

Pathfinding in an emulated Minecraft client

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Overview

- Background
- Problem Statement
- A* algorithm
- Implementation & Challenges
- Evaluation
- Machine learning in Minecraft



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Minecraft

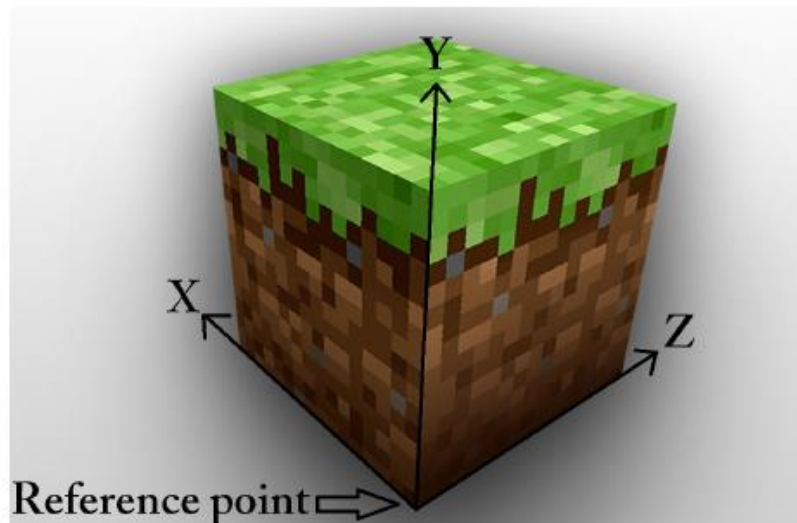


Minecraft

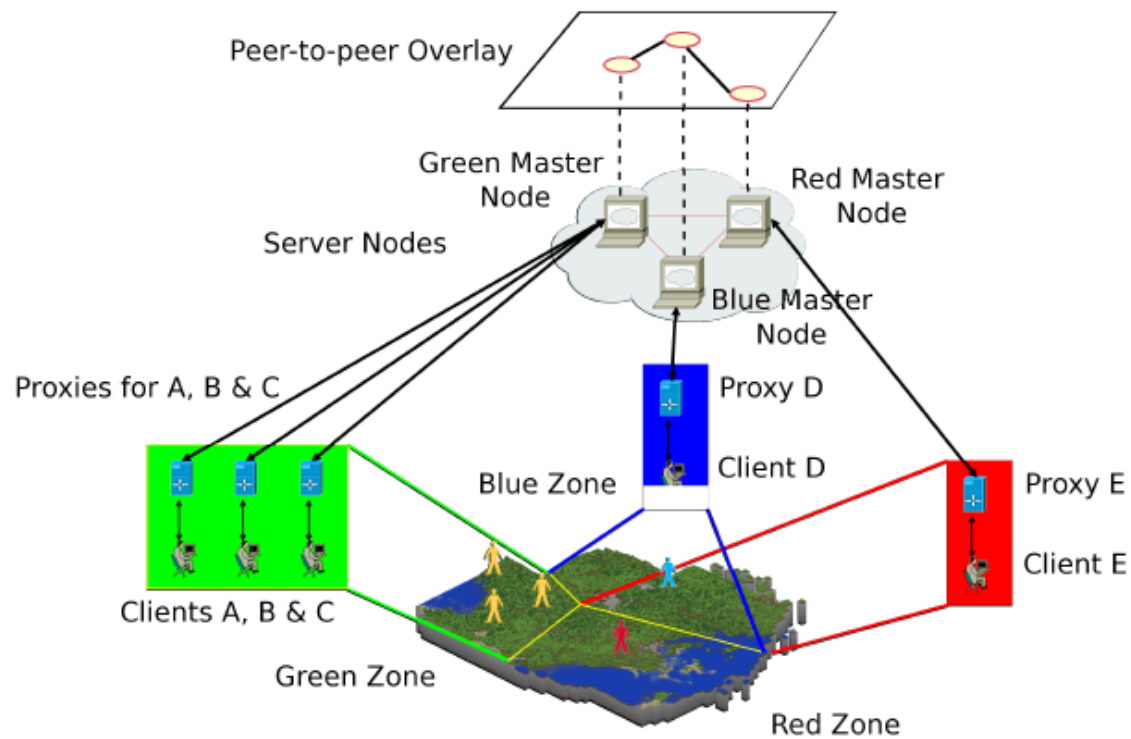


Pathfinder

1. Map representation – Grid with coordinate representation
2. Algorithm – A* with Euclidean heuristic
3. Conversion of path into movement.

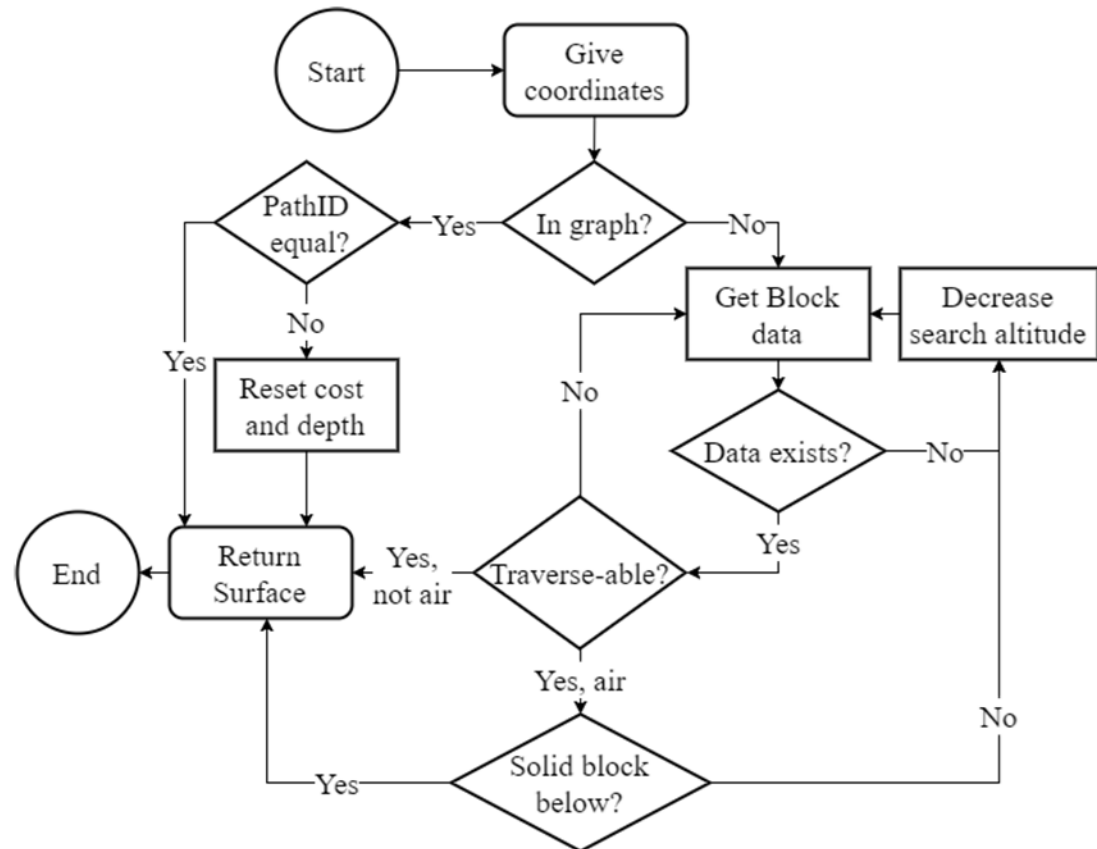
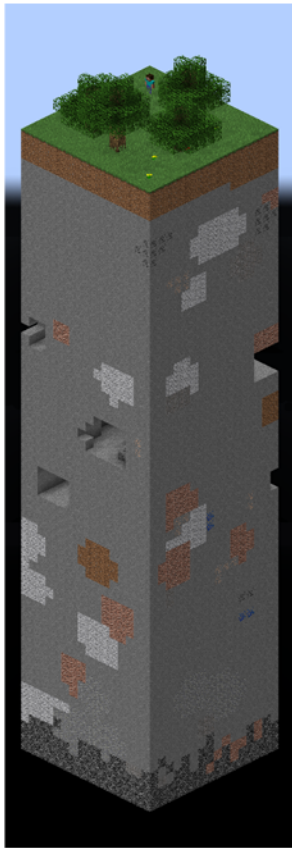


The Problem

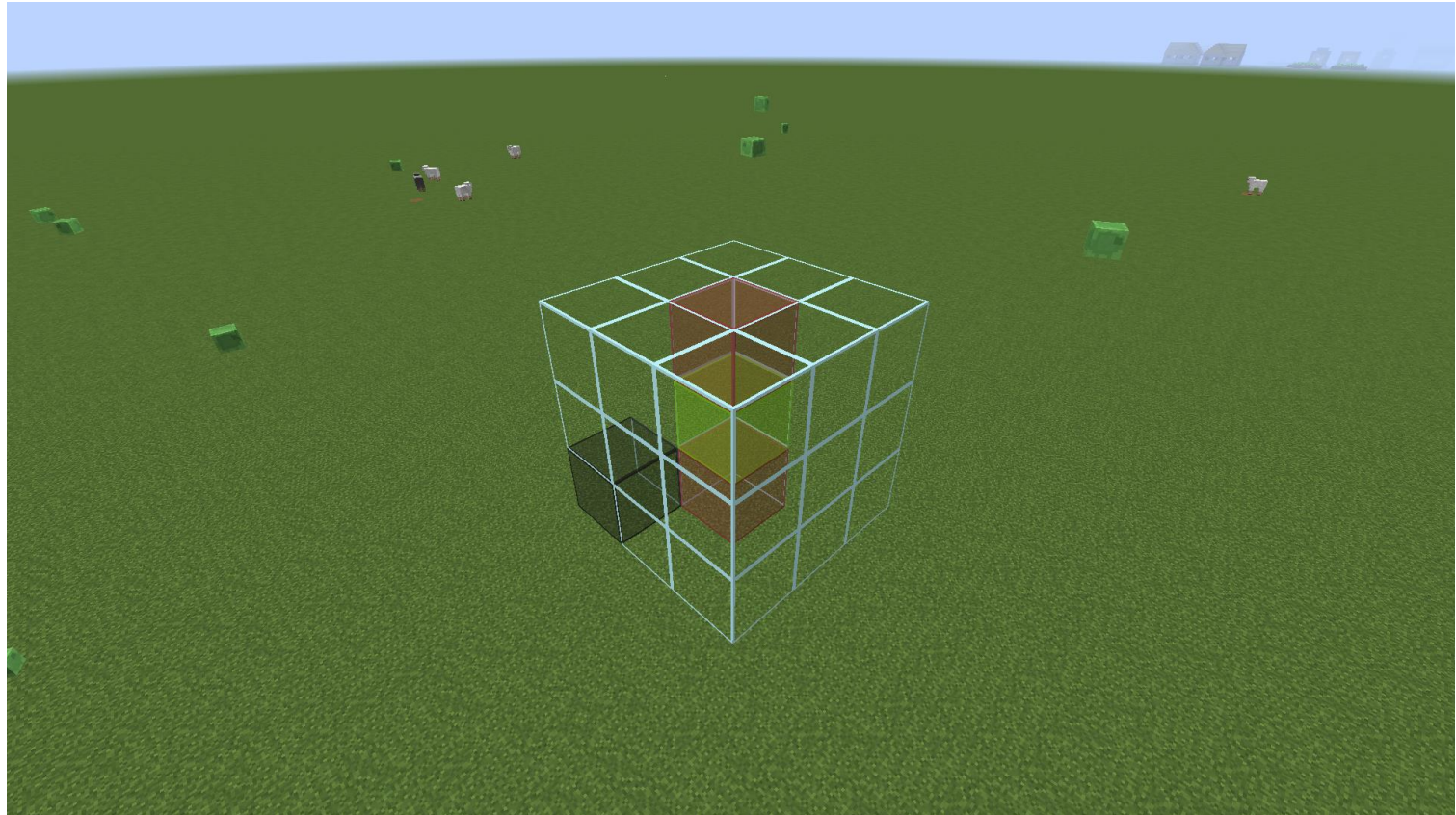


Obtained from “*Koekepan: Minecraft as a research platform*” by Dr H.A. Engelbrecht & Dr G. Schiele

