

Engagement through Minecraft

AVAILABLE EDITIONS

A guide for practitioners

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MINECRAFT AS AN ENGAGEMENT TOOL

Minecraft is an open-world, exploratory and generative video game¹, which was released in 2011 and quickly became one of the most popular games in the world. It is ideal for communicating various concepts¹⁻³ and is now used around the world as an educational and engagement tool⁴.

Players move freely around in the game, building with and mining a wide range of blocks. These have a wide range of properties, and can be explored in a variety of settings. The familiarity of the game and extensive experience that many children have with it can interest them in topics that they might not otherwise engage with and give them a sense of expertise and ownership^{3,5}.

The game can be used in different modes on a range of hardware, including Creative mode, which allows unlimited building and therefore has high flexibility. Some versions support ‘mods’ (modifications); third-party code that adds new or custom gameplay features to the base game. In some cases, content can be transferred between versions. Purchasing options vary between institutions and geographical locations, and should be checked locally.

The different options available, their costs and potential for transferability of content between versions listed here were collated in February 2021. This content is intended for the purposes of information only and does not constitute recommendations. These details are subject to change and should be checked by anyone wishing to obtain and use Minecraft or an equivalent. The authors are not responsible for any interpretation of the content within this document or purchase or use of software or equipment by others.

¹Lane, H. C. & Yi, S. (2017). ‘Playing with virtual blocks: Minecraft as a learning environment for practice and research’. In: Cognitive development in digital contexts. Cambridge, MA, U.S.A.: Academic Press. Chap. 7, 145–166

²Short, D. (2012). Teaching scientific concepts using a virtual world — Minecraft. *Teaching Science* 58 (3), pp. 55–58

³Hobbs, L., Stevens, C., Hartley, J. and Hartley, C., 2019. [Science Hunters: An inclusive approach to engaging with science through Minecraft](#). *Journal of Science Communication*, 18 (2), N01, 1–12

⁴Nebel, S., Schneider, S. and Rey, G. D. (2016). [Mining learning and crafting scientific experiments: a literature review on the use of Minecraft in education and research](#). *Educational Technology & Society* 19 (2), pp. 355–366

⁵Hobbs, L., Stevens, C., Hartley, J., Ashby, M., Lea, I., Bowden, L., Bibby, J., Jackson, B., McLaughlin, R. and Burke, T., 2019b. [Using Minecraft to engage children with science at public events](#). *Research for All*, 3(2), 142–160

VERSIONS OF MINECRAFT

PC AND MAC

MINECRAFT: JAVA EDITION

Minecraft: Java Edition is the original edition of Minecraft, available to all purchasers through free to create Microsoft accounts. Cross-platform play is not available (with either consoles or mobile) for this edition. Multiplayer gaming is possible on both Minecraft Realms (private servers provided by Microsoft for up to 10 players; £4.99 per month) and player-hosted (third-party) servers.

AVAILABILITY

Windows, macOS and Linux

PRICE

£17.95 | Can be purchased as a redeemable digital code – restrictions may apply.

MINIMUM SPECIFICATIONS

CPU

Intel Core i3-3210 3.2 GHz, AMD A8-7600 APU 3.1 GHz or equivalent

GPU (INTEGRATED)

Intel HD Graphics 4000 (Ivy Bridge) or AMD Radeon R5 series (Kaveri line) with OpenGL 4.4

GPU (DISCRETE)

Nvidia GeForce 400 Series or AMD Radeon HD 7000 series with OpenGL 4.4

RAM

4GB

STORAGE

At least 1GB of HDD space (4GB of SSD space recommended)

MODDING & CREATIVE CAPABILITIES

Minecraft: Java Edition has the most diverse and expansive potential for modding of all Minecraft editions. A vast selection of mods can be downloaded free of charge through third-party software such as the Twitch App.

Numerous third-party tools support creation of worlds and materials in Minecraft: Java Edition, such as MCEdit or Tinkercad.

