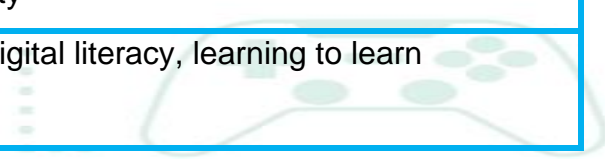


## Creating the game animation

Previous compulsory steps / Prior students' knowledge	Genre/Typology of the video game in order to choose the right tool
Learning objectives	Learning how animation works in general and in games. Practice using animation in a game engine.
Subjects	Arts, mathematics
Recommended Age (10 – 14) or (15 - 18)	10-14, 15-18
Material needed	Video display device, internet browser
Sequence duration	60 minutes
Individual or group activity	Group activity
Skills developed (after learning objectives)	Research, digital literacy, learning to learn



### Step by step: how to implement the sequence

- **Step 1: Introduction to animation principles (10 minutes)**

Show this video to your students. It explains the basic principles of animation:

[“The 12 Principles of Animation with Emanuele Colombo”](#) by Skillshare.

- **Step 2: Video game animation (10 minutes)**

- **2D animation**

**Ask your students what they know about video game animation. How do they think the principles of animation translate to video games?**

The simplest 2D animation is the digital version of paper flip books: a sprite sheet. This combines multiple sprites representing each step of an animation into one single sprite sheet file. Individual drawings are sequenced together over time to create a cycle.



Sobolev, J. (2016). mega man sprite sheet. [gamingshift.com](http://gamingshift.com)

The gif below shows the animated sprite:

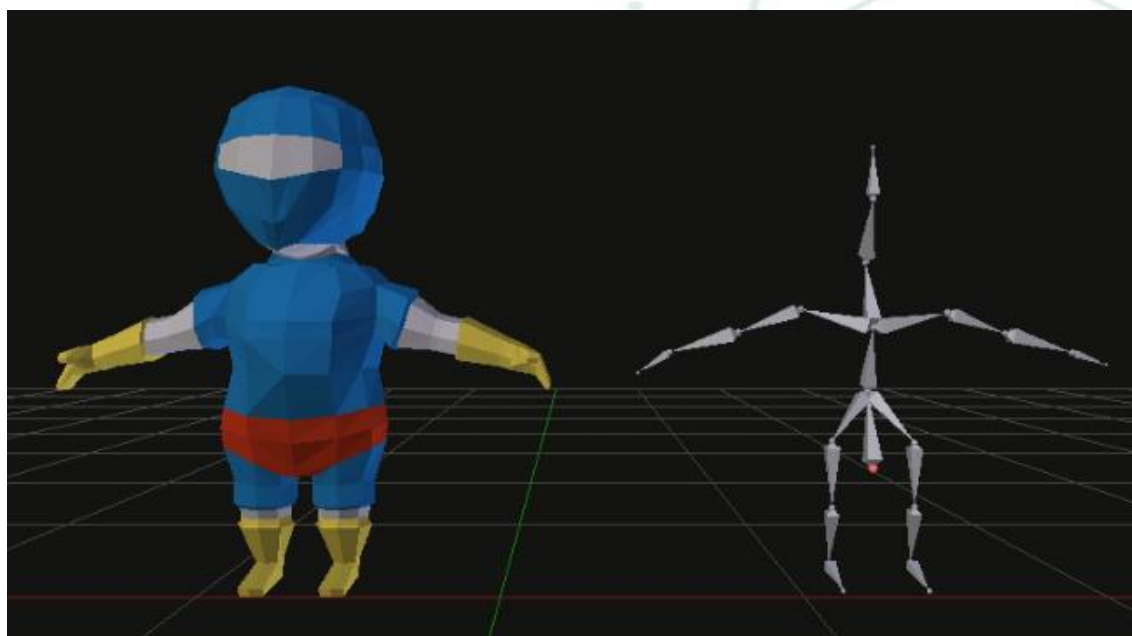


<https://gamingshift.com/wp-content/uploads/2019/12/mega-man-animation.gif>

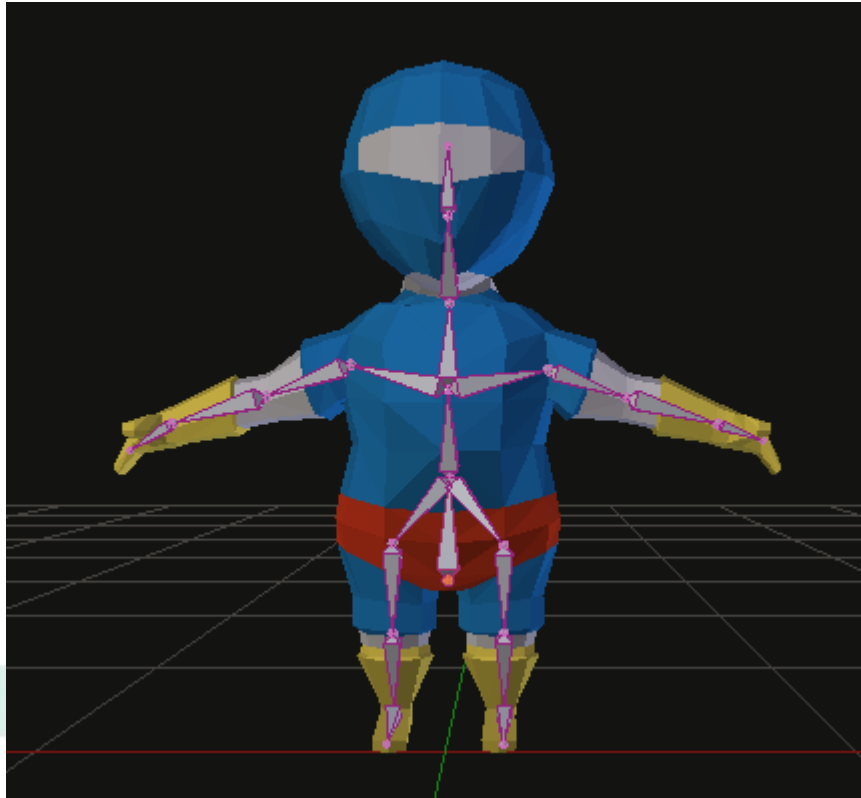
(Sobolev, 2016)

## 3D animation

3D Animation consists of an armature (bones) influencing the vertices of a 3D model.



Serrano, H. (2016). 3D mesh and a bone armature. haroldserrano.com



Serrano, H. (2016). Armature linked to the 3D mesh. haroldserrano.com

Rotating a bone affects nearby vertices of the 3D model. To see the result, click this link: [Serrano, H. \(2016\). Rotating a bone affects nearby vertices.](#)

3D animations are composed of several keyframes, drawings or shots that store the rotation and translation of every bone. As keyframes are played, the influence of bones on nearby vertices deforms the 3D model, creating the illusion of an animation. To see the result, click this link: [Serrano, H. \(2016\). Animation with keyframes.](#)

- **Step 3: Practical example (25 minutes)**

With your students, unzip the given sprite collection file- “ninjaadventurenew”.

Go to <https://www.piskelapp.com/p/create/sprite>

In the menu on the right, click import and “browse.piskel file”.



Screenshot from Piskel.com

Open the given piskel file “ninja\_attack-20210927-174044.piskel”.

Select “replace” and use default parameters. You should get an animation in the viewport.

Ask your students to remove frames 2 to 4. You get an animation that uses the most important poses of the animation.

**Ask your students what the benefits and drawbacks of keeping only key poses are.** Some possible answers may include: It is faster to draw, takes up less resources, but the animations are less smooth.

Ask you students to finish the animation by adding the last missing frame.

They should go to the menu on the right-hand side, click “import” > “browse images” and select the last image: “the Attack\_009”. Choose “combine” and pick the last frame as “insertion frame”. It is also possible to drag and drop the image in an empty frame.

Now, go to <https://editor.construct.net/?startTour>. Refuse the online tour and click the “new project” button at the top. Use the site’s default settings.

Then, follow [this video](#) on how to import your Piskel animation. Click the “replace entire animation” button upon uploading the spritesheet.

Following the same process, **ask your students to create a character’s idle animation.** An idle animation is the animation of a character who is not doing anything specific but is still animated so as not to look like a statue.

- **Step 4: Tool selection (10 minutes)**

Choose an animation software based on your game requirements.

For 2D these resources can help:

- 💡 [“Create a sprite sheet”](#) by Kim Wilkens
- 💡 [“The 10 best free animation software in 2021”](#) by Brad Buzzard

For 3D: Most game engines have built-in 3D animation tools, and many tutorials are available. You can also use pre-made animations using the website [Mixamo](#).

- **Step 5: Homework assignment (5 minutes)**

Ask your students to find tutorials for the tool you chose and ask them to practice at home. Based on your game requirements, split animation tasks among your students. For example, one could do the idle animation of the hero, another could do the attack animation of an enemy etc.

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