



**A digital book for a
inclusive learning**

Practical guide for adapting illustrations

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Introduction

The simplification of illustrations plays an important educational and inclusive role in the development of reading skills. Children with visual, learning and cognitive disabilities are not only integrated into the experience

This guide is intended to serve as a practical introduction to adapting illustrated images into a format that can be used by Flex Picture Ebooks (FPE). It is intended as a practical complement to the "Guidelines for adapting illustrations for pupils with severe visual impairments and learning disabilities" (link to be posted once online). Make sure you familiarise yourself with this document so that you have an overview of the subject.

We suggest you use our [Plugin for Adobe Illustrator](#) for this task, as it is specially designed to create this type of image and exports them directly in the correct file format for use with the FPE.

Suggested reader profile

This document is aimed at professionals who wish to adapt images for their own FPEs. Anyone with experience in the visual arts and at least a basic knowledge of digital art practices can learn to use this approach. It is useful to be familiar with vector drawing tools such as Adobe Illustrator.

If you'd like to find out more about the software needed to create these images, we refer you to [our tutorial video on using the Illustrator Flex Picture book plugin](#). You can obtain French subtitles by clicking on the subtitle settings, then ticking "Translate automatically".

Choice of title

This choice is based on several objectives:

Enabling a common culture

By making as many titles as possible accessible, this helps to promote a common culture for all children.

The first objective is to choose titles or authors that are **standards studied in most classes**, or that are part of a series often **offered in grouped school subscriptions**.



Making illustrations accessible

Many children's books contain illustrations that are incomprehensible to visually impaired children, either because they are too crowded (lots of elements) or because they are not easy to understand.



Extract from the French children's book *Le loup est revenu !* by Geoffroy de Pennart, published by l'école des loisirs

or because they are too complex (lack of contrast, different planes, etc.)



Extract from the French children's book *Ma vallée*, by Claude Ponti, published by l'école des loisirs

Making concepts accessible

Some books may seem accessible (simple illustrations, black borders around the illustrations, etc.), but this is not necessarily enough to make the concepts contained in the book accessible. For example, in *C'est quoi?* by Dorothee de Monfreid, the dogs talk to each other in speech bubbles, just like in a comic strip. For sighted people, speech bubbles are part of the identifiable codes of comics, which they learn quite naturally from magazines that, from a very early age, introduce them to small comic strips with 2 or 4 panels. Visually impaired children don't necessarily have these codes, especially as the texts are sometimes small and/or in capitals, making them difficult to read. The other concept of this book is the multiple use of the same object, which is sometimes a swimming pool, sometimes a boat, sometimes a tree house.



Extracts from the French children's book *C'est Quoi?* by Dorothée de Monfreid, published by l'école des loisirs

When it comes to choosing titles, you need to think about :

- the social impact of this adaptation (the more the book is used in class or given as a gift, the greater the impact on building a shared culture).
- the ability to make certain styles of illustration or story clearer
- the possibility of making concepts more accessible, beyond the illustrations themselves.

Consider the title as a whole: the railway

Text breakdown

Before looking at the illustrations, we need to look at the book as a whole, and define its structure. In an accessible EPUB3, the text must be separated from the images. For *Ben wants a bat*, the original work presented the text above the illustrations, but keeping this layout quickly revealed that it limited children's freedom in terms of text, since depending on the size and font chosen, the text sometimes ended up above the image

It is therefore preferable to adopt a classic layout: one page of text, one page of illustrations.

For most Cycle 1 and Cycle 2 titles, the structure is fairly simple and there are no real changes to be made for the adapted version.

