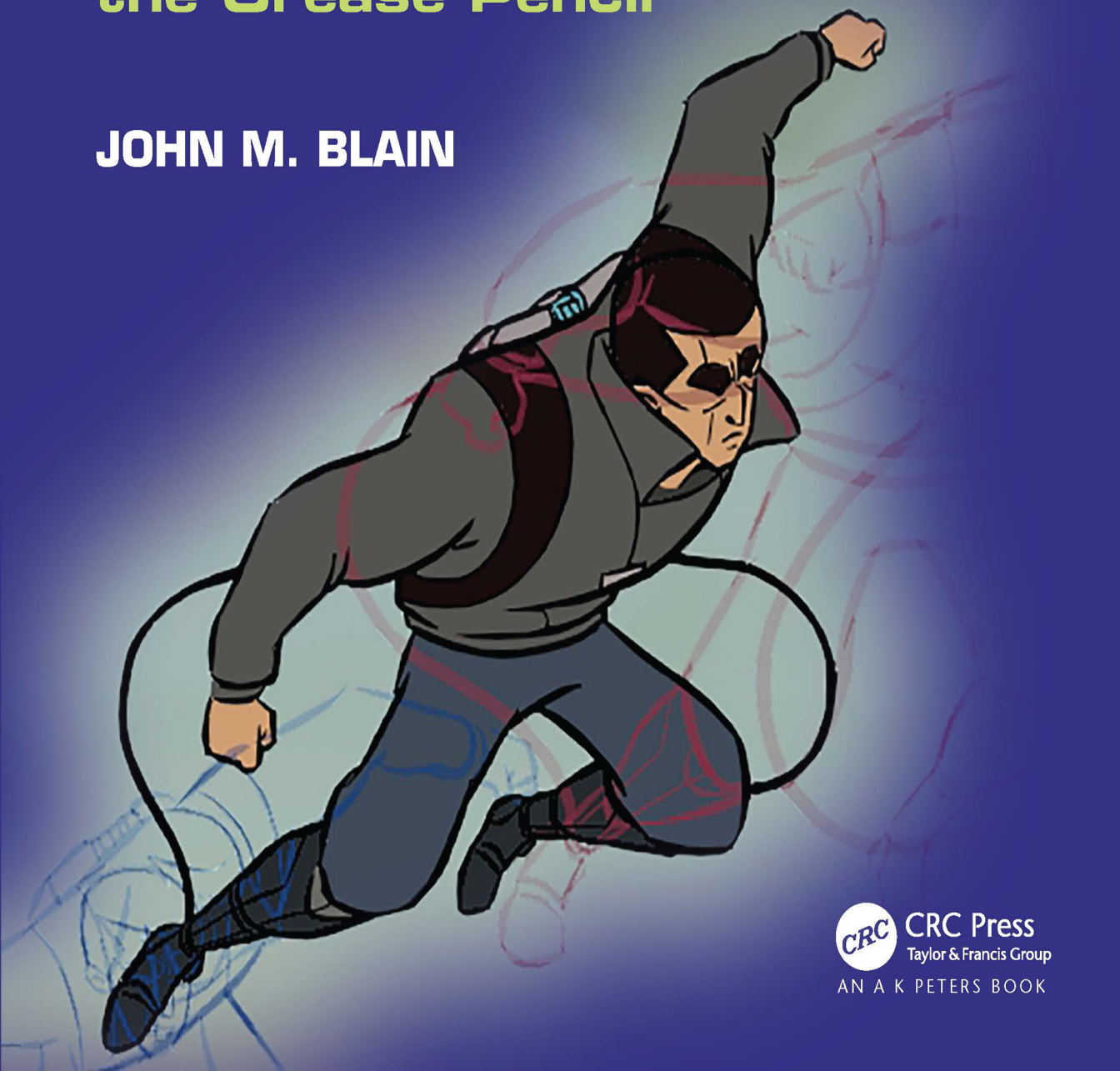
second edition

Blender 2D Animation

The Complete Guide to the Grease Pencil

JOHN M. BLAIN



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Blender 2D Animation

Blender, the 3D modeling and animation program, is a free, open-source, 3D, computer graphics software toolset used for creating animated films, visual effects, art, 3D printed models, motion graphics, interactive 3D applications, virtual reality and computer games. Grease Pencil is a component of Blender. *Blender 2D Animation: The Complete Guide to the Grease Pencil, Second Edition* describes how to access the Grease Pencil component in Blender and create 2D animation within the Blender 3D environment. It is assumed that the reader has no previous knowledge of the Blender program, and the text treats 2D animation using the Grease Pencil as a standalone application.

Key Features

- A comprehensive beginner's guide to the Grease Pencil component of Blender facets of operation is explained in short, concise chapters with cross references.
- Written instruction is accompanied by diagram illustrations in reference to the program's Graphical User Interface.
- The text is also available in a discounted set along with *The Complete Guide to Blender Graphics: Computer Modeling & Animation*.

John M. Blain has become a recognised expert in Blender, having authored to date eight successful prior editions of *The Complete Guide to Blender Graphics*. He became enthused with Blender upon retirement from a career in mechanical engineering. The original book came from personal notes compiled in the course of self-learning. The notes were recognised as an ideal instruction source by Neal Hirsig, Senior Lecturer (retired) at Tufts University. Mr. Hirsig encouraged publication of the first edition and in doing so is deserving of the author's gratitude. Gratitude must also be extended to the author's wife Helen for her continuing encouragement and patience as new editions of the book are compiled.

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The Complete Guide to the Grease Pencil

Second Edition

John M. Blain

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Blender Grease Pencil 2D Animation

