

SAINT MINECRAFT Guide



SAINT

HANDS ON INTRODUCTION TO ARTIFICIAL
INTELLIGENCE IN PRIMARY EDUCATION
USING MINECRAFT

30.10.2023

EKVASIS

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Project Number: 2022-1-FR01-KA220-SCH-000087794



Co-funded by
the European Union

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

REVISION HISTORY

Version	Date	Author	Description	Action	Pages
1.0	30/10/2023	EKVASIS	Creation	C	TBS

(*) Action: C = Creation, I = Insert, U = Update, R = Replace, D = Delete

REFERENCED DOCUMENTS

ID	Reference	Title
1	2022-1-FR01-KA220-SCH-000087794	SAINT Proposal
2		

APPLICABLE DOCUMENTS

ID	Reference	Title
1		
2		

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1. Introduction

1.1 The scope of the Project

Through Minecraft environments, the SAINT project seeks to educate instructors and students about artificial intelligence (AI). SAINT fills a gap in the majority of curriculum by providing a way for students and teachers to continue their peer-to-peer interactions while also addressing the urgent need for technology and distant learning techniques. Project-based learning will be used as its instructional technique (PBL). Consequently, Minecraft will aid in education.

PBL is an effective teaching method that encourages collaboration and experimentation as ways to learn. It also helps students get motivated to work for a shared goal. These are all just transferable skills from the virtual to the real world.

The need and supply of AI-related talents and competencies differ, despite the EU's belief that these skills are crucial for the twenty-first century and the fact that they are rarely taught in European schools. The SAINT project's AI adventures in Minecraft will satisfy this need by developing an educational package that will spread knowledge of AI and address its real-world applications in our society. By doing this, educators and students will be better prepared to comprehend the challenges that artificial intelligence (AI) may confront in the future and will have a more practical knowledge of the subject.

1.2 Target Groups

The SAINT project's main audience consists of curriculum writers, higher education instructors, and kids between the ages of 9 and 12. These teachers will either be involved in STEM education or will be somewhat interested in and knowledgeable about artificial intelligence (AI) and/or Minecraft. Additionally, the project is intended for STEM centers who want to increase the number of products in their inventory or their product library that advances AI competence, as well as higher education institutions that collaborate with government agencies or enterprises to deliver educational resources. More broadly, businesses, associations, or networks that provide parents and/or educators with instructional materials on artificial intelligence (AI). Examples of these include coding clubs, adult education centers, business coaching services, and continuing education facilities. This is because game-based learning has demonstrated efficacy across all age groups, indicating possible advantages of utilizing digital learning settings.

1.3 The scope of this output

This manual's objective is to give educators the useful technical know-how they need to utilize SAINT's resources and design custom Minecraft learning pathways.

Furthermore, it offers instruments for verifying the educational paths, enabling the assessment of students' growth and dedication, as well as their individual advancement in utilizing PBL methodology inside the classroom.

2. Minecraft overview

2.1 What is Minecraft?

Minecraft is a popular sandbox video game created by Markus Persson and later developed and published by Mojang Studios (now a subsidiary of Microsoft). It was first released in 2011 and has since become one of the best-selling video games of all time. Minecraft is known for its open-world, block-based, and procedurally generated gameplay.

In Minecraft, players are placed in a vast, open world composed of various biomes, landscapes, and environments. The game world is made up of blocks representing different materials such as dirt, wood, stone, and ores. Players can gather these blocks, craft tools and items, and use them to build structures, mine resources, explore caves and dungeons, and interact with the environment in a highly creative and open-ended way.

There are many game modes available in Minecraft. In Survival mode, players must keep track of their health, resources, and enemy encounters. In Creative mode, players have unrestricted access to materials and may construct and create anything they want. The game's potential are further expanded by the availability of several mods and user-generated material.

There is a large online community for Minecraft, and players can join multiplayer servers to play minigames, work together, or go on different adventures. The game's popularity may be attributed to its inventiveness, ease of use, and the flexibility it gives users to create and customize their own virtual environments.