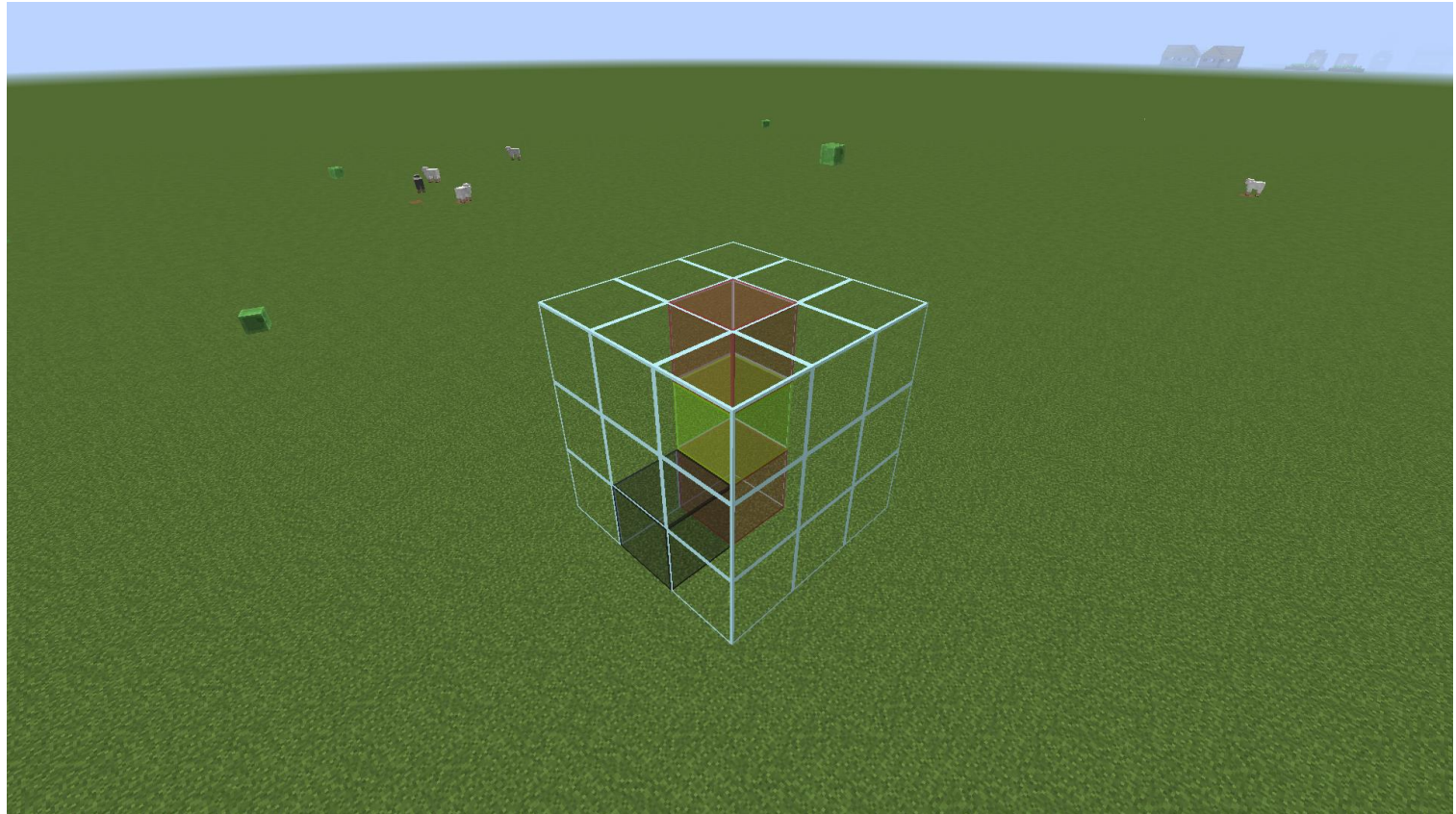
A*, Chunks and Surface Creation



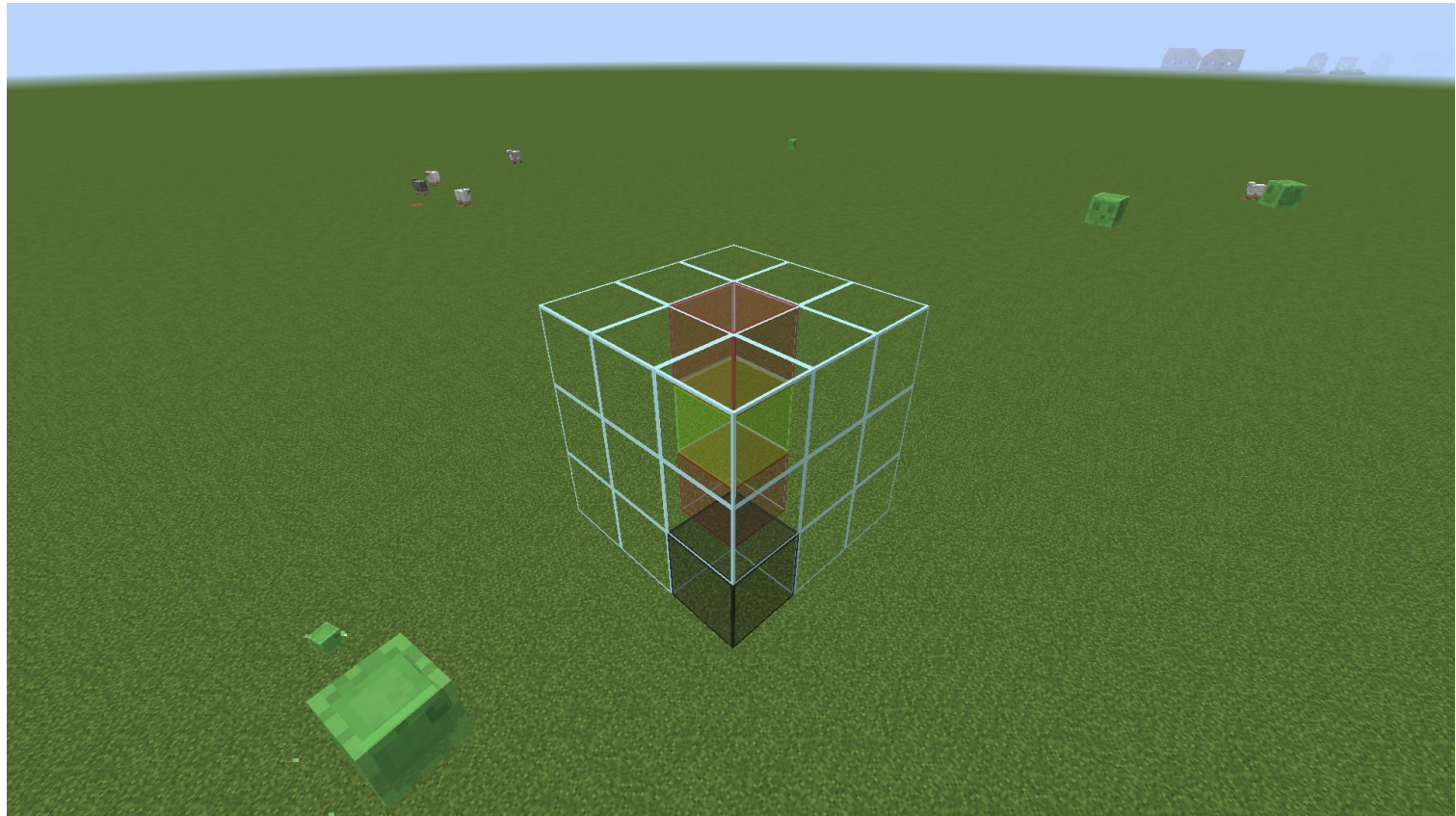
Node expansion



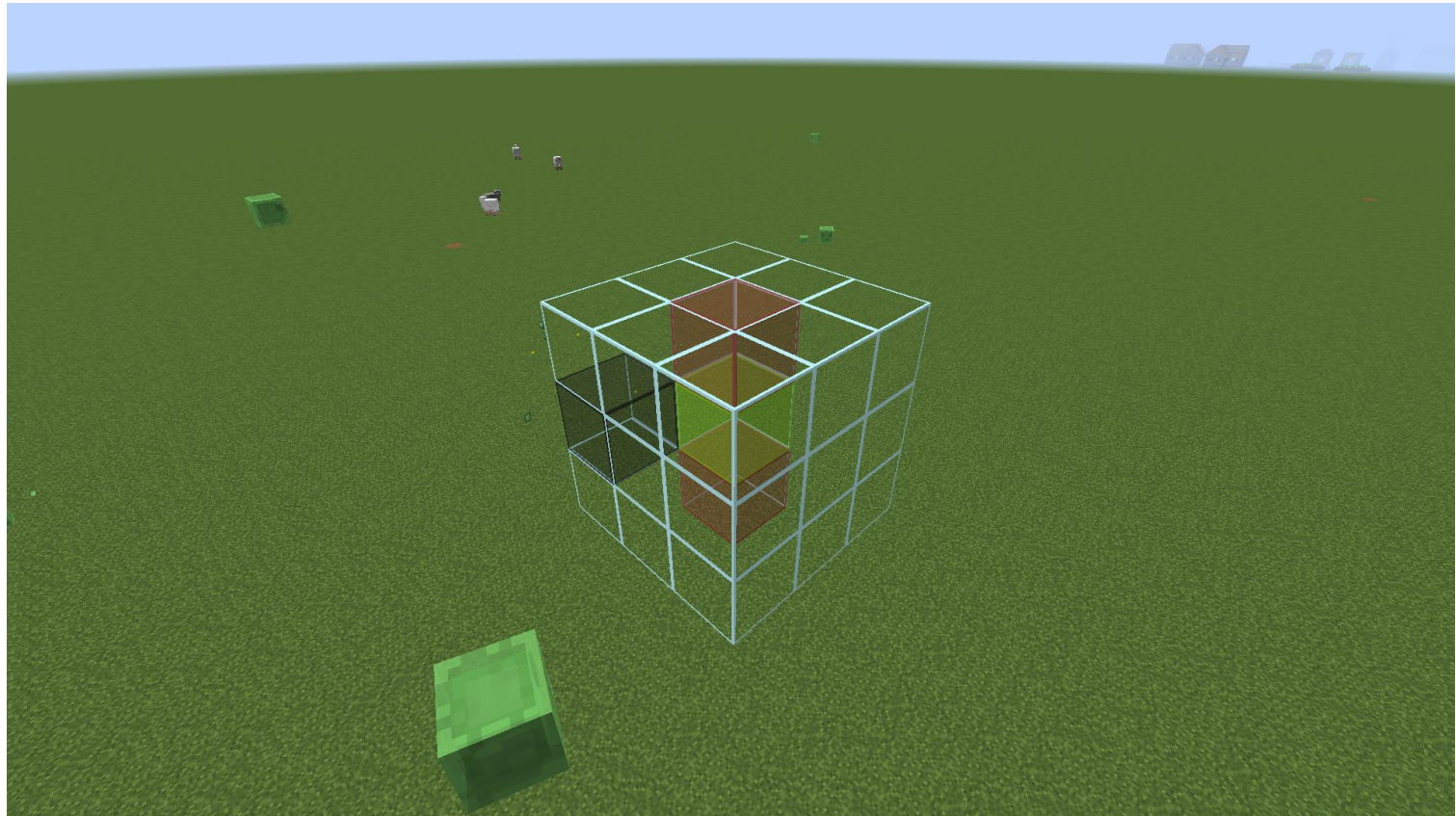
Node expansion



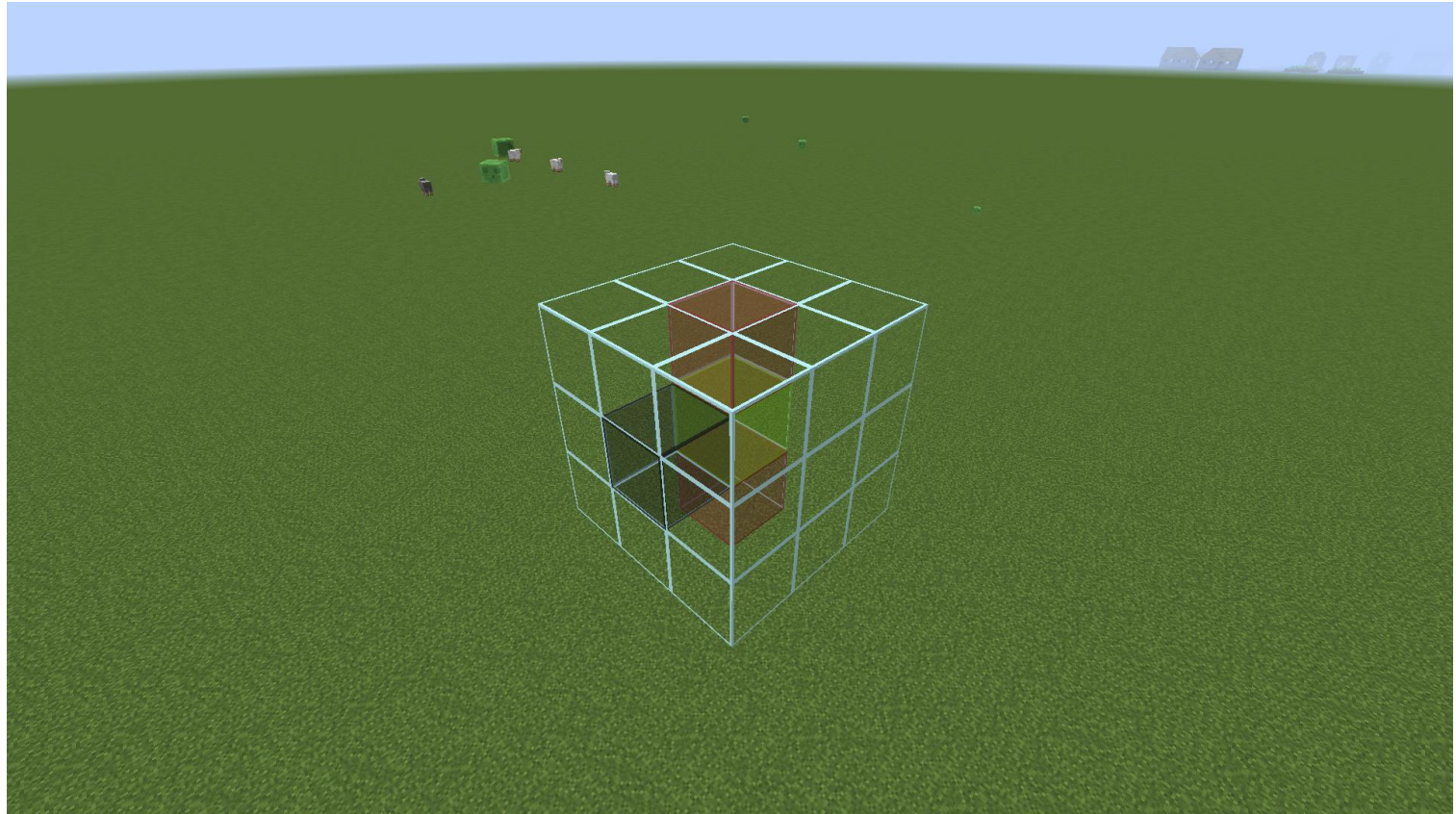
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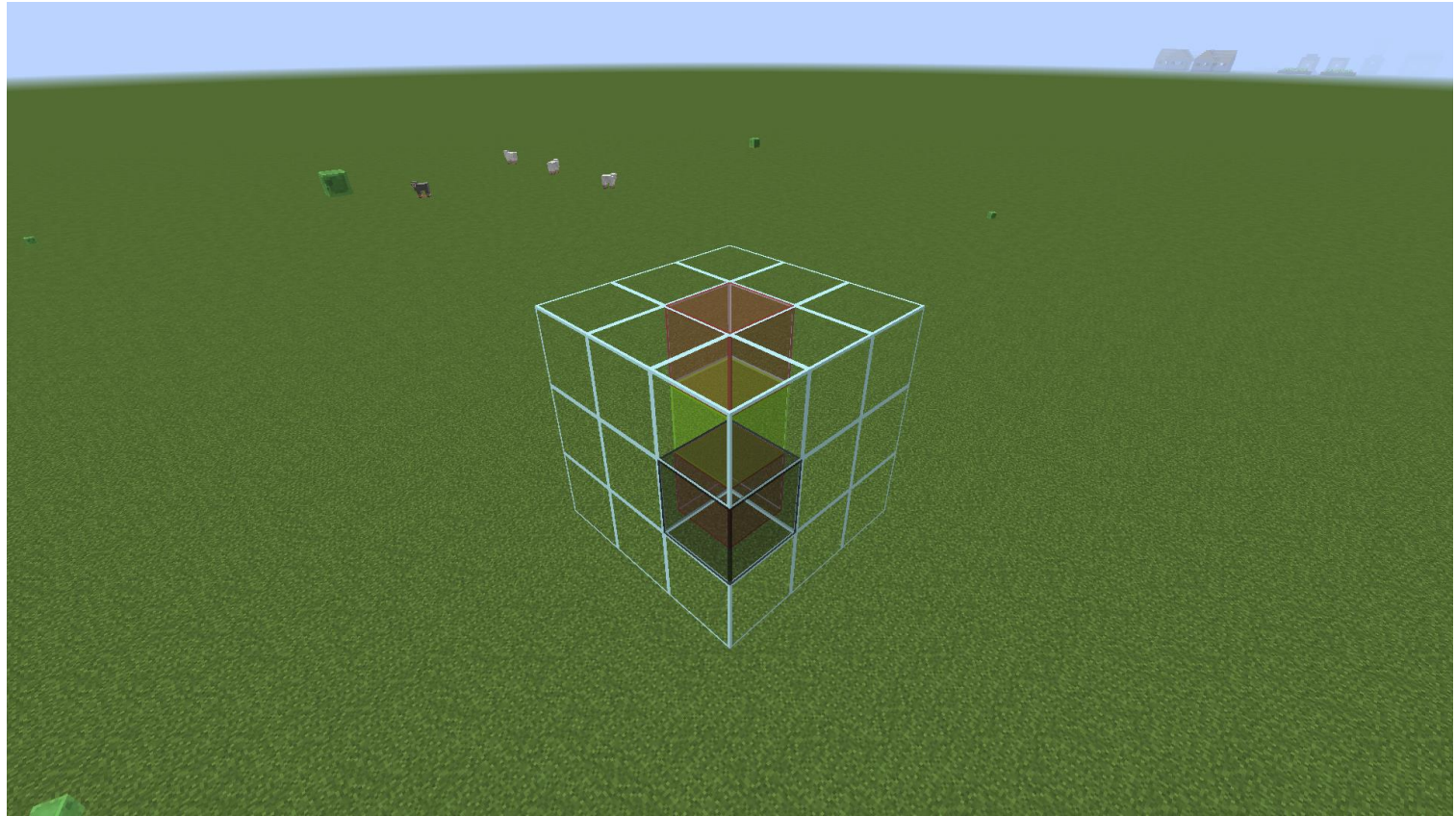
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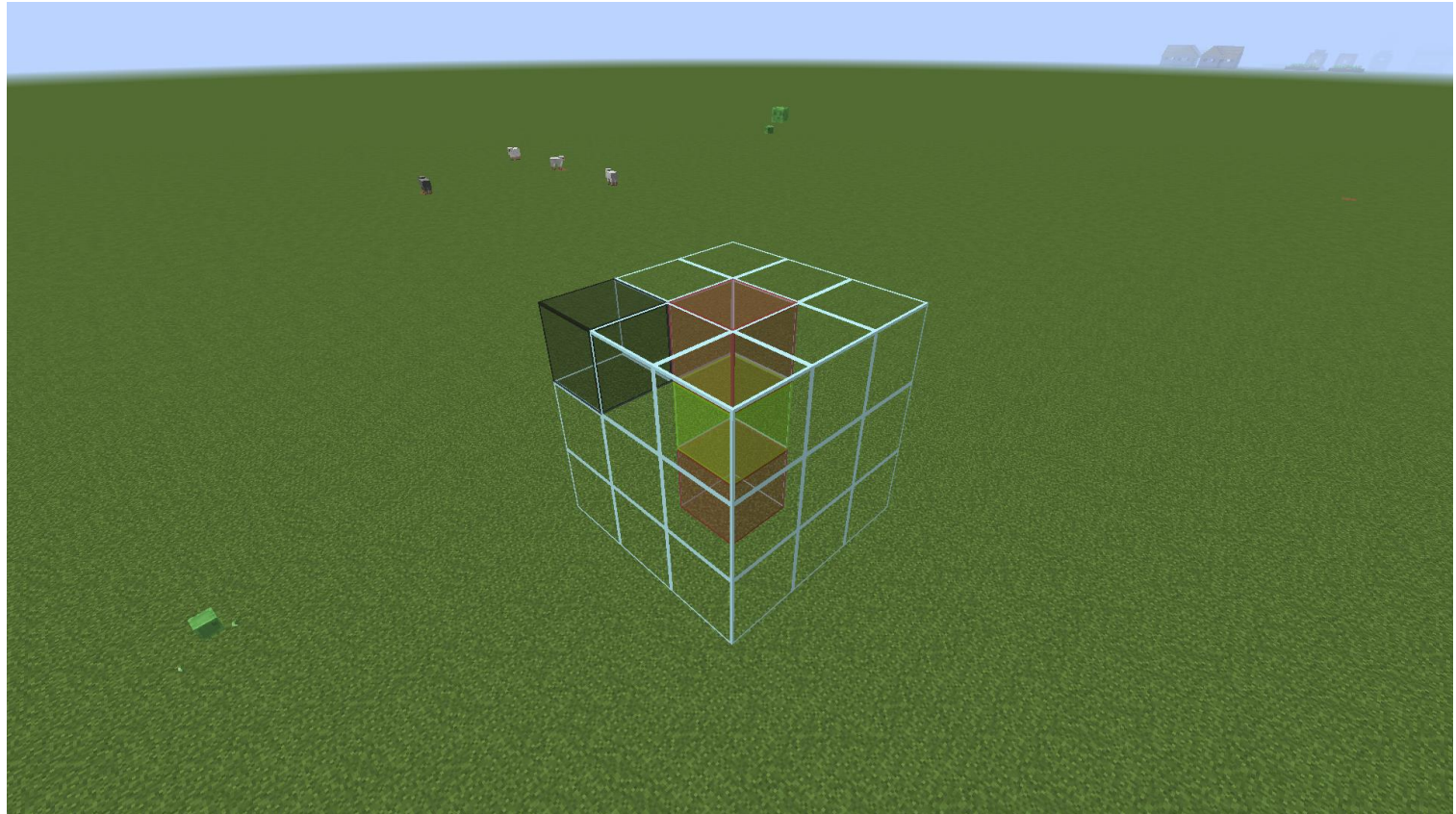
