - it'll be explained later in this Lesson.

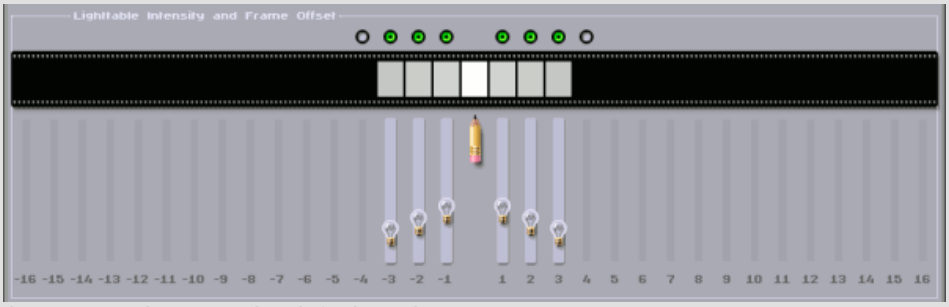
So, look further down...

Intensity & Offset Box

The most important and obvious part of the screen is the **Lighttable Intensity and Frame Offset** box in the lower half.

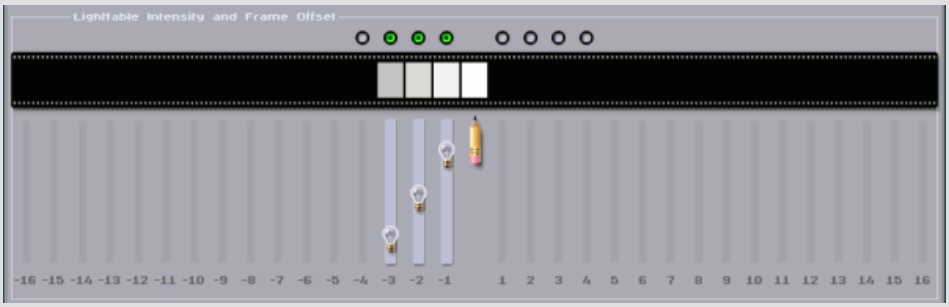
These are the lighttables fundamental settings. Let's explain - by a little series of examples...

We are using Paprika from Lesson 7 to illustrate the effect of the lighttable settings below...

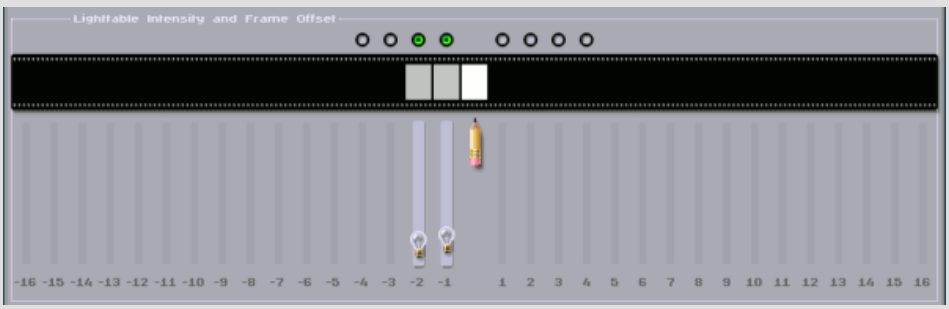


What you see here are the default settings.

It lets three frames shine through before your current frame - and three after. The current frame (the one you are drawing on) is indicated by the pencil in the middle.



This setting has the frames ahead of time (i.e. after your current frame, to the right) switched off. Also the intensity of the ones to the left has been changed so the frame just before the current is much more visible. The -3 frame is a bit less intense compared to the default setting above.

