Animation

JavaScript can be used for animating images on a web page

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The Plan

An animation is the rapid display of a series of still images ... like cartoons.

There are three steps to animation:
1) Place first still image(s) on web page
2) Prefetch the series of images and store them
3) Setup a timer to cycle through the images
   new0.gif, new1.gif, new2.gif, new3.gif

Smooth motion requires 30 times/sec display.
Creating GIFs

GIF files for animation are progressively different ... make them with Photoshop

- The series should all have the same size
- Begin with an initial GIF and build all others from it
- Getting the motion to be smooth may take a bit of fiddling

Animated GIFs -- GIFs that automatically cycle use a special format and software
1. Place Still Image(s)

Placing the image uses a standard `<img src=...> tag

```html
<html><head><title>Test Page</title></head>
<body>
  <img src="new0.gif">
  <script language="JavaScript"> Code here </script>
</body>
</html>
```
When HTML draws a page, the images go in an array: `document.images`

- Recall, arrays are names w/ indexes, like A[1]
- Each element of `document.images` array holds one image
- Pictures are put into `document.images` in the order encountered on page build ... so for Test Page, `document.images[0]` ⇔ new0.gif
- Changing the `.src` property of the array changes the picture

But the images must be prefetched first
“Prefetch” means to get the images and save them in (our own) array so they are handy to assign to `doc.im`

- We must declare an array (and probably an index variable, too):
  ```javascript
  var i, pref = new Array(4);
  ```

- Then we set it up to hold images:
  ```javascript
  for (i=0; i<4; i++) {
    pref[i] = new Image;
  }
  ```
Once the array is declared and setup, get the images and assign them to the .src field of the array:

```javascript
for (i=0; i<4; i++) {
    pref[i].src = "new" + i + ".gif";
}
```

Notice that the names of the images, `new0.gif`, `new1.gif`, `new2.gif`, `new3.gif` are constructed using the index variable.
Once a Web page is drawn, nothing happens unless you cause an event.

- To animate a series of stills, you must cause the computer to "wake-up" and change to the next image 30 times a second.
- Set a timer to cause the wake-up:

```javascript
setTimeout("animate()",&30);
```

- Milliseconds to wait
- Function to change picture
- JS Timer Setting Function
Animate Function

animate() must advance the frame counter, update the image and schedule the next timer...

```javascript
var frame=0, timeID;
function animate(){
    frame=(frame+1)%4;     //advance
    document.images[0].src = pref[frame].src; //update
    setTimeout("animate()",&30);
}
```
<h1>My Page</h1>

```javascript
var i, pref = new Array(4); 
var frame=0;
for (i=0; i<4; i++){
    pref[i] = new Image;
}
for (i=0; i<4; i++){
    pref[i].src="new" + i + ".gif";
}
setTimeout("animate()");2000); 
function animate(){
    frame = (frame+1)%4;
    document.images[0].src=pref[frame].src;
    setTimeout("animate()");30);
}
</script>
```
<h1>My</h1><img src="new0.gif">
<script language='JavaScript'>var i, pref = new Array(4);
var frame=0, timerID;
for (i=0; i<4; i++){
    pref[i] = new Image;
}
for (i=0; i<4; i++){
    pref[i].src="new" + i + ".gif";
}
setTimeout("animate()",2000);
function animate(){
    frame = (frame+1)%4;
    document.images[0].src=pref[frame].src;
    if (frame == 0)
        timerID = setTimeout("animate()",2000);
    else
        timerID = setTimeout("animate()",30);
}
</script><h1>Page</h1>
Summary

Animation requires a 3 step process

1) Place the initial image(s)
2) Prefetch the series of images that will be the animation
3) Setup the animation function to draw the next item in the series

When creating your own GIFs make sure that the sizes are all the same