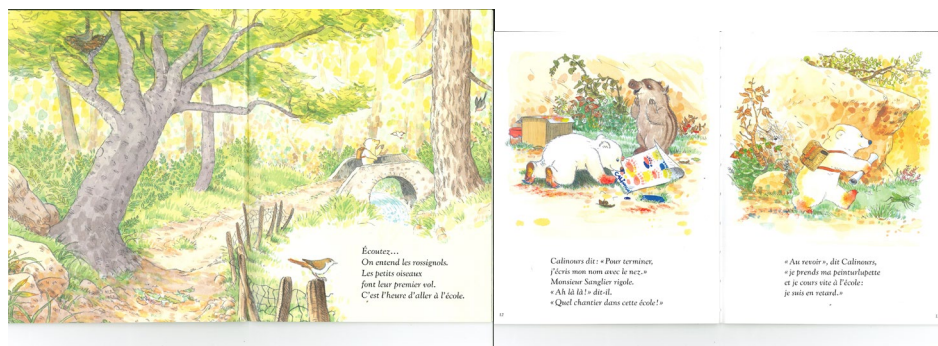
However, for other, more complex titles, it may be necessary to split the text again, keeping the text word for word, of course, but inserting the corresponding images.

For example, in *Ma vallée*, there are far more illustrations than text.

On some pages, there are as many as 6 or 8 illustrations for a single text that gives a lot of information in a few words. It's a good idea to cut the text so that it corresponds directly to the illustrations, rather than offering a text followed by 6 or 8 illustrations. This makes it much easier for children to make the connection between the information in the text and that in the illustrations. So you need to work out where the text ends on each page, organise the illustrations accordingly and try to alternate text and illustrations wherever possible.

Orientation of illustrations

For most titles, which are entirely in portrait or landscape format, the question will not come up, but it is also necessary to think about the orientation of the illustrations. Some titles alternate. For example, below "Calinours va à l'école" ("Calinours Goes to School"), with a landscape illustration on the left and two portrait illustrations on the right. You therefore need to decide on the best approach depending on the number of illustrations of each type, and what is important to keep. Sometimes this means reframing.



Extracts from the French children's book *Calinours va à l'école*, by Alain Broutin, published by l'école des loisirs



Extract from the digital adaptation of *Calinours va à l'école*, by Alain Broutin, published by Les doigts qui rêvent.

Analysis of illustrations

Respecting the meaning of the work

It is very important to ensure that you retain the essence of the illustration, even once it has been adapted.

This is what will remain on the last adaptation level.

Try to determine as best you can the usefulness of each illustration: what it tells us about the context, the characters (emotions, attitude, character...), or the situation itself.

In short, for each illustration, try to determine its essence, its *raison d'être*.

What is essential in this illustration

Helping people understand

Analyse the image and identify any reading problems.

What might appear complicated?

What is not legible in this illustration?

(non-exhaustive examples)



Image too busy,
too many elements or details

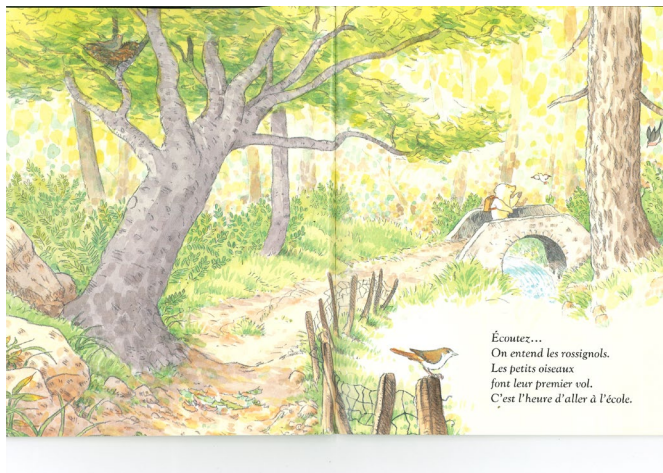


Image with no contrasts: the elements of
the illustration blend into each other, or
the background (decor) and characters are
the same colour, etc.



An image that indicates an emotion or
change in character expression



Image expressing movement through strokes or multiplication of the same element

Proposed solutions

Contour enhancement

Slight variations in colours and/or patterns

For each level, even the first (which is as close as possible to the original), the outlines are reinforced to better delineate the elements and characters.