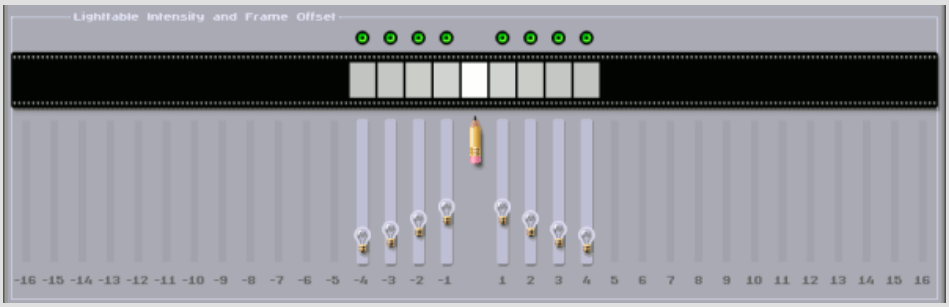


Here you only have two frames (-1 and -2) showing through. Also the intensity have been turned very low, so you can barely see them.

To switch off lighttable frames completely you do that using the radio buttons above

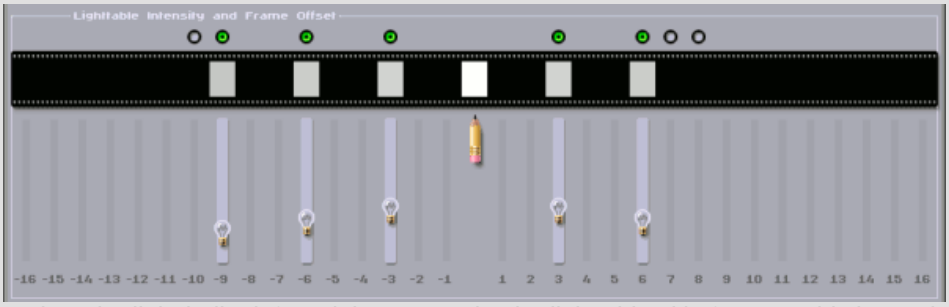
the filmstrip.

To adjust the intensity - drag the light bulbs up or down.



You can turn on up to eight frames shining through on your light table. That is, four before and four after your current frame.

If



you drag the light bulbs left or right you can let the lighttable skip frames! This is used if you are having a lot of close inbetweens and only need to see, say, every third frame like this example shows.

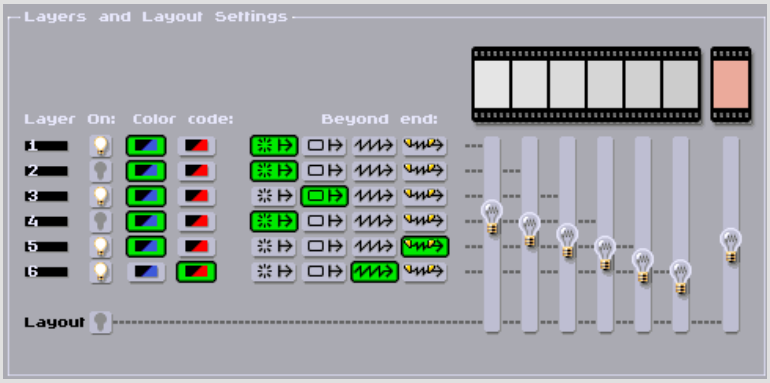
Light Presets

At the bottom of the **Light Setup** screen you'll find these buttons. Use them for storing and later re-using your own special settings. Preset 1 holds the settings you always get when you start PAP and turn on your lighttable.

Remember to set up your GUI (as you learned in Lesson 5), so you have your light presets handy.

Layer Settings

OK! Now let's look at the Layer options!



Your 6 layers are "stacked" on top of each other - with number 1 on the top. You can turn them on or off, like you can when you are drawing at the main PAP screen. At this example layer 1, 3, 5 and 6 are on.

Each layer can have the usual blue & black pencil lines. However it is possible to switch each layer individually to be color coded red & black instead. That's like having a moving layout! Or maybe you just want to keep two different characters visually apart - with one red and the other blue. (In this example layer 6 is color coded red/black.)

