

# Custom Blocks

This is a [startup script](#), meaning that you will need to *restart your game* each time you want to make changes to it.

You can register many types of custom blocks in KubeJS. Here's the simplest way:

```
StartupEvents.registry("block", (event) => {
  event.create("example_block") // Create a new block with ID "kubejs:example_block"
})
```

That's it! Launch the game, and assuming you've left KubeJS's auto-generated resources alone, there should be a fully-textured block in the Creative menu under KubeJS (purple dye). KubeJS will also generate the name "Example Block" for you.

To make modifications to this block, we use the **block builder** returned by the `event.create()` call. The block builder allows us to chain together multiple modifications. Let's try making some of the more common modifications:

```
StartupEvents.registry("block", (event) => {
  event.create("example_block") // Create a new block
  .displayName("My Custom Block") // Set a custom name
  .material("wood") // Set a material (affects the sounds and some properties)
  .hardness(1.0) // Set hardness (affects mining time)
  .resistance(1.0) // Set resistance (to explosions, etc)
  .tagBlock("my_custom_tag") // Tag the block with `#minecraft:my_custom_tag` (can have
multiple tags)
  .requiresTool(true) // Requires a tool or it won't drop (see tags below)
  .tagBlock("my_namespace:my_other_tag") // Tag the block with `#my_namespace:my_other_tag`
  .tagBlock("mineable/axe") //can be mined faster with an axe
  .tagBlock("mineable/pickaxe") // or a pickaxe
  .tagBlock('minecraft:needs_iron_tool') // the tool tier must be at least iron
})
```

## All Block Builder Methods

In case it wasn't covered above, here's list of each method you can use when building a block.

- `displayName('name')`
  - Sets the item's display name.
- `material('material')` (No longer supported in 1.20+, see `mapColor` and `soundType` below!)
  - Set the item's material to an available material from the Materials List:

## Materials List

air  
amethyst  
bamboo  
bamboo\_sapling  
barrier  
bubble\_column  
buildable\_glass  
cactus  
cake  
clay  
cloth\_decoration  
decoration  
dirt  
egg  
explosive  
fire  
froglight  
frogspawn  
glass  
grass  
heavy\_metal  
ice  
ice\_solid  
lava  
leaves  
metal  
moss  
nether\_wood  
piston  
plant  
portal  
powder\_snow  
replaceable\_fireproof\_plant  
replaceable\_plant  
replaceable\_water\_plant  
sand  
sculk

shulker\_shell  
snow  
sponge  
stone  
structural\_air  
top\_snow  
vegetable  
water  
water\_plant  
web  
wood  
wool

- `mapColor( MapColor )` (1.20.1+ only)
  - Set block map color, you can [find the entire list here](#), use ID in lowercase, e.g. `'color_light_green'`.
- `soundType( SoundType )` (1.20.1+ only)
  - Set block sound type:

## SoundType List

Instead of using `soundType( SoundType )` you can also use one of these shortcut methods:

- `noSoundType( )`
- `woodSoundType( )`
- `stoneSoundType( )`
- `gravelSoundType( )`
- `grassSoundType( )`
- `sandSoundType( )`
- `cropSoundType( )`
- `glassSoundType( )`

wood  
gravel  
grass  
lily\_pad  
stone  
metal  
glass  
wool  
sand  
snow  
powder\_snow

ladder  
anvil  
slime\_block  
honey\_block  
wet\_grass  
coral\_block  
bamboo  
bamboo\_sapling  
scaffolding  
sweet\_berry\_bush  
crop  
hard\_crop  
vine  
nether\_wart  
lantern  
stem  
nylium  
fungus  
roots  
shroomlight  
weeping\_vines  
twisting\_vines  
soul\_sand  
soul\_soil  
basalt  
wart\_block  
netherrack  
nether\_bricks  
nether\_sprouts  
nether\_ore  
bone\_block  
netherite\_block  
ancient\_debris  
lodestone  
chain  
nether\_gold\_ore  
gilded\_blackstone  
candle  
amethyst  
amethyst\_cluster  
small\_amethyst\_bud  
medium\_amethyst\_bud  
large\_amethyst\_bud  
tuff