2.2 A detailed overview of Minecraft Education Edition

Minecraft Education Edition is an educational adaptation of Minecraft designed for classroom use. It offers educators a tool to enhance learning by focusing on creativity, collaboration, problem-solving, and subject-specific skills. This classroom-friendly version is compatible with various platforms, including Windows, Mac, and iPad, and it features a library of pre-designed lesson plans and educational activities, enabling teachers to integrate the game into their curriculum. Students can engage in collaborative projects, explore virtual worlds, learn coding basics, and use the game to understand complex concepts in a hands-on manner. With teacher controls, accessibility features, and professional development resources, Minecraft Education Edition provides an interactive and inclusive educational experience.

2.2.1 Where can I play Minecraft

Devices that support Minecraft: Education Edition are Windows 7, 8.1, 10, and 11, Macs, iPads, Chromebooks and Mobile. Review Supported platforms for Minecraft: Education Edition for more information on available platforms.

2.2.2 Data Privacy

Minecraft: Education Edition takes data privacy seriously and is designed to be used in compliance with COPPA, CCPA, FERPA, and Microsoft's Privacy Statement and General Data Protection Regulation (GDPR). *Minecraft: Education Edition* processes data per the Microsoft Privacy Statement and the underlying agreement in place with the school or organization that purchased *Minecraft: Education Edition* for your use. For Microsoft enterprise products, including Office 365 Education, Microsoft 365, and *Minecraft: Education Edition*, Microsoft, as the data processor, will:

- Not collect or use student personal data beyond that needed for authorized educational or school purposes.
- Not sell or rent student personal data,
- Not use or share student personal data for advertising or similar commercial purposes, such as behavioral targeting of advertisements to students.
- Not build a personal profile of a student, other than for supporting authorized educational or school purposes or as authorized by the parent, guardian, or student of appropriate age.
- Require that our vendors with whom student personal data is shared to deliver the educational service, if any, are obligated to implement these same commitments for student personal data.

Source: User Privacy and Minecraft: Education Edition webpage

2.2.3 Minecraft License

To commence your *Minecraft Education Edition* (M:EE) experience, obtaining a *Minecraft Education License* is essential, available in two variants: academic and commercial. Before delving into crafting courses on M:EE, familiarizing yourself with the software's navigation is crucial. It's worth noting that intricate world edits may necessitate back-end coding. Upon launching the game, users will encounter a prompt to log in with their credentials. Explore the licensing information to determine the eligibility of your institution for specific programs. Alternatively, individuals can initiate a trial using their personal email, offering limited attempts at exploring *Minecraft* worlds. While a free trial is an option, acquiring a license is strongly recommended, especially as certain setup procedures may require restarting the game.

When you open the game:



This is the title screen. Depending on the version you're playing in, the background may alter. You can find the version of your game by looking at the lower right corner of the screen. Each of the buttons that appear on screen serve a different role:

- **Play:** Navigate to the menu where you will be able to either play, create or join a Minecraft world.
- **New & Featured:** Opens a library with promoted material that gets updated from time to time.
- **Settings:** Opens a menu where it lets you configure settings (more on the “Configure Settings” section)
- **Switch Accounts:** Opens the log-in window where you can change your log in information.
- **“Hanger Icon”:** Change your appearance
- **?:** Redirects you to the [Minecraft: Education Edition community hub](#).

2.3 Description of a typical party and the different goals, depending on the selected mode (survival, creative)

While in survival mode, the player can explore the planet at will, but their movement is restricted, and they must gather their own resources to stay alive.

In creative mode, the player has unrestricted resources, the ability to fly, and invincibility.

The player has a few more restrictions in adventure mode than in survival, but the purpose of this mode is to lead the player through a narrative without allowing them to interact with the environment in a way that would cause it to be destroyed.

2.4 Key bindings

You must find your way around the game once you've unlocked the globe. You may use your keyboard and mouse to navigate. The keyboard's buttons that need to be pressed are:

KEY	USAGE	KEY	USAGE
W	Move forward	E	Open inventory
A	Move left	Q	Throw selected object
S	Move backward	T	Open the chat
D	Move right	C	Open code builder
SPACE	Jump (double SPACE to fly when runs in creative mode)	/	Open chat and automatically add first character as "/"

You can point the direction also by moving your mouse.