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Blender Grease Pencil 2D Animation

Blender 2D and the Book

This book describes how to access the **Grease Pencil** component in **Blender** and create **2D Animation** within the Blender 3D environment. It is assumed that the reader has no previous knowledge of the Blender program and treats **2D Animation** using the **Grease Pencil** as a stand alone application.

The **Grease Pencil** is a component of the **3D Modeling and Animation Program - Blender**.

Blender is a **free open-source 3D Computer Graphics software tool set** used for creating animated films, visual effects, art, 3D printed models, motion graphics, interactive 3D applications, virtual reality and computer games.

Blender supports the entirety of the 3D pipeline—modeling, rigging, animation, simulation, rendering compositing and motion tracking, video editing and the **2D Animation Pipeline**.

The Blender program is maintained by the **Blender Foundation** and released as **Open Source Software** which is available for download and **FREE** to be used for any purpose.

The first step in using the Grease Pencil, is to download, install and open Blender. These operations are described in separate sections.

The second step is accessing the **Grease Pencil** when Blender is running. This step is often overlooked in many tutorials and requires explanation.

When Blender is opened, it opens in 3D Modeling Mode. The instruction in this book will, therefore, begin by briefly describe the 3D Interface to establish the basic concept of operation.

The **Grease Pencil** was originally a Tool for drawing construction notes during the 3D Modeling and Animation process. This Tool still exists but has been developed to facilitate 2D Drawing and Animation. 3D Modelling and Animation in Blender takes place in a 3D Workspace which is the arrangement of panels or windows in the programs interface. For 2D Animation a separate **Workspace** (arrangement of panels) has been developed which resides within the 3D environment.

Program Development

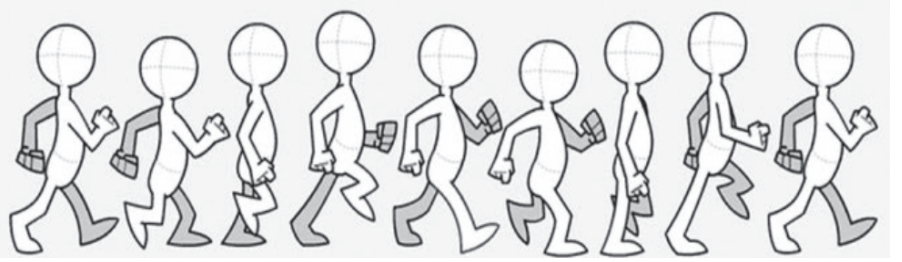
This book has been compiled using **Blender Version 3.5.3** and checked against the imminent release of **Blender 4.0.0**.