TRANSFERABILITY

Minecraft: Java Edition's licence cannot be transferred or give access to any other editions of Minecraft. While it is possible to have installations of Java Edition on multiple devices simultaneously with one licence, multiplayer can only be accessed on one device at a time. Worlds built in Java Edition are tied to the device itself and not the licence, so manual file transfer is needed to access worlds that have been built on another device.

Worlds can be converted and transferred to Minecraft: Windows 10 Edition installations using third-party software (e.g. Universal Minecraft Converter; US\$4.99 annually). There is no cross-play with other editions of Minecraft.

MINECRAFT: WINDOWS 10 (BEDROCK) EDITION

Minecraft: Windows 10 Edition (also known as Bedrock Edition) is available for all PCs that have the Windows 10 operating system. Unlike Java Edition, cross-platform play is possible with many other devices. Multiplayer gaming is possible on official featured multiplayer servers, Minecraft Realms (private server provided by Microsoft for up to 10 players; £4.99 per month) and player-hosted (third-party) servers.

AVAILABILITY

Windows 10, Xbox One and Oculus Rift

PRICE

£22.49+

MINIMUM SPECIFICATIONS

ARCHITECTURE

ARM, x64, x86

CPU

Intel Celeron J4105 or AMD FX-4100

GPU

Intel HD Graphics 4000 or AMD Radeon R5

RAM

4GB

STORAGE

4GB (SSD recommended)

MODDING & CREATIVE CAPABILITIES

Mods and worlds can be purchased and used from the integrated Minecraft Marketplace, removing the need for third-party software. However, the mods are mostly locked behind a paywall and the number and variety of mods available are drastically limited when compared with Minecraft: Java Edition.

Creating material for Windows 10 Edition is more difficult than it is for Java Edition, due to third-party tools such as MCEdit not being supported. Material is often created in Java Edition first, then converted to Windows 10 Edition using third-party software.

TRANSFERABILITY

Minecraft: Windows 10 Edition licences are tied to Microsoft accounts. Owning a licence grants access to play on Windows 10 PCs, Xbox One consoles and Oculus Rift virtual reality (VR) devices.

Worlds can be converted and transferred to Minecraft: Java Edition installations using third-party software (Universal Minecraft Converter; US\$4.99 annually). Unlike in Java Edition, cross-play with some other editions of Minecraft on other types of devices (Xbox One, iOS, Android, Nintendo Switch and more) is possible.

MINECRAFT: EDUCATION EDITION

Minecraft: Education Edition is a version of Minecraft designed for use with students in formal education settings and environments. It offers classroom lessons in programming, history, languages and more.

Features include:

- Portfolios and cameras (providing opportunities to capture evidence of learning and to carry out formative assessments).
- Ability for the educators to customise worlds, as well as the students' inventories.
- Blocks exclusive to Minecraft: Education Edition (e.g. board blocks, border blocks) to allow for easier guidance and teaching.
- Multiplayer play allowing up to 30 students to collaborate in learning activities.
- Tutorials designed for educators who are unfamiliar with Minecraft.

SPECIAL REQUIREMENTS

Office 365 Education account (one account per licence). Available to schools and other academic institutions.

AVAILABILITY

Windows 7 or later, macOS, iOS (iPad only) and Chromebook

PRICE

US\$5.00 per user per year **or** free (up to 25 logins for teachers and 10 logins for students).

MINIMUM SPECIFICATIONS

ARCHITECTURE

X64, X86

MODDING & CREATIVE CAPABILITIES

At this time, there are no mods available for Minecraft: Education Edition. Thus, for highly specific and tailored experiences, the use of regular Minecraft (Java Edition) in conjunction with mods may be more desirable.

TRANSFERABILITY

Minecraft: Education Edition licences are tied exclusively to Office 365 Education accounts. The licence is not transferable to other editions of Minecraft; thus Education Edition is only accessible for the devices/operating systems listed in the section above.

It is currently not possible to port worlds built in other versions of Minecraft (including Java Edition) to Education Edition, nor is it possible to export Education Edition worlds to other versions of Minecraft. This can be somewhat limiting, as the wide range of tools available to create material for Java Edition are not compatible with Education Edition.

