First learning scenarios (10 from each partner)

Learning Scenario Title	**How to Spot Fake News in media messages?**
Description	When fake news, such as false claims about the coronavirus, has threatened people's safety, tech companies have joined forces to crack down on the misinformation super-spreaders. But ad-supported networks are in somewhat of a bind, since they get money when users click on these stories - so the crazier the headline, the more money they make. Most kids and teens get their news from their feeds, so they need to learn how to view stories critically.
Grade of students	Grade Levels: Grades 8-12 The lesson has been designed to be completed in 1 x 60-minute class period and provides students critical thinking skills they can build on in future units and lessons, regardless of the content area.
Curricula topics	Information Technology, Literacy, Science, Privacy,
Competences	Digital literacy, critical thinking
Educational approach	Explorative learning
Learning Activities *Lesson plan*	**Activity 1: What is fake news?** 20 minute presentation introducing the concept of fake news. **Activity 2: How to check media messages in order to check if its fake** The teacher is introducing key questions to ask when analyzing media messages. Students are answering questions from the document. **Activity 3: Discussion on how to spot fake news** The discussion will be followed by main elements on spotting fake news and students are sharing experience if they are checking this: ● Look for unusual URLs or site names, including those that end with ".co" - these are often trying to appear like legitimate news sites, but they aren't. ● Look for signs of low quality, such as words in all

	caps, headlines with glaring grammatical errors, bold claims with no sources, and sensationalist images (women in bikinis are popular clickbait on fake news sites). These are clues that you should be skeptical of the source. ● Check a site's "About Us" section. Find out who supports the site or who is associated with it. If this information doesn't exist - and if the site requires that you register before you can learn anything about its backers - you have to wonder why they aren't being transparent. ● Check Snopes, Wikipedia, and Google before trusting or sharing news that seems too good (or bad) to be true. ● Consider whether other credible, mainstream news outlets are reporting the same news. If they're not, it doesn't mean it's not true, but it does mean you should dig deeper. ● Check your emotions. Clickbait and fake news strive for extreme reactions. If the news you're reading makes you really angry or super smug, it could be a sign that you're being played. Check multiple sources before trusting.
Roles	Students, Teachers, Facilitators (presenting the ideas)
Tools and services	Computer or paper in order to find key questions to ask when analyzing media messages. Additional resources for educators: 1. How to Spot Fake News https://www.commonsensemedia.org/blog/how-to-spot-fake-news-and-teach-kids-to-be-media-savvy 2. Fake new or fact https://askatechteacher.com/fake-news-or-fact-how-do-you-tell/

Learning Scenario Title	**What does Facebook know about everyone?**
Description	With nearly 3 billion monthly active users, Facebook can keep tabs on about a third of the world's population. Students are using Facebook very often. Whether you visit the social network daily (as 1.82 billion people do) or only log on to RSVP to events, you should be aware of how much of your personal data you're giving to the site and the company

	behind it. Facebook primarily uses your information to serve you more relevant targeted advertising. While some see this as uncomfortably intrusive, others accept the ads as the price they pay for the network's free services and tools. Whatever you think about the ethics of this data collection, you should know just what the company is learning about you—and how you can control the flow of information.
Grade of students	Grade Levels: Grades 8-12 The lesson has been designed to be completed in 1 x 60-minute class period and provides students critical thinking skills they can build on in future units and lessons, regardless of the content area.
Curricula topics	Information Technology, Literacy, Science, Privacy,
Competences	Digital literacy, critical thinking
Educational approach	Explorative learning
Learning Activities *Lesson plan*	**Activity 1: How to check What Facebook Knows About You** The teacher is introducing how and where to find additional information about everyone: ● To find out what Facebook knows about you, log in to Facebook and head to a page called <a href= "https://www.facebook.com/ads/preferences"> "Your ad preferences" https://www.facebook.com/ads/preferences **Activity 2 – Discussion on what information is being tracked by Facebook** The discussion will be followed by main tracked elements: ● Facebook keeps track of anything you "Like" as you use its service. ● Facebook also tracks what you do on the internet. Plus, every time you use Facebook to log in to apps on your phone it tracks that information. ● Facebook builds a profile about you, which you can see by clicking on "your categories." This is info Facebook shares with advertisers. ● Facebook also tracks your location, meaning where you are and where you've been, using both Facebook and Instagram. **Activity 3 – Discussion on How to Control What**

	Facebook Knows About You You can control how advertisers use your data by visiting your account settings and selecting 'Ad Settings.' You can toggle the available options from 'Allow' to 'Not Allowed.' Students are sharing experience and new information about what they have found about themselves and telling what is right and wrong and going to conclusions.
Roles	Students, Teachers, Facilitators (presenting the ideas)
Tools and services	Computer or mobile phone in order to check, what Facebook knows about students. Additional resources for educators: 1. What Facebook is tracking https://www.businessinsider.com/how-to-find-out-everything-facebook-knows-about-you-2018-3 2. How To See Everything Facebook Knows About You https://www.alphr.com/facebook/1003521/see-everything-facebook-knows-about-you-here-s-how/

Learning Scenario Title	**How to spot disinformation?**
Description	There are many terms in the context of fake news. It is important for students to define main definitions – fake new, misinformation, disinformation and spot them on social media and other sources. This lesson in based on the analysis of disinformation. Children can be targets and objects of mis/disinformation, but they can also actively counter its flow. They can contribute to online fact-checking and myth-busting initiatives. Equipping children with the critical reading and thinking skills can help them determine the veracity of information. Considering how mis/disinformation moves easily between online and offline contexts, it is important to develop critical thinking skills amongst children even in non-digital contexts.

Grade of students	Grade Levels: Grades 8-12 The lesson has been designed to be completed in 1 x 60-minute class period and provides students critical thinking skills they can build on in future units and lessons, regardless of the content area.
Curricula topics	Information Technology, Literacy, Science, Privacy,
Competences	Digital literacy, critical thinking
Educational approach	Explorative learning
Learning Activities *Lesson plan*	**Activity 1: What is disinformation?** A short (5-10 min) presentation of the main characteristics of disinformation spotting the differences between definitions: ● misinformationis false information that is spread, regardless of whether there is intent to mislead. ● fake news is purposefully crafted, sensational, emotionally charged, misleading or totally fabricated information that mimics the form of mainstream news. ● Disinformation is deliberately misleading or biased information; manipulated narrative or facts; propaganda. **Activity 2: Playing disinformation spotting game** The students are playing "Get Bad News Game for Lithuania: don't let disinformation deceive you" game, which is designed by disinformation analysis center. **Activity 3 – Discussion on how to spot disinformation?** After playing the game of spotting disinformation, students are sharing experience and new information and going to conclusions.
Roles	Students, Teachers, Facilitators (presenting the ideas)
Tools and services	Computer or mobile phone in order to play spotting disinformation game. Additional resources for educators: 1. News: Fake News, Misinformation & Disinformation https://guides.lib.uw.edu/c.php?g=345925&p=7772376 2. Digital misinformation / disinformation and children https://www.unicef.org/globalinsight/stories/digital-misinformation-disinformation-and-children