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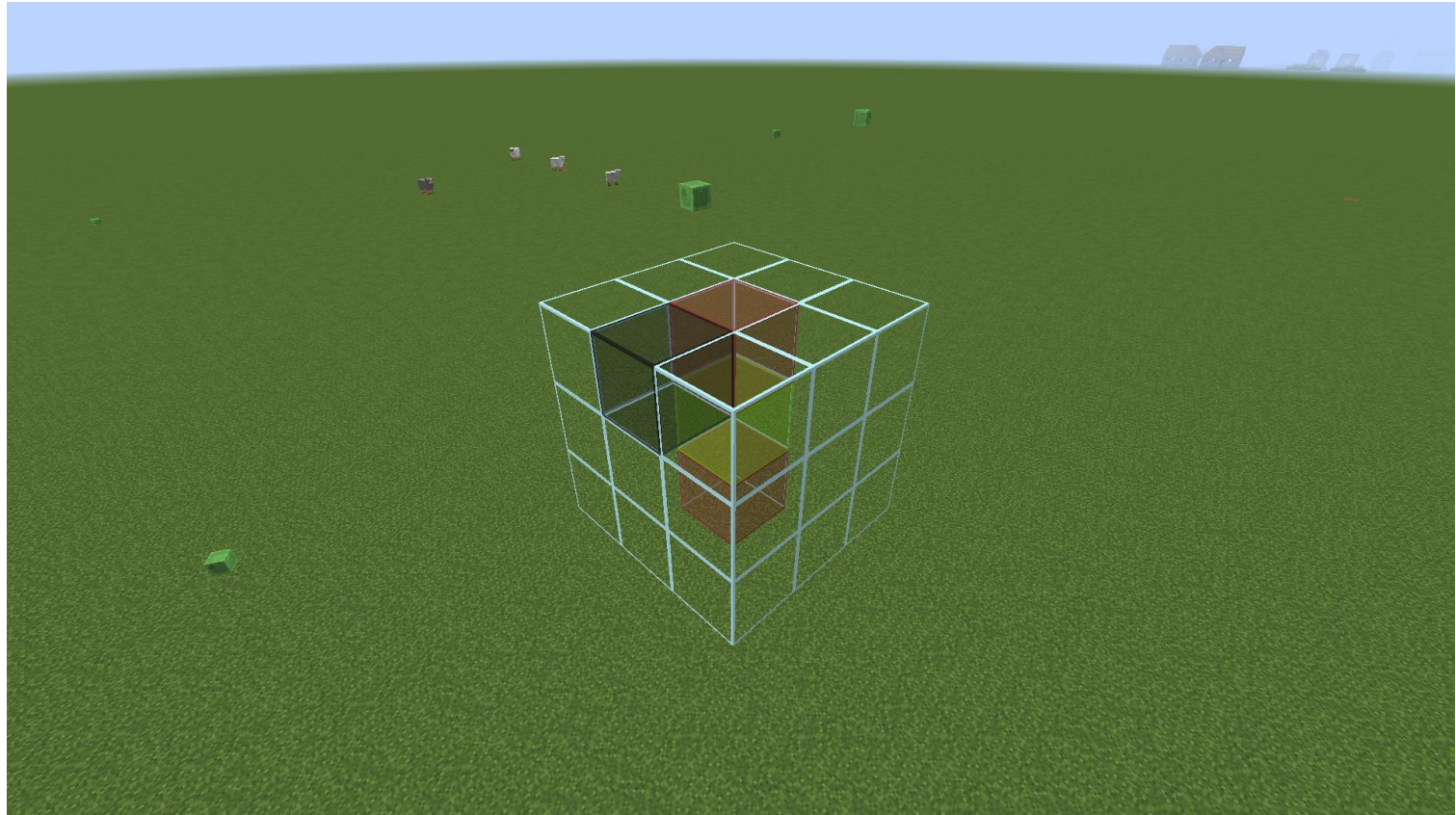
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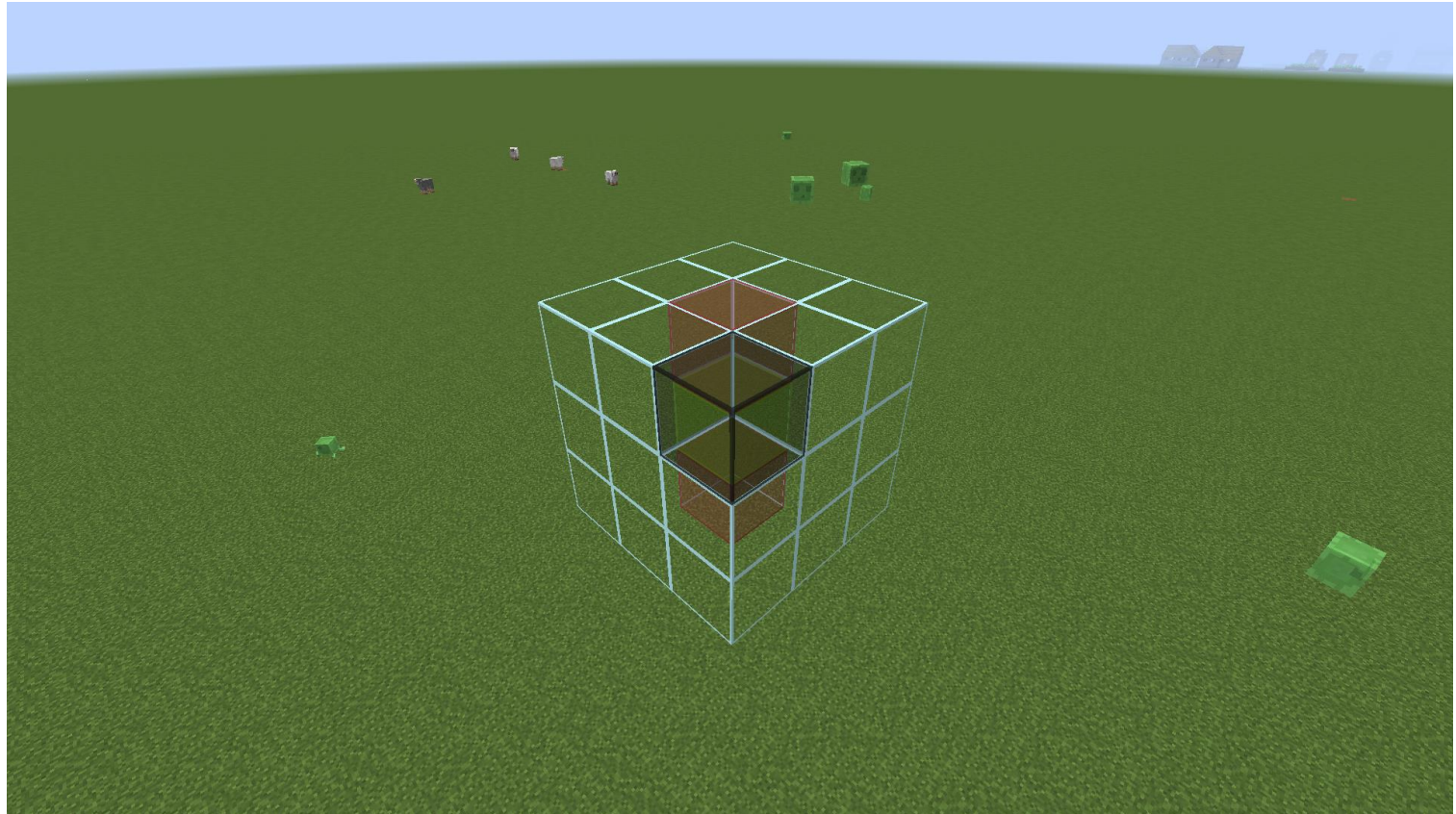
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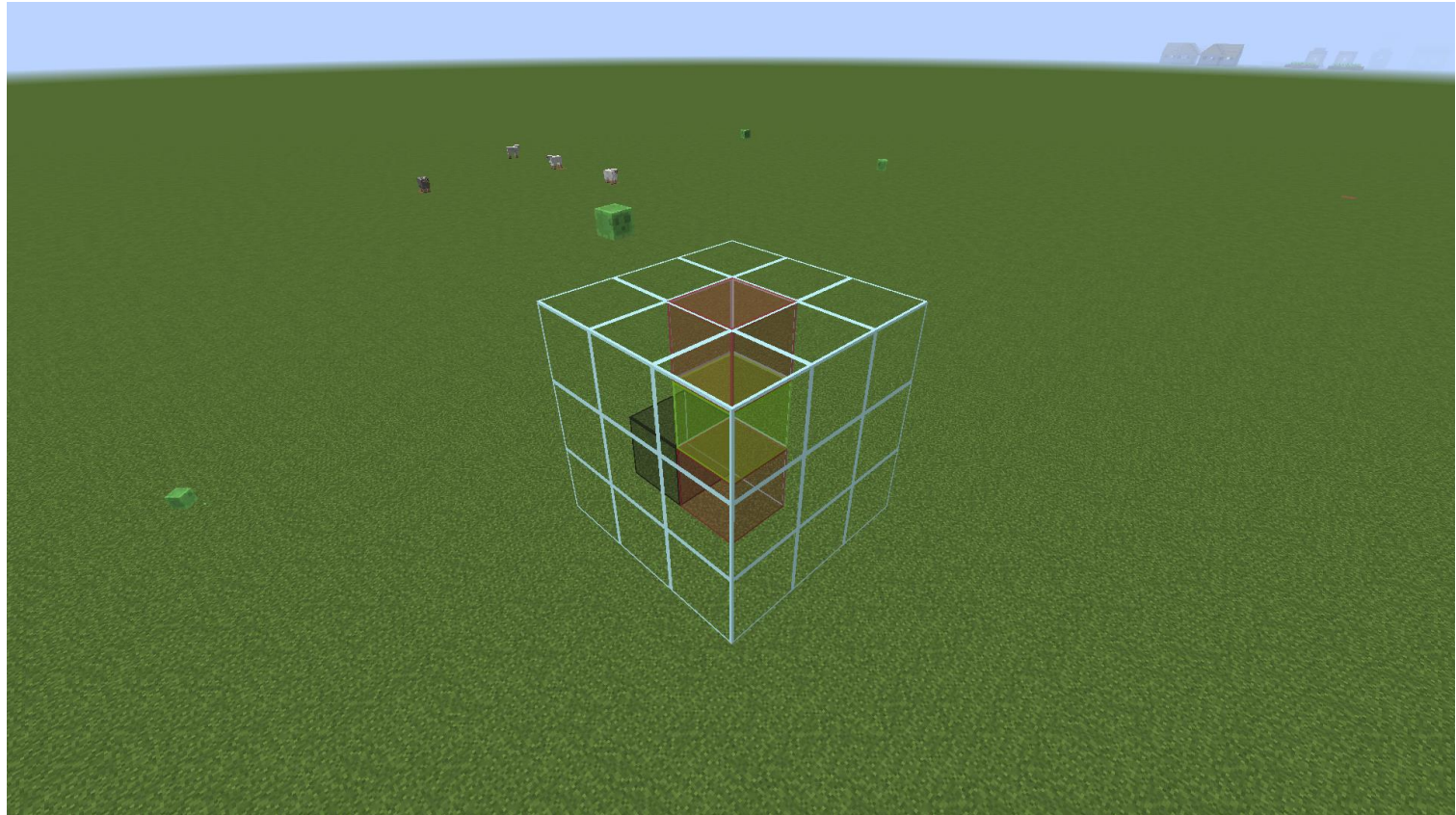
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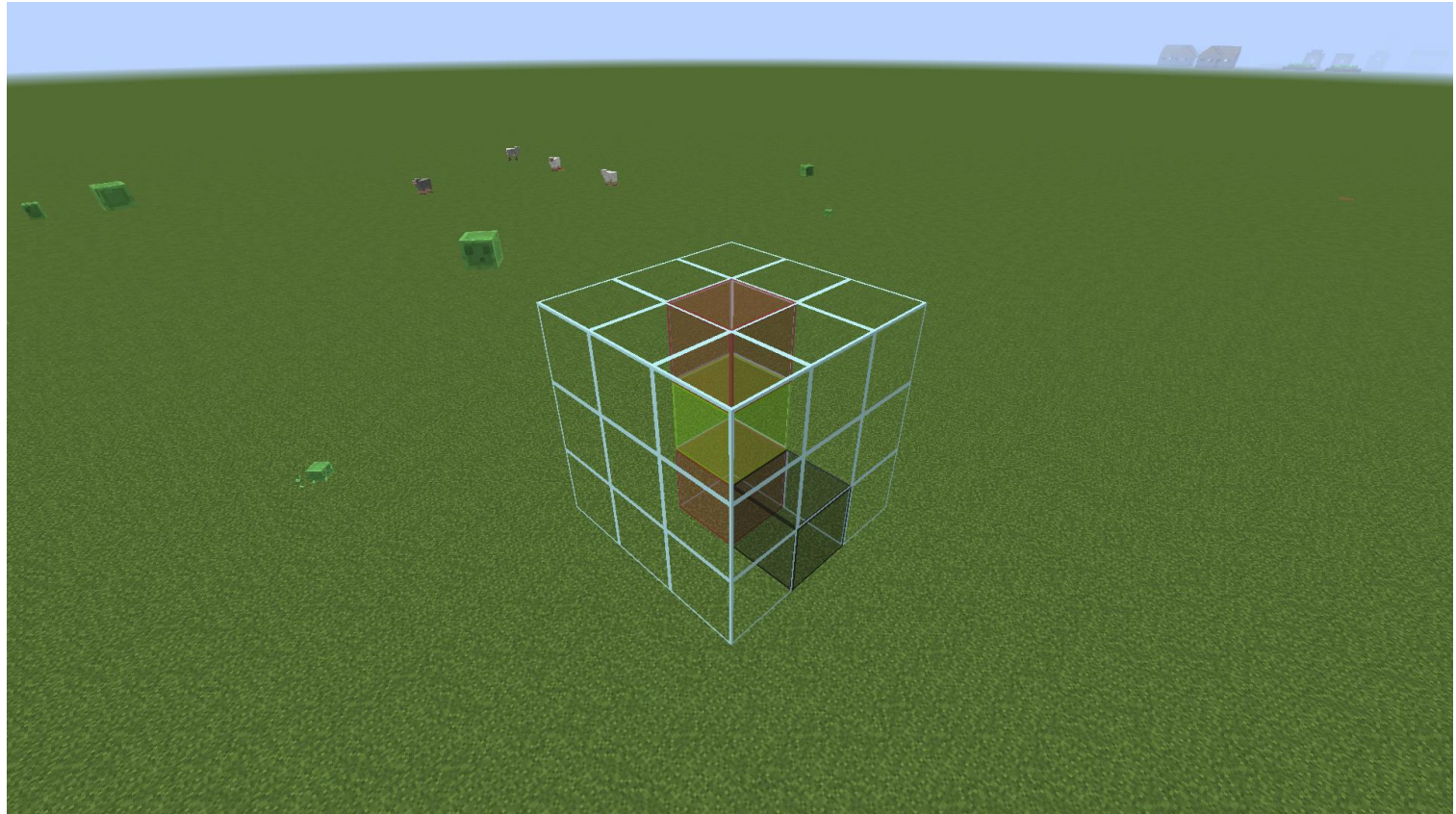