The next section, called **Beyond End**, has to do with what that particular layer will show if it hasn't got as many frames as other layers. The first mode displays blank frames after the last frame. The second mode (switched on at this examples layer 3), holds the last frame to infinity. Next mode (on at layer 6), will loop that layers frames infinitely. And the last mode (on at layer 5), will loop too - but only loop and show what is *inside* the Range at that layer.

At the far right, you can set the intensity of each layer by dragging the bulbs up or down.

By now, just know that you have all these options. It doesn't really make sense to play around with them if you haven't got any relevant animation on your layers right now. You can always get back to these settings, when you need them.

Layout Intensity

Lastly we have the intensity setting for your red layout layer. Drag the bulb to set it as you want it.


You can also switch layout on or off completely like any other layer, but this is also done by clicking **Toggle Layout** or hitting [L] while you are at the main PAP screen, as you know.

That was Light Setup! Click OK or Cancel to leave. You could also press [Shift Space] like you did to get here in the first place.

Now, let's get animating again! But this time, using the most advanced cutout features. The basic bouncing ball with a twist...

Go to Top

Lesson 10

Alternative approach to the famous Bouncing Ball - using **advanced Cutout features**. (to come)

This Lesson is still to come.

Please move along to Lesson 11...

Go to Top

Lesson 11

How to manage perfect sync with only key drawings. **Keys system** and **Slide Mode** explained

Alright! We are getting towards the end of these tutorials! Most of the functionality of PAP have been covered by now - however there are still a few things to mention, which will be important, not least to the professional animator.

Let's talk about how you work with your key drawings...

If you have an animation you are working on at the moment feel free to use that. Otherwise think of a little test animation you would like to do and rough the keys out now.

You could also choose to be very lazy and just load in the unfinished Paprika Walk, like the Walk03.pap file from Lesson 4 - but really! You are an animator! Draw!!

Now, make sure you have some key frames with some time (clone frames) between them.

Problem?

Here's a problem: If you are doing lip sync to a dialog sound track or maybe animating to the beat of music you would like to lock down the position of your key drawings - so that if you change the pause of one of your early keys the rest will not change position in time.

Like you know, you can drag your clone frames in the X-Strip down or up to add or delete frames respectively - making the pause of the above original (key) longer or shorter. Unfortunately dragging these clones will shift the rest of the animation forward or back in time making it out of sync with the sound or any animated action on other layers.

Toggle X-Strip Mode


The solution: **Toggle X-Strip Mode**. It switches between *Add Clones Mode* (default) and *Slide Mode*. Click it now to go to *Slide Mode*. Notice how the little mode indicator in the top right corner of the PAP screen changes.

Slide Mode

Slide Mode will let you slide one original drawing without changing the timing of the others. If you have an original drawing with clone frames above it, you are able to drag it upwards 'eating' the clones above, but adding clones below. You simply make your drawing appear earlier, but stay equally longer. You move it.

The same way you can move an original forward in time by dragging it downwards.

Keeping in Sync

Go ahead! Just try it! You can not accidently drag away (i.e. delete) an original. Only clones are added and deleted.

Notice how you will automatically start to drag the next original when you reach it - (when all clones between two neighboring originals have been removed). This way you keep all your originals and push them like carriages on a train.


To go back to drag-adding clones like you are used to, just **Toggle X-Strip Mode** back again.

OK. That's all good and fine. But what if you only want to flip between a few key drawings and have breakdowns and inbetweens you want to skip?

Tip: While in Slide mode, functions like   ***Add Clone Frame*** *[NumPad +] and* ***Delete Frame*** *[Shift Delete] are still working and can be very handy. These do change the overall timing though.*

Skipping Clones


You know you can skip your clones with your Light Table, remember? But skipping clones is not always enough.

Again, make sure you have your half done animation present - you have your key drawings, some originals with some clones between them.

Toggle Key


Now press [K] while standing on a key frame. You can also click the icon. It is called **Toggle Key** [K] and defines the current frame as a key frame. You'll notice that the current frame thumbnail in the X-Strip now has a little red key on it.