Be aware, **Blender** is continually evolving as developments which expand and improve functionality are added. Developments are introduced frequently which often incur subtle changes and modifications to operational procedures and to the program's display. When this occurs, Blender is released with a **New Version Number**.

When attempting Blender for the first time by following a tutorial, whether it is a book, a written tutorial or a video tutorial, always consider the Blender version for which the tutorial is written and work through examples using that version of Blender. It is tempting to grab the latest Blender release but consider the information given, in the tutorial, as a training exercise then step up to the latest developments in the current version. Blender maintains a download page containing all earlier releases of the program (see Download and Installation).

2D Animation Concept

One example of 2D Animation is depicted in the **Walk Cycle** where drawings of a character in different poses are displayed in quick succession creating the illusion of the character walking.



Grease Pencil Animation Example

To see an example of 2D Animation created using Blender's Grease Pencil see:

HERO – Blender Grease Pencil Showcase
at
https://www.youtube.com/watch?v=pKmSdY56VtY

Why Grease Pencil?

Grease Pencil Definition from Wikipedia

The **grease pencil**, is a wax writing tool also known as a **wax pencil**, **china marker**, or **chinagraph pencil**, which is a writing implement made of hardened colored wax and is useful for marking on hard, glossy non-porous surfaces. Marks made by grease pencils are resistant to moisture and can usually be removed by rubbing the marked surface with a paper towel.

So why Blender Grease Pencil?

When using Blender to construct 3D Scenes and generate animations it has been useful for artists to sketch notes on the computer screen. This does not mean that a crayon, as described above, was employed but that a digital marking was superimposed on the work being created. This marking is drawn on a separate digital layer which is easily modified or removed when the work is finished.

Sketching freehand notes is accomplished by drawing Strokes (lines), therefore, the concept has been developed to drawing sketches of characters and scenery as depicted in a cartoon drawing. Further development has seen the lines forming the sketch animated thus creating full 2D Animation. This 2D Animation, in Blender, is constructed within the Blender 3D environment providing a flexible animation tool. The tool has been termed, the **Grease Pencil** and is applied within a dedicated **2D Animation Workspace**.

A **Workspace** is the arrangement of panels and windows containing controls as seen on the computer screen when the program is run.

To understand this concept, begin by downloading and installing Blender.

To follow the instructions provided in this book it is suggested that you employ **Blender 3.5.3.**

Philosophy of the Book

The philosophy employed in this publication is to introduce **Blender** by describing the program's **Graphical User Interface (GUI)** and give short descriptions and examples of the controls and their function. The Controls constitute the Tools for performing the different operations which produce specific results. Knowing what Tools are available and where they are located is the key to understanding Blender.

Blender Platforms

A **computing platform** or **digital platform** is the environment in which a piece of software is executed. It may be the hardware or the operating system (OS).

Blender is a cross-platform application for **Windows Vista and above, Linux** and **Mac OSX 10.6** and above operating systems.

System Requirements

Graphics

Blender 2.82 and later requires OpenGL 3.3 or above, with recent graphics drivers from your graphics card manufacturer.

Hardware

Minimum (basic usage) hardware

- 64-bit dual core 2Ghz CPU with SSE2 support.
- 4 GB RAM
- 1280×768 display
- Mouse, Trackpad or Pen plus Tablet
- Graphics Card with 1 GB RAM, OpenGL 3.3
- Less than 10 years old.