MOBILE

iOS

This is the edition of Minecraft that can be played on Apple iOS devices. Cross-platform play is possible with many other devices, including PC (Windows 10 Edition) and consoles. Multiplayer gaming in official featured multiplayer servers, Minecraft Realms (private servers provided by Microsoft for up to 10 players; £4.99 per month) and player-hosted (third-party) servers is possible.

AVAILABILITY

Requires iOS 10.0 or later. Compatible with iPhone 5S or later and iPad Mini 2nd Generation or later.

PRICE

£6.99

MODDING & CREATIVE CAPABILITIES

Mods and worlds can be purchased and used from the integrated Minecraft Marketplace, cutting out the need to use third-party software. However, the mods are mostly locked behind a paywall

and the number and variety of mods available are drastically limited when compared with Minecraft: Java Edition.

Creating material with Minecraft on iOS is more difficult than it is for Java Edition, due to third-party tools such as MCEdit not being supported. Material is often created in Java Edition first then converted to Windows 10 Edition using third-party software. The content is then accessed on iOS through multiplayer cross-play.

TRANSFERABILITY

Minecraft on iOS licences are tied to Apple accounts. Owning a licence grants access to the game on all Apple devices that are logged in to the associated Apple account. Multiplayer gaming also requires a valid Microsoft account.

Unlike Java Edition, cross-play with some other editions of Minecraft on other types of devices (Windows 10 PC, Xbox One, Android, Nintendo Switch and more) is possible. While worlds built on iOS devices can be accessed by these other types of devices, conversion of iOS worlds to Java Edition is neither practical nor feasible.

ANDROID

This is the edition of Minecraft that can be played on Android mobile devices. Cross-platform play is possible with many other devices, including PC (Windows 10 Edition) and consoles. Multiplayer gaming in official featured multiplayer servers, Minecraft Realms (private servers provided by Microsoft for up to 10 players; £4.99 per month) and player-hosted (third-party) servers is possible.

AVAILABILITY

Android devices (the version of Android required varies with device)

PRICE

£6.49

MODDING & CREATIVE CAPABILITIES

Mods and worlds can be purchased and used from the integrated Minecraft Marketplace, removing the need for third-party software. However, the mods are mostly locked behind a paywall and the number and variety of mods available are drastically limited when compared with Minecraft: Java Edition.

Creating material with Minecraft on Android is more difficult than it is for Java Edition, due to third-party tools such as MCEdit not being supported. Material is often created in Java Edition first then converted to Windows 10 Edition using third-party software. The content is then accessed on Android devices through multiplayer cross-play.

TRANSFERABILITY

Minecraft for Android licences are tied to Google accounts. Owning a licence grants access to the game on all Android devices that are connected to the associated Google account. Multiplayer gaming also requires a valid Microsoft account.

Unlike Java Edition, cross-play with some other editions of Minecraft on other types of devices (Windows 10 PC, Xbox One, iOS, Nintendo Switch and more) is possible. While worlds built on Android devices can be accessed by these other types of devices, conversion of Android worlds to Java Edition is neither practical nor feasible.

CONSOLE

MINECRAFT FOR XBOX ONE

This is the edition of Minecraft that can be played on Xbox One consoles. Cross-platform play is possible with many other devices, including PC (Windows 10 Edition) and mobile. Multiplayer gaming in official featured multiplayer servers and Minecraft Realms (private servers provided by Microsoft for up to 10 players; £4.99 per month) is possible. However, joining player-hosted (third-party) servers is not possible.

AVAILABILITY

Xbox One or later

PRICE

£16.74. Available for free with Xbox Game Pass.

MODDING & CREATIVE CAPABILITIES

Mods and worlds can be purchased and used from the integrated Minecraft Marketplace, removing the need for third-party software. However, the mods are mostly locked behind a paywall and the number and variety of mods available are drastically limited when compared with Minecraft: Java Edition.

Creating material for Minecraft on Xbox One is more difficult than it is for Java Edition, due to third-party tools such as MCEdit not being supported. Material is often created in Java Edition first then converted to Windows 10 Edition using third-party software. The content can then be accessed on the console through multiplayer cross-play.