Now select a few (say 3 or 4) originals to be keys.

When you flip through your animation using your arrow keys - nothing is different, - yet!

Toggle Key Mode


Now **Toggle Key Mode** [Shift K] on! The mode indicator in the top right corner of the PAP screen shows that *key mode* is on. Now try flipping with your arrow keys! All other frames than the ones indicated by a little key is now skipped. The same goes for the light table if you turn it on [Space].


Using the [K] key on your keyboard, you can quickly mark a frame as a key frame and unmark it with [K] again when you are done with it as a key. Very simple.


Hit [Shift K] again to leave *key mode* and start flipping through all frames as usual.

Once you get into this, it will become second nature and something you'll use effectively all the time.

Clear Keys


At some point you might want to remove all key markers in one go. Use **Clear Keys** [Ctrl K].

Just keep these possibilities in the back of your mind. They will come in handy.

Now let's rush on to the last lesson which discusses sheet resolution sizes and how to take you animations beyond PAP...

Lesson 12

Go to Top

Choosing optimal **Sheet Size** (resolution) and what's **beyond PAP** - exporting your animation

Whau! Final lesson!

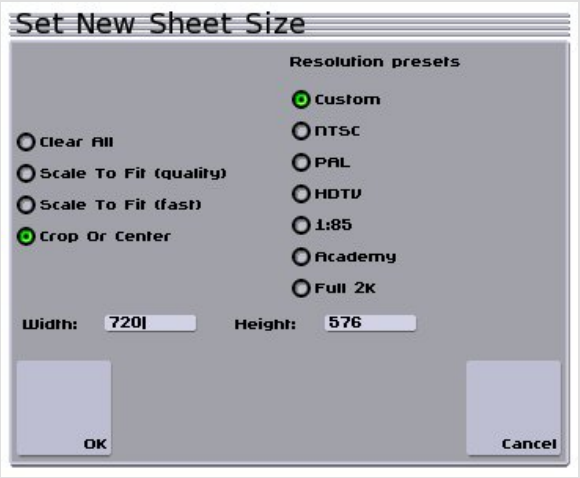
You have to be warned, though, that parts of this Lesson will be slightly technical. Most of you geeks like it like that anyway, so read on! If the non-technical readers don't understand everything, then just don't worry about it! - The important thing is the art, right? Not the technical computery nonsense...

New Sheet Size

When you launch PAP for the very first time, it will start up in PAL resolution, which is 720x576 pixels. If you will be using any other resolution, simply click the New Size icon and set your prefered resolution.

Panning or Zooming Camera

When you click the New Size icon, the window shown to the right will appear. You will have a choice of all the common TV/Film resolutions as presets - or you can type in your own custom resolution.



Sometimes you will need to have a higher size of your sheet than the resolution of the screen format you are doing animation for. That is, if you want to animate a large scene that is later going to be used for panning across or has to be zoomed in or out.

Working with more space will be obvious to some, but here's a little example to explain it anyway: Say you have a wide background with some rugged terrain. You want your character to climb/walk/jump across it from one side to the other while we follow him closely with the camera. To do this, you would choose a resolution which is so wide that it fits all of the background, animate every step of your character precisely matching the terrain of the background as if it was one very wide screen. Then, after exporting your finished wide frames from PAP, you would do the panning across the background, and animation layers, in compositing - ending up with your destination screen format.

Note: Below are the most common TV and film resolutions...

NTSC	*(D1)*	*720x486*
NTSC	*(16:9, square)*	*1024x486*
PAL	*(D1)*	*720x576*
PAL	*(square)*	*768x576*
PAL	*(16:9, square)*	*1024x576*
HDTV	*(1080 i/p)*	*1920x1080*
1:85		*1828x1332*
Academy		*1828x1556*
Full 2K		*2048x1556*
IMAX		*4096x3072*

(NTSC are the TV format used in USA and Japan, and PAL are the TV format in Europe.)