	3. Disinformation-misinformation https://www.debunkeu.org/disinformation-misinformation

Learning Scenario Title	**Digital media monitoring**
Description	The teaching of media in school is a very complex activity that requires specific strategies. Often the use of technology is synonymous with innovation in the practice of teaching, as if the media were good in itself. It is useful instead to check whether the introduction of an experience of media education in schools has resulted in real progress in education. But social media, while posing many benefits, has been called out as a major influence in things like school bullying, which is why school districts in the U.S. are debating whether or not to monitor the use of teens' social media activity. In fact, schools across the country are starting to make efforts, or ramping up previous efforts, to get a handle on school bullying manifested through social media.
Grade of students	Grade Levels: Grades 8-12 The lesson has been designed to be completed in 1 x 60-minute class period and provides students critical thinking skills they can build on in future units and lessons, regardless of the content area.
Curricula topics	Information Technology, Literacy, Science, Privacy,
Competences	Digital literacy, critical thinking
Educational approach	Explorative learning
Learning Activities *Lesson plan*	**Activity 1: Discussion on how digital media monitoring works** The moderator will lead a discussion with students following the prompts below: ● How Does Social Media Monitoring Work? Social media monitoring, or listening, works by tracking public mentions of keywords and phrases that are specifically searched for in social media and across the Internet. Media monitoring tools can be set up to look for these specific items, helping those monitoring narrow the

	results. ● Social Media Monitoring and Privacy For schools monitoring social media accounts, keywords could alert them to possibly harmful instances related to bullying, child predators, self-harm, suicide, or inappropriate relationships with faculty or staff. **Activity 2: How to do the social media monitoring for your content?** Students are using additional Google Chrome Extension: FakerFact: Fake News Detection This extension will open up a new tab on www.fakerfact.org to check your current tab's content for indications of fake news. FakerFact uses a machine learning algorithm Walt (named after Walter Cronkite). Walt has read millions of articles from sites all over the internet, and has been trained to detect relevant Fake News patterns. For example, Walt can tell you whether the web page you are viewing shares characteristics of articles that are typical of good journalism, opinion pieces, clickbait, conspiracy theories, or satire. Students are selecting online information, articles and checking them. **Activity 3 – Discussion on the importance of digital media monitoring** Students are sharing experience and new information about what they have found and telling what is right and wrong and going to conclusions.
Roles	Students, Teachers, Facilitators (presenting the ideas)
Tools and services	Computer in order to use additional Google Chrome Extension: FakerFact: Fake News Detection Additional resources for educators: 1. Social media monitoring https://pgui.com/social-media-monitoring-a-measure-for-school-safety-or-an-invasion-of-privacy/ 2. Teaching media in school: observing and monitoring http://www.gabinetecomunicacionyeducacion.com/sites/default/files/field/adjuntos/teaching_media_in_school_observing_and_monitoring.pdf 3. Keeping It off the Record: Student Social Media Monitoring and Keeping It off the Record: Student Social

	Media Monitoring and the Need for Updated Student Records Laws the Need for Updated Student Records Laws https://scholarship.law.vanderbilt.edu/cgi/viewcontent.cgi?article=1021&context=jetlaw

Learning Scenario Title	**Digital media ethics**
Description	Digital media ethics deals with the distinct ethical problems, practices and norms of digital news media. Digital news media includes online journalism, blogging, digital photojournalism, citizen journalism and social media. It includes questions about how professional journalism should use this 'new media' to research and publish stories, as well as how to use text or images provided by citizens. We are moving towards a mixed news media – a news media citizen and professional journalism across many media platforms. This new mixed news media requires a new mixed media ethics – guidelines that apply to amateur and professional whether they blog, Tweet, broadcast or write for newspapers. Media ethics needs to be rethought and reinvented for the media of today, not of yesteryear. Students are becoming an active users of digital media, so it is important for them to understand the importance of ethics in digital media.
Grade of students	Grade Levels: Grades 8-12 The lesson has been designed to be completed in 1 x 60-minute class period and provides students critical thinking skills they can build on in future units and lessons, regardless of the content area.
Curricula topics	Information Technology, Literacy, Science, Privacy,
Competences	Digital literacy, critical thinking
Educational approach	Explorative learning
Learning Activities *Lesson plan*	**Activity 1: Discussion on digital media ethics** The moderator will lead a discussion with students following the prompts below: ● Who is a journalist in digital media?

	• Is anonymity accepted in digital media? Are you reading articles written by anonymous authors? • Should citizen journalists be required to be balanced and impartial? • What is the ethics of images? **Activity 2: Code of ethics** The teacher is introducing how and where to find additional information about code of ethics. Students are reading the code of ethics and analyzing, which principles can be defined as the most important. **Activity 3 – Discussion on how to use ethics in digital media** Students are sharing experience and new information about what they have found and telling what is right and wrong and going to conclusions.
Roles	Students, Teachers, Facilitators (presenting the ideas)
Tools and services	Computer printed paper in order to read about code of ethics. Additional resources for educators: 1. Digital media ethics https://ethics.journalism.wisc.edu/resources/digital-media-ethics/ 2. 4 Strategies for Teaching Media Literacy https://www.edutopia.org/article/4-strategies-teaching-media-literacy

Learning Scenario Title	**How to define and create fake news?**
Description	The internet comes with an overload of information. Though this is a benefit to most teachers and students, internet has a dark side. Photoshop shows you pictures of things that didn't actually happen, websites have articles with fake content, and amateur journalists invent impressive statistics that are actually a hoax. On the internet, anything may look real, but

	it isn't. A recent Stanford Graduate School of Education report shows that many students have trouble judging the credibility of information online. The results showed that 80-90 percent of high school students had a difficult time judging the credibility of news.
Grade of students	Grade Levels: Grades 8-12 The lesson has been designed to be completed in 1 x 60-minute class period and provides students critical thinking skills they can build on in future units and lessons, regardless of the content area.
Curricula topics	Information Technology, Literacy, Science, Privacy,
Competences	Digital literacy, critical thinking
Educational approach	Explorative learning
Learning Activities *Lesson plan*	**Activity 1: Discussion and checking of fake news checklist** The moderator will lead a discussion with students following the prompts below: ● How can you define fake news? ● Do you know the criteria of fake news? After answering, students are going to any news portal, selecting a few articles and analyzing them according to fake news checklist. **Activity 2: Is it easy to create a fake news?** Today it is very easy to create fake news and publish it on the internet. So it is very important not to trust every source. In order to make sure about this, students are using Fake news generator tools: **1. Fake newspaper generator tool** **2. Online newspaper generator** **3. Breaking News generator** **Activity 3 – Discussion on fake news definition and creation** Students are sharing experience and new information about what they have found about fake news and going to conclusions.

Roles	Students, Teachers, Facilitators (presenting the ideas)
Tools and services	Computer or mobile phone in order to check fake news checklist, use Fake news generator tools. Additional resources for educators: 1. Fact checking and fake news https://www.bookwidgets.com/blog/2019/01/fact-checking-and-fake-news-lesson-plans-the-ultimate-teacher-guide 2. Teaching Your Students About Fake News https://blog.listenwise.com/2021/06/teaching-your-students-about-fake-news/

Learning Scenario Title	**How to define and create fake news?**
Description	The internet comes with an overload of information. Though this is a benefit to most teachers and students, internet has a dark side. Photoshop shows you pictures of things that didn't actually happen, websites have articles with fake content, and amateur journalists invent impressive statistics that are actually a hoax. On the internet, anything may look real, but it isn't. A recent Stanford Graduate School of Education report shows that many students have trouble judging the credibility of information online. The results showed that 80-90 percent of high school students had a difficult time judging the credibility of news.
Grade of students	Grade Levels: Grades 8-12 The lesson has been designed to be completed in 1 x 60-minute class period and provides students critical thinking skills they can build on in future units and lessons, regardless of the content area.
Curricula topics	Information Technology, Literacy, Science, Privacy,
Competences	Digital literacy, critical thinking
Educational approach	Explorative learning

Learning Activities *Lesson plan*	**Activity 1: Discussion and checking of fake news checklist** The moderator will lead a discussion with students following the prompts below: ● How can you define fake news? ● Do you know the criteria of fake news? After answering, students are going to any news portal, selecting a few articles and analyzing them according to fake news checklist. **Activity 2: Is it easy to create a fake news?** Today it is very easy to create fake news and publish it on the internet. So it is very important not to trust every source. In order to make sure about this, students are using Fake news generator tools: **1. Fake newspaper generator tool** **2. Online newspaper generator** **3. Breaking News generator** **Activity 3 – Discussion on fake news definition and creation** Students are sharing experience and new information about what they have found about fake news and going to conclusions.
Roles	Students, Teachers, Facilitators (presenting the ideas)
Tools and services	Computer or mobile phone in order to check fake news checklist, use Fake news generator tools. Additional resources for educators: 1. Fact checking and fake news https://www.bookwidgets.com/blog/2019/01/fact-checking-and-fake-news-lesson-plans-the-ultimate-teacher-guide 2. Teaching Your Students About Fake News https://blog.listenwise.com/2021/06/teaching-your-students-about-fake-news/