3. Minecraft in classroom

3.1 Technical skills

To create your own challenges and learning paths in Minecraft: Education Edition, the required knowledge will vary depending on the complexity of the world you want to build. At a basic level, comfort with using Minecraft and its controls in creative mode is essential. While there are more advanced tools available for game infrastructure construction (e.g., Minecraft WorldEdit, VoxelSniper), they are not mandatory.

If you wish to implement non-player characters (NPCs) with multiple text boxes, a basic understanding of JavaScript or minimal programming knowledge is helpful. This knowledge allows you to replicate template files available online or extract them from existing projects. Additionally, you can opt to insert custom entities into the game using a tool like Blockbench. This means you'll need the skills to create 3D models, although Blockbench offers a user-friendly interface for this purpose.

The Minecraft: Education Edition (M:EE) platform offers several tools that learners can use as a learning journal. These tools include:

1. **Book and Quill** (accessible through the Items tab or via the slash command `/give @s writable_book`): The Book and Quill is particularly useful for documenting stories and serves as an essential tool for recording one's learning journey. Learners can use it to take notes, document their findings, store images, and export their work from M:EE for later study or teacher review. Players can insert pictures taken with the Camera tool into a portfolio book and make text edits. After editing their book, players can click "Sign" to customize the cover and "sign" it, effectively locking the book's content.

Once locked, even the author cannot make changes, and the book appears in purple in the inventory.

Clicking on the book in the inventory opens it for exporting. The default export filename is <Book Title> <Author Name>, and it's typically saved in the documents folder.

The exported book is a ZIP file, with picture pages saved as JPEG files and text on the pages saved as TXT files.

2. The **Portfolio**, which can be found in the creative inventory or acquired via the /give command, functions similarly to the Book and Quill. Its primary purpose is to serve as a repository for the images that learners have captured within the M:EE world. The Portfolio acts as a convenient storage space for all the pictures taken during gameplay. Unlike the Book and Quill, it doesn't function as a detailed journal but instead offers a quick and accessible "highlight reel" of lessons, showcasing the visual aspects of a student's journey or the various lessons they've completed in a course. All captured images are automatically saved in the Portfolio, making it a user-friendly and efficient tool. Just like the Book and Quill, the Portfolio can also be exported to an external file for safekeeping or further review.
3. The **Camera**, available in the Education Edition's creative inventory, is a tool that Minecraft users can employ to capture images and store them in the previously mentioned containers. It offers a more engaging approach compared to the simple act of taking a screenshot each time it's required. Using the Camera involves a minor process, like aiming the camera and configuring it, which makes note-taking less monotonous and more enjoyable. When you use the Camera from your inventory, it captures a first-person screenshot. Additionally, it can be placed to create a camera entity that follows the player and captures images from its perspective. If you want to take close-up snapshots of an item on the ground, you can do so by holding the Shift key while right-clicking.
4. The **Structure Block**, which can be accessed via commands like /setblock, /fill, or /give, is a unique feature in Minecraft that doesn't naturally appear but can be obtained through commands. It serves as a block used to save a specific area of your Minecraft World and export it as a 3D object in .obj file format. This allows learners to save their progress or submit it for review without being limited to the two dimensions of a picture. Generating 3D objects for assignments or study purposes is often more captivating to students because it offers a novel and engaging approach that differs from what they're accustomed to.
5. **Command Blocks**: In all versions of Minecraft, there are specific blocks known as command blocks. These blocks are designed to execute commands that players might not be able to perform on their own or accomplish as quickly. At the start of a lesson, command blocks can be activated, essentially serving as training aids for the players. Once the players have grasped the concept of the task at hand, these command blocks can be deactivated or turned off. This allows players to either repeat the task without the training aids or continue with the same task but complete it independently, without any assistance.

Some examples of what command blocks can enable for players include:

- Enabling flight
- Allowing block placement
- Granting additional blocks or resources to the player
- Increasing health
- Providing more resources
- Boosting speed and jumping abilities
- Activating night vision, and more.