TRANSFERABILITY

Minecraft for Xbox One licences are tied to Microsoft accounts. Owning a licence grants access to the game on any Xbox One console via Microsoft account login.

Unlike Java Edition, cross-play with some other editions of Minecraft on other types of devices (Windows 10 PC, mobile, Nintendo Switch and more) is possible. While worlds built on Xbox One consoles can be accessed by these other types of devices through multiplayer gaming, conversion of Minecraft for Xbox One worlds to Java Edition is neither practical nor feasible.

(Note: owning Minecraft Windows 10 Edition allows the game to be played using an Xbox One or later, even if Minecraft for Xbox One was not purchased separately.)

MINECRAFT FOR NINTENDO SWITCH

This is the edition of Minecraft that can be played on Nintendo Switch. Cross-platform play is possible with many other devices, including PC (Windows 10 Edition), consoles and mobile. Multiplayer gaming in official featured multiplayer servers and Minecraft Realms (private servers provided by Microsoft for up to 10 players; £4.99 per month) is possible. However, joining player-hosted (third-party) servers is not possible.

AVAILABILITY

Nintendo Switch, Nintendo Switch Lite

PRICE

£19.99

MODDING & CREATIVE CAPABILITIES

Mods and worlds can be purchased and used from the integrated Minecraft Marketplace, removing the need for third-party software. However, the mods are mostly locked behind a paywall and the number and variety of mods available are drastically limited when compared with Minecraft: Java Edition.

Creating material for Minecraft on Nintendo Switch is more difficult than it is for Java Edition, due to third-party tools such as MCEdit not being supported. Material is often created in Java Edition first then converted to Windows 10 Edition using third-party software. The content can then be accessed on Nintendo Switch through multiplayer cross-play.

TRANSFERABILITY

Minecraft for Nintendo Switch licences are tied to Nintendo accounts. Owning a licence grants access to the game on any Nintendo Switch device via Nintendo account login. Multiplayer gaming also requires a valid Microsoft account.

Unlike Java Edition, cross-play with some other editions of Minecraft on other types of devices (Windows 10 PC, mobile, console and more) is possible. While worlds built on Nintendo Switch devices can be accessed by these other types of devices through multiplayer gaming, conversion of Minecraft for Nintendo Switch worlds to Java Edition is neither practical nor feasible.

MINECRAFT FOR PLAYSTATION 4

This is the edition of Minecraft that can be played on PlayStation 4 consoles. Cross-platform play is possible with many other devices, including PC (Windows 10 Edition), mobile and other consoles. Multiplayer gaming in official featured multiplayer servers and Minecraft Realms (private servers provided by Microsoft for up to 10 players; £4.99 per month) is possible. However, joining player-hosted (third-party) servers is not possible. Minecraft for PlayStation 4 also allows for virtual reality gameplay (through PSVR).

AVAILABILITY

PlayStation 4 (playable on PlayStation 5 but with missing features)

PRICE

£12.99

MODDING & CREATIVE CAPABILITIES

Mods and worlds can be purchased and used from the integrated Minecraft Marketplace, removing the need for third-party software. However, the mods are mostly locked behind a paywall and the number and variety of mods available are drastically limited when compared with Minecraft: Java Edition.

Creating material for Minecraft on PlayStation 4 is more difficult than it is for Java Edition, due to third-party tools such as MCEdit not being supported. Material is often created in Java Edition first then converted to Windows 10 Edition using third-party software. The content can then be accessed on the console through multiplayer cross-play.

TRANSFERABILITY

Minecraft for PlayStation 4 licences are tied to PlayStation accounts. Owning a licence grants access to the game on any PlayStation 4 or PlayStation 5 device via PlayStation account login (**note:** as of the time of writing, some features are missing on PlayStation 5). Multiplayer also requires a valid Microsoft account.

Unlike Java Edition, cross-play with some other editions of Minecraft on other types of devices (Windows 10 PC, mobile, Nintendo Switch and more) is possible. While worlds built on PlayStation devices can be accessed by these other types of devices through multiplayer gaming, conversion of Minecraft for PlayStation 4 worlds to Java Edition is neither practical nor feasible.