Learning Scenario Title	**How to master critical reading?**

Description	In the era of fake new, critical reading is becoming an important skill. Especially when starting analysis of critical reading while being a student. Critical reading involves presenting a reasoned argument that evaluates and analyses what you have read. Being critical, therefore - in an academic sense - means advancing your understanding, not dismissing and therefore closing off learning.
Grade of students	Grade Levels: Grades 8-12 The lesson has been designed to be completed in 1 x 60-minute class period and provides students critical thinking skills they can build on in future units and lessons, regardless of the content area.
Curricula topics	Information Technology, Literacy, Science, Privacy,
Competences	Digital literacy, critical thinking
Educational approach	Explorative learning
Learning Activities *Lesson plan*	**Activity 1: Presentation of SQ3R as a well-known strategy for critical reading** Teacher is defining the Common Features of SQ3R: ● Survey - This relates to speed-reading, scanning and skimming the text. At this initial stage students will be attempting to gain the general gist of the material. ● Question - It is important that, before students begin to read, they have a question or set of questions that will guide them - why am I reading this? ● Read - Now students will be ready for the main activity of reading. This involves careful consideration of the meaning of what the author is trying to convey and involves being critical as well as active. ● Recall - Regardless of how interesting an article or chapter is, unless students make a concerted effort to recall what they have just read, they will forget a lot of the important points. A significant element in being active is to write down, in your own words, the key points. ● Review - The final step is to review the material that students have recalled in your notes. Did they understand the main principles of the argument? Did they identify all the main points? Are there any gaps? Students can review the text again to make sure and clarify.

	Activity 2: Working in groups on SQ3R steps The students are selecting articles for analysis of SQ3R steps in the databases available at school. They are divided into 3 groups: ● Group 1 will analyze article based on social media. They can select any in the databases. ● Group 2 will analyze article based on students' motivation. They can select any in the databases. ● Group 3 will analyze article based on fake news. They can select any in the databases. Students are working with every step mentioned in Activity 1. After analysis they are formulating main conclusions.
Roles	Students, Teachers, Facilitators (presenting the ideas)
Tools and services	Computer or printed version of articles selected for SQ3R steps Additional resources for educators: 1. Critical Reading and Reading Strategy https://www.skillsyouneed.com/learn/critical-reading.html 2. Teaching Critical Reading and Writing in the Era of Fake News https://www.peterlang.com/document/1058700

Learning Scenario Title	**How to master critical reading?**
Description	In the era of fake new, critical reading is becoming an important skill. Especially when starting analysis of critical reading while being a student. Critical reading involves presenting a reasoned argument that evaluates and analyses what you have read. Being critical, therefore - in an academic sense - means advancing your understanding, not dismissing and therefore closing off learning.

Grade of students	Grade Levels: Grades 8-12 The lesson has been designed to be completed in 1 x 60-minute class period and provides students critical thinking skills they can build on in future units and lessons, regardless of the content area.
Curricula topics	Information Technology, Literacy, Science, Privacy,
Competences	Digital literacy, critical thinking
Educational approach	Explorative learning
Learning Activities *Lesson plan*	**Activity 1: Presentation of SQ3R as a well-known strategy for critical reading** Teacher is defining the Common Features of SQ3R: ● Survey - This relates to speed-reading, scanning and skimming the text. At this initial stage students will be attempting to gain the general gist of the material. ● Question - It is important that, before students begin to read, they have a question or set of questions that will guide them - why am I reading this? ● Read - Now students will be ready for the main activity of reading. This involves careful consideration of the meaning of what the author is trying to convey and involves being critical as well as active. ● Recall - Regardless of how interesting an article or chapter is, unless students make a concerted effort to recall what they have just read, they will forget a lot of the important points. A significant element in being active is to write down, in your own words, the key points. ● Review - The final step is to review the material that students have recalled in your notes. Did they understand the main principles of the argument? Did they identify all the main points? Are there any gaps? Students can review the text again to make sure and clarify. **Activity 2: Working in groups on SQ3R steps** The students are selecting articles for analysis of SQ3R steps in the databases available at school. They are divided into 3 groups: ● Group 1 will analyze article based on social media. They can select any in the databases. ● Group 2 will analyze article based on students' motivation. They can select any in the databases.

	● Group 3 will analyze article based on fake news. They can select any in the databases. Students are working with every step mentioned in Activity 1. After analysis they are formulating main conclusions.
Roles	Students, Teachers, Facilitators (presenting the ideas)
Tools and services	Computer or printed version of articles selected for SQ3R steps Additional resources for educators: 1. Critical Reading and Reading Strategy https://www.skillsyouneed.com/learn/critical-reading.html 2. Teaching Critical Reading and Writing in the Era of Fake News https://www.peterlang.com/document/1058700

Learning Scenario Title	**How to define a clickbait?**
Description	Clickbait is a sensationalized headline that encourages you to click a link to an article, image, or video. Instead of presenting objective facts, clickbait headlines often appeal to your emotions and curiosity. Once you click, the website hosting the link earns revenue from advertisers, but the actual content is usually of questionable quality and accuracy. Websites use clickbait to draw in as many clicks as possible, thus increasing their ad revenue. However, clickbait can be harmful when it's used along with the creation of fake news. The outrageous fake headlines stoke the emotions of readers, who then spread the content on social media. Unfortunately, studies have shown that 6 out of 10 people share headlines on social media without reading the actual article. It's a problem focused on young audience and students should be more informed about this.
Grade of students	Grade Levels: Grades 8-12 The lesson has been designed to be completed in 1 x 60-minute class period and provides students critical thinking skills they can build on in future units and lessons, regardless of the content area.

Curricula topics	Information Technology, Literacy, Science, Privacy,
Competences	Digital literacy, critical thinking
Educational approach	Explorative learning
Learning Activities *Lesson plan*	**Activity 1: Discussion on clickbaits** The moderator will lead a discussion with students following the prompts below: ● How often you attention is attracted by the headlines on social media? ● Why is clickbait an issue? **Activity 2: Analysis of examples** The teacher is introducing how and where to find examples of cklickbaits. Analysis of cklickbaits will be held in 3 groups based on examples identified below: ● Group 1 will begin with Facebook Clickbait Examples. ● Group 2 will discuss YouTube clickbait examples. ● Group 3 will analyze the BuzzFeed clickbait examples. **Activity 3 – Discussion on how to spot a clickbite** Students are sharing experience and new information about what they have found and going to conclusions.
Roles	Students, Teachers, Facilitators (presenting the ideas)
Tools and services	Computer or mobile phone in order to check Clickbait examples. Additional resources for educators: 1. Digital Media Literacy - What is Clickbait? https://edu.gcfglobal.org/en/digital-media-literacy/what-is-clickbait/1/ 2. This is Clickbait - A Lesson on Being a Discerning News Consumer https://www.freetech4teachers.com/2019/06/this-is-clickbait-lesson-on-being.html

