# Ten Steps to a perfect Inbetween

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# Prologue

Before inbetweening a scene, a series of questions should be asked (and answered) about the scene:

1.) What is going on?
Find out what is happening on the other levels of the scene, what's happening in the story, and what mood should be established by the animation.  This can have an important effect on the inbetweens.

2.) What does the scene look like?
Look at the perspective of the layout, the size and placement of the characters, the direction of the light source, how big the elements you are drawing are, how far away they are, and anything else that relates to the scene.

3.)What are you drawing ?

Is it smoke, fire, oil, water, a fat character, a skinny character?  How big is it, and how violently or slowly is it moving?  Remember all things or materials have different ways of moving so they will be inbetweened differently.  (Some things such as electricity, may not inbetween at all)

Finally, solutions  to most problems can be discovered using common sense, memory, and experience.  There may not be a stock answer as to how a rock breaks apart or how a characters hair moves, but by using logic, physics, and reference from nature, it's possible to work out the solution without having to ask for the "Right" answer.  Use your head!  Think out the problem and then solve it!

But if that doesn't work don't spin your wheels. Go to someone more experienced, they can usually come up with a solution much quicker than you can.

The timing chart is the guidline as to where to put your inbetweens. It is usually located in the upper right hand corner of the extreme drawings, and in many cases there may be separate charts for different parts of the same drawing.



Timing Chart for Balance of drawing

Timing Chart for Arm

Drawing # Key is circled

Sequence & Scene numbers between pegs
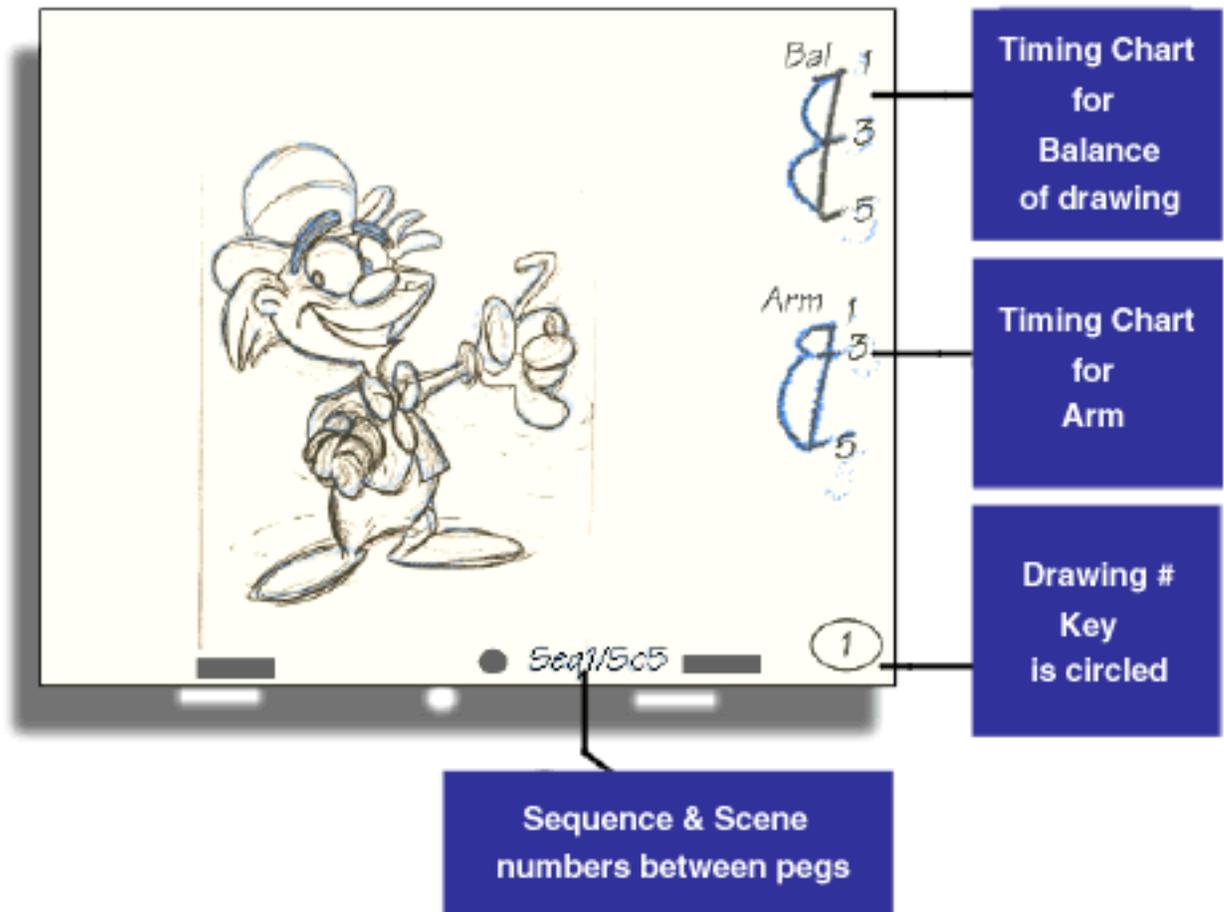
**Step1 continues...**