Colours can also be revised to improve contrast, or patterns simplified.

The number of levels

Zoom and pointing functions

To take the load off the images, the different levels from level 2 onwards allow you to reduce the number of elements and concentrate on the essentials.

The number of levels and their qualification depends on the titles. They can be modified according to the needs of each adaptation.

The aim is for each child to be able to explore the image with at least the essential elements and more or less detail depending on the level, so that they can enjoy the story and understand its meaning without cognitive overload.

Visual animations

When a facial expression is highlighted in the original, the illustration can be animated to reinforce this expression and make it more visible.

[Ben smiles]

Similarly, if movement is indicated in the original illustration (movement lines or multiple elements to illustrate movement), this movement can be made real through visual animations.

[a bat flies]

Visual animations can also be a way of reducing the number of illustrations without altering the work: instead of 3 illustrations in the original, one animation may suffice.



Soundscapes and sound effects

To accompany visual animations, or to complement them, it is also possible to add sound effects that reinforce or explain an action. For example, if a bat comes to life and flies, it's best to add the sound of its wings. Or if characters are running, add the sound of footsteps. In this way, the child receives auditory information that reinforces the visual information in the animation.

Background sounds can also be added to help set the context. For example, to indicate that you are in a cave, adding a soundtrack with resonances and gently falling drops helps to immerse the child and make it easier to understand.

It is therefore difficult to establish a standard procedure, as there are many variables depending on the titles, the style of the illustrations, their contexts and their concepts. But there is a common approach.

The great advantage of digital adaptation is the incredible freedom it offers, because "anything is possible". However, care must be taken to use only animations that are useful for comprehension and not to turn the book into a cartoon. The aim is to facilitate understanding, so that children can explore the book more easily and with as little cognitive overload as possible.

A concrete example of how illustrations can be adapted

To explain our approach to image adaptation, we'll use this image as an example:



Extract from the French children's book *Ben wants a bat*, by R. Badel and V. Cuvellier, published by Gallimard Jeunesse.

As you can see, this is a scan of a hand-drawn image that contains fine details, such as the hatching representing the shadows. The lines are fine and wavy. Some lines, such as those representing the foot of the lamp, are interrupted for stylistic reasons. One of the bat's wings passes behind its head, superimposing the shapes, which can be difficult to perceive.

Level 1: The complete illustration

The first level consists of creating a digital version of the drawing by tracing the image, while simplifying it somewhat. Here, the shadows are represented in the form of solids (rather than stripes).



The lines are straight and carefully chosen. Lines that were previously fragmented into several lines now form a single line (look at the desk or the lamp for comparison).

The addition of simple textures to objects, such as points representing the roughness of the ground, is permitted, but must be very limited.

It's also possible to add simple background elements that don't add anything to the story but provide interesting detail, such as the newspapers under the table.

In this stage, the textures represented by hatching and lines also need to be simplified to solid colours (look at the characters' yellow shirts).

- Each shape should have a light black outline.
- Tracing the image
- Clean lines, rarely interrupted
- Simple background textures allowed
- Shadows are shapes
- Clear contours

Level 2: Shadow suppression

At level 2, shadows are completely removed. Visual clutter, such as textures, is also removed.



Elements that don't necessarily help tell the story (such as the diary) are removed. Simple props made up of shapes, such as the characters' two-tone hair or oven gloves, are permitted, as long as they are not too detailed and can be represented by shapes.

- Remove shadows
- Remove background textures
- Remove unnecessary objects
- Simple details are permitted

Level 3: Perspective reduction / Head to head

At this point, perspective is removed from the image. Where there used to be a vanishing point, all



shapes are now two-dimensional and flat. All the corners of square objects are now at 90 degrees. Compare the table in the example with the previous level: you can no longer see the top and the inside of the legs.