Learning Scenario Title	**Choose your citizen science project**
Description	Did you know that every day, students just like you help scientists answer tough questions? And they do it in a fun way! From analysing the depths of the ocean, to tracking bugs, to exploring distant galaxies using data collection forms, mobile phones and online games, citizen scientists are involved in a wide range of exciting activities. In this lesson, we'll help you find the right citizen science project for you! Lesson goal: Thoughtfully identify a citizen science project to participate in, join the community and start answering scientific questions. Learning scenario based on the following learning resource: https://www.calacademy.org/educators/lesson-plans/choose-your-own-citizen-science-project
Grade of students	Grade Levels: Grades 8-12
Curricula topics	Information technology, science, biology, chemistry
Competences	Digital literacy, critical thinking, creativity, scientific literacy
Educational approach	Experiential learning
Learning Activities	**Activity 1: Find sources of inspiration** What interesting discoveries have come from citizen science? How have students like you contributed to real research? *Have your students find articles or videos about citizen science online that inspire them and encourage them to get involved in citizen science projects. For example, a video about a teenage Ukrainian who made an amazing deep-sea discovery, or an article about the many ways students is helping scientists around the world.* *Once your students have chosen a video or article, ask them to write a paragraph describing why it inspires them and what type of citizen science project they would like to try.* **Activity 2: What do you want to do and can do?** Now that your students have found their inspiration, it's time to think not only about what type of citizen science project they would like to try but also about what kind of projects they can do, given the geographical constraints, the

	equipment needed and the time resources. For example, a citizen science project looking at the oceans may seem particularly interesting, but if you don't live near the ocean, it may be difficult to participate. Think about what would motivate students to participate in a particular citizen science project? Perhaps you would like to spend more time outdoors, learn about different plant species in your neighbourhood, or maybe you are interested in projects that look like video games. Start activity 2: *Divide students into groups based on similar interests in citizen science projects. Each group should prepare a list of citizen science projects in which they would like to participate.* *Specify the rules to be followed by the pupils. For example, to stay on school grounds if short trips are not possible. Discuss the deadlines for participation.* *Have your students add your list of instructions to the list they made with their group, and then add the whole list in the left-hand column "Which project should we choose?" template under "Project requirements and questions".* *Then, under each item on the list, come up with a question for your students to ask about the citizen science project to see if it fits that need/want.* *For example, if you want to be outdoors as part of a citizen science project, you could ask "Does this project take place outdoors?" or "Where does this project take place?"* Action 3: Search for a citizen science project Your students should now have a list of needs and wants for a citizen science project. Have your students search for citizen science projects and, when they find projects that meet most or all of these needs/wants, ask them to write them down in the top line "Which project should we choose?" table. Then, in each box that corresponds to a need/desire, ask your students to answer your own question about how this project does or does not fulfil that particular point. Tell your students to find at least three citizen science projects that meet most or all of your needs and wants. As you research your projects, also identify the science question(s) being asked that citizen scientists are helping to

	answer. Here are some ideas on where to look for citizen science projects: ● SciStarter - SciStarter allows you to search for projects by the type of activity you want to do (e.g. online, at the beach, etc.) or by topic (e.g. birds, physics, etc.). ● Zooniverse - Zooniverse is an online collection of citizen science projects with topics ranging from astronomy to weather, animals to archaeology and more! ● Your local science museum and other science organisations ● Science museum or other science-oriented organisations in your region. Do they have local citizen science projects you can get involved in? **Activity 4: Choose a project** Give your students time to weigh up the advantages and disadvantages of the three projects that their group has come up with. Which project seems to be the most fun? Which project meets all the requirements you, the teacher, have set? Review the pros and cons of the activity to help them decide which project might be best. Then ask your students to rank their projects as first, second and third. You, the teacher, will have the final say, so have them argue convincingly why their group should be allowed to do the first citizen science project. Let them state their arguments as follows: ● 2 sentences describing the project ● 1 sentence about the scientific question(s) being asked in the project ● 2-3 sentences explaining how the project meets the list of needs/wants ● 2 sentences about what they think they will learn from the project ● 1 sentence about why they are excited about the project Once you say YES to the project, your students are ready to start! If you say NO, ask them to construct an argument for a

	second or third choice project. **Task 5: Make a plan** With your groups of students, ask them to go through all the information they can find about their citizen science project and start making some lists. ● What equipment will you need? ● Will you need to learn some things before taking part? ● How to identify some species? ● How to perform certain skills? ● Does your project website offer tools and resources to learn these necessary components? ● What steps do you need to take to do your best in the project? ● Are there different tasks that you can divide up to make the work easier and more efficient? Use the planning and timeline template to help students organise their work. **Activity 6: Become a citizen scientist** It's time to dance! Using your planning and timeline document, ask your students to complete the steps of your chosen citizen science project. Make sure they are careful and think through each step - they want their data to be accurate and useful to scientists! Each day, your students will keep a journal in their scientist's notebook to help them keep track of the interesting things they are learning and any questions they have. When you have finished participating, be sure to send in your details! Some projects can upload them online, some projects collect data through participation (e.g. Zooniverse projects) and some ask you to send in your data sheets. Be sure to check how their data will be made available to researchers. Task 7: Answer one of your questions Now that your students have sent in their data to help answer the scientist's question, it's time to answer one of them! Ask your students to go back to their scientist's notebook and choose one of the questions they would like to know the

	answer to along the way. What information will they need to answer? Let your pupils do some research and see if they can find out the answer. If they don't find the answer, they may have asked a question that hasn't been answered yet! These are the types of questions that scientists ask and then carry out investigations to try to answer. Ask your students: ● Will your research help you or other citizen scientists? ● Do you need to collect new and different data to answer your question? **Additional task - scientific conference in the classroom** After conducting research to answer questions, scientists need a way to share their results and findings with the wider scientific community and other interested people. Scientists can write an article in a journal or do a radio interview. Often scientists go to a conference where hundreds of thousands of other scientists and interested people can share information about their research through presentations and posters. Organise a science conference in your classroom! Each group should create a presentation or poster about a citizen science project they have been involved in. The presentation or poster should include the following topics: Background information about the citizen science project, including what questions are being asked and who is asking them: ● Why you chose this particular project ● What actions you have taken as a result of your participation in the project ● What type of data you collected and how it will help answer the research questions ● Anything interesting you saw in the data you collected ● The question you had during your participation and how you answered it (or how you would answer it if it was an original question) ● Your findings/conclusions from your participation in the citizen science project **As you listen to each group's presentation or read their poster, come up with one thoughtful question you can ask them about their project.**

Roles	Students, teachers
Tools and services	● Internet connection ● Added templates (which project should we choose?, Planning and Timeline, Scientist's Notebook) ● Paper and pens ● Computer/projector and poster board for presentations

Learning Scenario Title	**Can you trust your newsfeed?**
Description	Children today do not look for news on traditional news sources. Instead most of the time an algorithm selects what they see on WhatsApp, Youtube or Instagram. Hence, thinking critically, fact-checking, interpreting and evaluating the information you receive, wherever it appears, is a crucial skill. However, young people lack these basic skills of digital evaluation according to a study released by Stanford Education Group in 2016. The lecture aims to fill in this gap through CS-based approach of simultaneous learning and knowledge making. Numerous checklists and methods exist to assist in the evaluation of information sources where content consumers are encouraged to assess the source in front of them according to each criterion and question the source in order to determine its reliability. By employing the expertise of Vilnius Tech researchers on digital communications, the lecture will focus on a research-based approach to digital source criticism. By distinguishing between what is real and what is fake, the children will learn to think for themselves, as well as gain a better understanding of the world.
Grade of students	Grade Levels: Grades 8-12 The lesson has been designed to be completed in 2 x 60-minute class periods and provides students lateral-reading skills they can build on in future units and lessons, regardless of the content area.
Curricula topics	Technology, Literacy, Science
Competences	Developing source criticism skills, digital literacy
Educational approach	Explorative learning

Learning Activities *Lesson plan*	**Activity 1 - guide to fake news and misinformation** Quick guide to fake news and misinformation (presentation by the lecturer > uploaded in this Google doc) + class discussion. This productive discussion about "fake news" encourages students to think about the importance of validating information and reflect on how they currently do this. **Activity 2 - introduction and practice application of the lateral reading** This particular activity focuses on fact-checking information presented in social media using lateral reading. Lateral reading is basically searching for information about a source while you are reading it; you are checking for currency, relevancy, authority, accuracy, and purpose by reading what other sites say about your source. Presentation of the checklist to assist in the evaluation of information sources (Currency, Relevance, Authority, Accuracy, Purpose) by Debczak (2017) > link Application of the checklist on predefined case studies. In small groups, students review a case study, discuss the checklist components, and determine whether the post is credible. If the students have access to the internet, they are encouraged to base their reasoning on information they found regarding each of the components, such as information about the author of the material. If students do not have access to an internet-connected device, they can describe the types of searches they would perform. **Activity 3 - evaluating the newsfeeds of pupils'** Evaluate the trustworthiness of pupils' newsfeeds. Once students have been introduced to the checklist as a class, they work on their own to complete similar evaluations of the news items in a variety of social media sources. Students assess each source's validity and provide a short written analysis. The students will be asked to evaluate 7 random newsfeed items and fill in a questionnaire provided by the researchers. The data from the questionnaire will be used by the researchers in deconstructing the trustworthiness of newsfeed in young people's lives. **Activity 4 - debrief session** In the debrief session, groups are provided a list of discussion questions such as ● Who is responsible for fact checking information: the producer or the consumer?