These command blocks offer a range of capabilities that enhance the gameplay experience and support the learning process.

6. The **Code Builder** is an exclusive feature of the Minecraft: Education Edition (M:EE) platform. It allows players to establish commands that essentially provide them with the same effects as command blocks. The Code Builder can be configured either by the teacher or the students themselves. The Code Builder offers significant potential, which will be explored in more detail in subsequent sections.
Regarding scaffolding, the Code Builder can perform functions similar to command blocks, with the primary distinction lying in how they are set up and summoned. For instance, you can set up a scenario where there is a limited number of uses for command blocks, or you can use the Code Builder infinitely from any location within the game world.
7. **Multplayer Functionality:** Minecraft: Education Edition (M:EE) offers a user-friendly multiplayer server feature. With this functionality, teachers can directly show students how to accomplish specific tasks, offer immediate feedback, address questions, enable or disable command blocks, set up the Code Builder, and more. Further details on the capabilities of the multiplayer functionality will be explored in subsequent sections.
8. **Redstone** is a crucial element in Minecraft, serving as the game's version of basic circuits. It allows you to modify the game with a lesser impact compared to command blocks. Redstone components enable the creation of fundamental circuits such as combination locks, AND gates, OR gates, and more, which can be integrated into various in-game scenarios. Redstone contraptions can either operate behind the scenes or be visible, providing an engaging visual element for students.

3.2 Assessment and Grading

The SAINT methodology incorporates an evaluation procedure that assesses the user's achievement in various activities, with a focus on factors like user-friendliness, quality, user experience, and playability.

The use of recreational activities for educational purposes has a long history, and in today's education landscape, the integration of video games as a teaching tool is gaining prominence due to the growing

influence of information and communication technologies (ICT). Video games hold educational potential because they can create an immersive learning environment, allowing players to absorb and internalize new information seamlessly.

To implement SAINT in the classroom, educators should possess technical knowledge of Minecraft, creativity, expertise in the subject matter, problem-solving skills, teamwork capabilities, the ability to engage students effectively, an understanding of online safety, and familiarity with problem-based learning methodologies. Saint's validation process validates each of these components using a user-friendly assessment grid and checklist.

3.2.1 Grading Components

In the classroom:

- Student engagement and motivation.
- Development of social skills, encompassing teamwork, community building, taking on responsibilities, fostering imagination, curiosity, creativity, and ingenuity, enhancing concentration, organizational and planning skills, and boosting self-confidence.
- Assessment of problem-solving behavior.
- Tracking the progress of students in STEM subjects covered by SAINT and their overall academic performance.

Within a specific region, a cluster of educational institutions comprises:

- The number of students participating in the initiative categorized by their age, gender, and educational stage.
- Quantity of schools situated in challenging or underserved areas
- Classification of schools based on their environment, such as urban or rural, or designation within priority education zones.
- Assessment of the commitment of educators and educational institutions, encompassing the number of participants and the time invested, as well as their personal professional development.
- Integration of female students in technological processes.

4. Annexes

4.1 Quiz solutions

4.1.1 World 1

1. Learning



2. False



3. True



4. False



5. False



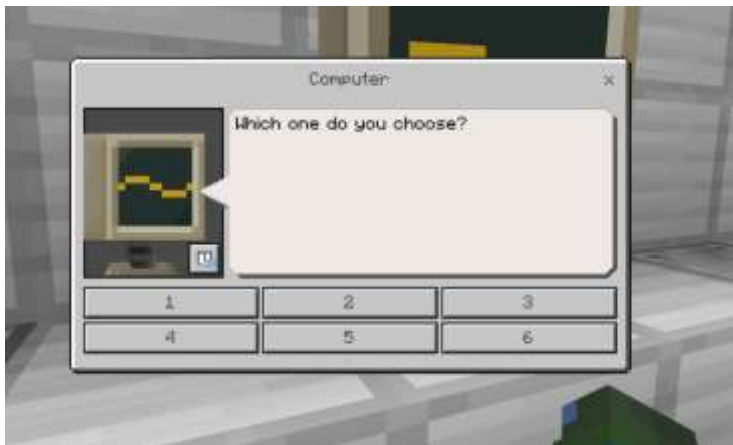
6. True



4.1.2 World 2

After you reach the Mars base, you talk with the computer, and you press right click on every box. Then you return to the computer to talk to it:

1. 1



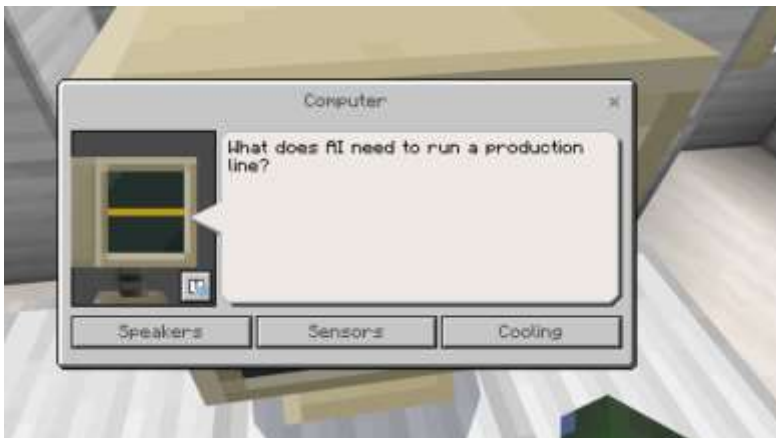
2. Then, you will have to put together some pieces. The correct combination is this:



3. 3



4. Sensors



5. Yes



6. With AI



7. Yes



8. Fifty-fifty



4.1.3 World 3

After following the instructions, the quiz part starts.

1. You press on the middle grey parts to create a whole gold part.

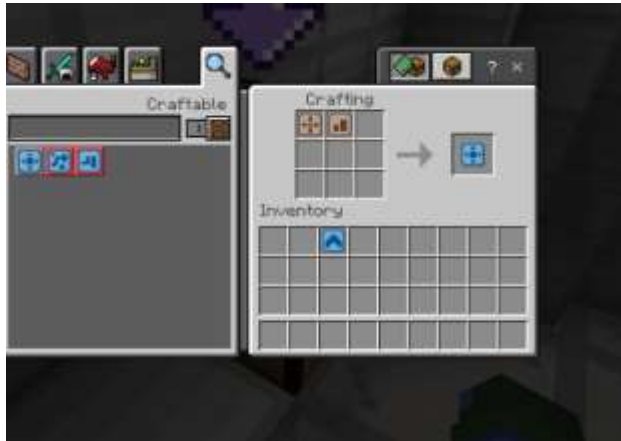


2. Inside the Dome tree, you will have to match the colors with the correct flowers.
The correct order is Dandelion, blue orchid, lilac, sugar cane, pink tulip, turtle.
3. There are missing words, and the correct answers are:



4.1.4 World 4

After following the instructions, you enter each room and choose from the crates the asking pieces to program correctly.



Be careful! You have this order and a correct answer:



**BUT: You will see error because it teaches you that AI makes mistakes as well.
Then, you must go to the computer again and complete a new puzzle.**

You start a new programming with the required combination of:



You will see again error because it needs further interaction.
Then, you must go to the computer again and complete a new puzzle.



A new quiz will start:

1. False



2. True



3. True

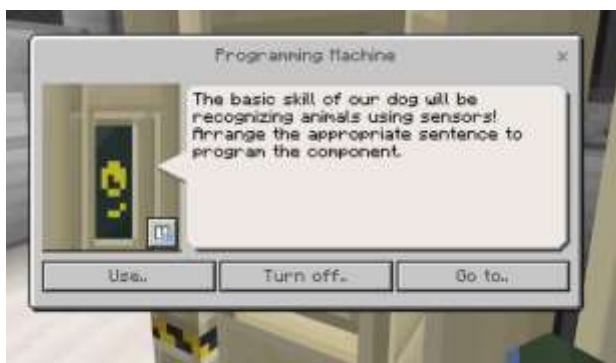


4. False



4.1.5 World 5

After following the instructions, you will have to choose each time the correct word/ phrase like that:



To get 5 components, you have to complete the 5 following sentences:

1.



