MINECRAFT
EDUCATION EDITION

Educator Guide

Block 1 – Lesson 6
45 minutes
Multiplayer

Revisiting biomes: Collaborative build

OVERVIEW

Tell students that they are ready to take everything they've learned from the different biomes they've visited and get creative. When students visit Dr. Barwin, they can revisit each of the biomes they have worked in. In each biome there are five different activities to test the coding skills with the Agent. This time students will work together in groups to solve the challenges.

THINGS TO KEEP IN MIND:

- The lesson provides a lot more freedom in how students will tackle the activities and in what order;
- The lesson is collaborative, which means students will be working in groups in the same world;
- No "reset" activity is provided for this lesson;
- No "activity complete/ lesson complete" signs are provided for this lesson;
- Plan to leave 10 minutes at the end for students' presentation of the projects.

LESSON RUNDOWN:

- 5 min – Review
- 5-10 min – Planning, forming groups
- 20-25 min – Collaborative build
- 10-15 min – Presentation

REVIEW

Split students in groups of 4-5, they will be working together. Prior to working in Minecraft, they need to review the concepts learnt in this block.

Lesson 1

Decomposition - Breaking down a complex problem or system into smaller parts that are more manageable and easier to understand.

Sequencing - The set of logical steps that are carried out/executed in order.

Pseudo Code - An informal description of a computer program or algorithm.

```
on chat command "4" ⊕
    agent turn  right ▾
    agent move  forward ▾  by  1
    agent move  up ▾  by  1
    agent move  forward ▾  by  1
    agent move  up ▾  by  1
    agent move  forward ▾  by  1
    agent move  up ▾  by  1
    agent move  forward ▾  by  2
    agent move  down ▾  by  3
    agent move  forward ▾  by  1
```

Lesson 2

Pattern Recognition - Finding similarities or patterns that help us solve larger problems.

Algorithm – Detailed step-by-step instructions or formulas for solving a problem or completing a task.

Loop - a structure that repeats a set of instructions (algorithms) until it is told to stop.

```
on chat command "trees" ⊕
    repeat  6  times
    do  agent destroy  forward ▾
        agent collect all
        agent move  forward ▾  by  1
```

Lesson 3

Conditional - a statement that tells a program to do different actions depending on whether a condition is true or false.

```
on chat command "avalanche" ⊕
    while  agent detect  block ▾  forward ▾
    do  agent destroy  forward ▾
        agent move  forward ▾  by  1
        agent destroy  up ▾
```

Lesson 4

Nested Loop – A loop within a loop.

```
on chat command "bamboo" ⊕
  repeat 4 times
  do
    repeat 3 times
    do
      agent set block or item [🪄 ▼] count 64 in slot 1
      agent place down ▼
      agent move forward ▼ by 1
    agent turn right ▼
```

Lesson 5

```
on chat command "1" ⊕
  while not < agent detect block ▼ forward ▼ >
  do
    agent move forward ▼ by 1

  agent turn left ▼
  while not < agent detect block ▼ forward ▼ >
  do
    agent move forward ▼ by 1

  agent turn right ▼
  while not < agent detect block ▼ forward ▼ >
  do
    agent move forward ▼ by 1

  agent turn right ▼
  while not < agent detect block ▼ forward ▼ >
  do
    agent move forward ▼ by 1

  agent turn left ▼
  while not < agent detect block ▼ forward ▼ >
  do
    agent move forward ▼ by 1
```

Collaborative Building

Number of Activities: 5

Students need to work in groups to decide which area they will be building in. Recommended number of players per world is 4-5. Some useful tips on how to host/ join worlds is here: https://minecrafteducation.zendesk.com/hc/en-us/articles/360001429408-How-To-Set-Up-A-Multiplayer-Game- .

Students have a choice: they can either try the presented activities or build their own with code.

There are 4 areas and 5 potential activities. The areas include:
- Beach with sea turtles
- Arctic with Polar Bear
- Panda Bear
- Wolves

Each area will have the following activities for groups of students to code to test their knowledge of the concepts they have learned in the lessons.
- Build a bridge
- Complete the maze
- Clean up the trash
- Build a fence
- Build a tower

Encourage students not only complete the activities presented but also come up with their own coding activities for the Agent, using provided coding blocks.
After students are done with their area, they need to be asked to present in front of the whole class on their activities and solutions.

SUCCESS CRITERIA:
Each group of students demonstrates

- At least 1 completed coding activity per group
- Coding solutions include repeat loops, conditional loops and nested loops
- Students have arrived at more than one successful solution to each of the puzzles.

EDUCATION STANDARDS

CSTA K-12	
1A-AP-08	Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.
1A-AP-09	Model the way programs store and manipulate data by using numbers or other symbols to represent information.
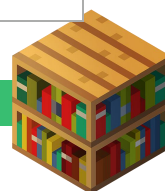
1A-AP-10	Develop programs with sequences and simple loops, to express ideas or address a problem.
1A-AP-11	Decompose (break down) the steps needed to solve a problem into a precise sequence of instructions.
1A-AP-12	Develop plans that describe a sequence of events, goals, and expected outcomes.
1A-AP-14	Debug, (identify and fix) errors in an algorithm or program that includes sequences and simple loops.
1B-AP-08	Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
1B-AP-10	Create programs that include sequences, events, loops, and conditionals.
1B-AP-11	Decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.
ISTE	
3D	Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.
4A	Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
5C	Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.