Work in High Res?

You might choose to work in higher resolutions in general than what your output screen format is - since you then have the freedom of scaling it down afterwards in compositing. This of course demands more of your storage, memory and CPU capacity, so it is not always a good idea. For common use you should stick to your standard format.

Note: Maximum custom resolution of PAP is 4096 pixels (width) x 3072 pixels (height).

Remembers your Resolution

Did you set your resolution yet? Please select the one you want or just leave it as it was. But don't click OK - we are not done!

By the way, - next time PAP is launched it will remember your last settings and start up with your prefered sheet size resolution. This is nice when you work on the same project for a period of time.

Options

Anyway... Before you click OK, let's just run through the options on the left. They are *Clear All*, *Scale to Fit* (two methods) and *Crop or Center*.

Important!

If you have just launched PAP there are really no difference between these options, since you haven't got anything loaded or animated yet. If, however, you have something present it is very important to know what to choose, because you could potentially ruin your present work. These conversions can not be undone.

Clear All

Clear All: This will delete everything currently loaded and leave you with only one blank frame present.

Scale to Fit

Scale to Fit (quality or fast): These two options will scale all your frames in all layers to the resolution you select. The 'quality' method means that PAP will scale using full anti-aliasing algorythms to keep the quality as high as possible. Scaling pixel-based drawings always means that you loose some quality. - In practice this is normally not a problem, but it could result in your lines looking slightly blurred. This is just how it is. If you use the 'fast' option, PAP will calculate the scaling very quickly but won't try to smooth anything.

Down-scaling is good

When you go from high resolution to a lower, then, even though you loose information, you end up with very smooth and detailed looking lines. So in that respect you get very high quality at your given target resolution. That's just a good little fact to remember! Scaling down don't need to be done in PAP, you could wait to do it at the compositing stage as well. That desision depends on how large you like your interim file sizes, how much RAM you'll need at the coloring stage, how much you want to keep the freedom of doing camera adjustments in compositing and so on.

Note: Please also refer to Lesson 7, which talks about similar down-scaling techniques when using cutouts.

Crop or Center

Crop or Center: The last option means that if you are going from a large sheet size - to a smaller, PAP will cut off the sides leaving only the middle part. If you are going the opposite direction, from small to large, PAP will leave your animation (pixel for pixel) as it is, but simply center it on the larger sheet.

Note: You can choose a new size that is say, larger in height and smaller in width, compared to your current size. PAP will then scale, crop or center each axis independently.

Coloring

As you know, PAP is not for doing coloring or compositing. Other programs are very good at that. That is programs like, *Photoshop* or the free alternative *The Gimp*. Gimp is actually just as good as Photoshop for coloring and even handles frame stacks (aka image sequences) like the ones you get when you export your animation from PAP.

Words: If you are doing a search in these lessons for the term 'inking and painting', you just found it here. To read about 'inking' in PAP, please take a look in lessons 1, 2, 3, 4, 7 and 8. 'Painting' is what we call 'coloring' in this lesson.

Compositing

To do your compositing, use what ever software fits your needs and pipeline setup. Lots of PAP users tend to use *After Effects*, but others use compositing programs like *Shake*, *Fusion*, *Nuke,* - or simpler ones that will work fine too.

Programs like *Animo* or *Flash* can also be of great use to for doing both coloring and compositing. It is really up to your preference and situation.

Compatible Simplicity

The point is that PAP exports as frame-stacks in the common standard image formats. That makes it easy and simple. You are working with nicely numbered sequences of frames, and most setups and ways will work fine and be fully compatible.

3D CG & Stop Motion Animators

Many PAP users are really animators in other mediums - like 3D CG animators or maybe stop motion animators. They use PAP for studying, or blocking, ideas before doing their final animating. They may export their hand drawn PAP frames for reference when posing or timing in 3D.