calcite  
dripstone\_block  
pointed\_dripstone  
copper  
cave\_vines  
spore\_blossom  
azalea  
flowering\_azalea  
moss\_carpet  
pink\_petals  
moss  
big\_dripleaf  
small\_dripleaf  
rooted\_dirt  
hanging\_roots  
azalea\_leaves  
sculk\_sensor  
sculk\_catalyst  
sculk  
sculk\_vein  
sculk\_shrieker  
glow\_lichen  
deepslate  
deepslate\_bricks  
deepslate\_tiles  
polished\_deepslate  
froglight  
frogspawn  
mangrove\_roots  
muddy\_mangrove\_roots  
mud  
mud\_bricks  
packed\_mud  
hanging\_sign  
nether\_wood\_hanging\_sign  
bamboo\_wood\_hanging\_sign  
bamboo\_wood  
nether\_wood  
cherry\_wood  
cherry\_sapling  
cherry\_leaves  
cherry\_wood\_hanging\_sign  
chiseled\_bookshelf  
suspicious\_sand

suspicious\_gravel  
decorated\_pot  
decorated\_pot\_cracked

You can construct your own sound type with `new SoundType(volume, pitch, breakSound, stepSound, placeSound, hitSound, fallSound)` where volume and pitch are floats 0.0 - 1.0 (usually leave it as 1.0) and all sounds are SoundEvents.

- `property(BlockProperty)`
  - Adds more blockstates to the block, like being waterlogged or facing a certain direction. A full list of properties is available in the Properties List:

## Properties List

Usage: `.property(BlockProperties.PICKLES)`

### Boolean Properties (true/false):

attached,  
berries,  
bloom,  
bottom,  
can\_summon,  
conditional,  
disarmed,  
down,  
drag,  
east,  
enabled,  
extended,  
eye,  
falling,  
hanging,  
has\_book,  
has\_bottle\_0,  
has\_bottle\_1,  
has\_bottle\_2,  
has\_record,  
inverted,  
in\_wall,  
lit,  
locked,  
north,

occupied,  
open,  
persistent,  
powered,  
short,  
shrieking,  
signal\_fire,  
snowy,  
south,  
triggered,  
unstable,  
up,  
vine\_end,  
waterlogged,  
west

## Integer properties:

age\_1,  
age\_2,  
age\_3,  
age\_4,  
age\_5,  
age\_7,  
age\_15,  
age\_25,  
bites,  
candles,  
delay,  
distance,  
eggs,  
hatch,  
layers,  
level,  
level\_cauldron,  
level\_composter,  
level\_flowring,  
level\_honey,  
moisture,  
note,  
pickles,  
power,  
respawn\_anchor\_charges,  
rotation\_16,

stability\_distance,  
stage

## Directional Properties:

facing,  
facing\_hopper,  
horizontal\_facing,  
vertical\_direction

## Other (enum) Properties:

attach\_face,  
axis,  
bamboo\_leaves,  
bed\_part,  
bell\_attachment,  
chest\_type,  
door\_hinge,  
double\_block\_half,  
dripstone\_thickness,  
east\_redstone,  
east\_wall,  
half,  
horizontal\_axis,  
mode\_comparator,  
north\_redstone,  
north\_wall,  
noteblock\_instrument,  
orientation,  
piston\_type,  
rail\_shape,  
rail\_shape\_straight,  
sculk\_sensor\_phase,  
slab\_type,  
south\_redstone,  
south\_wall,  
stairs\_shape,  
structureblock\_mode,  
tilt,  
west\_redstone,  
west\_wall