Some animators also vary the location and style of the charts, but generally they fall into the following categories:

# Timing chart examples
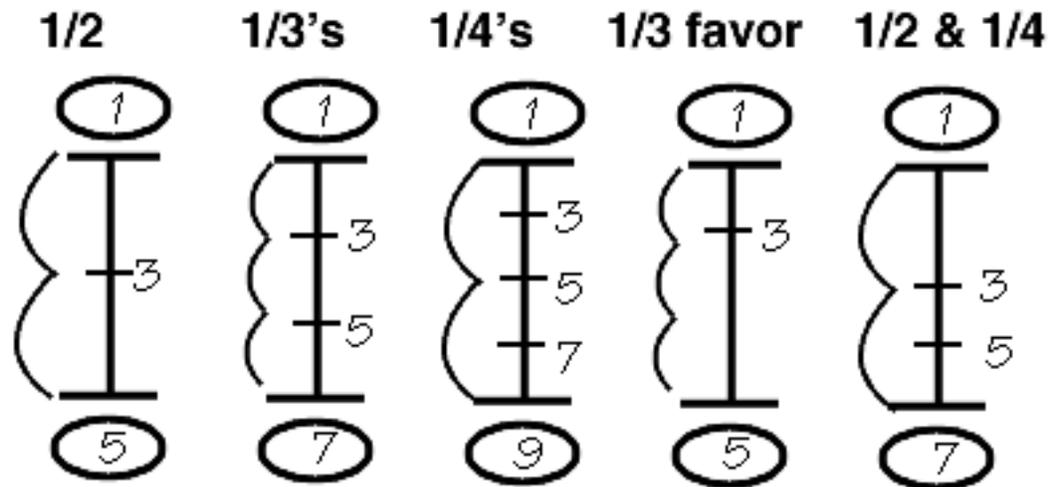
| 1/2 | 1/3's | 1/4's | 1/3 favor | 1/2 & 1/4 |
|---|---|---|---|---|
| Drawing 3 is halfway between 1 & 5 | 3 is 1/3 between 1 & 7. Drawing 5 is halfway between 3&7 | 5 is halfway between 1&9. 3 is halfway between 1&5. 7 is halfway between 5&9. | 3 is one third between 1&5 favoring 1 | 3 is halfway between 1& 7. 5 is halfway between 3&7 |

Some animators also call for inbetweens favoring the extremes. In these cases you have to use your own judgement, based on how the chart looks , as to where to put the inbetween. But when the timing chart calls for a specific timing ie: (1/2 way between the two extremes) there is only one place it can be, exactly where the animator called for it. If the inbetween doesn't follow the charts, it is wrong. Remember you are not animating, you are inbetweening.

This is a very important part of doing your inbetween.  It is called finding and following the arcs.  The movements of most living and non-living follow circular paths of action called arcs.  The animator charts the position of his drawings along this arc. He makes his key drawings indicating where the inbetweens should be placed to keep the line of action on this curved path.  Inbetweens done without following the arcs change the action rdically, usually resulting in jerky and stilted animation.