But if your medium is "traditional" animation, then you want to take your frames further down your production pipeline, to people and programs specialized for handling those tasks. That is of course how the studios do it. If you are only your self or a small crew, then you might need to follow your animation all the way to the finished film.

But... Whatever your setup is - you need to export your frames! So let's go into that

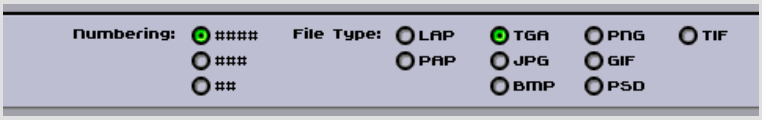
now...

Do you have your animation ready?


Click **Save As** or press [Alt S]. On the file screen you'll see the different formats you can choose from in the lower right side.

Beside the native animation file formats, which is .LAP (default format) and .PAP, you have a choice of the single frame formats TGA, JPG, BMP, PNG, GIF, PSD and TIF.

Note: Depending on your operating system you might have a choice of AVI or Quicktime too.



All of them work the same. All your frames of the current active layer will be saved in a numbered sequence of images. The width and height of the images will be the full resolution as your current sheet size and they will be in the selected file format. Which file format to choose depends on what your destination software requires, but usually it doesn't matter.

Compression

One thing to consider, though, is what kind of compression technique each file format is using. BMP and PSD is completely uncompressed and will because of that take up a lot of harddisk space. TGA, PNG, GIF and TIF use compression, but this is the *lossless* kind of compression. These are the recommended formats, since PAP frames usually are highly compressable, because of all the white empty space between the lines, and since it is lossless, you don't loose any image information at all. This means that your output frames are *exact* copies of your original PAP drawing.

The JPG format is different, because it IS lossy and tend to introduce very slight (though barely detectable) noise around the lines in the images.

Note: PAP:Free users only have the option to export in JPG format.

So go with a format such as TGA or PNG.

Technote: TGA, called 'Targa', is short for Truevision Advanced Raster Graphics Adaptor. PNG is for Portable Network Graphics.

When you select an image format, you'll get other options. These are **Numbering**, the **range of frames to export** and if you want **clones to be exported** or not.

Numbering

The Numbering options means that you can choose how many digits (2, 3 or 4) you want for the numbering in your file name. If you choose say, 4 (####), you'll get a sequence that look like this: name0001.tga, name0002.tga and so forth.

Exporting Clones

About exporting clones. If you *do* export clones, you'll get all frames exported and keep the timing of the whole sequence. The drawback is that the coloring artist do not have an easy way of knowing which frames are the same and could potentially have to color frames which he could have skipped or just copied.

If you export frames *without* clones, the sequence of frame numbers is broken every time a clone frame is skipped. This makes coloring quick and simple, since you do not have to worry about doing the same frames several times in a row.

To get the "broken" timing back after coloring, most compositing programs will allow you to hold (or freeze) the last frame, when frames are skipped (or 'missing') in the sequence.

Alpha Channel

Now a completely other thing to consider...

What about an **alpha channel**, you might ask?

An alpha-what-channel? An Alpha Channel is a 'hidden' part of an image (or image file), which defines where the image is see-through (transparent) and where it is solid (opaque). An alpha is also called a matte or a mask and is essential when you composit layers of characters or objects on top of a background.

You need your compositing program to know what part of your drawings are transparent (where you see the background) and what is solid animated character or -object.

When you do your coloring, whether you like to paint areas by hand or use the fill tool of your paint program, you are at the same time defining what is solid character and

the inside of your lines - and what is outside of your line (transparent).

If you are using Photoshop or a similar paint program, a quick way of doing coloring is to fill areas, with the fill-tool set to 'eat' a little bit of the anti aliased PAP line. Then you either composit your original line on top of your color layer at the end - or you could have a copy of your original PAP line, as a Photoshop layer on top, - using the "multiply" layer option. (The default setting in Photoshop is "normal").