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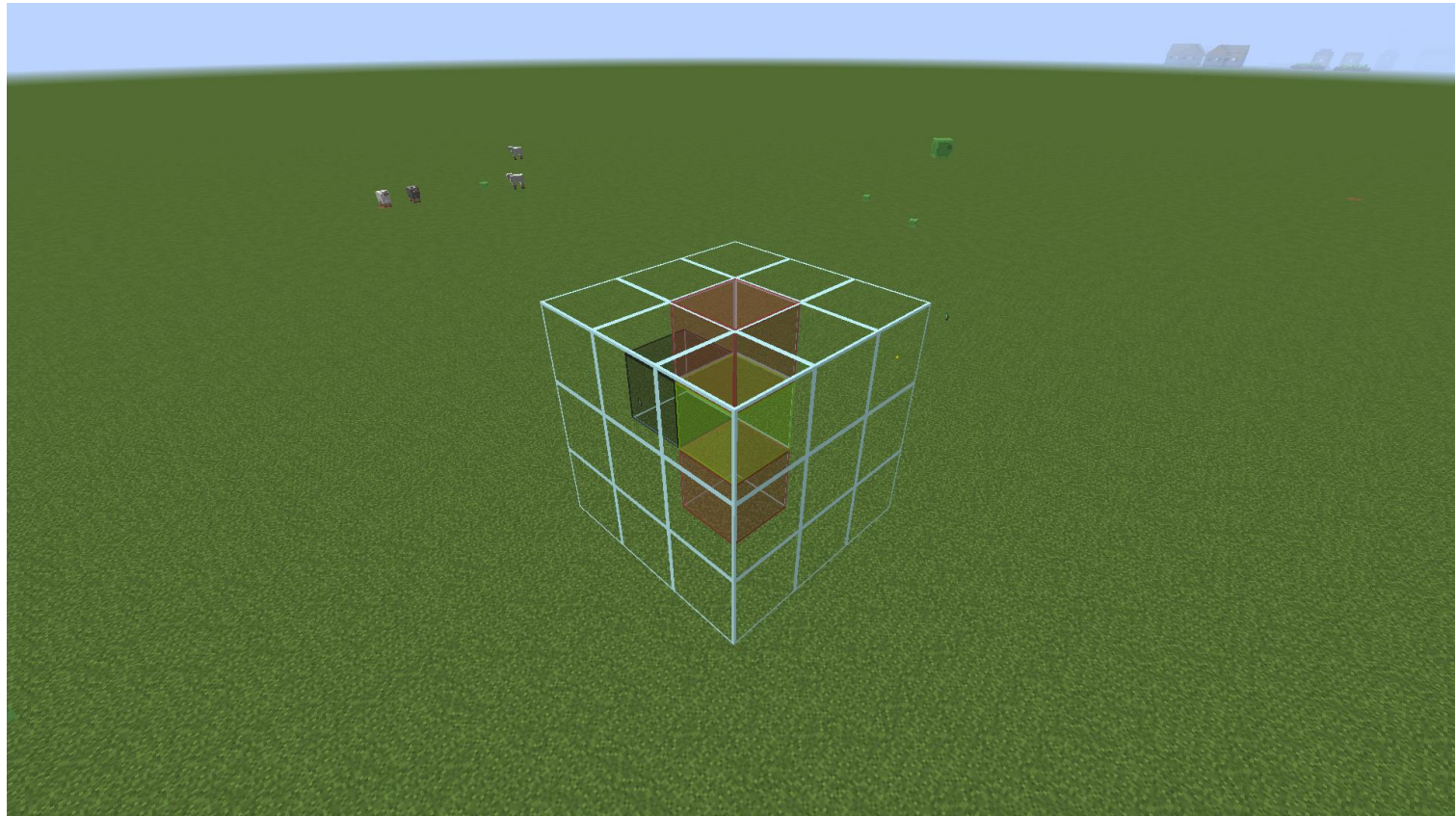
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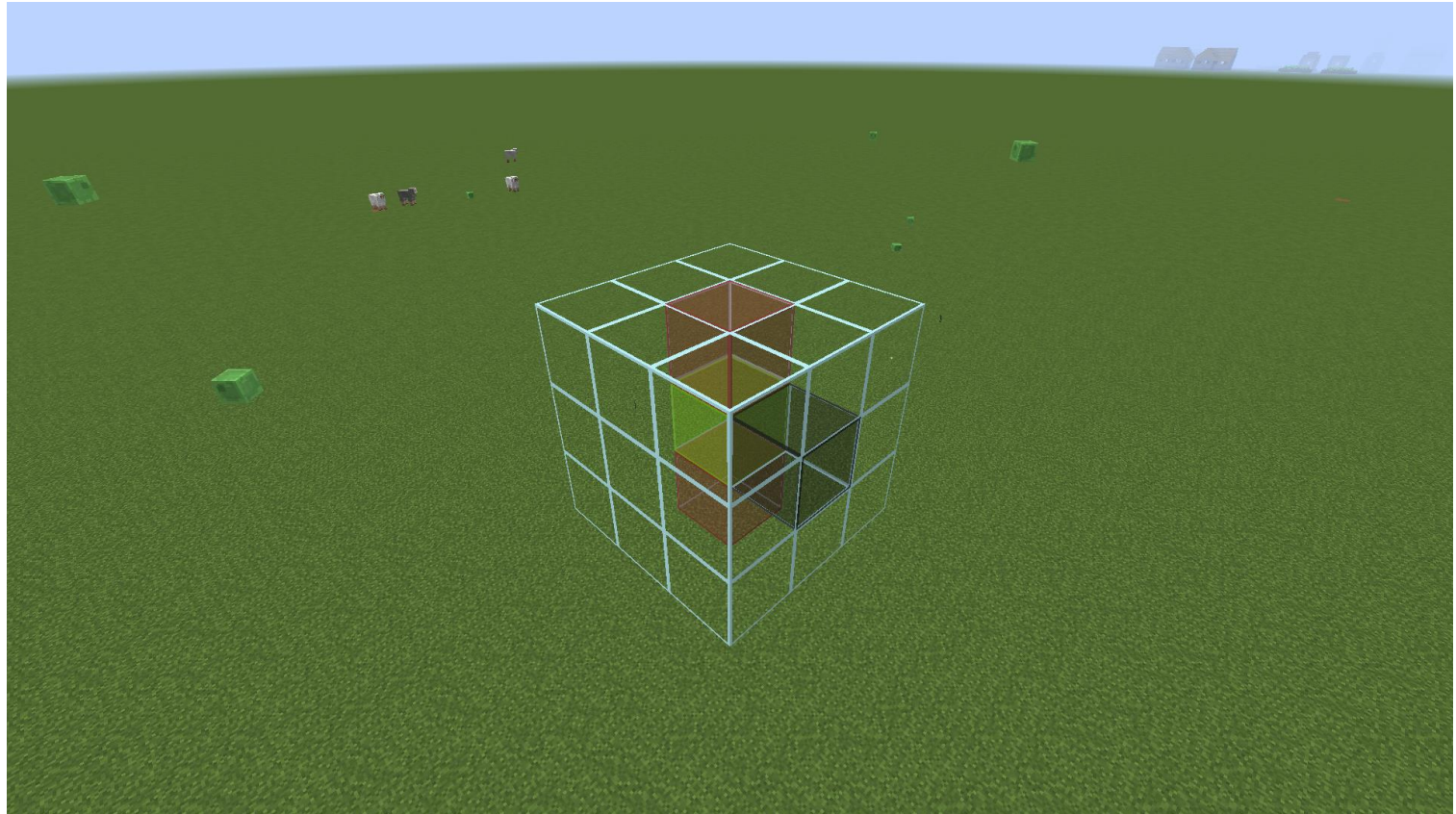
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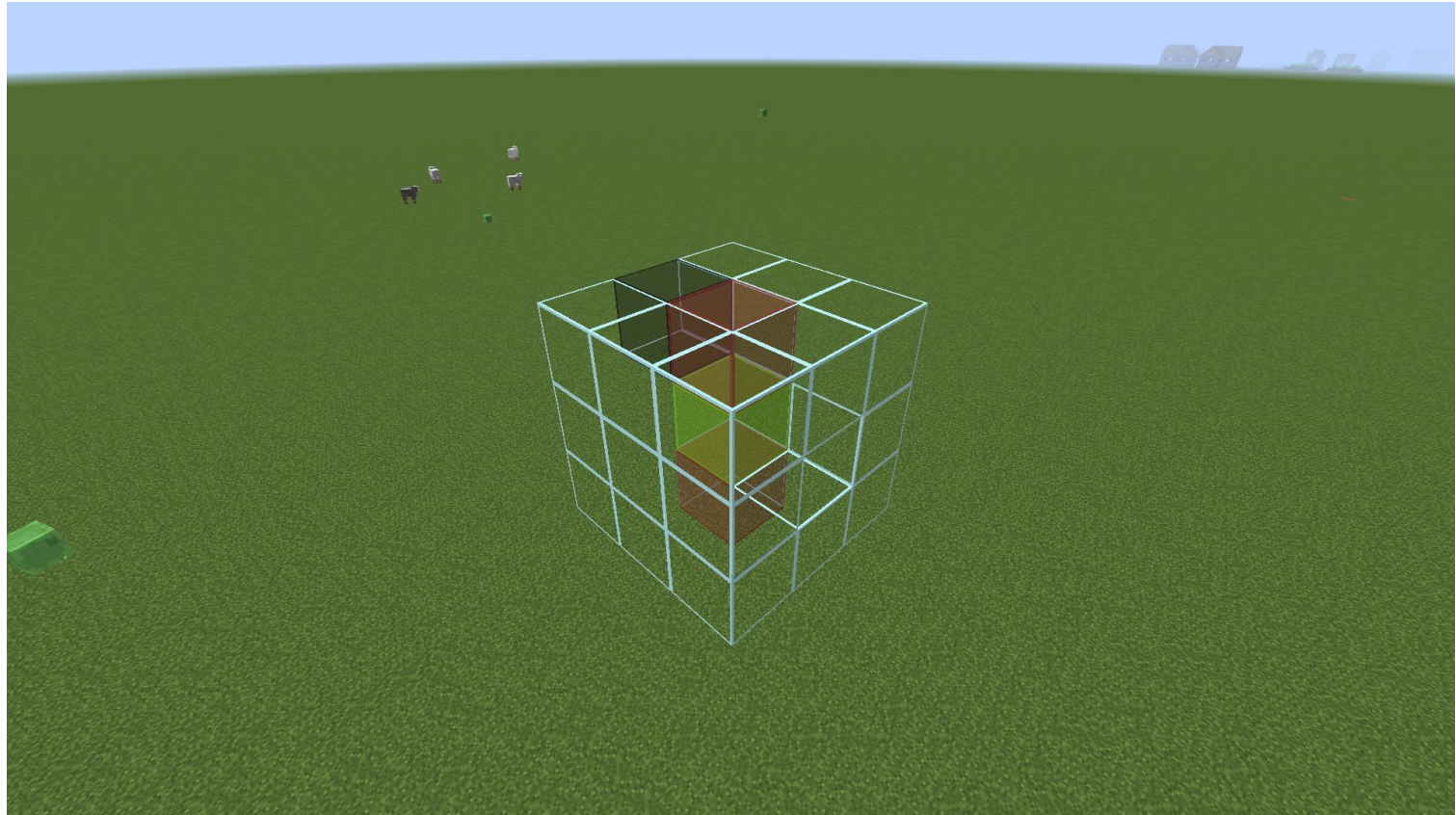
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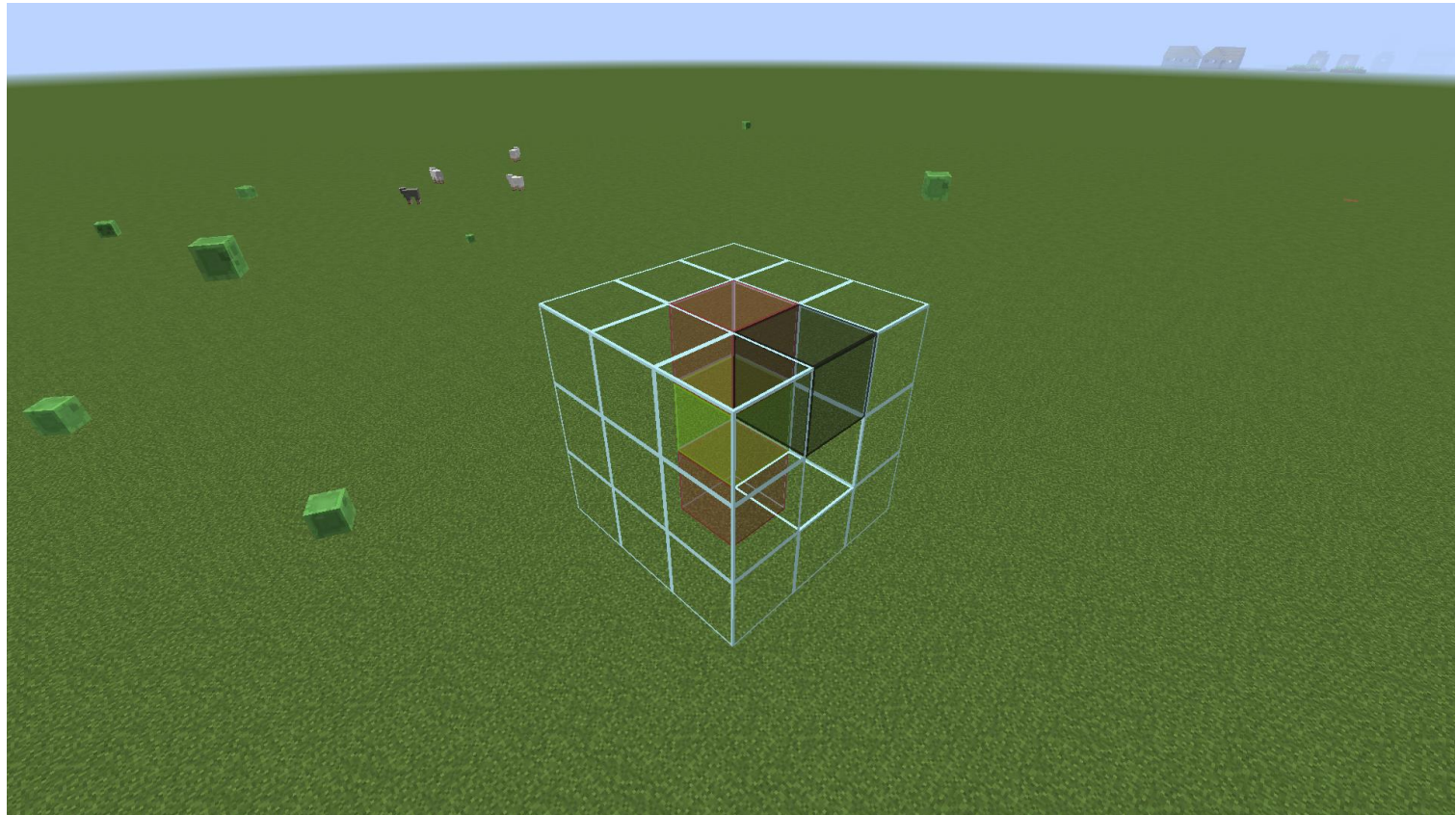