Recommended hardware

- 64-bit quad core CPU
- 16 GB RAM
- Full HD display
- Three-button mouse or pen plus tablet
- Graphics card with 4 GB RAM

Optimal (production-grade) hardware

- 64-bit eight core CPU
- 32 GB RAM
- Full HD displays
- Three button mouse and pen plus tablet
- Graphics card with +12 GB RAM
-

Supported Graphics Cards

- **NVIDIA**: GeForce 400 and newer, Quadro Tesla GPU architecture and newer, including RTX-based cards, with NVIDIA drivers (list of all GeForce and Quadro GPUs)
- **AMD**: GCN 1st gen and newer. Since Blender 2.91, Terascale 2 architecture is fully depreciated, try using 2.90 (albeit not supported, it might still work) [list of all AMD GPUs]
- **Intel**: Haswell and newer (list of all Intel GPUs)
- **macOS**: Version 10.13 or newer with supported hardware.

Preamble

Before reading this book it will help if you are aware of the way in which it is written and the conventions employed.

Formats Conventions and Commands

In writing this book the following format conventions have been adopted:

Paragraphs are separated by an empty line and have not been indented.

Key words and phrases are printed in **bold text** with the first letter of a component name specific to Blender capitalized. **Bold text**, therefore, replaces the use of inverted commas.

Headings are printed in **Bold Olive Green.**

The following conventions will be used when giving instructions.

When using a Mouse connected to a computer, the commands will be:

Click or **Click LMB** – In either case this means make a single click with the left mouse button with the Mouse Cursor positioned over a control displayed on the computer Screen. In some instances it is explicit that the left mouse button should be used.

A Control – Is a designated area on the computer Screen represented by an icon in the form of a button or bar, with or without text annotation.

Double Click – Make two clicks in quick succession with **LMB** (the left mouse button).

Click, Hold and Drag – Click the left mouse button; hold it depressed while moving the mouse. Release the button at the end of the movement.

Click RMB – Click the right mouse button.

Click MMB – Click the middle mouse button (the middle mouse button may be the scroll wheel).

Scroll MMB – Scroll (rotate) the scroll wheel (MMB).

Clicking is used in conjunction with placing the Mouse Cursor over a button, icon or a slider which is displayed on the Screen.

Drawing Strokes (Lines) – The initial introduction to drawing Strokes will be demonstrated using a Mouse.

How to use a Drawing Tablet with a Stylus will follow.

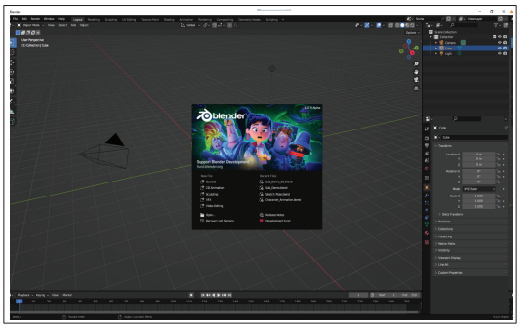
Book Illustration

When the Blender program opens the interface displays in a dark color scheme. The scheme is appropriately named **Blender Dark.**

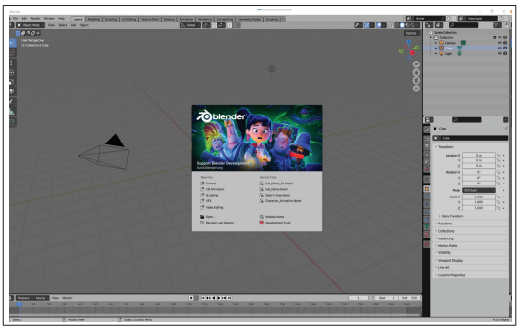
Blender Dark is one of several color schemes which you may choose or you can customize the interface to your personal preferences.