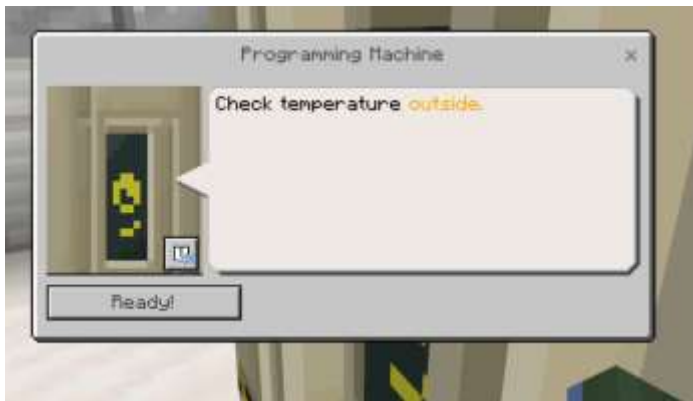
2.



3.



4.



5.



You will get 5 components in your inventory and you will have to put them in the purple box above the dog.

Then you go to the cows.

Be careful! There is no correct answer for that.



You follow the instructions to reach the landing pad and answer the final quiz!

1. AI



2. Fifty-fifty



3. Vision



4. False



5. Very likely



4.2 Troubleshooting

You must first download the “McWorld” files for the worlds to use the Minecraft Education Edition. These files will launch the Minecraft Education system immediately when you double-click on them. It will ask you to sign in using the account that you obtained a Minecraft Education license from Microsoft. The worlds need the newest for Minecraft Education to function correctly.

For Educational Organizations, there are free licenses to be acquired following these procedures. <https://educommunity.minecraft.net/hc/en-us/articles/360061371532-Purchasing-Options-for-Minecraft-Education-Edition-Licenses>

Another option will be to import the world manually. When loading the game, after adding your credentials, press play and then you will see on the right bottom part the “Import” button.

Are there any additional issues you run into when loading the world? Check to see whether any of these solutions may be useful.

PROBLEM: I download the worlds and it says import failed.

SOLUTION: That could happen for a number of reasons.

You could try importing the world manually, by opening the game, selecting play, and then select IMPORT on the bottom right of your screen. Then select the file. If this fails, check the steps below.

You could try closing and re-opening the Minecraft: Education Edition app. Maybe there was an import that didn't finish properly and that caused the game to fail to import the next worlds. Restarting your PC might also help.

Last resort solution: Change the name of the <name of world>.mcworld file to <name of world>.zip. This will turn the file into a zip file. Unzip the file and open it. Go to the manifest file and change the UUID using a UUID online generator. Zip the new folder and rename it to .mcworld. Try opening the world again.

Depending on the different error message, different actions have to happen, so if there is something specific addressed to you, like a numbered code or an explanation about why the import failed, feel free to check out the Minecraft education edition community for solutions to your problem.

PROBLEM: The world doesn't have any NPC in.

SOLUTION: That means that the BEHAVIOR PACK didn't load appropriately with the world. Exit the world (but not the Minecraft app). Find the world you are looking for and select SETTINGS. On the left side of your screen try to find the TAB that says BEHAVIOR PACKS. Then you will see two TABS on the main screen. ACTIVE PACKS and MY PACKS. Your behaviour pack should be in the tab MY PACKS, which you should click and select activate. If you are not sure what pack you need, go look at the ACTIVE PACKS and one of those should say that "This pack is missing". Find the Pack with the same name on the MY PACKS tab and activate it.

PROBLEM: The world has boards that have weird text, say something like board.act.1. NPC's have weird dialogue. ETC

SOLUTION: That means that the RESOURCE PACK didn't load appropriately with the world.