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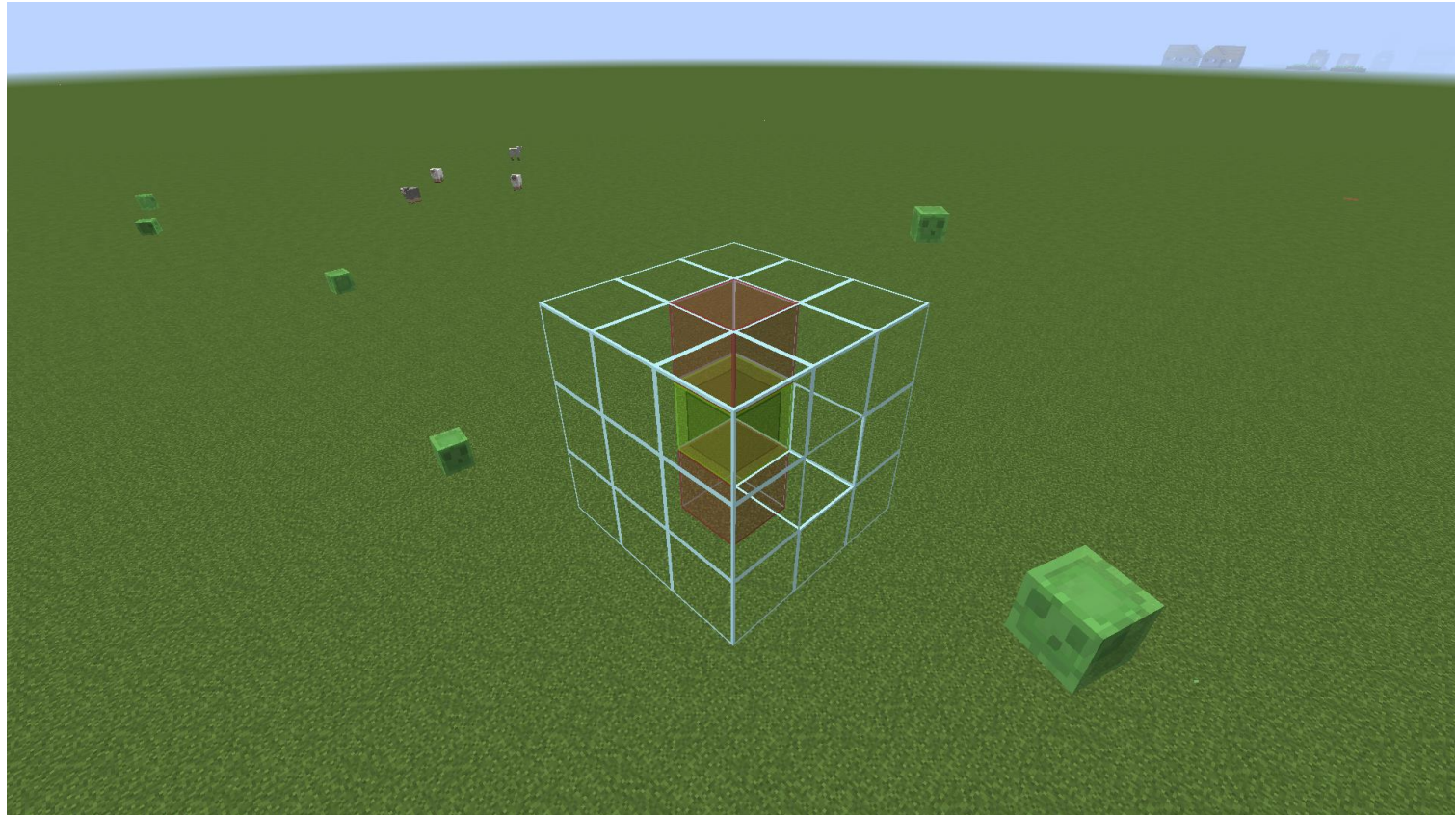
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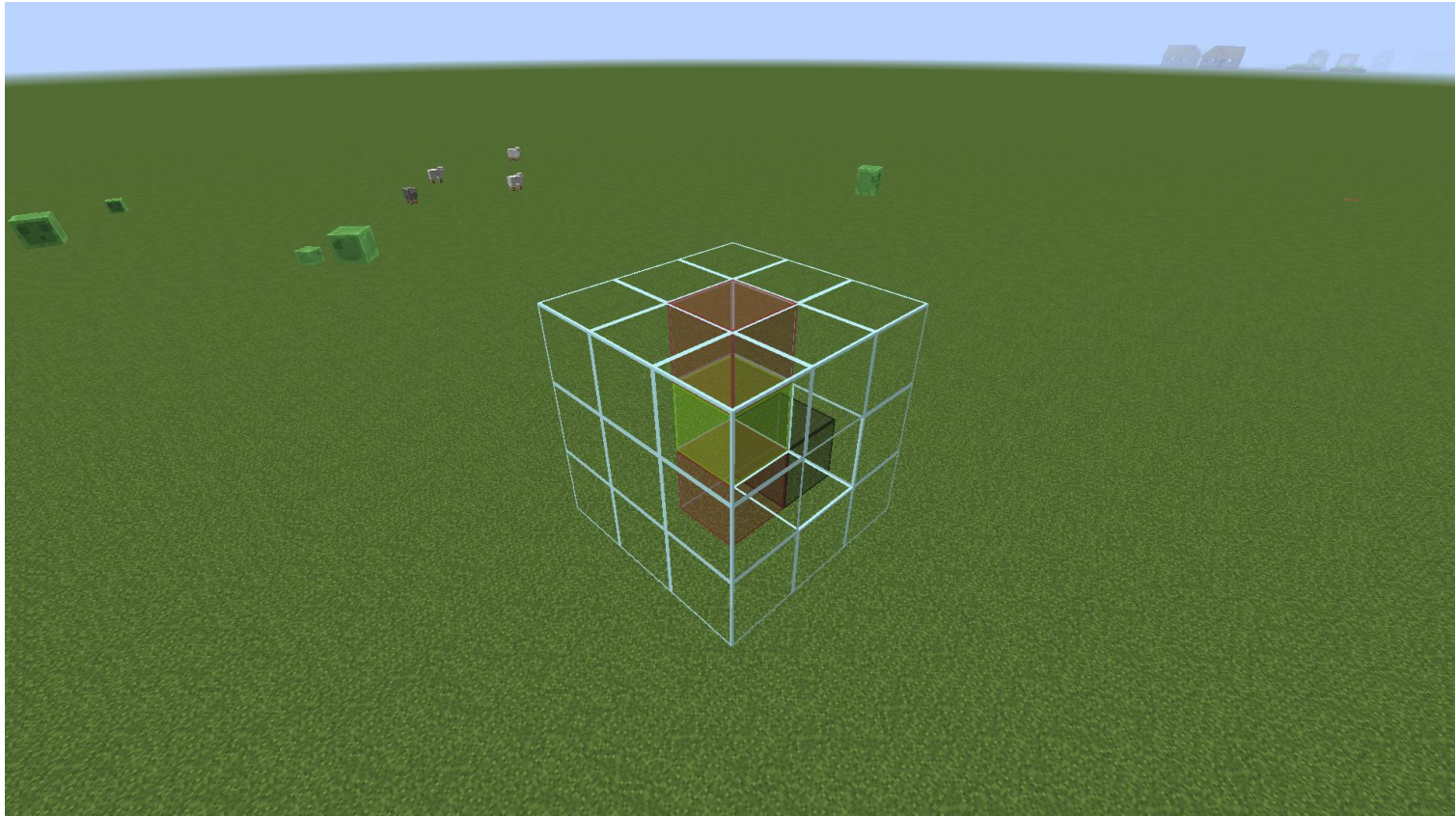
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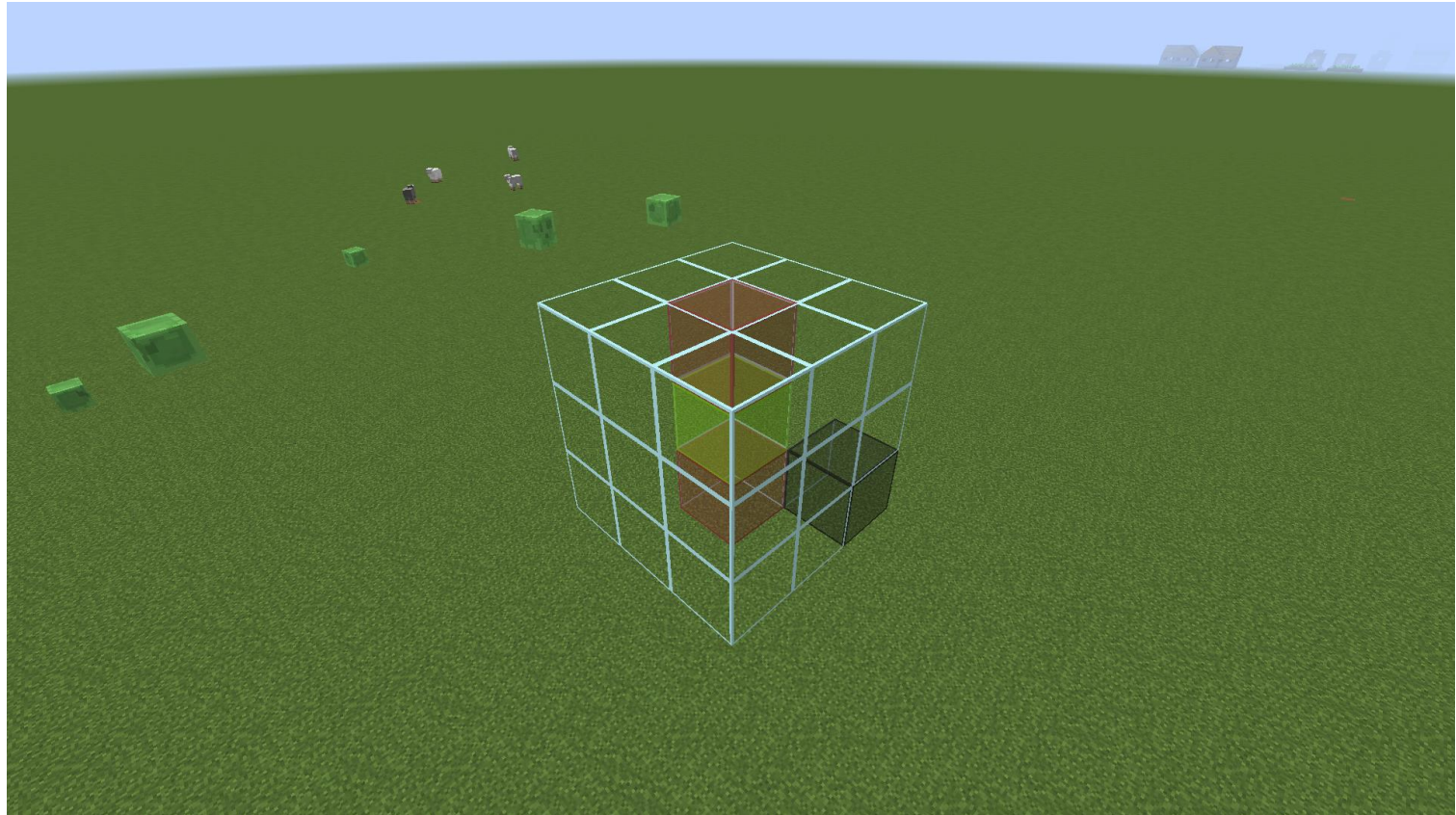
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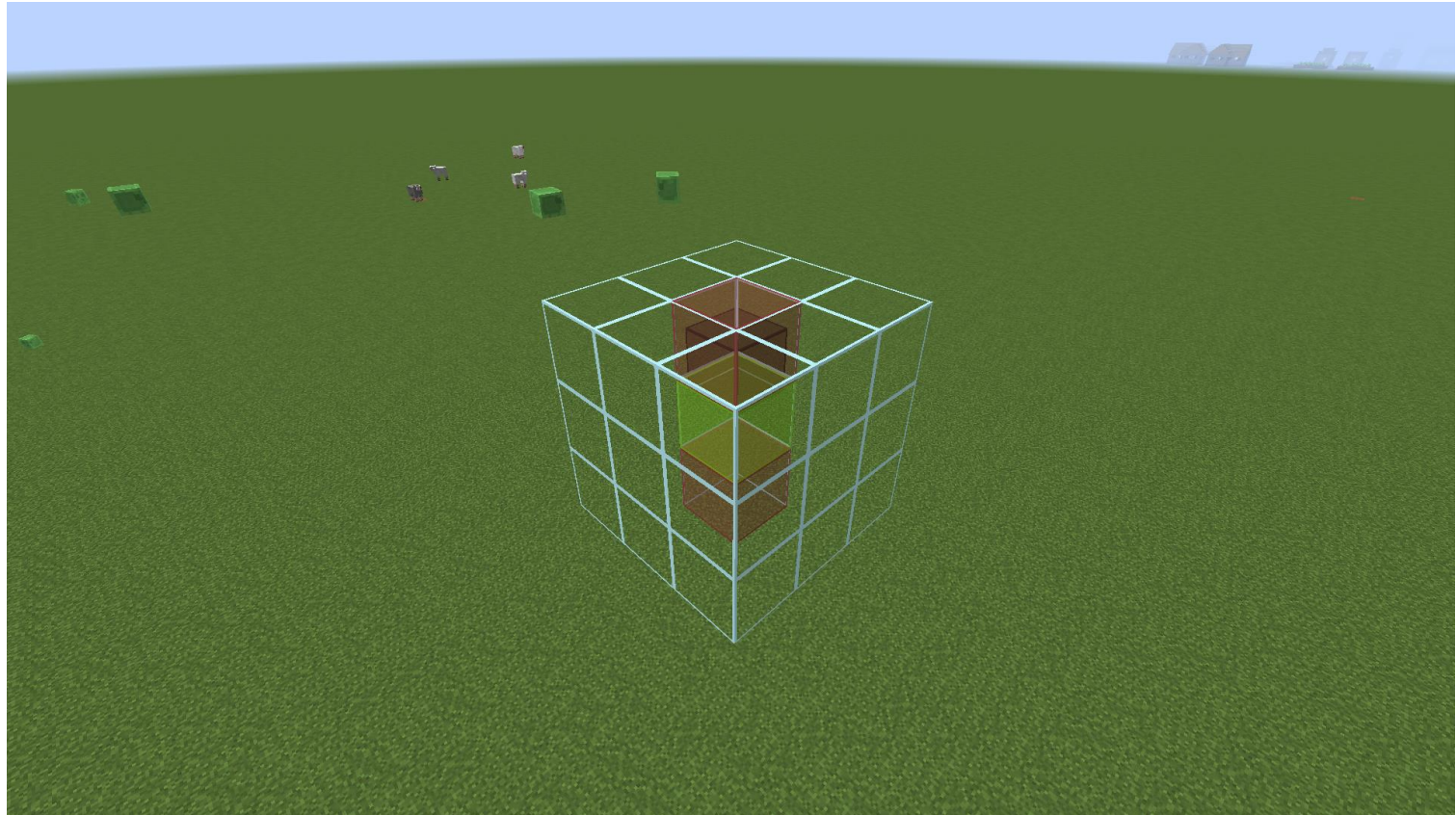