Example :
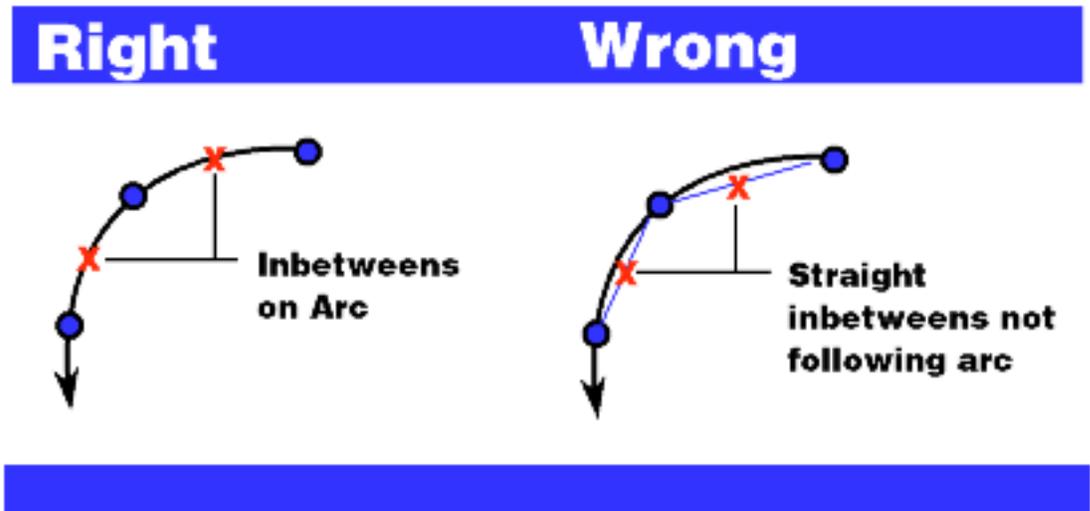


If the animator hasn't indicated the arcs you must find them yourself.  To find the arcs place the extremes you are inbetweening, plus the preceding and following extremes, in sequence on the pegs. ( In our example drawings 1, 3, 5,7, and 9)



Now by rolling the drawings in sequence the arcs in the action become evident.  Note all of these circular paths by making light indications on the keys, or on your inbetween, in blue pencil.

Take care that you roll enough extremes to see the full arcs it is easy to mistakenly arc something the wrong way making your inbetweens really bad and bringing down the wrath of the animator on your head.

**Step 2 continues...**

Also while rolling the drawings you should be watching for places where the following animation principles are being employed,  and be sure that your inbetween doesn't stiffen the action.

To find overlap, follow thru, and drag, determine the primary action.  Now anything attached, if flexible, will have an overlapping action.  In other words appendages DRAG until the primary action changes direction, then when their secondary action is spent, they overlap, follow thru and drag.

This principle for changing direction can be applied to anything flexible.
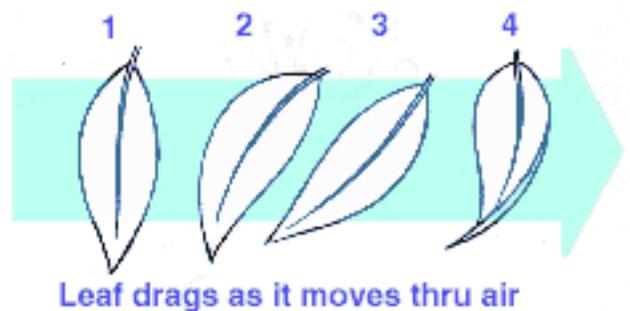
Leaf drags as it moves thru air

Connection to the primary action (A) changes direction first, followed by the middle section.  (B)

The tip, depending on the length and flexibility, continues on its course until interrupted by the pull of the main body (A&B)

(Hint: Study the action of a thin strip of paper)
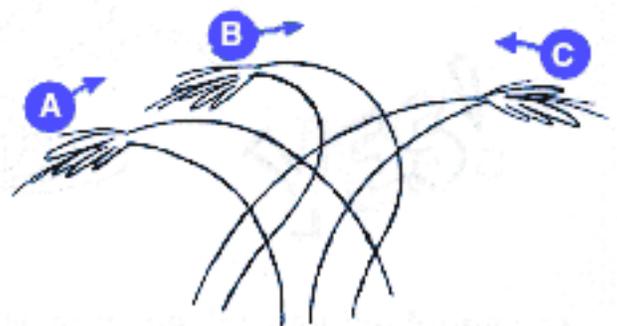
Hair drags as it moves in one direction it overlaps & whips as direction reverses

 Following the animators ruffs for all  drag and overlap will contribute to loose animation.