	● What are the consequences if you do not fact check the information you receive? ● What does the term “fake news” mean to you? ● What types of evidences persuade you to believe someone? The questions focus on how pupils consume and produce information, their responsibilities in checking the validity of the information they use and share, and when they would use lateral reading.
Roles	Students, Teachers, Facilitators (presenting the ideas)
Tools and services	Paper (to distribute the checklist and evaluation frameworks) and computer (to access the survey and social media news feeds)

LEARNING SCENARIO	**IT1 (English Version)**
Learning Scenario Title	IT1 Introduction to Smartphones as a teaching tool
Description	Smartphones are instruments with great potential, always at hand and can be a valuable teaching contribution.
Context / Target group	This scenario is introductory to a series of activities designed to teach how to use smartphones as a useful tool for surveying and collecting data. This knowledge will be used during the following experiences to study the accessibility, practicality and conservation of cultural, landscape and naturalistic national heritages. The learning scenario is suitable for a wide range of citizens and is designed to be within reach of grade 5-9 students.
Curricula topics	Physics, technology, IT
Competencies	Scientific investigation, IT competencies, Data Collection, Conversion and Analysis.
Educational approach	The use of digital devices (according to MIUR) promotes the autonomy of students. There is a gradual transition to learning situations that

	enhance students' spirit of initiative and responsibility. A conscious approach to “digital" must be supported, as well as the ability to use information sources critically, also with a view to lifelong learning.
Learning Activities (LA)	Phases of the learning scenario, in relation to the FabCitizen framework
LA1	General presentation of the problem aimed to define: - objectives of the experience; - data collection and interpretation.
LA2	Discussion: contextualization of the topic with students, to understand their level of understanding of the subject.
LA3	Overview of the potential of the phone as a portable physics lab
LA4	Worksheets completion
LA5	Worksheets proofreading
Roles	Teachers: they conduct the entire experience, present the objectives, introduce the sensors, discuss with the students to figure out their level of understanding and comment on worksheets correction.
Tools and Materials	Smartphones, worksheets, pencils

LEARNING SCENARIO	IT2 (English Version)
Learning Scenario Title	IT2 Introduction to Smartphone Sensors
Description	Smartphones are instruments with great potential, always at hand and can be a valuable teaching contribution.
Context / Target group	After introducing the use of smartphones as a means of education and having explored the characteristics that allow us to define it as a valuable teaching contribution, this current scenario allows us to briefly investigate how many and which sensors are inside smartphones and how they are used to conduct didactic experiences. The learning scenario is suitable for a wide range of citizens and is designed to be within reach of grade 5-9 students.
Curricula topics	Physics, technology, IT
Competencies	Scientific investigation, IT competencies, Data Collection, Conversion and Analysis.
Educational approach	The educational benefits of this experience are many: besides the obvious ability to teach rudimentary concepts of physics, thanks to this scenario, students understand the criteria underlying creative thinking, problem solving with alternative means, by participating in collective experiences that have a distinctly educational (and partly playful) approach.
Learning Activities (LA)	Phases of the learning scenario, in relation to the FabCitizen framework
LA1	General presentation of the problem aimed to define: - objectives of the experience; - data collection and interpretation.
LA2	Discussion: contextualization of the topic with students, to understand their level of understanding of the subject.

LA3	Presentation of the main sensors present in the smartphone and their use: ● an accelerometer that measures acceleration forces ● a magnetometer that measures magnetization/magnetic fields ● a light sensor that measures the strength of light ● a gyroscope that measures orientation ● a proximeter that detects when something is close
LA4	Worksheets completion
LA5	Worksheets proofreading
Roles	Teachers: they conduct the entire experience, present the objectives, introduce the sensors, discuss with the students to figure out their level of understanding and comment on worksheets correction.
Tools and Materials	Smartphones, worksheets, pencils

LEARNING SCENARIO	IT3 (English Version)
Learning Scenario Title	IT3 Accelerometer focus and gravity force (Part 1)
Description	In this scenario we examine the relationship between the sensor called "Accelerometer", used to measure linear speed variations in the 3 directions of space, and the "Gravimeter", used to evaluate the 3 components of the G-force.
Context / Target group	This experience is designed to let students understand the functioning of two important sensors used to analyze movement, such as the accelerometer and the gravity sensor. The learning scenario is suitable for a wide range of citizens and is designed to be within reach of grade 5-9 students.
Curricula topics	Physics, technology, IT
Competencies	Scientific investigation, IT competencies, Data Collection, Conversion and Analysis.
Educational approach	Issues of scientific learning in young people's schooling must be addressed with appropriate educational tools. In fact, the natural curiosity that arises in young people when they observe what surrounds them must be stimulated. This connection with reality is therefore important to introduce the bases of scientific education to interpret reality. One of the objectives is therefore to relate the role of observation, with practical tools accessible to young people, such as smartphones and tablets.
Learning Activities (LA)	Phases of the learning scenario, in relation to the FabCitizen framework
LA1	General presentation of the problem aimed to define: - objectives of the experience; - data collection and interpretation.
LA2	Using the Accelerometer tool, allow the smartphone to fall down onto a pillow. Using the

	data recorded, determine the acceleration due to gravity.
LA3	Worksheets completion
LA4	Worksheets proofreading
Roles	Teachers: they conduct the entire experience, present the objectives, introduce the sensors, discuss with the students to figure out their level of understanding and comment on worksheets correction.
Tools and Materials	Smartphones, worksheets, pencils

LEARNING SCENARIO	IT4 (English Version)
Learning Scenario Title	IT4 Accelerometer focus and gravity force (Part 2)
Description	In this scenario we examine the relationship between the sensor called "Accelerometer", used to measure linear speed variations in the 3 directions of space, and the "Gravimeter", used to evaluate the 3 components of the G-force.
Context / Target group	This experience is designed to let students understand the functioning of two important sensors used to analyze movement, such as the accelerometer and the gravity sensor. The learning scenario is suitable for a wide range of citizens and is designed to be within reach of grade 5-9 students.
Curricula topics	Physics, technology, IT
Competencies	Scientific investigation, IT competencies, Data Collection, Conversion and Analysis.
Educational approach	Issues of scientific learning in young people's schooling must be addressed with appropriate educational tools. In fact, the natural curiosity that arises in young people when they observe what surrounds them must be stimulated. This connection with reality is therefore important to introduce the bases of scientific education to interpret reality. One of the objectives is therefore to relate the role of observation, with practical tools accessible to young people, such as smartphones and tablets.
Learning Activities (LA)	Phases of the learning scenario, in relation to the FabCitizen framework
LA1	General presentation of the problem aimed to define: - objectives of the experience; - data collection and interpretation.
LA2	Study g-forces in all dimensions by using the G-Force measuring tool. Try orienting the

	smartphone differently, and seeing the effect on the total and individual g-force axes. Try to get the device to read - if only temporarily - a g-force of 0 in all dimensions at the same time.
LA3	Worksheets completion
LA4	Worksheets proofreading
Roles	Teachers: they conduct the entire experience, present the objectives, introduce the sensors, discuss with the students to figure out their level of understanding and comment on worksheets correction.
Tools and Materials	Smartphones, worksheets, pencils

