

# Module 6:

# Hardware and connectivity

Instruction kit for teachers

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## Short topic description

To use the Internet, you need the right hardware and the right connection. These are the preconditions for being active online.

In the module 'Hardware and connectivity', we explain which types of devices are available for surfing the Internet, which types of connectivity offer the best results at the lowest price, and what you can do with a smartphone.

We also repeat the importance of copyright and right of publicity (see also: 'Digital use of video and music'). Furthermore we pay attention to the fake nature of some online photos and videos, so that younger people become aware that not everything online is a reflection of reality.

## Objectives

This module has the following objectives:

1. Provide insight into the different connection types (also known as connectivity) and their respective advantages and disadvantages.
  2. Learn to deal with a number of smartphone functions.
  3. Create awareness of the fact that online photos and videos are often edited.
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## ICT attainment levels

This module comprises the following attainment levels:

- Pupils can use ICT in a safe, responsible and effective way.
- Pupils can use ICT to communicate in a safe, responsible and effective way.
- Pupils can use ICT to give creative shape to their own ideas.
- Pupils can practice independently in an ICT-supported learning environment.

Furthermore, attention is paid to the attainment levels for 'Artistic Education':

- Pupils can recognize, understand, interpret and critically evaluate visual information.

## Target group

- Primary education third grade
- Secondary education first grade

## Necessities

- Min. 5 computers / laptops / smartphones
- Access to Internet
- 'Equipment? Check!' diggit module

## Duration

2 hours of lessons  
(2 x 50')

## Preparation

- Charge computers / laptops / smartphones
- Set up the diggit module 'Equipment? Check!' on the interactive board

## Important terms and definitions

Below you will find an overview of a number of relevant terms and definitions regarding hardware and connectivity:

### 3G

3G is the third generation of mobile telephone networks. It is a digital network that enables you to surf on the go without being connected to a Wi-Fi network.

### 4G

4G is the fourth generation of mobile telephone networks. 4G is even faster than 3G, so you can also stream videos, play games online and download heavy files.

### 5G

5G is the mobile network of the future, which will allow the user to surf up to 10 times faster than today. This mobile technology is necessary, for instance, for ensuring self-driving cars to function properly, for immediately publishing HD video images from drones online, for online gaming while on the go, for watching films and series on your smartphone, and for making a top-quality Skype call without the slightest of delays when you're out and about. 5G is currently being tested in Belgium and will probably be implemented as of 2020.

### Wifi

Wi-Fi is a collective term for wireless Internet networks. Wi-Fi networks can be closed (as in your home, where the Wi-Fi network is protected with a password), or open (like the free networks which you can use in some cities).

### Uploading

Uploading means placing digital information on the Internet. This can be in the form of a text document, a video or audio file, etc.

### Data

The term 'data' comes from the Latin which means 'facts'. Data in this context stands for 'digital data.' The term data in information and communication technology refers to the digital data that are exchanged on a network, such as 3G or 4G.

### Resolution

The resolution gives the number of pixels per inch on your computer or smartphone screen. The higher the resolution, the better the image quality.

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### Pixel

The term 'pixel' is a contraction of the first syllables of picture and element. A pixel is a single point in only one color in a digital image or on a computer, smartphone or tablet screen. Many pixels together form an image. Everything that can be seen on the screen is built with pixels. The number of pixels on a screen determines the resolution of that screen. PC screens, for example, consist of 1280 x 1024 pixels or 1920 x 1080 pixels. The more pixels available per surface unit, the sharper the image.

### Downloading

Downloading is the opposite of uploading. It means placing digital information on your computer, smartphone, tablet or smartwatch. This can be either a text document, a video or audio file, or a game.

### Filter

A filter is a digital layer you apply on a digital photo to make it look different.

### Home screen

The 'home screen' is the first 'page' you see when you open your smartphone or tablet. All your applications, functions and documents are collected on this screen. You can immediately use them upon starting your device.

### Selfie

A selfie is a photo self-portrait, usually taken with a smartphone or tablet.