The illustrations in this book have, by and large, been constructed using screen captures taken with the Blender interface in one of the alternative color schemes named **Blender Light.**

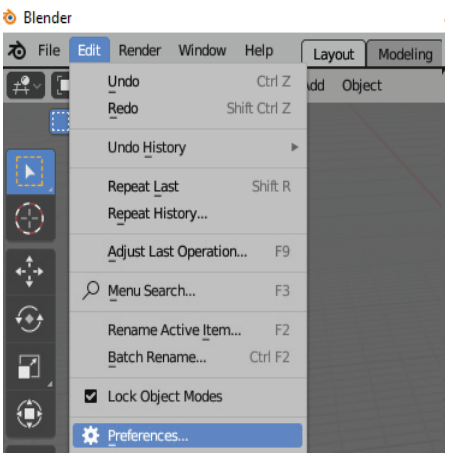
Blender Dark

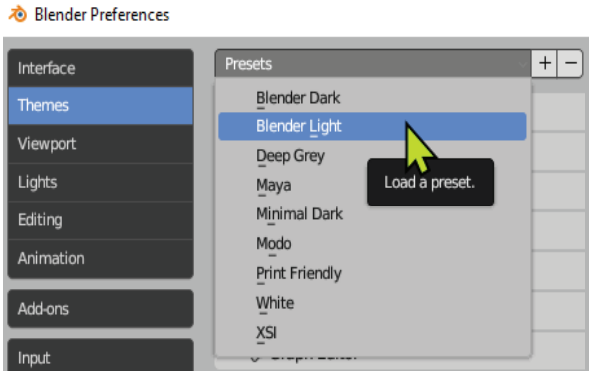


Blender Light



To view the Blender interface in the **Blender Light Theme**, have Blender opened (see Chapter 17) then in the upper left-hand corner of the Screen click with the Left Mouse button on Edit, drag the Mouse down placing the Cursor over Preferences and click LMB.





In the Blender Preferences panel which opens click on Themes in the left-hand column and where you see **Blender Dark** at the top of the right-hand column, place the Mouse Cursor over Blender Dark and click with the left Mouse button. Select (click) on **Blender Light** in the menu that displays.

Close the Blender Preferences panel by clicking on the cross in the upper right-hand corner of the panel.

The next time you open Blender the interface will display in the **Blender Light** Theme.

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1

Introducing
The Grease Pencil

1.1 Blender and the Grease Pencil

The **Grease Pencil** is a component of Blender.

Blender is a computer **3D Modeling and Animation** program.

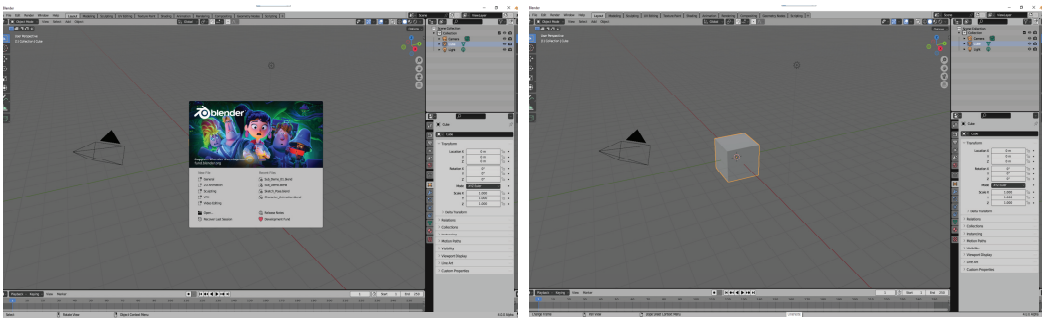
When Blender is opened, it displays on the computer monitor or screen with an arrangement of Panels or Windows which constitute a **Workspace**. The Panels in Blender are referred to as **Editors**.

The arrangement of Editors that display when Blender is first run is the default Workspace designed for 3D Modeling and Animation.

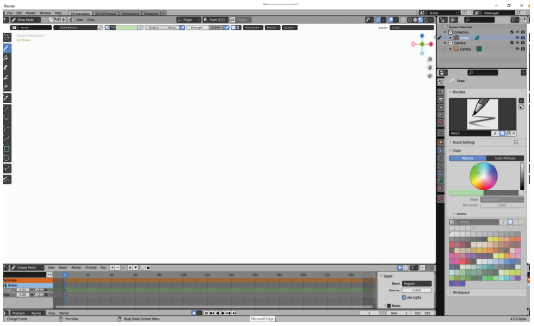
The first step to **2D Animation using Blender's Grease Pencil** is to activate the **2D Workspace** which is the **2D Drawing Environment** in Blender (Figure 1.1a).