# Step 3 Turn on the backlight & place the drawings in flipping order.

Place the drawings in the following order on the pegs: On the bottom The first extreme, Secondly the last extreme, finally on top the blank page for your inbetween.  Turn on the backlight ( The light behind your animation disk).

## Flipping Order

Inbetween

Key 2

Key 1
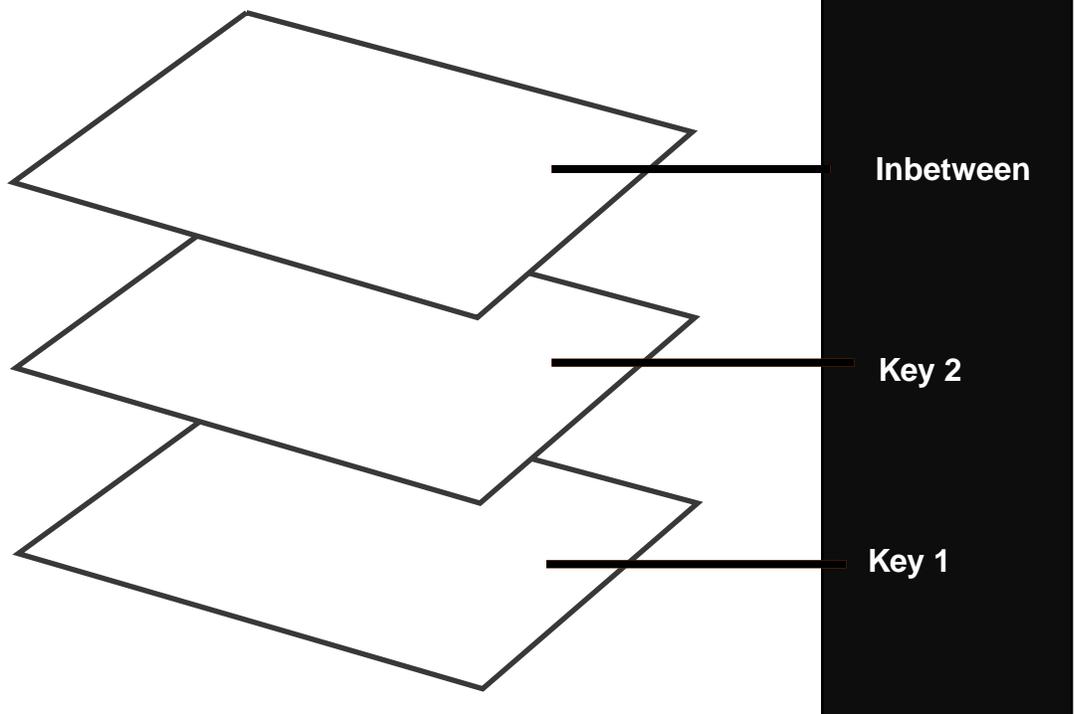
# Step 4 Build the foundation for your inbetween

Now using the backlight, plot the position of the shapes & lines between the two keys. make sure that you are following the arcs and are placing the shapes in the charted postion. Finish drawing this skeleton for your inbetween by accurately pla cing the shapes between the shapes and the lines between the lines.

Sometimes a particular object may be hard to visualize for your inbetween in these caes it is helpful to use basic 3-D shapes to build your drawing. There is no substitute for good drawing, and the most logical approach is to rely on basic shapes to get that good drawing. Most of the problems that come up are when an object moves so far that it cant't be inbetweened simpley (lines between lines) and actually has to be drawn....FROM SCRATCH! No model! You think no object ever got in that position . The extremes were easy to draw, but the inbetweens are impossible.

## Using basic shapes to assist in drawing

A difficult inbetween          Another difficult inbetween
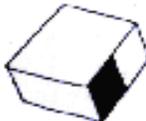
Find the basic shape          Find the basic shape
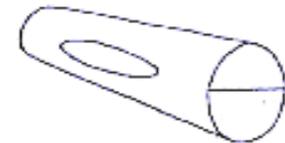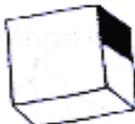
Inbetween that shape          Inbetween that shape
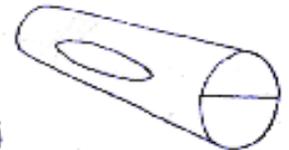
Add the details          Add the details

# Step 5 Turn off the backlight

# Step 6 Flip the drawings to check the inbetween

Grasp the drawings in the following manner

Thumb on top grasping inbetween with thumb & index finger
Middle & ring fingers grasping the next drawing the last extreme
The first extreme is on the bottom separated  by the ring and little finger from the next drawing

Now by flipping the drawings in the following manner you can see your inbetween in motion
between the two keys and easily make changes to it.