### Teamie

A teamie is a group photo of yourself with your 'team'. This can be a group of colleagues, friends or family.

### Data usage

Data usage refers to the volume of data that your smartphone, tablet or computer exchanges with a 3G or 4G network. The data you use constitute the basis of your telecom bill.

## Important terms and definitions

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### Time lapse

Time lapse is a technique whereby the frequency at which film frames are captured is spread out more than the frequency used to view the sequence. When played at normal speed, time appears to be moving faster, and thus lapsing.

### Slow motion (slo-mo)

Slow motion is the opposite of a time lapse. It is a video that consists of extremely slowed down images.

### Copyright

Copyright is the right of the author(s) of a work to publish or disseminate that work. In other words, without this copyright, you may not disseminate that work.

### Right of publicity

The right of every person to prohibit the publication of images on which he or she appears.

## Classroom script

Below, you will find an overview of the different steps in the lesson about hardware and connectivity :

**Part 1: Introduction**

**Part 2: Conversation starters**

**Part 3: Types of devices**

**Part 4: Connectivity**

**Part 5: Basic use of a smartphone**

**Part 6: Taking photos with a smartphone**

**Part 7: Making videos with a smartphone**

**Part 8: Smart handling of photos and videos**

## Part 1: Introduction

The use of smartphones has become a permanent fixture in society. Yet there is still work to be done to get senior citizens (aged 65+) on board this digital evolution. By way of illustration: only half of senior citizens use a smartphone instead of an 'old' mobile telephone.<sup>1</sup> But one in two senior citizens seeks information on goods and services online.<sup>2</sup>

To bridge the digital divide, it is vital for them to catch up with the help of young people who have grown up with smartphones, etc. It is therefore also important to start with the right device and the right connection.

## Part 2: Conversation starters

Pupils are often very active in the digital world so it's important for them to share their experiences. What do they do online? What do they find interesting? What goes right and what goes wrong sometimes? Getting the conversation started in class is one way of making pupils more digitally savvy. Below you will find a few questions that are meant as 'conversation starters' for the topic 'Hardware and Connectivity'.

- Do you know when you use data – and therefore when your data bundle is active? Explain it to your classmates.
- You send a WhatsApp message to your best friend. How does that message travel online? Try to sketch the different steps between sender recipient as completely as possible.
- What is the difference between a tablet and a smartphone? Which one do you prefer to use? Why?

<sup>1</sup> Source: Digimeter 2018 IMEC

<sup>2</sup> Source: EU Digital Single Market

## Part 3: Types of devices

### Short description

It is not always easy to decide which device is best to use. It all depends on where you use the device, for what purpose, and how often you use it.

### Step by step

| Content per step   | Methodology                     | Media |
|--|---------------------------------|-------|
| <p><b>Poll:</b> Who uses a ...</p> <ol style="list-style-type: none"><li>1. Computer or PC?</li><li>2. Laptop?</li><li>3. Notebook?</li><li>4. Smartphone?</li><li>5. Tablet?</li></ol> <p>Explain which one you use the most and why.</p> | Interactive moment in classroom |       |

| Content per step   | Methodology        | Media      |
|--|--------------------|------------|
| <p><b>Explanation:</b><br/>There are different types of devices available. We list the most important types below:</p> <ol style="list-style-type: none"><li><b>1.</b> A computer, also known as a personal computer or PC, has a fixed computer unit and a separate monitor. It stands on a desk or table and is not suitable for use on the go.</li><li><b>2.</b> A laptop is smaller than a computer and consists of a single element.</li><li><b>3.</b> It is easy to take along and also exists in a version with a screen that can be detached and used as a tablet.</li><li><b>4.</b> Notebooks are smaller versions of laptops that you can use primarily to surf. They are not suitable for intensive word processing or games.</li><li><b>5.</b> A smartphone is a sort of pocket computer that can also be used as a telephone.</li><li><b>6.</b> A tablet is a larger version of the smartphone. It is suitable for users who prefer to use a larger screen.</li></ol> | Classroom teaching | Appendix 1 |

## Part 4: Connectivity

### Short description

A device alone is not enough to use the Internet. The user will also have to set up a connection with the Internet.