LEARNING SCENARIO	IT5 (English Version)
Learning Scenario Title	IT5 Walking diagrams (in relazione con progetto IT1)
Description	The sensors inside smartphones allow tracking various parameters with high precision. These parameters are able to describe many qualities of a walking path, thanks to the accelerometer and gravimeter sensors seen in detail from previous experiences.
Context / Target group	Application designed to quantitatively and qualitatively evaluate a walking path, and the relationship between various parameters such as accelerations' componentes and gravity forces. The learning scenario is suitable for a wide range of citizens and is designed to be within reach of grade 5-9 students.
Curricula topics	Physics, technology, IT
Competencies	Scientific investigation, IT competencies, Data Collection, Conversion and Analysis.
Educational approach	The physics topics present in the experience are introduced referring to phenomena and actions of daily life, trying to give a simple but accurate explanation of what we observe, illustrating the models and the physical principles that underlie these phenomena. Mathematical formalization is reduced to the strictly minimum needed. The topics are complemented by demonstrations, to make the experimental approach even more noticeable. Great importance is given to the observation and description of the phenomena through the critical analysis of the collection of data.
Learning Activities (LA)	Phases of the learning scenario, in relation to the FabCitizen framework
LA1	General presentation of the problem aimed to define: - objectives of the experience; - field activities;

	- data collection and interpretation.
LA2	Field experiment: walking with the smartphone, attached to the back or chest area, facing different path conditions. Collect data while walking using the g-Force or Accelerometer tools.
LA3	Data collection: export the data obtained in csv format, import into a spreadsheet and create graphs
LA4	Data interpretation: compare graphs between different path conditions. Identify patterns.
LA5	Worksheets completion
Roles	Teachers: they conduct the entire experience, present the objectives, introduce the sensors, discuss with the students to figure out their level of understanding and comment on worksheets correction.
Tools and Materials	Smartphones, computers, worksheets, pencils

LEARNING SCENARIO	IT6 (English Version)
Learning Scenario Title	IT6 Cultural Heritage Accessibility
Description	Exploring the role of Higher Education Institutions as incubators of the next generation open science citizens, in terms of staff and student skills, curricula and interdisciplinarity in the area of cultural heritage. Students will be involved in mapping the accessibility of cultural sites and heritage of a reference context identified as a pilot project.
Context / Target group	While the cultural heritage professionals of tomorrow – students and PhDs – are a vital target audience both in terms of developing and transferring the insights gained through the project, other stakeholder communities will be involved in FabCitizen too, including amateur culture enthusiasts and non-specialized European citizens.
Curricula topics	Arts, social science, history, Technology
Competencies	CT 10 Social, CT17 Internet Use, CT7 Data, CT16 Information Retrieval
Educational approach	The educational approach to the activity starts from the fundamental concept of accessibility to culture for all, providing for an important collective need. It will start from the concept of the person with a disability as a product of environmental, physical and social factors and then move on to the analysis of indicators and implementation tools in a broad and multidimensional key. A first set-up phase will explain the project, and the most important markers and theoretical topics involved. Also the pilot project is introduced, with its main features. After the data acquisition, visualization and results will be presented and discussed with pupils.
Learning Activities (LA)	Phases of the learning scenario, in relation to the FabCitizen framework

LA1	**Up to go** General presentation of the problem: brief, but focused on important points: - Aim; - Measurements; - Activities on field;
LA2	**Quescussion** Contextualization from students about the whole problem, to understand if the “global picture” about previous explained concepts is clear.
LA3	**Experiment design** Explanation of the experiment and the pilot project. Drafting of the itinerary with choice of spaces and objects to be analyzed. Shared drafting of the grid of indicators for the evaluation of accessibility standards: 1. Mobility 2. Orientation 3. Accessibility 4. Usability 5. Communication 6. Information 7. Understandability and ease of use 8. Autonomy 9. Security 10. Pleasantness
LA4	**Take the field!** Field surveys and mapping according to the designed itinerary. Showing data merging and data analysis.
LA5	**Outcome** Analysis of collected data. Shared construction of a heat map for data interpretation and visualization.
Roles	External expert: to conduct the whole learning scenarios, and to lead pupils and teacher to an understanding of concepts and needed activities; data merging and data analysis presentation. Teachers: they will conduct the on-field

	experiment; they can focus on the subject's concepts about the experimentation to teach to the pupils.
Tools and Materials	Smartphone or dedicated smart-object with evaluation questionnaires and data collection

LEARNING SCENARIO	IT7 (English Version)
Learning Scenario Title	IT7 Compass and GPS
Description	This is a preliminary activity to the project of "interactive tourist map construction" (IT11-12). It allows students to understand the functioning of two sensors, present in the smartphone, which provide geolocation, called GPS and Compass.
Context – Grade of students	In fact, thanks to GPS, it is possible to calculate the position of the smartphone referring to its distance from the satellites that it connects to, and the compass allows the user to calculate the position of north and therefore the orientation of the smartphone in space. The learning scenario is suitable for a wide range of citizens and is designed to be within reach of grade 5-9 students.
Curricula topics	Physics, technology, IT
Competences	Scientific investigation, IT competencies, Data Collection, Conversion and Analysis.
Educational approach	
Learning Activities (LA)	Phases of the learning scenario, in relation to the FabCitizen framework
LA1	General presentation of the problem aimed to define: - objectives of the experience; - data collection and interpretation.
LA2	Discussion: contextualization of the topic with students, to understand their level of understanding of the subject.
LA3	Start the "compass" application and compare the reading with a real compass to determine its accuracy; observe the behavior of the two devices when placed in contact with a magnet.
LA4	Worksheets completion

LA5	Worksheets proofreading
Roles	Teachers: they conduct the entire experience, present the objectives, introduce the sensors, discuss with the students to figure out their level of understanding and comment on worksheets correction.
Tools and services	Smartphones, worksheets, pencils

LEARNING SCENARIO	IT8 (English Version)
Learning Scenario Title	IT8 Image sensor
Description	An image sensor is a sensor that detects and conveys the information used to create a picture. It actually converts the variable attenuation of light waves (as they pass through or reflect onto objects) into signals, small pulses of current that transmit the information.
Context – Grade of students	Nowadays, every smartphone is equipped with image sensors, allowing users to have an image data acquisition tool at their fingertips at all times. The learning scenario is suitable for a wide range of citizens and is designed to be within reach of grade 5-9 students.
Curricula topics	Physics, technology, IT
Competences	Scientific investigation, IT competencies, Data Collection, Conversion and Analysis.
Educational approach	
Learning Activities (LA)	Phases of the learning scenario, in relation to the FabCitizen framework
LA1	General presentation of the problem aimed to define: - objectives of the experience; - data collection and interpretation.
LA2	Discussion: contextualization of the topic with students, to understand their level of understanding of the subject.
LA3	Using the camera application enter manual mode. Manually control the shutter speed to appreciate how the exposure of the image depends on its value. If possible use a setting that allows users to highlight overexposed and underexposed areas. Compare results by taking screenshots of the smartphone display

LA4	Worksheets completion
LA5	Worksheets proofreading
Roles	Teachers: they conduct the entire experience, present the objectives, introduce the sensors, discuss with the students to figure out their level of understanding and comment on worksheets correction.
Tools and services	Smartphones, worksheets, pencils

LEARNING SCENARIO	IT9 (English Version)
Learning Scenario Title	IT9 QR code: what is it and how to create one
Description	A QR code is a two-dimensional barcode, i.e. a matrix code, composed of black modules arranged within a white square pattern, typically used to store information intended to be read by a special optical reader or even smartphone.
Context – Grade of students	Thanks to QR codes it is possible to spread useful information in an optimized way, simply by framing them. QR codes are interesting for this scenario because they do not require a special optical reader to be used, but only a simple smartphone. In the scenario it will be shown how to realize QR codes, how much information they can transmit and how. The learning scenario is suitable for a wide range of citizens and is designed to be within reach of grade 5-9 students.
Curricula topics	Technology, IT
Competences	Scientific investigation, IT competencies, Data Collection, Conversion and Analysis.
Educational approach	
Learning Activities (LA)	Phases of the learning scenario, in relation to the FabCitizen framework
LA1	General presentation of the problem aimed to define: - objectives of the experience; - data collection and interpretation.
LA2	Discussion: contextualization of the topic with students, to understand their level of understanding of the subject.
LA3	Creating a QR code and exploring its potential: how much data it can store, how its actual dimensions affect its functionality
LA4	Worksheets completion