This is called flipping.  As you flip the drawings note whether it works smoothly.  Are there lines
missing?  Do any of the lines jiggle or get shorter and longer?  Is anything out of arc?  Fix these
problems as you see them then sit back and take a good look at your drawing.  It probably looks
pretty good to you doesn't it?  Wrong!!!  At this point it probably looks like a  butt ugly bent wire
tracing.

You must now make sure the inbetween works as a 3-Dimensional drawing.  Flipping all the
while, check to see that details are properly drawn in perspective and are firmly anchored to the
main masses.  That things look solid rather than flat, that the lines wrap around the forms.  Think
of the drawing as a real  object and try imaginethe unseen side of the form.  Sculpt as you draw.

**Step 6 continues...**

Look closely at the extremes as you flip and see the way the forms are described.  Try to match the animators drawing, and most of all try to capture that fleeting essence that will give believability to to your drawing.



Flat Bent-Wire Tracing                    Three-Dimensional Drawing

If the drawing looks flat or warped it is probably because it hasn't been inbetweened 3-Dimensionally.  This can be overcome by following the previous advice of building the inbetween using basic shapes such as cubes, balls and cylinders.  After laying in the basic forms it is a simple matter to add the details.  It is very important to build the inbetweens in this manner or they may look as if they are made of jello, and details will float instead of being anchored to the main masses.

Now that you have  a good drawing that seems to inbetween properly put the drawings in rolling order (In sequence with the first extreme at the bottom).  Roll thru the drawings and re-check the inbetween for all the things we have been talking about ( Drawings out of arc, jittering and crawling lines, changing volumes, floating details) and any other inbetweening problems.
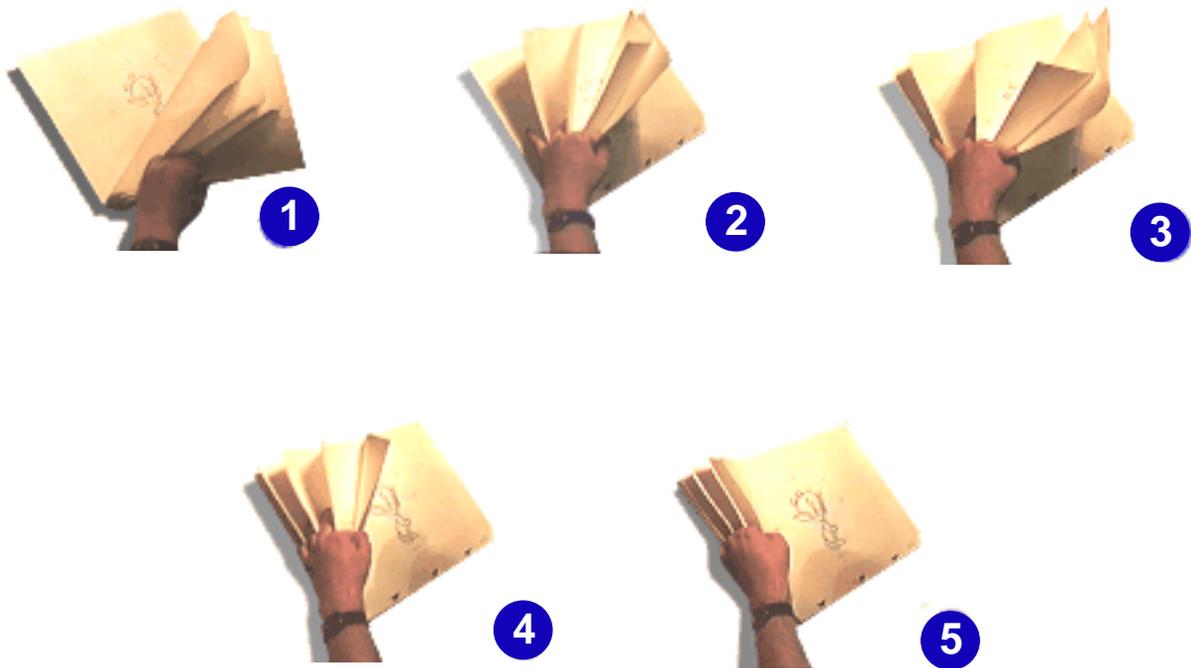
# Step 8  Turn on the backlight