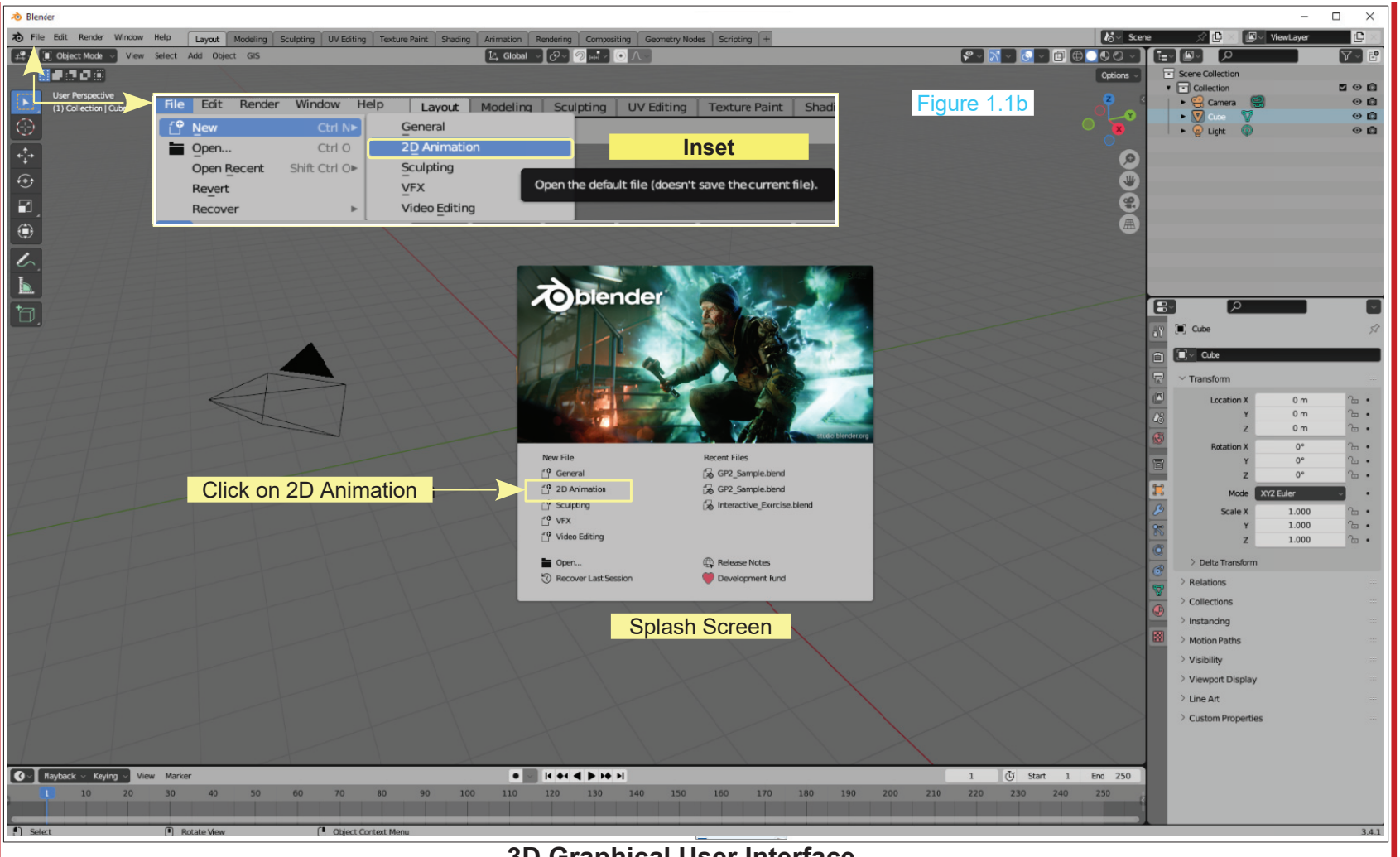
Blender 3D Modeling and Animation Figure 1.1a

Blender Default Screen **Splash Screen Removed**



Grease Pencil 2D Animation Workspace





3D Graphical User Interface

1.2 Activating the 2D Environment

It will be assumed that you have downloaded and installed the Blender program and that you have the program opened displaying the **Graphical User Interface** on your computer Screen (Figure 1.1b).