MINECRAFT FOR OCULUS RIFT

This is the edition of Minecraft that can be played on Oculus Rift virtual reality devices. Cross-platform play is possible with many other devices, including PC (Windows 10 Edition), consoles and mobile. Multiplayer gaming in official featured multiplayer servers, Minecraft Realms (private servers provided by Microsoft for up to 10 players; £4.99 per month) and player-hosted (third-party) servers is possible. A major advantage of this edition is its ability to provide virtual reality Minecraft gameplay.

AVAILABILITY

Oculus Rift, Oculus Rift S

PRICE

Free

MODDING & CREATIVE CAPABILITIES

Mods and worlds can be purchased and used from the integrated Minecraft Marketplace, removing the need for third-party software. However, the mods are mostly locked behind a paywall and the number and variety of mods available are drastically limited when compared with Minecraft: Java Edition.

Creating material for Minecraft on Oculus Rift is more difficult than it is for Java Edition, due to third-party tools such as MCEdit not being supported. Material is often created in Java Edition first then converted to Windows 10 Edition using third-party software. The content can then be accessed through multiplayer cross-play.

TRANSFERABILITY

Minecraft for Oculus Rift licences are tied to Oculus accounts. Owning a licence grants access to the game on any Oculus Rift or Oculus Rift S device via Oculus account login. Multiplayer gaming also requires a valid Microsoft account.

Unlike Java Edition, cross-play with some other editions of Minecraft on other types of devices (Windows 10 PC, mobile, Nintendo Switch and more) is possible. While worlds built on Oculus devices can be accessed by these other types of devices through multiplayer gaming, conversion of Minecraft for Oculus Rift worlds to Java Edition is neither practical nor feasible.

(Note: owning Minecraft Windows 10 Edition allows for the game to be played using an Oculus Rift or Oculus Rift S, even if the game was not purchased in the Oculus store.)

POTENTIAL ALTERNATIVES

There are many potential alternatives to purchasing Minecraft. Some of these are official free trials provided by Mojang/Microsoft for Minecraft, which typically last 100 minutes.

There are also some non-Microsoft alternatives to Minecraft that are available, some of which are summarised below.

Roblox

A free PC, mobile and console platform in which players can create their own gameplay experiences in 3D worlds, then share/play them with others.

Block Craft 3D

A free alternative to Minecraft for mobile devices. There is a greater focus on village building and villager management than in Minecraft. However, the game is limited in terms of cross-platform availability, modding capability, educational potential, world transferability and multiplayer features.

LEGO Worlds

Similar to Minecraft, but with a LEGO theme (PC and console). There is a greater focus on quest completion than in Minecraft.

Eco

A PC sandbox game inspired by Minecraft that educates players on the importance of sustainability. Players are put in a world where they must specialise into different professions, form governments, pass laws and ultimately cooperate to prevent the annihilation of the world from an incoming meteor. Every action a player takes has an effect on the environment and if players are not careful, pollution and the extinction of numerous species can become a major problem.

Minetest

A free sandbox game available for PC, Linux, Mac and Android systems. It has many similar features to Minecraft and has also been used in educational contexts.

ABOUT BUILDING TO BREAK BARRIERS



Suspension bridge built by Alex Kiyani

Building to Break Barriers uses Minecraft to engage children from under-represented groups with engineering. It is derived from the Science Hunters project, which supports children facing potential barriers to accessing educational opportunities, to engage with Science, Technology, Engineering and Maths.

Building to Break Barriers works with engineers, education and outreach practitioners and children and young people around the UK to co-produce and deliver Minecraft-based sessions about engineering. The project focuses on reaching children and young people from groups under-represented in engineering, increasing representation of engineers to enable children and young people to see 'people like them' in engineering roles, and offering a different view of engineering and the way it is used, outside of traditional perceptions.

Please see [Science Hunters](#) and [Building to Break Barriers](#) for more information about the projects, or Dr Laura Hobbs and Sophie Bentley at ExtendingSTEM@uwe.ac.uk.

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