### Step by step

| Content per step  | Methodology   | Media                              |
|---|---|------------------------------------|
| <p><b>Assignment:</b></p> <ol style="list-style-type: none"><li>1. Look up what 3G and 4G mean. Explain it in your own words.</li><li>2. Look up what Wi-Fi means. Explain it in your own words.</li><li>3. What is the difference between 3G/4G on the one hand and Wi-Fi on the other?</li><li>4. Who knows what 5G is? Why do we need even faster mobile Internet, in your view?</li></ol> | <p>Work in small groups<br/>+ 1 student who explains to the class (someone else from the group for each assignment)</p> | <p>Computer with Google Chrome</p> |

| Content per step   | Methodology               | Media |
|--|---------------------------|-------|
| <p><b>Explanation:</b></p> <p><b>1. 3G and 4G</b> (see above: Important terms and definitions)<br/>           3G or 4G is based on the mobile telephony network (also known as the GSM network).</p> <ul style="list-style-type: none"> <li>a. <b>Advantage:</b> You find it nearly everywhere, certainly in Belgium where the coverage is very high.</li> <li>b. <b>Advantage:</b> Thanks to 4G, the user can surf very fast and upload/download a lot of data.</li> <li>c. <b>Disadvantage:</b> If the user surfs on 3G or 4G, s/he uses data. It is important that s/he keeps track of the data usage.</li> </ul> <p><b>2. Wi-Fi</b> (see above: Important terms and definitions)<br/>           Wi-Fi functions as a local, wireless network, at home or in school, for instance.</p> <ul style="list-style-type: none"> <li>a. <b>Advantage:</b> If the user surfs on Wi-Fi, s/he uses no mobile data. The mobile data use is free of charge, in other words.</li> <li>b. <b>Disadvantage:</b> Wi-Fi is available only in a limited area.</li> <li>c. <b>Disadvantage:</b> If a Wi-Fi network is not secure, the user must be very careful about what kind of information s/he shares.</li> </ul> | <p>Classroom teaching</p> |       |

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| Content per step   | Methodology        | Media |
|--|--------------------|-------|
| <p><b>Tips:</b></p> <ul style="list-style-type: none"><li>• The choice between 3G and 4G on the one hand and Wi-Fi on the other depends on where you are when you want to use the Internet. It also depends on what you need. It is best to download a video on a secure Wi-Fi network, for instance, to avoid excessively high data usage.</li><li>• Surfing on an unsecured Wi-Fi network should be avoided, if you want to make sure that your data are not hacked inadvertently – certainly in the case of sensitive information. It is therefore best to surf on a secure Wi-Fi network at all times!</li></ul> | Classroom teaching |       |

## Part 5: Basic use of the smartphone

### Short description

With a smartphone or tablet, you can get down to work immediately using apps that are on the home screen by default. The user can subsequently download his or her favorite apps, such as a digital newspaper, TikTok, Snapchat, etc. from the App Store (Apple) or the GooglePlay Store (for Android devices).

### Step by step

| Content per step   | Methodology        | Media      |
|--|--------------------|------------|
| <p><b>Explanation:</b> Review the apps that are on the home screen by default.</p> <ol style="list-style-type: none"><li>1. This is how you can make phone calls.</li><li>2. Click on this button to send an e-mail.</li><li>3. Use this app to listen to music.</li><li>4. You can adjust the settings of your smartphone and your apps here.</li><li>5. Click on this button to gain access to your alarm clock, stopwatch and timer.</li><li>6. This is a camera for making photos, selfies and teamies.</li><li>7. This is the calendar you can use to plan recurring appointments, for instance.</li><li>8. You can send a text here.</li><li>9. You can look up the weather forecast here.</li><li>10. You can write down your thoughts, lists and notices here.</li></ol> | Classroom teaching | Appendix 2 |

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| Content per step  | Methodology        | Media |
|---|--------------------|-------|
| <b>Tip:</b><br>Before you download new apps, always check which information this app uses so as to prevent the manager of an application from using sensitive information about you, like your e-mail address, for example. | Classroom teaching |       |

## Part 6: Taking photos with a smartphone

### Short description

Taking photos is the most frequently used function on a smartphone, certainly among young people. All more recent smartphones have a top-quality camera that can be used to take splendid photos with a high resolution.