# Step 9 Shift the drawings off the pegs to check volumes and details

Now that you've just about finished the inbetween, shift the top extreme and your inbetween off the pegs. pick a part of the drawing you want to check.  Using the backlight, shift the top extreme until the part you are checking is lined up precisely with the corresponding part on the bottom extreme.  Tape or hold the drawing in place.  Next line up the inbetween between the keys using as many reference points as possible.  Now by flipping and using the light you will be able to see and fix any problems with the tiniest of details:  such as volume changes, placement of details, and bobbling of features to name a few.  Proceed through the inbetween checking and fixing all the detail in this way.

This technique may also be used in step 4 of building the foundation of your inbetween, especially if the extremes are quite far apart.  Care has to be taken though that the inbetween doesn't become stilted as a result.

## Drawings on the pegs



## Drawings shifted off the pegs for easier inbetweening
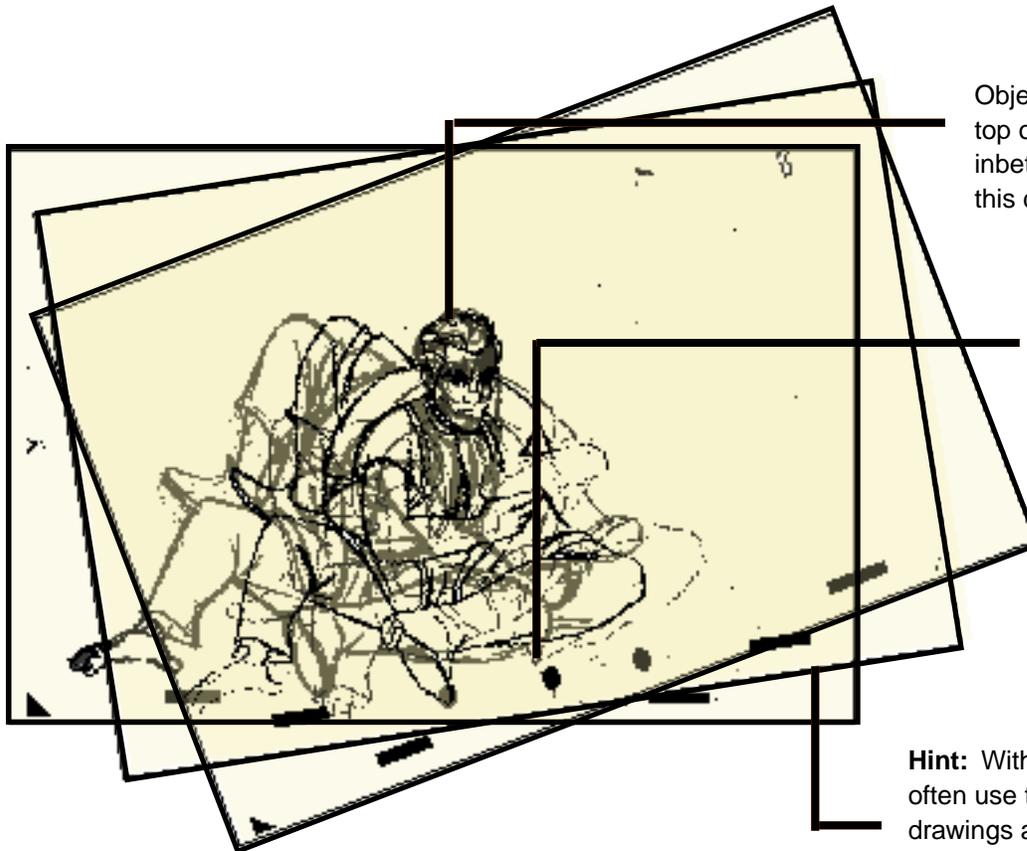


Objects shifted & lined upon top of each other for inbetweening. The head in this case.

Peg holes used for reference

**Hint:** With 1/2 inbetween you can often use the corners of the drawings and the peg holes to line up the drawings.

Roll thru and flip the drawings to do a final check of your inbetween.  Fix any problems if there are any.

Start the next inbetween