Tip: Using Photoshop, automated 'actions' can be useful for doing a quick single color fill inside all lines. Check out the Popstar Coloring Action which a user made for cleverly coloring PAP frames many years ago.

Wether you do it at the coloring or compositing stage, this 'multiply' method assures you that you utilize the high quality anti aliased line coming out of PAP to full extend. Your line is blending perfectly into the painted areas on the inside of your character and at the same time blending perfectly onto the background at the outside of your lines.

What the multiply function does, is, simply speaking, to treat the line as an alpha and composit black on top of your background and color layers, - making the final image black where there is black - and see through where there is white - in the original PAP frame.

The nice thing is that all the various shades of grey pixels of your line, which you see as anti aliasing along the edges of your black ink PAP line, when you zoom in close, - will be regarded as similar various percentages of transparency when fused on to the background.

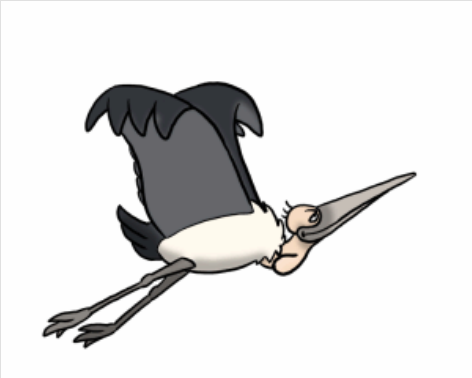
Line Color

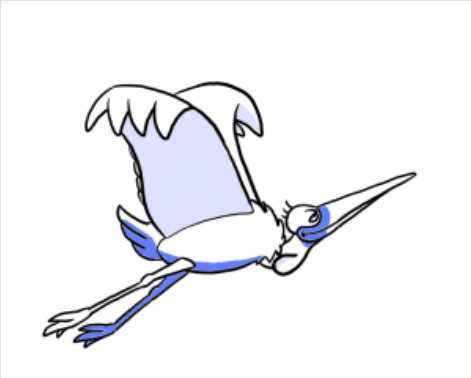
Of course you don't need to limit your self to a black line. If your design requires it, go with any other color. The technique is the same, as long as you keep your line black when inking inside PAP - then treating the black-line-on-white-background PAP-image as an alpha channel, you can composit any solid single color image on top of your painted color- and background layers. And why stick to solid line color? You could even make it gradients or patterns!

What about doing some shading effects?

High-Light and Shadow Effects

Achieving layer effects with PAP:Home





In PAP:Pro you have your layers. If you use them for adding high-lights or shadows, you can give you animation a more dimensional and sophisticated look. In compositing you can easily use these shadow or high-light elements to darken or lighten your color element. Maybe you want to blur your effect layer a bit to give it a bit of a smooth gradient edge. Again, putting the original ink line on the top will work well and will also hide any spill from the blurred effect element.

Actually you can achieve this exact effect using PAP:Home and the blue pencil. Use pen presets to set a dark blue and a light blue color. Also make sure to turn pressure sensitivity off for the shading and set the size of your pen to as large as you need it. Once you have your lines cleaned up in black, you can now draw in the blue areas to make up the effect layer. Use the dark blue for shadow parts and the light blue for high-lights. As you know, the blue lines will always keep underneeth your black line and will not ruin any finished black lines.

Using compositing or say, Photoshop, you can split the two effect elements and apply them again as layers modifying the color layer. That is, making the color layer of the character darker in the shadow parts and the color layer lighter in the high-light parts.

See the stork animation left and right for the finished look and for how it would look inside PAP:Home.

Well - That's all folks! Hopefully you haven't become too drained with all this information? Why don't you take a little breather... - but then bounce back, and do your best and most advanced animation in PAP to date!

You can do it! Go on! Animate! Enjoy!

Happy Animating!

Comments and suggestions to the author of these tutorials, Niels Krogh Mortensen, are very welcome. Please send your emails to nielskm@plasticanimationpaper.dk or reach him at the user forum: www.plasticanimationpaper.dk/forum