### Step by step

| Content per step  | Methodology                              | Media      |
|---|--|------------|
| <b>Assignment:</b> Take a nice teamie of your workgroup and apply a beautiful filter to it. | Work in small groups with the smartphone | Smartphone |

| Content per step  | Methodology               | Media             |
|---|---------------------------|-------------------|
| <p><b>Explanation:</b><br/>                     A photo can be edited very easily in the 'Photos' app on your telephone. You can for instance:</p> <ul style="list-style-type: none"> <li>• Crop your photo.</li> <li>• Adjust the colors: warmer, colder, black and white, pastels, sepia, etc.</li> <li>• You can also click on 'Automatic' and your photo will look as professional and clean as possible.</li> </ul> <p>If you are looking for specific functions, you can also download photo-editing apps. Make sure the app is free of charge and does not try to collect all your data.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"><br/>Instagram</div> <div style="text-align: center;"><br/>Facebook</div> <div style="text-align: center;"><br/>TikTok</div> <div style="text-align: center;"><br/>Snapchat</div> <div style="text-align: center;"><br/>Snapseed</div> <div style="text-align: center;"><br/>Phonto</div> <div style="text-align: center;"><br/>Layout</div> </div> | <p>Classroom teaching</p> | <p>Appendix 3</p> |
| <p><b>Tip:</b><br/>                     It is important for your students to understand that other Internet users also have access to filters and photo editing apps. It may therefore seem as if everyone on social media has a flawless complexion and fit body, but such photos are often touched up. In other words, they are fake photos that do not correspond to reality. This advice cannot be repeated often enough so that you do not compare yourself to others too much and are happy with your own mirror image.</p>   | <p>Classroom teaching</p> |                   |

## Part 7: Making videos with the smartphone

### Short description

Young people really like making videos and sharing them with their friends. The success of TikTok is largely based on that trend.

### Step by step

| Content per step   | Methodology                             | Media      |
|--|---|------------|
| <b>Assignment:</b><br>Make a video clip of everything hanging on the walls in class. | Work in small groups<br>with smartphone | Smartphone |

| Content per step  | Methodology               | Media             |
|---|---------------------------|-------------------|
| <p><b>Explanation:</b><br/>           You can do far more with your smartphone than just make an ‘ordinary’ video. We explain a few functions.</p> <ul style="list-style-type: none"> <li>• If you click on your camera icon and then on ‘Video’ below, you will shoot a classic video. Check also whether the camera is directed to the front or towards you.</li> <li>• Click on ‘slow motion’ to shoot a clip in slow motion.</li> <li>• Use the ‘Time lapse’ button to make an accelerated video over a long period.</li> </ul> <p>You can also record videos in apps such as Facebook and Instagram – without using the Camera app. Here, you can also add filters, stickers and emojis to your video.</p> <p>For extra functions, you can also download separate video and editing apps.</p> <div style="display: flex; justify-content: center; gap: 20px;"> <div style="text-align: center;">  <p>VSCO</p> </div> <div style="text-align: center;">  <p>Unfold</p> </div> </div> | <p>Classroom teaching</p> | <p>Appendix 4</p> |
| <p><b>Tips:</b></p> <ul style="list-style-type: none"> <li>• For a successful video, follow these rules of thumb:               <ul style="list-style-type: none"> <li>- Speak loudly and clearly.</li> <li>- Always film yourself with the sun in your back.</li> <li>- Hold your smartphone horizontally for the most beautiful images.</li> </ul> </li> <li>• If you search for ‘smartphone video hacks’ or ‘camera effects’ on YouTube, you will find examples of all sorts of ways in which you can add special effects to your videos.</li> </ul>   | <p>Classroom teaching</p> |                   |