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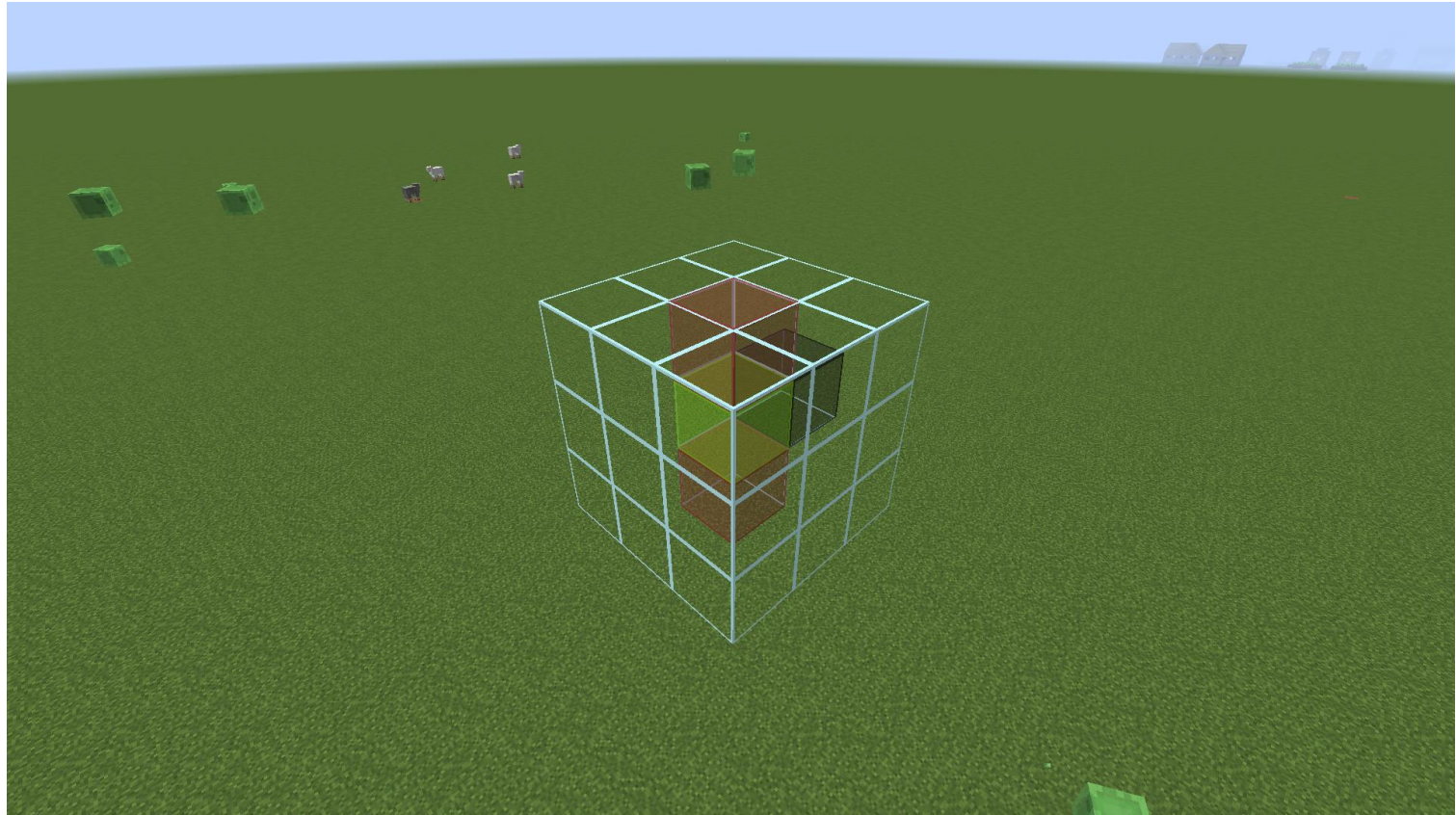
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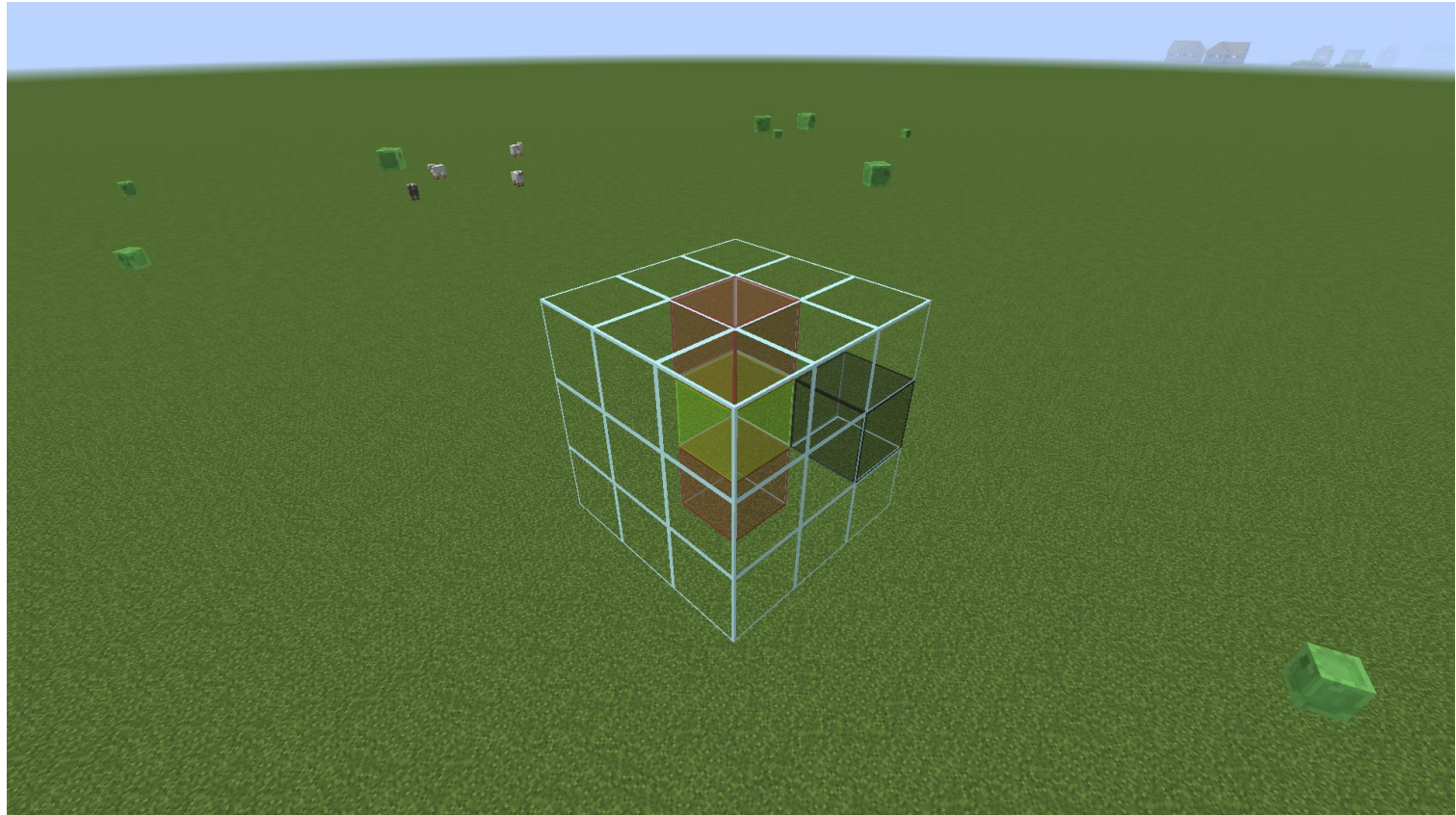
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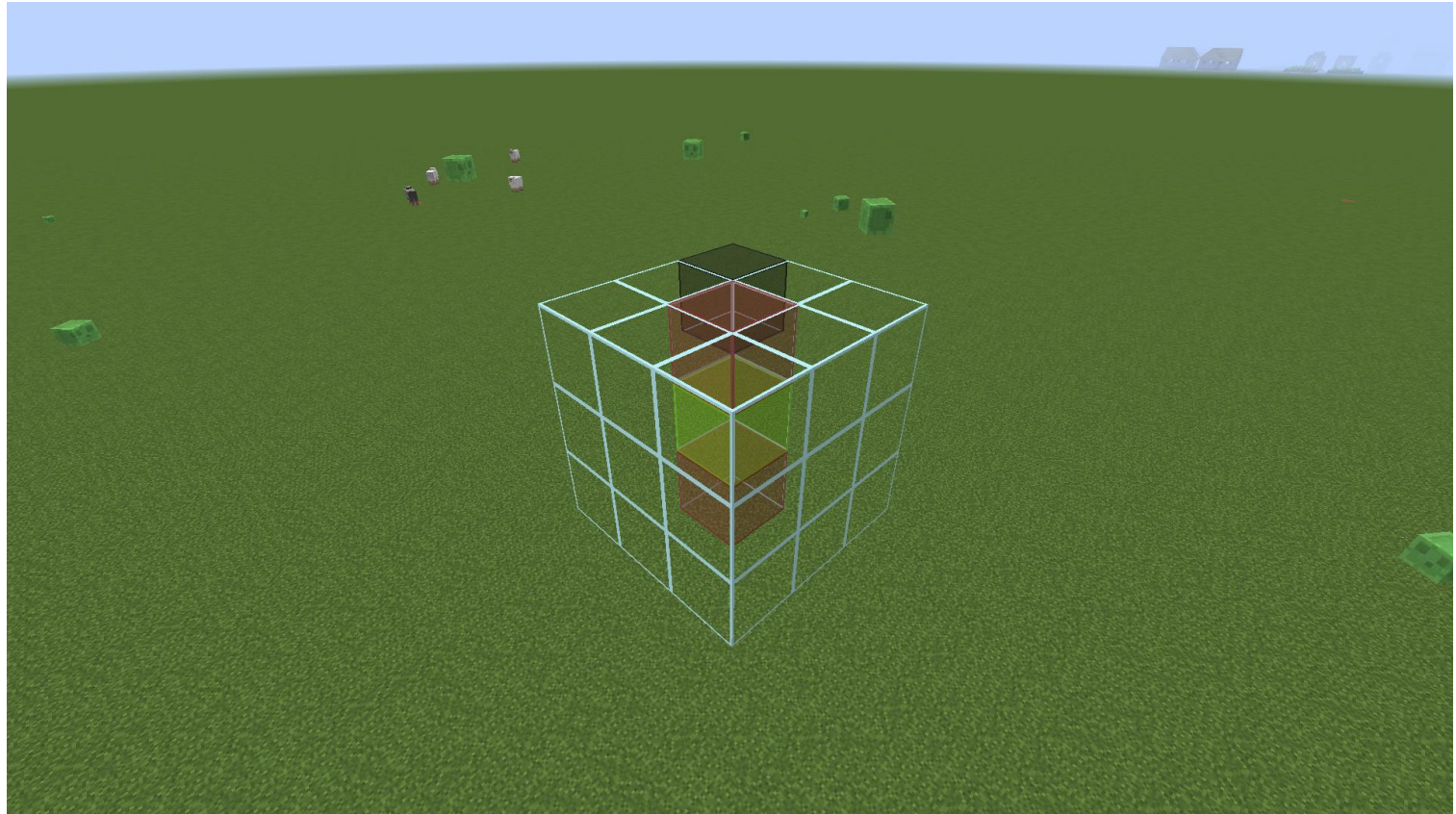
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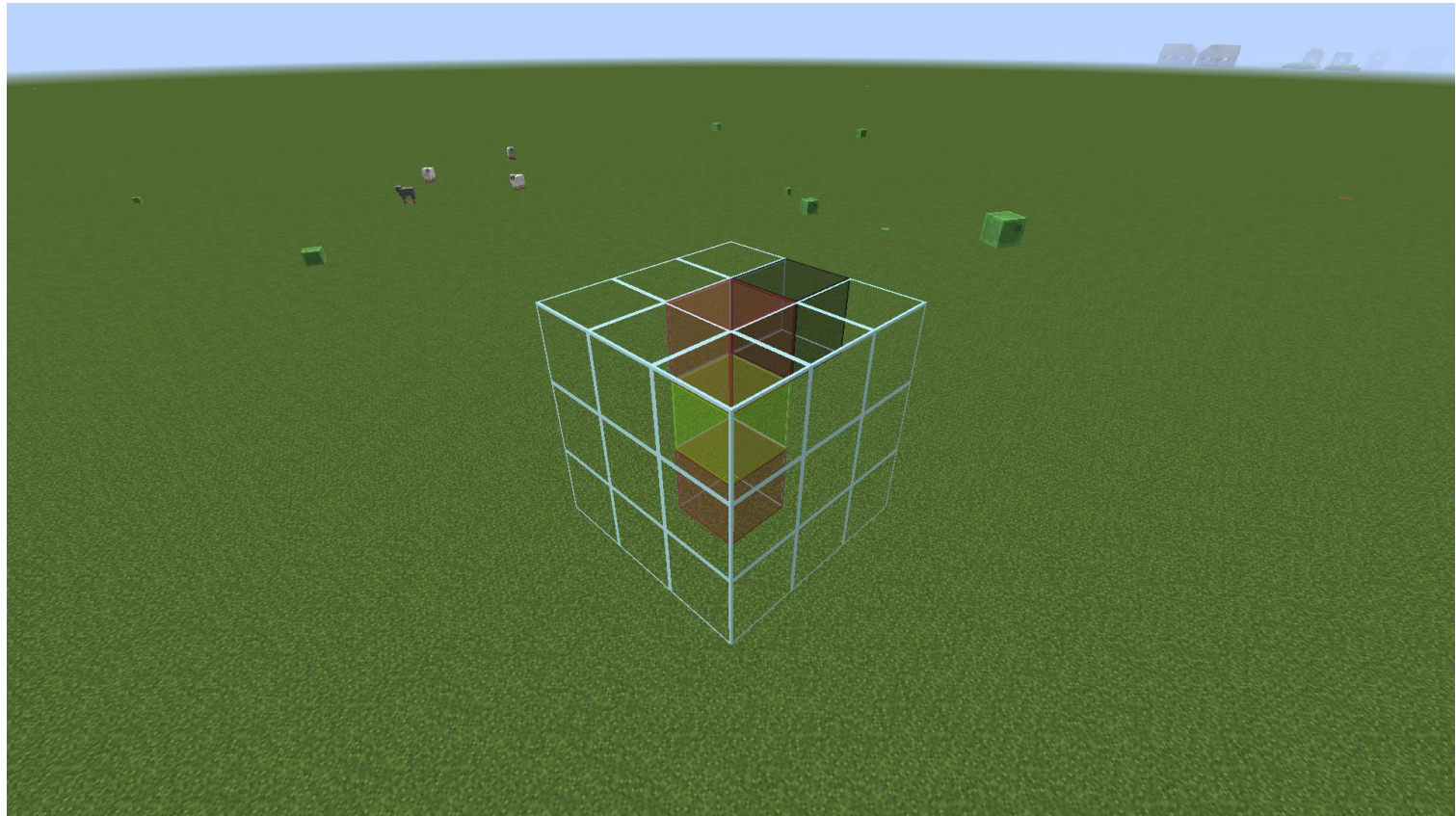