- `tagBlock(' namespace: tag_name' )`
  - adds a tag to the block

- `tagItem(' namespace: tag_name' )`
  - adds a tag to the block's item, if it has one
- `tagBoth(' namespace: tag_name' )`
  - adds both block and item tag if possible
- `hardness( float)`
  - Sets the block's Hardness value. Used for calculating the time it takes for the block to be destroyed.
- `resistance( float)`
  - Set's the block's resistance to things like explosions
- `unbreakable( )`
  - Shortcut to set the resistance to `MAX_VALUE` and hardness to `-1` (like bedrock)
- `lightLevel( number)`
  - Sets the block's light level.
  - Passing an integer (0-15) will set the block's light level to that value.
  - Passing a float (0.0-1.0) will multiply that number by 15, then set the block's light level to the nearest integer
- `opaque( boolean)`
  - Sets whether the block is opaque. Full, opaque blocks will not let light through.
- `fullBlock( boolean)`
  - Sets whether the block renders as a full block. Full blocks have certain optimizations applied to them, such as not rendering terrain behind them. If you're using `.box( )` to make a custom hitbox, please set this to `false`.
- `requiresTool( boolean)`
  - If `true`, the block will use certain block tags to determine whether it should drop an item when mined. For example, a block tagged with `#minecraft:mineable/axe`, `#minecraft:mineable/pickaxe`, and `#minecraft:needs_iron_tool` would drop nothing unless it was mined with an axe or pickaxe that was at least iron level.
- `renderType(' solid' | ' cutout' | ' translucent' )`
  - Sets the render type.
    - `cutout` is required for blocks with texture like glass, where pixels are either transparent or not
    - `translucent` is required for blocks like stained glass, where pixels can be semitransparent
    - otherwise, use `solid` if all pixels in your block are opaque.
- `color( tintindex, color)`
  - Recolors a block to a certain color
- `textureAll(' texturepath' )`
  - Textures all 6 sides of the block to the same texture.
  - The path must look like `kubejs: block/texture_name` (which would be included under `kubejs/assets/kubejs/textures/block/texture_name.png`).
  - Defaults to `kubejs: block/<block_name>`
- `texture(' side', ' texturepath' )`
  - Texture one side by itself. Valid sides are `up`, `down`, `north`, `south`, `east`, and `west`.
- `model(' modelpath' )`
  - Specify a custom model.
  - The path must look like `kubejs: block/texture_name` (which would be included under `kubejs/assets/kubejs/models/block/texture_name.png`).

- Defaults to `kubejs:block/<block_name>`.
- `noItem()`
  - Removes the associated item. Minecraft does this by default for a few blocks, like nether portal blocks. Use this if the player should never be able to hold or place the block.
- `box(x0, y0, z0, x1, y1, z1, boolean)`
- `box(x0, y0, z0, x1, y1, z1)` // defaults to true
  - Sets a custom hitbox for the block, affecting collision. You can use this multiple times to define a complex shape composed of multiple boxes.
  - Each box is a rectangular prism with corners at (x0,y0,z0) and (x1,y1,z1)
  - You will probably want to set up a custom block model that matches the shape you define here.
  - The final boolean determines the coordinate scale of the box. Passing in `true` will use the numbers 0-16, while passing in `false` will use coordinates ranging from 0.0 to 1.0
- `noCollision()`
  - Removes the default full-block hitbox, allowing you to fall through the block.
- `notSolid()`
  - Tells the renderer that the block isn't solid.
- `waterlogged()`
  - Allows the block to be waterloggable.
- `noDrops()`
  - The block will not drop itself, even if mined with silk touch.
- `slipperiness(float)`
  - Sets the slipperiness of the block. Affects how much entities slide while moving on it. Almost every block in Vanilla has a slipperiness value of 0.6, except slime (0.8) and ice (0.98).
- `speedFactor(float)`
  - A modifier affecting how quickly players walk on the block.
- `jumpFactor(float)`
  - A modifier affecting how high players can jump off the block.
- `randomTick(consumer<randomTickEvent>)`
  - A function to run when the block receives a random tick.
- `item(consumer<itemBuilder>)`
  - Modify certain properties of the block's item (see link)
- `setLootTableJson(json)`
  - Pass in a custom loot table JSON directly
- `setBlockstateJson(json)`
  - Pass in a custom blockstate JSON directly
- `setModelJson(json)`
  - Pass in a custom model JSON directly
- `noValidSpawns(boolean)`
  - If `true`, the block is not counted as a valid spawnpoint for entities
- `suffocating(boolean)`
  - Whether the block will suffocate entities that have their head inside it
- `viewBlocking(boolean)`

- Whether the block counts as blocking a player's view.
  - `redstoneConductor( boolean )`
    - Sets whether the block will conduct redstone. True by default.
  - `transparent( boolean )`
    - Sets whether the block is transparent or not
  - `defaultCutout( )`
    - batches a bunch of methods to make blocks such as glass
  - `defaultTranslucent( )`
    - similar to `defaultCutout( )` but using translucent layer instead
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