Details such as the shoe, which help to tell a story about the setting in which Ben lives, but do not contribute to the main story of the image, are also removed. Shape textures/ornaments intended to give depth to objects, such as the main character's hair having a colour and an outline, or the bat having a dark shape inside its wings, are now removed.

However, the simple background elements that set the scene in a light environment are still present. In this example, the table and lamp, which show that the scene is taking place in someone's living room, are left in place.

- Remove perspective from the image
- Move objects in the background
- Remove shapes/details that add depth to objects
- Certain lines inside objects are still permitted

Level 4: Suppression of the environment



At level 4, the background is completely removed. Lines that do not emphasise the general shape (or outline) of objects are also removed. Unnecessary details such as eyebrows or lines indicating the inside of the ear are removed. If the line is necessary to describe an object (such as the eye or nose, which are necessary for the face to be identifiable as such), it can be retained.

What remains here are the elements that are most important to the story. If an object can be removed and the overall story of the image remains intact, that object should be removed at that point.

- Removing the environment
- Only the most important elements are kept
- Remove additional details

Level 5: The absolute essentials



At this stage, all that's left is the bare minimum. Everything that can be represented by a silhouette must be represented by an abstract shape. Groups of shapes belonging to the same object should be summarised in a single shape (the bat's body).

The contrast should be as high as possible: If the contrast between a shape and its outline is not high enough, as in the example of our bat, it can be represented as one large shape. Here, the bat's head has also been spatially separated from its body, to make it easier to identify it as two different things.

Lines and ornaments that can be removed without breaking the form, such as the protagonist's collar or nose, should also be eliminated, leaving only the bare minimum necessary to continue to identify the image.

- Maximise contrast - remove edges where necessary
- Delete all details not required to identify the object
- You can separate objects if necessary



Documents to be sent

The script

Provides a basic document for the illustrator, giving an idea of the desired rendering.

- Numbering/naming illustrations is very important for exchanges
- Indicate the essential elements of the illustration
- Indicate the elements to be pointed/zoomed
- Indicate the desired events
- Sound effects

Request for sound effects

Whether this is done in-house or by a service provider, the request for sound effects must be specified:

- 1 mp3 file per page + 1 mp3 file per sound or ambience.
- Indicate the number and type of voices required for the story being read
- Enter text
- Describe the desired sound effects or sound animation
- Indicate time in seconds

Ideally, sound effects should be created once the visual animations have been produced, as it is easier to match sound to animations than to match animations to sound. What's more, this gives the people doing the sound effects a better idea of the desired effect.



Appendix 1: Project summary

Flex Picture Ebook: A digital book for inclusive learning

Existing teaching materials often do not meet the specific needs of children with disabilities. In addition, adapted books are often expensive and pose problems when it comes to integrating them into inclusive educational environments.

In partnership with digital accessibility experts, teachers and a children's book publisher, this project aims to design an illustrated digital book that is accessible to all children, including those with disabilities. In addition to the text to be configured, a "Flex Picture Ebook" includes adapted illustrations with several levels of simplification, interactive elements and an audio narration, while remaining affordable. A quick demonstration of how to set up the *Simplify Isolate Animate Zoom* illustrations can be found on the project website.

Our aim is to increase the availability and quality of accessible digital books that fit seamlessly into inclusive learning environments.

The main expected results :

- Digital Flex Picture Ebook "Ben Wants a Bat" (V Cuvellier, R. Badel) in 5 languages.
- Raising awareness and providing support for teachers and parents by supplying teaching scenarios that have been tested in the classroom.
- Training for content producers in the publication of Flex Picture Ebooks and provision of free software and guidelines.

Appendix 2: European partners

France

Les Doigts Qui Rêvent, Talant
Ludosens, Bègles
Institute for the Young Blind (IJA), Toulouse

Austria

Johannes Kepler University, Linz

Italy

Fondazione Robert Hollman, Padova
AbilNova, Trento

Lithuania

Lietuvos Aklųjų ir Silpnaregių Ugdymo Centras (LASUC), Vilnius