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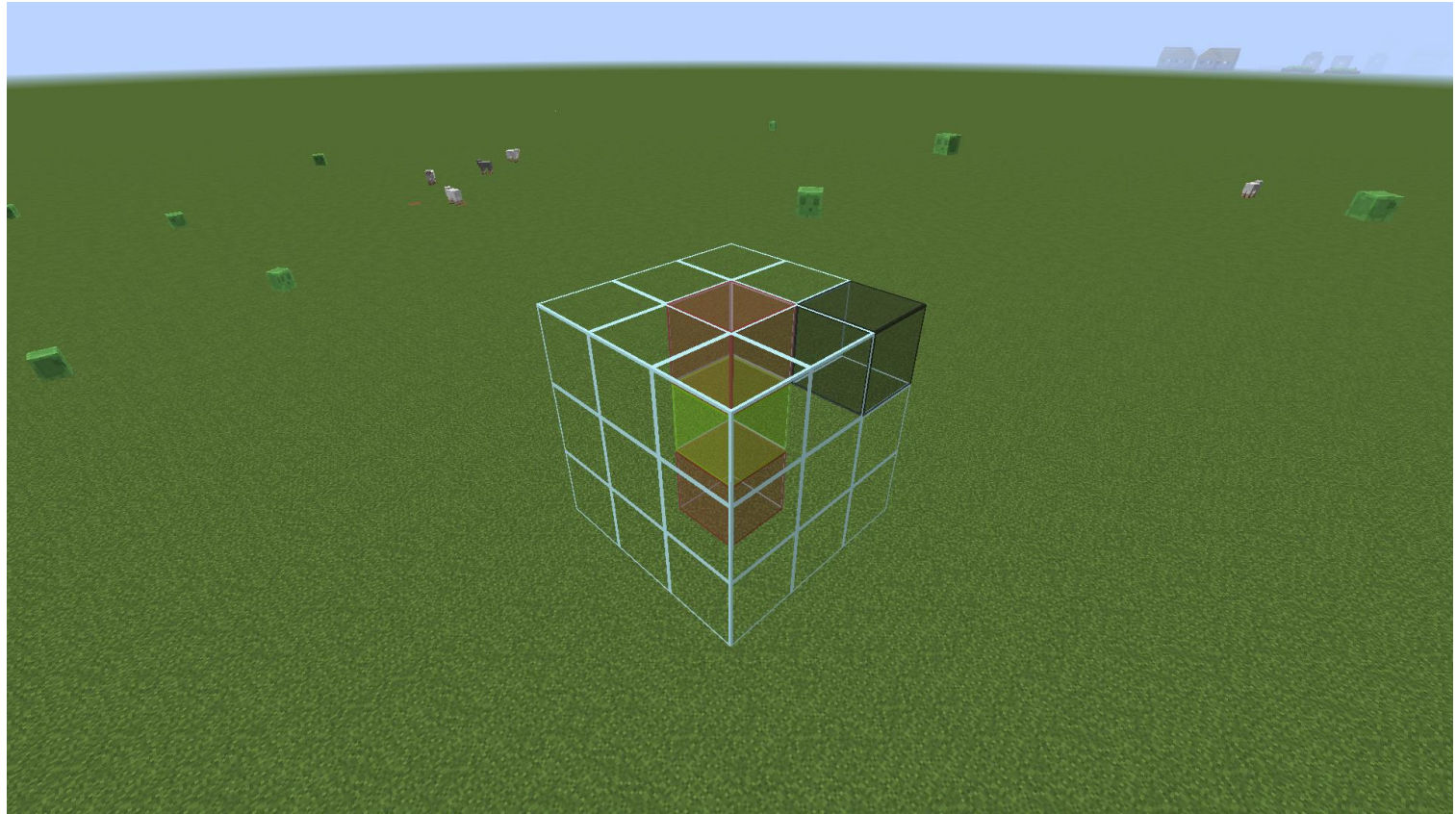
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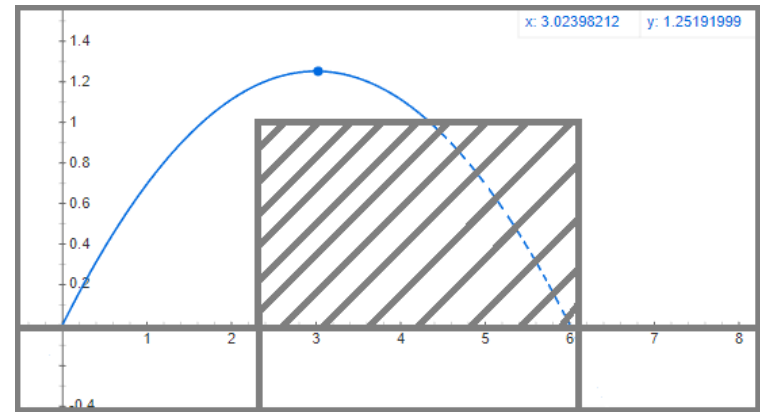
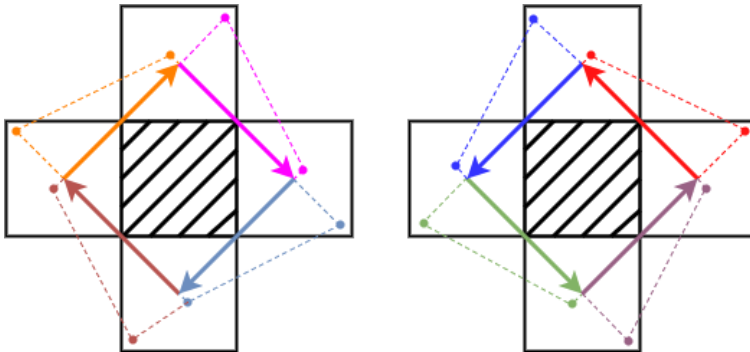
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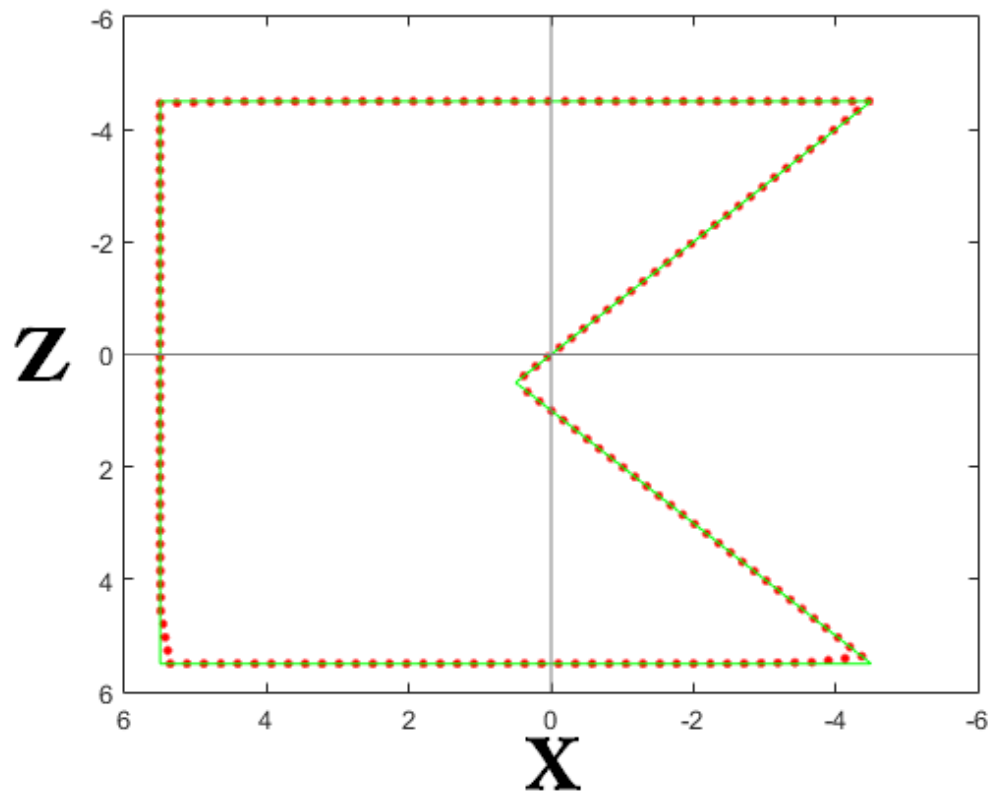
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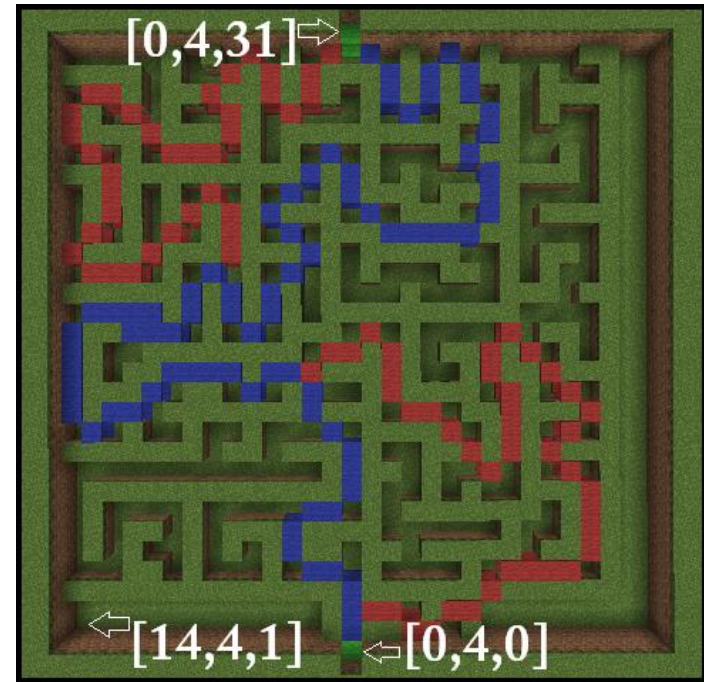
Challenges



