Minecraft + MS Makecode / Tynker

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Minecraft programming with MS Makecode
http://minecraft.makecode.com

Events associated to:
- the player:
    - hearing <u>someone saying</u> something
    - <u>chat commands</u> (with number args)
    - <u>actions</u>
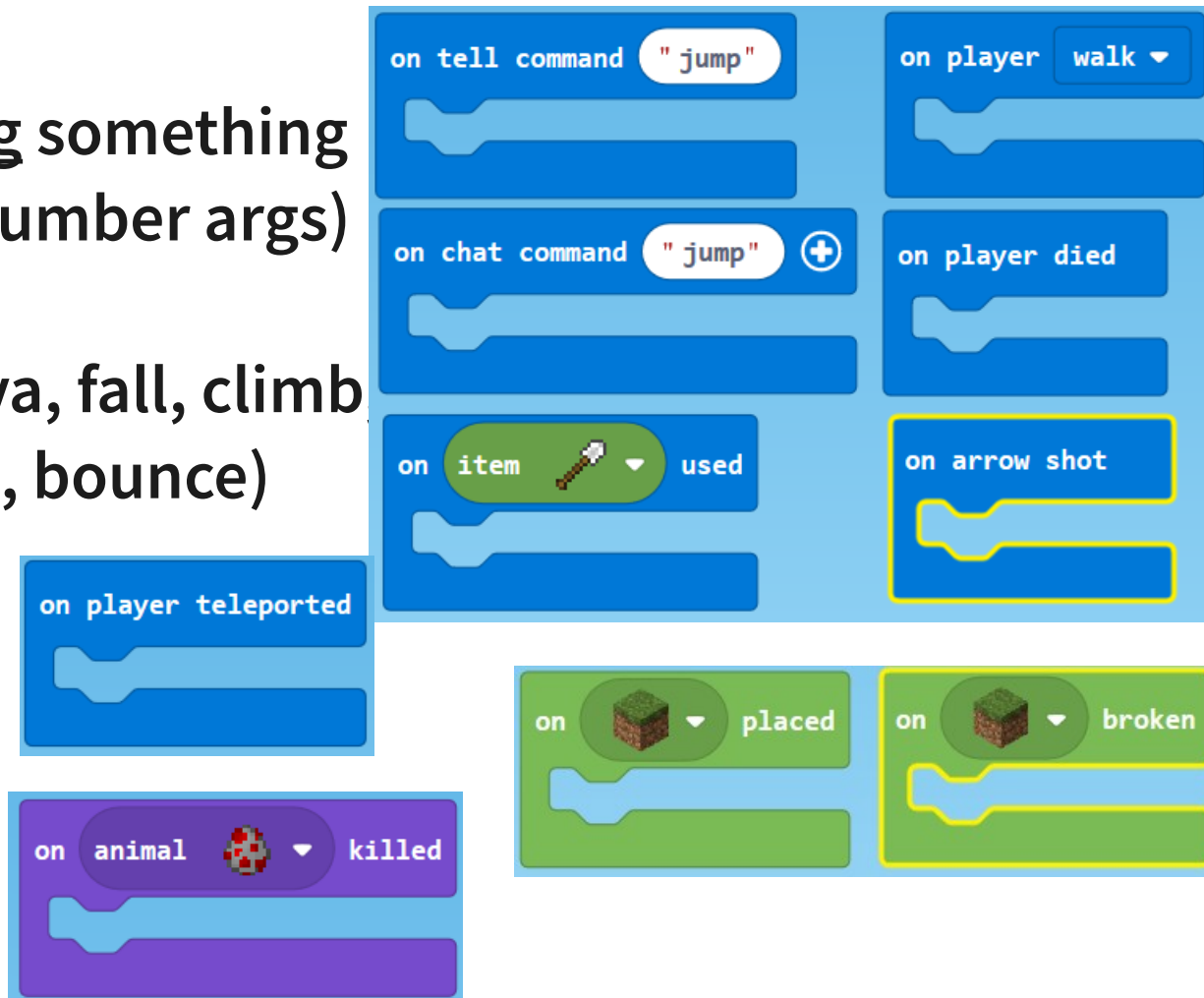   (walk, swim water/lava, fall, climb
        fly, ride, sneak, sprint, bounce)
    - using <u>tools/arrows</u>
    - <u>dying/teleporting</u>

- blocks <u>placed/broken</u>
- animals <u>killed</u>
<u>many more ....</u>

Control blocks

External blocks:
- <u>Forever</u>   (MANY allowed)
- <u>OnStart</u>   (only one allowed)
- <u>RunInBackground</u>   NEW!!!   (only one allowed)

Loops: repeat N times, counted loop, foreach, while-do

Function definition:
- WITH parameters   NEW!!!   (text, number, bool, position)
- NO return   (ONLY in JavaScript)

Full (statically typed) JavaScript mode

<u>NEW: Python!</u>

Programming style

Event-based programming

ONE foreground thread   (onStart)

ONE background thread   (but MANY forever loops !?!)

Functional?   (only in JavaScript/Python)

Object-oriented?   (only in JavaScript/Python)

Threads?   NO

Messages?   ONLY TO PLAYERS   (Say XXX to player YYY)

Minecraft-specific elements

Player: position and chat commands

Player's Agent: move/teleport/destroy/collect/carry

Other Entities: teleport/enchant/give/apply effect/execute command

Blocks: fill/clone block in layer/volume, test for block

Mobs: spawn/kill

Gameplay: set weather/difficulty/time/game rules
survival/creative/adventure

Builders: for building big structures

Reporters for: positions, nearest entities, named players, …

Shapes: lines/circles/spheres of blocks

Minecraft programming with Tynker
http://tynker.com

Events: onStart

when XXX/Any   Block   Placed/Broken

when XXX/Any   Item   Acquired/Dropped/Used

when XXX/Any   Received   Chat Message/Tell

when Player   Travels/Dies/Teleported/Bounced

when XXX   Mob   Killed/Spawned

Agent   move/turn/place/detect/attack/destroy
collect/till/drop/teleport

TynkerBot   test
start/run/clear buffer
move/turn/point to/checkpoint

Programming style

<u>NO JavaScript edit</u>   (read-only code view)

Event-based programming

Sending/receiving/waiting messages (with parameter)

Functions WITH args and <u>WITH return statement</u>
   (they can be used <u>both as block or as reporters</u> if needed)

BEWARE: name changes are <u>NOT updated everywhere</u>

Other actors

World:
- give XXX/kill/enchant player/entity
- weather …

Agent: (visible agent)

TynkerBot: (invisible agent)   NEW!

Block Language properties

Types: numbers, strings, lists, items, mobs, blocks

Messages with values (and wait)

Loops with BREAK and CONTINUE

Functions with arguments and return

Local variables (to function, actor or global) with initializer

Object properties, "keys of" → dictionary?

NO print/say/drawtext ?

Demo

http://minecraft.makecode.com

DEMO

http://tynker.com