## Part 8: Smart handling of photos and videos

### Short description

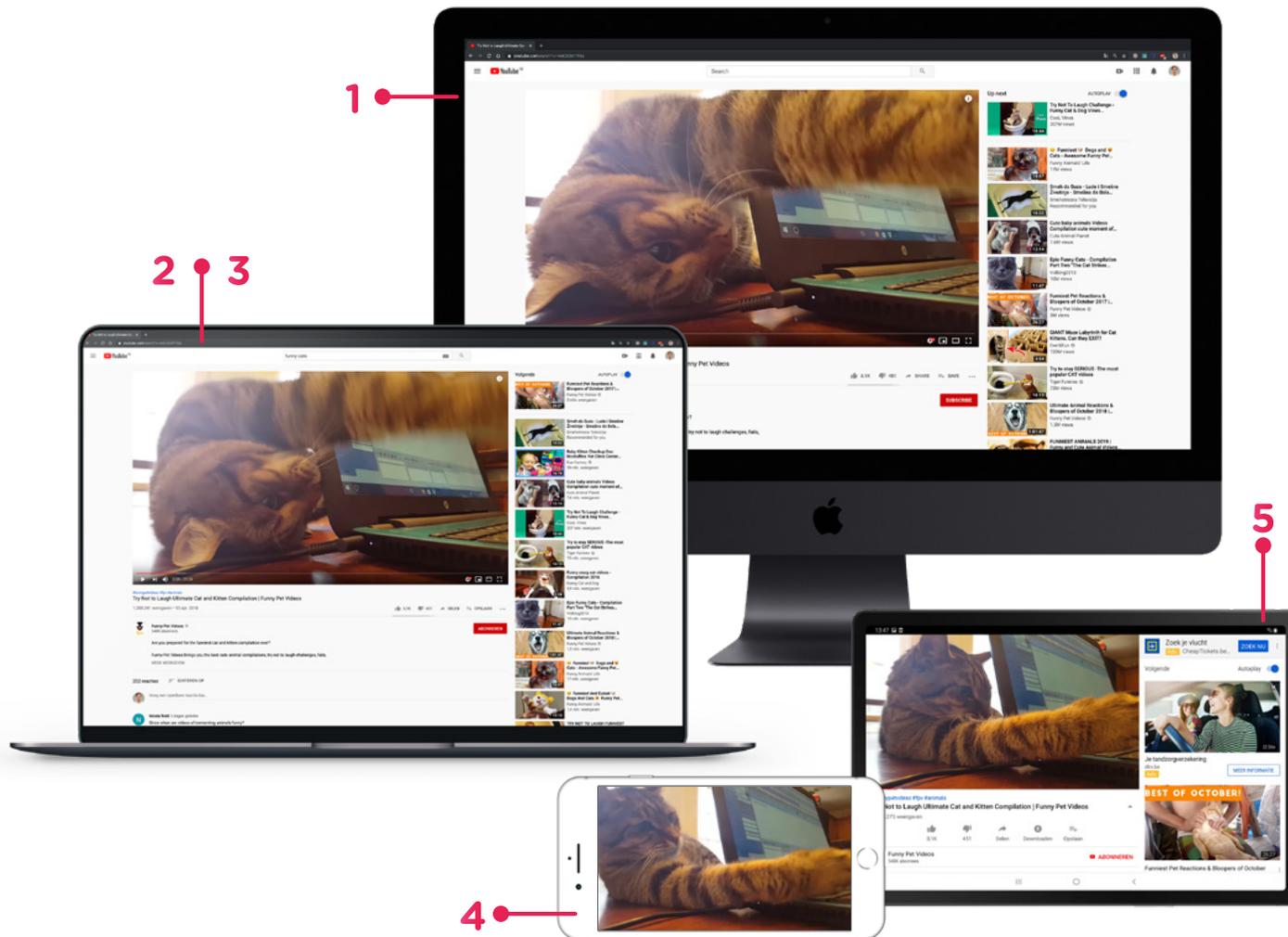
Regardless of the method the user chooses to share photos and videos, it is always smart to pay close attention to what you share. The best tip that you can give young people is: **“Before you share something, ask yourself whether you would let your granny or granddad see it. If the answer is ‘yes’, then share it because #SharingisCaring; if you have doubts, then just drop it.”**