Exit the world (but not the Minecraft app). Find the world you are looking for and select SETTINGS. On the left side of your screen try to find the TAB that says RESOURCE PACKS. Then you will see two TABS on the main screen. ACTIVE PACKS and MY PACKS. Your behaviour pack should be in the tab MY PACKS, which you should click and select activate. If you are not sure what pack you need, go look at the ACTIVE PACKS and one of those should say that "This pack is missing". Find the Pack with the same name on the MY PACKS tab and activate it. *Check if you are facing both of these problems, go to both of these solutions*

PROBLEM: The world is in a different language.

SOLUTION: The worlds have been translated into different languages. Maybe you have a world that is in a different language than yours, find the appropriate language and start again. If this doesn't work, make the language of the Minecraft app is set to your preference. In the English version look for the English US option, not the UK.

4.3 Checklist

This checklist model is designed to help ensure that all essential components required for carrying out activities are in place. It should be customized to align with specific teaching scenarios. This checklist is intended for the teacher and individuals participating in the coordination and organization of these activities.

Training session plan / E-learning session plan

Item	Description (if needed)
Title	It is helpful to illustrate what will be learned during the lesson.
Required knowledge and skills	Giving the students this information enables them to revisit the ideas needed to finish the task and can function as a foundation for further instruction.
Day, date, and time, time required	
Target group and number of people	
Objectives of the session	What learning goals do you have for the students at the end of this session?
Methodology	Step-by-step session (with timing and responsibilities)
Space needed	Space requirements and type of class
Materials needed	Handouts and other training materials
Concrete outcomes of the session	What short and long-term outcomes are you hoping for from this exercise?
Debriefing questions	How should the session's technical and practical progress be assessed?
Evaluation	Approach for evaluating students' learned or validated skills
Follow-up	Long-term monitoring of the project

4.4 Tips

- **Accessibility**

The users can alter the controls of the game to their liking. They can even use a controller if this is something that they are more familiar with. A useful tip for left-handed people is instead of WASD controls, change them to IJKL, and mirror the remaining commands from there.

- **What to do when you're stuck in a Minecraft world**

If you are ever stuck, check if the world you are playing has commands enabled. If this is the case, a simple command: `"/gamemode c"` can get you to creative version and help you get unstuck or get the resources you need. Remember to get back to the default game mode with the command: `"/gamemode s"` or `"/gamemode a"` depending on the world you are playing.

- **How to convert Minecraft worlds**

When using a different version of Minecraft Education Edition or another version of Minecraft, it is mandatory to convert the worlds to make them compatible. There is an online tool that can help you, Chunker (<https://chunker.app/>). However, Chunker does not convert entities and NPCs and this tool will only be suitable for simple worlds. You risk losing all the interactive elements you have created.

- **How to deactivate Microsoft S mode.**

If your computer runs in Microsoft Windows S mode, you need to deactivate the S mode to be able to download the Minecraft Education Edition. To exit Microsoft S mode and gain access to apps beyond the Microsoft App store, follow these steps:

1. Create a new Microsoft account not designated as work or school-related.
2. Associate this Microsoft account with your laptop.
3. Navigate to Settings > Update & Security > Activation on your Windows 10 S mode PC.
4. Locate the Switch to Windows 10 Home or Switch to Windows 10 Pro section, then click on the Go to the Store link.
5. Be cautious not to click on the link under Upgrade your edition of Windows, as it involves a distinct process that maintains S mode.
6. On the Microsoft Store page that emerges (Switch out of S mode or a similar page), click the Get button. After confirming this action, you'll be able to install apps from sources other than the Microsoft Store.

5. Resources

Here you can find a list of resources (websites, etc.) to help you with Minecraft:

Official websites

- Minecraft Education Edition official website (<https://education.minecraft.net/en-us>)
- Minecraft Wiki (https://minecraft.fandom.com/wiki/Minecraft_Wiki)
- Minecraft: Education Edition community. (<https://educommunity.minecraft.net/hc/en-us>)

Aid for Teachers

Minecraft: Education Edition - Teacher Academy. An online course series that helps teachers understand what Minecraft is and how to integrate it inside their classroom. (<https://learn.microsoft.com/en-us/training/paths/minecraft-teacher-academy/>)