

MINECRAFT

EDUCATION EDITION

Minecraft: Education Edition brings an immersive world of learning to your students

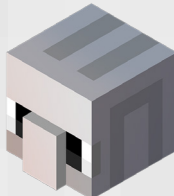
Now with the Chemistry Resource Pack and Code Builder, over 300 free lessons and a global community of educators, Minecraft: Education Edition offers a transformative learning experience for all ages and subjects.

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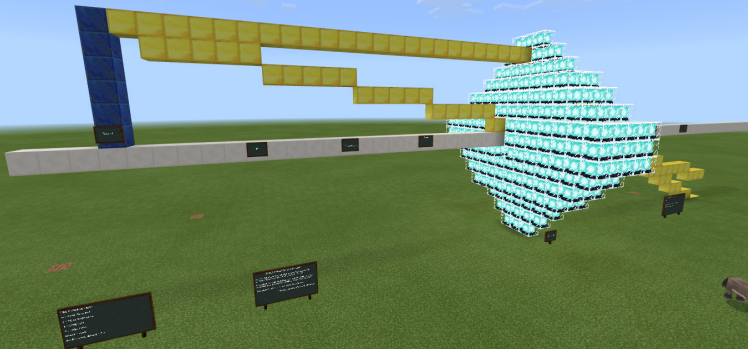
Minecraft: Education Edition is available to purchase for \$5 per user, per year, in the Microsoft Store for Education:

aka.ms/meestore



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IMAGES FORMED BY CONVEX LENS

Subject: Physics

Ages: 9-12, 13+ | Lesson developed by Vilas Bhagwat



This lesson introduces students to the concepts of optics and convex lenses. By using Minecraft, teachers can incorporate multiple learning styles and present an interactive space where students can see a 3D view of the lens and light rays.

NGSS: Waves and Electromagnetic Radiation, Analyzing and Interpreting Data
MS-PS4.B, HS-PS4-1

Learning Objectives:

- Describe how magnification is produced by a convex lens.
- Create an accurate model demonstrating that images formed by a convex lens depend upon the distance of an object from the lens.

Teach This Lesson:

- Review the lens formula and sign convention used in optics science using the attached Minecraft: Education Edition world file.
- Use graph paper to draw ray diagrams as a technique for understanding how the convex lens produces magnification.
- Work in groups to create unique Minecraft worlds. Place objects at various distances along the principal axis and resulting rays. Students can document their work using the camera and portfolio features.

■ Access the full lesson and Minecraft world file: aka.ms/meeconvxlens



WHAT IS THE WORLD MADE OF?

Subject: Chemistry

Ages: 9-12



This chemistry lesson demonstrates the structure and properties of matter. Using Minecraft: Education Edition, students take familiar blocks and visually reduce them to reveal their elemental composition.

NGSS: Structure and Properties of Matter, Analyzing and Interpreting Data
5-PS1-3, PS1.A

Learning Objectives:

- Demonstrate an understanding that objects are made of elements.
- Identify the most common elements found on Earth.

Teach This Lesson:

- Collect and analyse materials from their Minecraft world to find elemental compositions using the Material Reducer, a tool that breaks Minecraft blocks into elements and compounds.
- Discuss what types of materials have similar elemental compositions and why.
- As a challenge, have students create a compound using only materials they've collected from the world around them.

■ Access the full lesson and Minecraft world file: aka.ms/whatistheworldmadeof



STRUCTURES & MODELS OF MOLECULES



Subject: Chemistry

Ages: 9-12, 13+

This lesson teaches students about different ways to create models of chemical compounds. Minecraft is used to show complex models in an interactive 3D space, and allow students to create their own models using familiar building blocks.

NGSS: Topic: Structure and Properties of Matter, Developing and Using Models
MS-PS1-1

Learning Objectives:

- Demonstrate knowledge that atoms and molecules can be represented in a variety of ways, including ball and stick models and chemical formula.
- Identify how different representations are useful for different situations.

Teach This Lesson:

- Discuss how chemical formulas and models provide information about how many atoms of a particular element are in a molecule and how they bond.
- Create simple structures to represent atoms in an element using colored Minecraft blocks.
- Then create molecular models of compounds containing just carbon and hydrogen (hydrocarbons). Increase the complexity of the molecule by introducing oxygen and nitrogen.
- Alternatively, students can create 2D representations of molecules using element blocks.

■ Access the full lesson: aka.ms/moleculamodels



BUILDING SUSTAINABLE HOMES

Subject: Ecology, Climate Change

Age: 9 and up



This lesson demonstrates the influence of human behavior on weather and climate. Minecraft is used to creatively engage multiple learning styles by having students plan and create a model of a sustainable home.

NGSS: Weather and Climate, Interdependent Relationships in Ecosystems, Influence of Science, Engineering, and Technology on Society and the Natural World 3-ESS2-2, 4-ESS3-1, MS-ESS3-5, HS-ESS2-2

Learning Objectives:

- Demonstrate an understanding of the influence of human behavior on the natural world.
- Show understanding of how sustainable building techniques can help structures withstand climate change.

Teach This Lesson:

- Research environmental factors such as climate change that impact the viability of a sustainable home.
- Design and create a plot of land with at least two features to support sustainability as well as an environmentally sustainable home.
- Use the camera and portfolio to document the process.
- As an extension, students can design the interior of their home or create a sustainable business.

■ Access the full lesson: aka.ms/sustainablehomes



EUKARYOTIC CELLS

Subject: Biology

Age: 11-13 | Lesson developed by Leticia Ahumada



This life science lesson uses a unique Minecraft world to allow students to explore the inside of plant and animal cells. By interacting with 3D models, students learn to identify and analyze the structure and function of organelles.

NGSS: Structure, Function, and Information Processing MS-LS1-1, MS-LS1-2, LS1.A

Learning Objectives:

- Identify parts of a cell including organelles.
- Differentiate between animal and plant cells.

Teach This Lesson:

- Use the provided Minecraft world to explore the inside of a cell.
- Research and identify the organelles. Take in-game photos of each part of the cell using the camera tool, then write a few lines about them using the portfolio.
- Work in a group to create a unique cell model and present it to the class.
- As a challenge, have students create a powered rail track that moves proteins around the cell model.

■ Access the full lesson: aka.ms/meecells