### Step by step

| Content per step   | Methodology               | Media  |
|--|---------------------------|--|
| <p><b>Tips:</b></p> <ol style="list-style-type: none"> <li>1. Never post photos or videos online of people who have not given their consent.</li> <li>2. Never publish shocking photos online.</li> <li>3. Always bear in mind that your photos may be disseminated.</li> <li>4. Always check the photographer/video maker, whether s/he thinks it is a good idea to have a photo or video shared.</li> <li>5. Don't let anyone pressure you into making a clip or photo, not even your own friends. If you feel forced or threatened, talk about it with someone you trust, like your parents or your teacher.</li> </ol> | <p>Classroom teaching</p> | <p>Tools for teacher: 'Digital use of video and music'</p> |

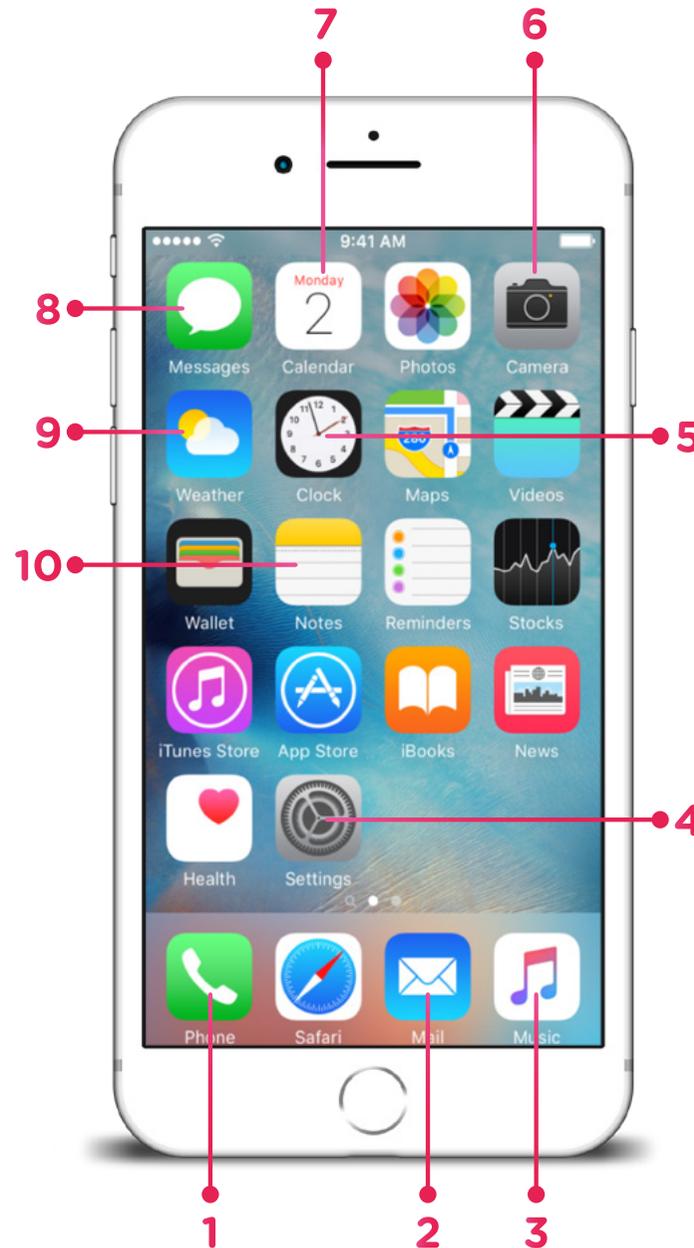
## Appendices

1.



## Appendices

2.



## Appendices

3.



## Appendices

4.