LA5	Worksheets proofreading
Roles	Teachers: they conduct the entire experience, present the objectives, introduce the sensors, discuss with the students to figure out their level of understanding and comment on worksheets correction.
Tools and services	Smartphones, worksheets, pencils

LEARNING SCENARIO	IT10 (English Version)
Learning Scenario Title	IT10 Coding & Scratch (in relazione con IT2 e IT3)
Description	The literal meaning of coding is "computer programming." Often this discipline is associated with teaching as it is based on computational thinking, that group of mental processes used to solve problems. To extend this valuable learning system to primary and secondary education, Scratch has been created, a block programming environment for coding and for educational robotics.
Context – Grade of students	Scratch is an intuitive tool, because it allows users to program with a visual language, and thus can be used by anyone. The learning scenario is suitable for a wide range of citizens and is designed to be within reach of grade 5-9 students.
Curricula topics	Technology, IT, coding
Competences	Scientific investigation, IT competencies, Data Collection, Conversion and Analysis.
Educational approach	
Learning Activities (LA)	Phases of the learning scenario, in relation to the FabCitizen framework
LA1	General presentation of the problem aimed to define: - objectives of the experience; - data collection and interpretation.
LA2	Discussion: contextualization of the topic with students, to understand their level of understanding of the subject.
LA3	Fundamentals of programming with the scratch language: coding a simple animated greeting card.
LA4	Worksheets completion

LA5	Worksheets proofreading
Roles	Teachers: they conduct the entire experience, present the objectives, introduce the sensors, discuss with the students to figure out their level of understanding and comment on worksheets correction.
Tools and services	Smartphones, worksheets, pencils

Learning Scenario ID	**DE1**
Learning Scenario Title	AppInventor 1: Outdoor App - Plant List
Main ideas and description	This learning scenario serves as a preparation for the greater “Outdoor Computing application”. In the first step, a plant list app should be implemented in AppInventor to be able to collect plants and add them into a list.
Context – Grade of students	From grade 5-9
Curricula topics	Biology: ● nature, plants Computer science: ● Content field 1 (information and data) ○ data management and data storage ○ model and implement an application using a data structure in a programming language ● Content field 2 (algorithms) ○ Modify programs ○ analyze and test algorithms and programs ○ create syntactically correct programs
Competencies (add link to the framework)	● example competencies from the framework _____ ● Understanding and creation of lists ● Add items to a list ● Using techniques for managing data
Educational approach	Explorative approach
Learning Activities	4 learning activities

LA 1 : Context	The teacher introduces the purpose of the task. The nature, the plants and the biodiversity should be investigated in the local area of the children.
LA 2 : Doing	Students get the task to edit the worksheet. In the first step they create the UI and in a second step they create the building blocks.
LA 3: Exploration	Students get the task to use the plant list application and to identify errors.
LA 4: Problem solving	The students should identify errors in the app (step before) and should be able to correct them.
Roles	• Students • Teachers • Additional persons for support
Tools and services	**Worksheet (english):** Worksheet Step by Step to the plant list application **Worksheet (german):** Arbeitsblatt 5: Schritt für Schritt zur Pflanzen-Listenapp Android tablets and a tablet pen **MIT Appinventor** - http://appinventor.mit.edu/

Learning Scenario ID	**DE2**
Learning Scenario Title	AppInventor 2: Outdoor App - Part 2
Main ideas and description	In the outdoor app there should be the possibility to add a plant name, a plant foto and also the location where the plant was retrieved. In the further extension of the outdoor app it should be possible to edit the entries in the app. After adding a plant, the plant name, its location and the photo should be displayed in a list view. The plants are saved in a list which is going to be saved in a database (TinyDB). When the app is reopened, the data is loaded from the local database and is displayed again.
Sources	Own created
Context – Grade of students	From grade 5-9
Curricula topics	Biology: ● nature, plants Computer science: ● Content field 1 (information and data) ○ data management and data storage ○ model and implement an application using a data structure in a programming language ● Content field 2 (algorithms) ○ Modify programs ○ analyze and test algorithms and programs ○ create syntactically correct programs
Competencies -	● Understanding and creation of lists ● Add items to a list ● Using techniques for managing data
Educational approach	● Explorative approach
Learning Activities	4 learning activities
LA1: Context	The teacher introduces the purpose of the task. The nature, the plants and the biodiversity should be investigated in the local area of the children.
LA2: Act	Students get the task to edit the worksheet. In the first step they create the UI and in a second step they create the building blocks.

LA3: Test	Students get the task to use outdoor application.
LA4: Identification	The students should identify errors in the app (step before).
LA5: Error correction	The students should be able to correct the errors.
Roles	• Students • Teachers • Additional persons for support
Tools and services	**Worksheet (english):** Worksheet Outdoor App 2.docx **Worksheet (german):** Arbeitsblatt Outdoor App

Learning Scenario ID	**DE3**
Learning Scenario Title	What is a database
Main ideas and description	The main idea is to increase the understanding of a database in general and to enable the students to know the difference between local and online databases.
Context – Grade of students	From grade 5-9
Curricula topics	Computer science: ● Content field 1 (information and data) ○ Data acquisition, data processing and data management and data storage ○ model and implement an application using a data structure in a programming language
Competencies	● Understanding databases ● Data management ● Understanding the difference between a local and a global database ● Understanding the principle of data storage
Educational approach	Self learning
Learning Activities	3 learning activities
LA 1 : Context	The teacher introduces the purpose of the task.
LA 2 : Doing	Students get the task to edit the worksheet.
LA 3: Check	The students check their results and the solution words.
Roles	● Students ● Teachers ● Additional persons for support
Tools and services	**Worksheet (english):** What is a database? **Worksheet (german):** Arbeitsblatt 6: Was ist eine Datenbank Android tablets and a tablet pen **MIT Appinventor** - http://appinventor.mit.edu/

Learning Scenario ID	**DE04**
Learning Scenario Title	AppInventor: Teachable machine
Main ideas and description	A teachable machine is developed in AppInventor. The basic idea of the Teachable Machine is to teach the program or the computer to recognize certain images, sounds and visual material. As part of the worksheet, images are captured and classified using the Look Extension. Afterwards, students can try out google's teachable machine and train their own model.
Context – Grade of students	From grade 5-9
Curricula topics	Computer science: ● Content field 2 (algorithms) ○ Modify programs ○ The students recognize that machines do not have an intelligence of their own, but that the control of computer systems up to systems with "artificial intelligence" are based on algorithms that are designed by humans. ○ design algorithms using the variable concept and control structures (MI). ● Superordinate competency requirements (Argumentation) ○ explain and evaluate informatics modeling, computer programs and computer systems
Competencies	● Understanding artificial intelligence ● Programming ○ Import of extensions into a program ○ Using logic in programs ● UI Design
Educational approach	Explorative approach
Learning Activities	3 learning activities
LA 1 : Context	The teacher introduces the purpose of the task.
LA 2 : Doing	Students get the task to edit the worksheet. The students try out their program and Google's Teachable Machine.
LA 3: Check	The students try out their teachable machine and check the results.
Roles	● Students ● Teachers ● Additional persons for support
Tools and services	**Worksheet (english):** Worksheet Teachable Machine

	Worksheet (german): Arbeitsblatt Teachable Machine Android tablets and a tablet pen **MIT Appinventor** - http://appinventor.mit.edu/