If you are new to Blender and require assistance in downloading, installing and opening Blender please see **Chapter 17** towards the end of the book.

With Blender opened you see the **Graphical User Interface (GUI)** as shown in Figure 1.1b opposite.

The **Graphical User Interface** is the arrangement of panels or windows making up a **Workspace**. There are different Workspaces for different functions.

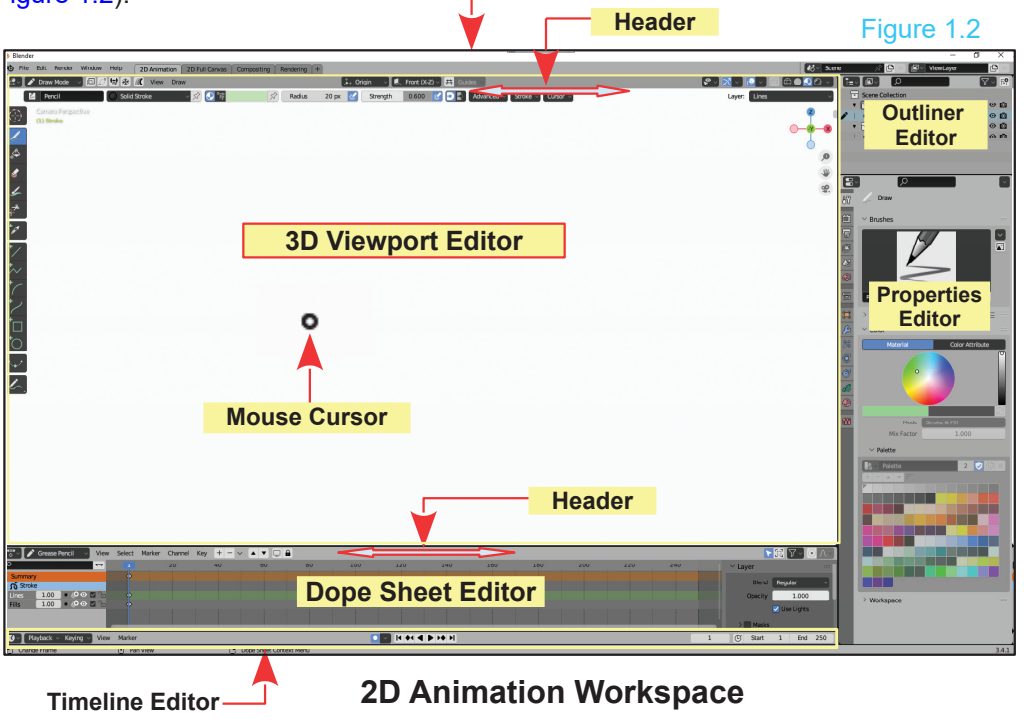
When Blender is first opened it displays the **3D Modeling Workspace** with the **Splash Screen** superimposed in the center of the Screen. The Splash Screen only displays when Blender is first opened and if you click with the Mouse anywhere in the interface the Splash Screen disappears.

To activate the **2D Environment** (**2D Workspace**) click with the **Left Mouse Button** (LMB) in the Splash Screen where you see **2D Animation** (Figure 1.1b).

Alternatively, if the Splash Screen has been cancelled, LMB mouse over on **File** at the top left of the Screen, LMB Click, drag the Mouse Cursor over **New** then over **2D Animation** and **Click LMB** on **2D Animation** (see Figure 1.1b inset).

The Screen changes to the **2D Animation Workspace** which is **The Grease Pencil** (Figure 1.2).

Figure 1.2



2D Animation Workspace