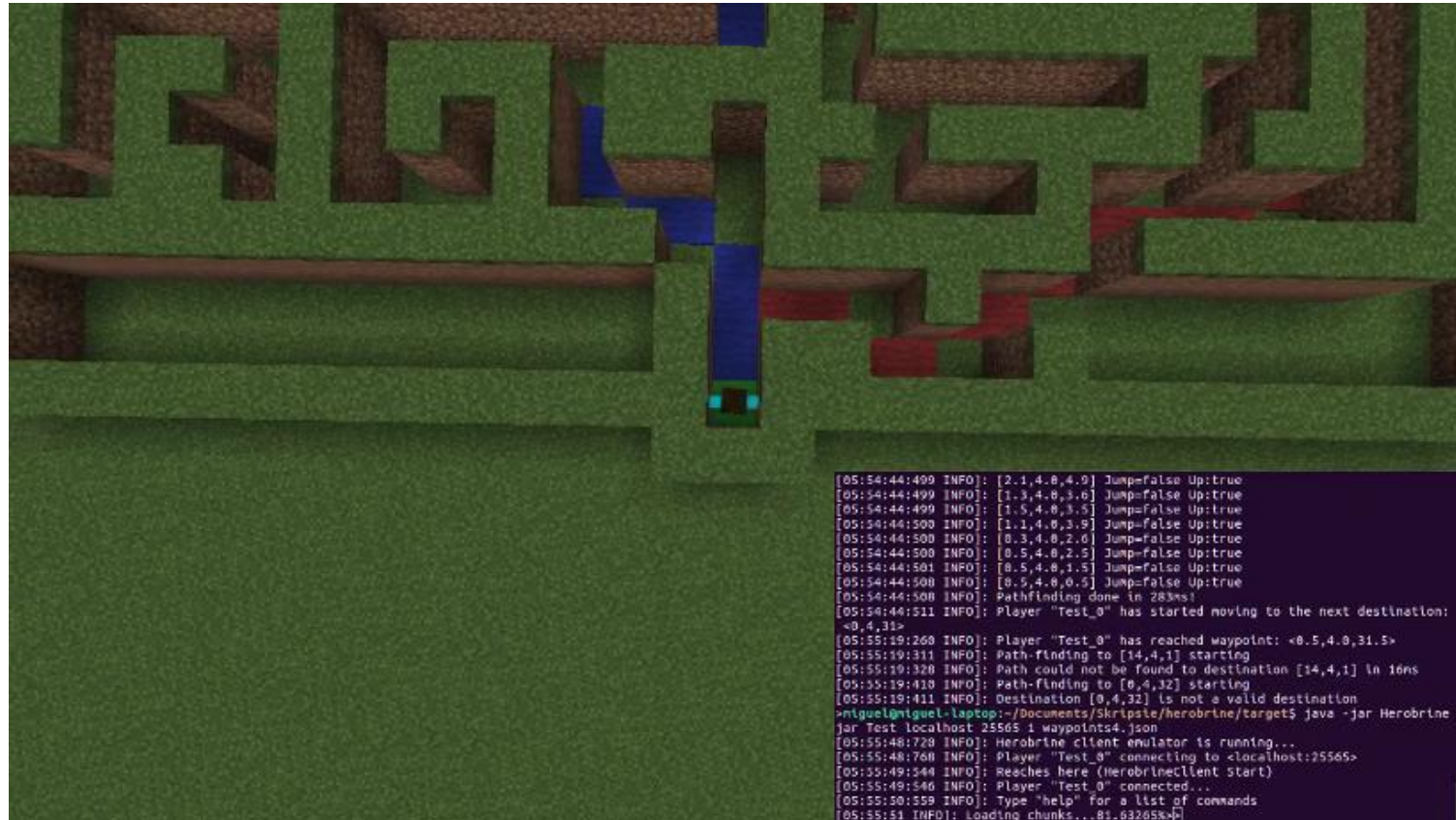
Basic Navigation



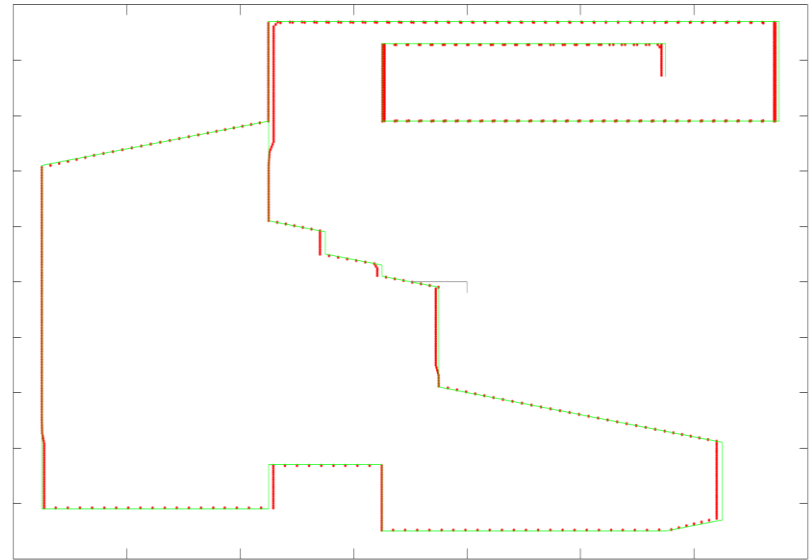
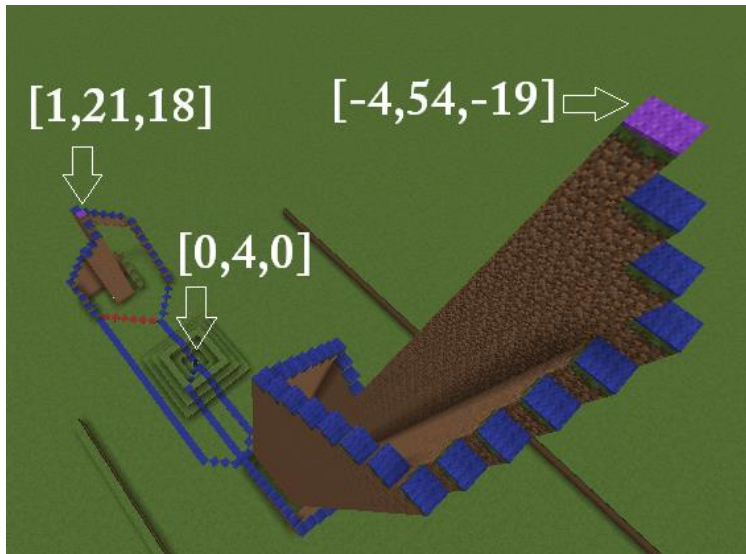
2D Navigation



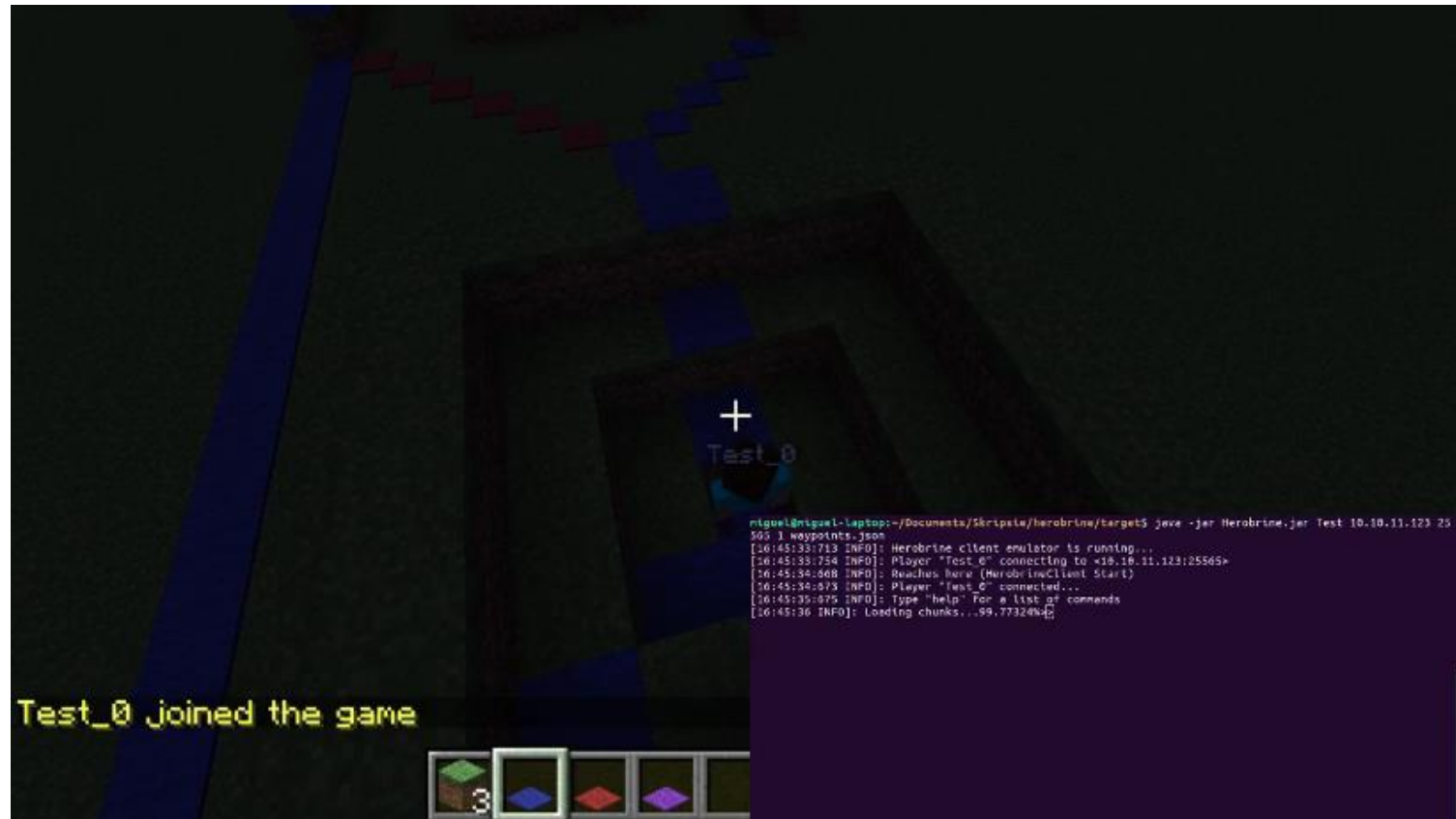
2D navigation



3D Navigation

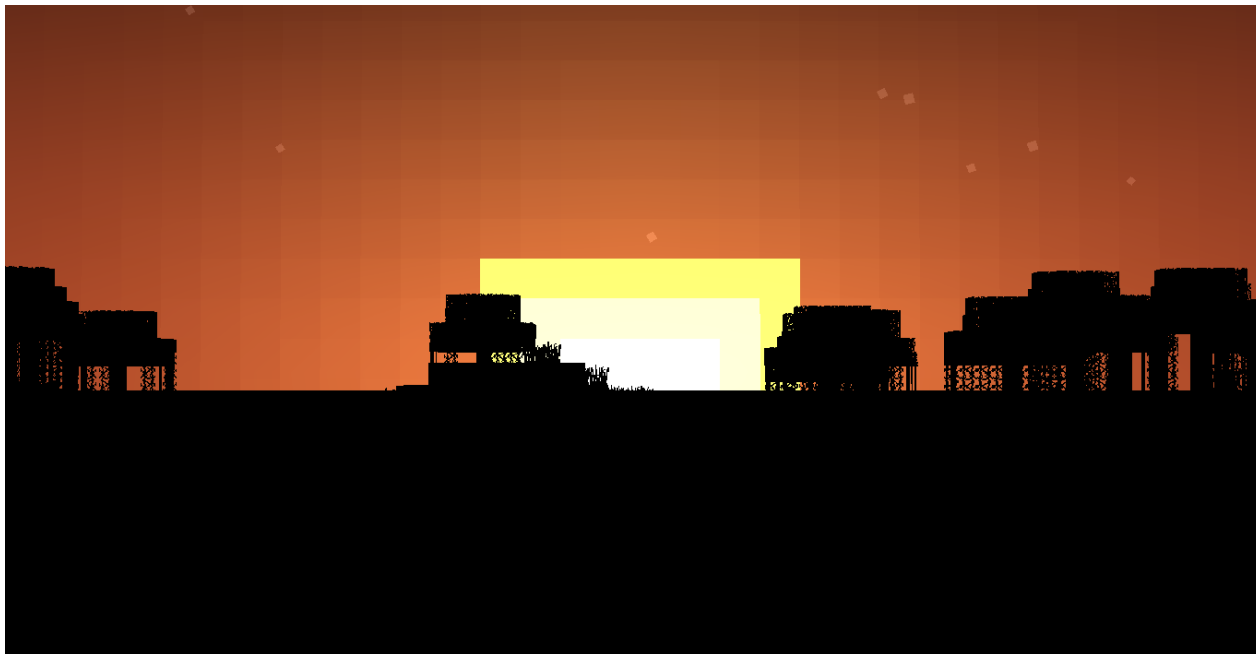


3D Navigation



So about that machine learning...

- Reinforcement machine learning
 - Reinforcement via autonomous agent
 - Reinforcement via controlled agent



Thank you

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