Learning Scenario ID	**DE05**
Learning Scenario Title	AppInventor: Creation of a country capital app with the Tiny Web DB
Main ideas and description	The present scenario is a basic scenario to prepare the students to assess data literacy competencies to be able to handle data. This learning scenario is based on the AppInventor application where building blocks and UI-elements can be used to create a low-code based application. A land capital app is being developed with the help of AppInventor. Countries and the corresponding capitals can be entered into this and also retrieved. The data is stored using the AppInventor associated database "TinyWebDB".
Context – Grade of students	Own created TinyDB scenario, based on the AppInventor platform: http://appinventor.mit.edu/
Curricula topics	Computer science: ● Content field 1 (information and data) ○ Data acquisition, data processing and data management and data storage ○ model and implement an application using a data structure in a programming language ○ process data using information technology (MI) systems, ● Content field 2 (algorithms) ○ Modify programs ○ analyze and test algorithms and programs (MI) ○ create syntactically correct programs (MI)
Competencies -	● Programming ● Data storage ● UI Design ● Data retrieval ● Knowledge of cities and their capitals
Educational approach	Explorative approach
Learning Activities	3 learning activities
LA 1 : Context	The teacher introduces the purpose of the task.
LA 2 : Doing	Students get the task to edit the worksheet.

LA 3: Check	The students check their results and the solution words.
Roles	• Students • Teachers • Additional persons for support
Tools and services	**Worksheet (english):** Worksheet Create a TinyWebDB - Country Capital.docx **Worksheet (german):** Arbeitsblatt 8: TinyWebDB - Land-Hauptstadt-App Android tablets and a tablet pen **MIT Appinventor** - http://appinventor.mit.edu/

Learning Scenario ID	**DE06**
Learning Scenario Title	AppInventor: Creating a database (TinyDB)
Main ideas and description	The present scenario is a basic scenario to prepare the students to assess data literacy competencies to be able to handle data. This learning scenario is based on the AppInventor application where building blocks and UI-elements can be used to create a low-code based application. A TODO-list application is built with the AppInventor to learn to save data in the local tinydb (database). The app can capture entries, save entries and also display entries.
Sources	Own created TinyDB scenario, based on the AppInventor platform: http://appinventor.mit.edu/
Context – Grade of students	From grade 5-9

Curricula topics	• Content field 1 (information and data)
	  ○ Data acquisition, data processing and data management and data storage
	  ○ model and implement an application using a data structure in a programming language
	• Content field 2 (algorithms)
	  ○ Modify programs
	  ○ analyze and test algorithms and programs (MI)
	  ○ create syntactically correct programs (MI)

Competencies	• Database • Data structure • Data storage
Educational approach	Explorative approach
Learning Activities	3 learning activities
LA1: Introduction to the topic	The teacher introduces the purpose of the task.

LA2: Worksheet editing	Students get the task to edit the worksheet.
LA3: Check	The students check their results and check whether the information is stored in the database.
Roles	• Students • Teachers • Additional persons for support
Tools and services	**MIT Appinventor** - http://appinventor.mit.edu/ Tablet and a tablet pen **Worksheet (english):** Worksheet Creating a TODO list.docx **Worksheet (german):** Arbeitsblatt 7: Anlegen einer TinyDB TODO Liste

Learning Scenario ID	**DE08**
Learning Scenario Title	AppInventor: Creation of a Scavenger Hunt Quiz
Main ideas and description	In the following scenario, a scavenger hunt app is developed using the AppInventor coding platform. With the help of this scavenger hunt app, QR codes can be scanned, solution words entered, checked and approved. In addition, a completion screen is displayed when one has successfully solved the scavenger hunt. In the following learning scenarios DE09 and DE10, two examples of scavenger hunt tasks are given. These can be extended as desired
Sources	Own created
Context – Grade of students	From grade 5-9
Curricula topics	Computer science ● Content field 1 (information and data) ○ data management and data storage ○ model and implement an application using a data structure in a programming language ● Content field 2 (algorithms) ○ Modify programs ○ analyze and test algorithms and programs (MI) ○ create syntactically correct programs (MI) Media competency framework ● Problem solving and modeling ○ Principles of the digital world ○ Recognizing algorithms ○ Modeling and programming
Competencies	● Data storage and databases ● Different databases and data formats ● Saving and receiving data ● Programming ● Data structure: list
Educational approach	Explorative approach
Learning Activities	3 learning activities
LA1: Introduction to the topic	The teacher introduces the purpose of the task.
LA2: Worksheet	Students get the task to edit the worksheet and to program the scavenger hunt quiz.

editing	
LA3: Check	The students check their results and check whether the information is stored in the database. Furthermore, they check whether the QR-Scan is working and and whether the unlocking of the next catches as well as the route function works properly.
Roles	• Students • Teachers • Additional persons for support
Tools and services	Tablet and a tablet pen **Worksheet (english):** Worksheet Scavenger Hunt Quiz **Worksheet (german):** Arbeitsblatt Schnitzeljagd **MIT App Inventor** - http://appinventor.mit.edu/

Learning Scenario ID	**DE09**
Learning Scenario Title	Task for the Scavenger Hunt Quiz (Lists)
Main ideas and description	In the previous scenario, a scavenger hunt app was built that allows you to scan the QR codes and see a map of where the next Catch is. This scenario and the next one are about worksheets that can be placed at the stations to find a solution word that can then be entered into the previously programmed app. This puzzle sheet deals with lists
Sources	Own created
Context – Grade of students	From grade 5-9
Curricula topics	Computer science ● Content field 1 (information and data) ○ Knowledge of the data structure “list” ● Content field 2 (algorithms) ○ Analysis of algorithms Mathematics ● Content field (arithmetic / algebra) ○ concrete handling of numbers through variables
Competencies	● Analysis and interpretation of algorithms ● Knowledge of the data structure “list”
Educational approach	Explorative approach
Learning Activities	3 learning activities
LA1: Introduction to the topic	The teacher introduces the purpose of the task.
LA2: Worksheet editing	Students get the task to edit the worksheet.
LA3: Check	The students check their results and check if the solution word makes sense.
Roles	● Students ● Teachers ● Additional persons for support
Tools and services	Tablet and a tablet pen **Worksheet (english):** Work sheet Scavenger hunt quiz - lists **Worksheet (german):** Schnitzeljagd 5: Listen

	MIT Appinventor - http://appinventor.mit.edu/

Learning Scenario ID	**DE10**
Learning Scenario Title	Task for the Scavenger Hunt Quiz (Min Max Function)
Main ideas and description	In the previous scenario, a scavenger hunt app was built that allows you to scan the QR codes and see a map of where the next Catch is. This scenario and the next one are about worksheets that can be placed at the stations to find a solution word that can then be entered into the previously programmed app. This puzzle sheet deals with lists and how to find the minimum and maximum of a list.
Sources	Own created
Context – Grade of students	From grade 5-9
Curricula topics	Computer science ● Content field 1 (information and data) ○ Knowledge of the data structure “list” ● Content field 2 (algorithms) ○ Analysis of algorithms ○ Understanding of variables ○ reflect on the design process and also describe it in technical language ○ evaluate the problem adequacy of an algorithm Mathematics ● Content field (arithmetic / algebra) ○ concrete handling of numbers through variables
Competencies	● Knowledge of the concept “variables” ● Reading and interpreting algorithms / program code ● Reflect on the design process of the algorithm and also describe it in technical language
Educational approach	Explorative approach
Learning Activities	3 learning activities
LA1: Introduction to the topic	The teacher introduces the purpose of the task.
LA2: Worksheet editing	Students get the task to edit the worksheet.
LA3: Check	The students check their results and check whether the solution word makes sense.
Roles	● Students ● Teachers ● Additional persons for support

Tools and services	Tablet and a tablet pen **Worksheet (english):** Worksheet Scavenger Hunt Quiz - Min - Max Function **Worksheet (german):** Schnitzeljagd - Min Max Funktion **MIT Appinventor** - http://appinventor.mit.edu/