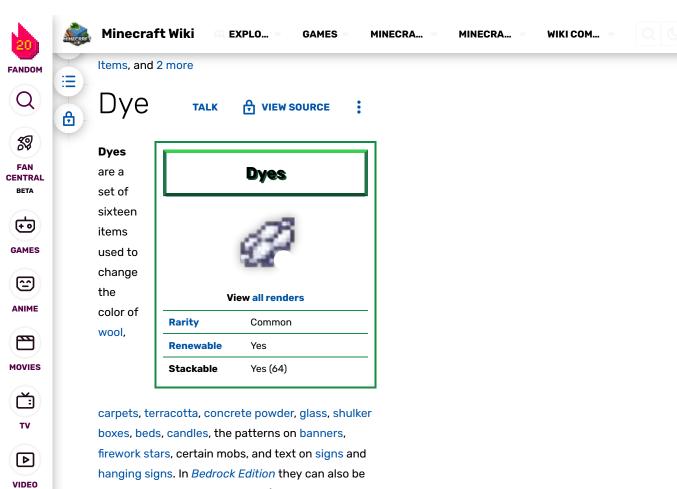


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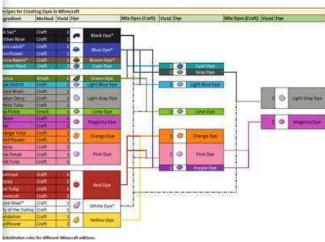
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carpets, terracotta, concrete powder, glass, shulker boxes, beds, candles, the patterns on banners, firework stars, certain mobs, and text on signs and hanging signs. In *Bedrock Edition* they can also be used to dye water in a cauldron (which is thereafter used to dye leather armor); in *Java Edition* leather armor can be dyed directly. In *Minecraft Education* dyes can also be used to dye balloons and glow sticks.

In Bedrock Edition and Minecraft Education, bone meal, ink sacs, lapis lazuli, and cocoa beans can generally substitute for white dye, black dye, blue dye, and brown dye, respectively, in crafting recipes and for use in dyeing items or mobs. However, they have other important uses that aren't related to color, and are therefore not considered true dyes. They are mentioned in this article only in regard to their use as dyeing agents; see their individual articles for complete information about them.





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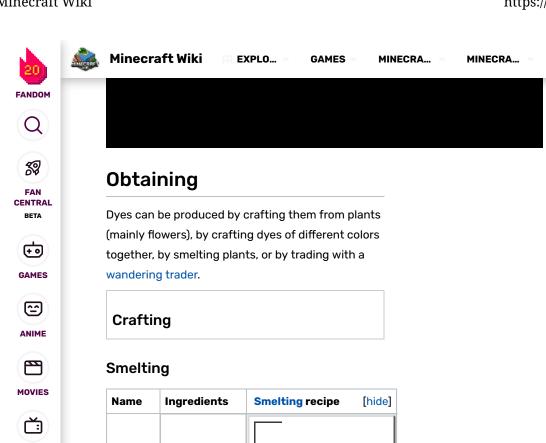
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Name Ingredients Smelting recipe [hide] Lime Dye Sea Pickle + Any fuel Green Cactus + Any fuel 1

Trading

Wandering traders can sell 3 dyes for an emerald. In Bedrock Edition, they can also sell 3 lapis lazuli, bone meal, cocoa beans, or ink sacs for one emerald.

Apprentice-level cleric villagers sell one lapis lazuli per emerald.

Chest loot

Item	Structure	Container	Quantity	Chance
		Java Edition		
Blue Dye	Trail ruins	Suspicious gravel	1	4.4%
Green Dye	Village	Desert house chest	1	14.3%
Orange Dye	Trail ruins	Suspicious gravel	1	4.4%
Light Blue Dye	Trail ruins	Suspicious gravel	1	4.4%
Yellow Dye	Trail ruins	Suspicious gravel	1	4.4%
renow bye	Village	Mason's chest	1	20.8%

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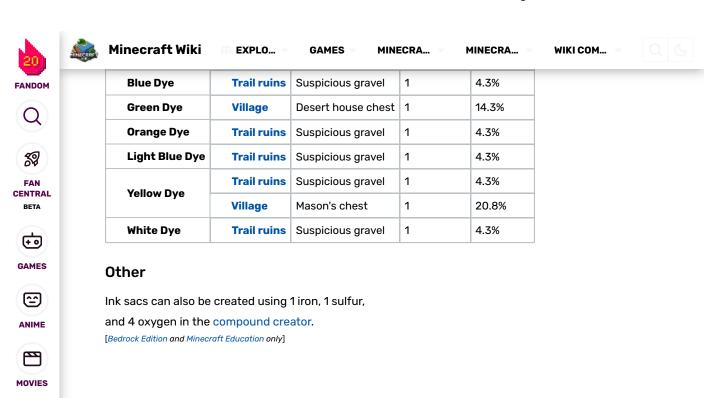
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Usage

Similar to their use in crafting, bone meal, ink sacs, lapis lazuli, and cocoa beans can be substituted for the corresponding dye in any of the following usages unless otherwise specified.[Bedrock Edition only]

Dyeing wool and mobs

Players can dye wool by placing wool and any dye in a crafting grid.

Ingredients	Crafting recipe					
Any Wool + Matching Dye						

Dyes can be used on sheep to change the color of the wool. Shearing a colored sheep drops the corresponding color of the wool, and the sheep retains the color when the wool regenerates.

Breeding colored sheep produces a lamb colored as one of the parent sheep, or a color resulting from the combination of both parents' color. The color combining follows the same rules that dyes use – red and yellow sheep produce an orange lamb, but a blue and yellow sheep cannot create a green lamb. The unlimited reproduction of colored sheep makes

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Dye can also be used on a tamed wolf or cat to change the color of its collar from the default red to the color of the dye.

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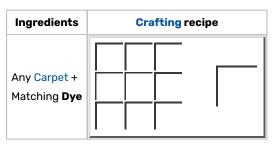
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Dyeing carpets

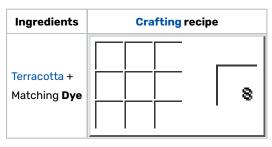
Minecraft Wiki

Carpets can be dyed.



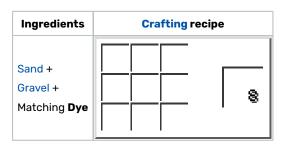
Dyeing terracotta

Terracotta can be dyed by placing 8 blocks around a dye on a crafting table.



Creating concrete powder

Dyes can also be used to craft concrete powder, which can then be set into their respective concrete blocks (they cannot be dyed directly).



Staining glass

Stained glass can be stained by placing 8 blocks of glass around a dye on a crafting table. Just like regular glass, stained glass can be crafted into stained glass panes. The recipe for this is the same as with regular glass.



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MOVIES

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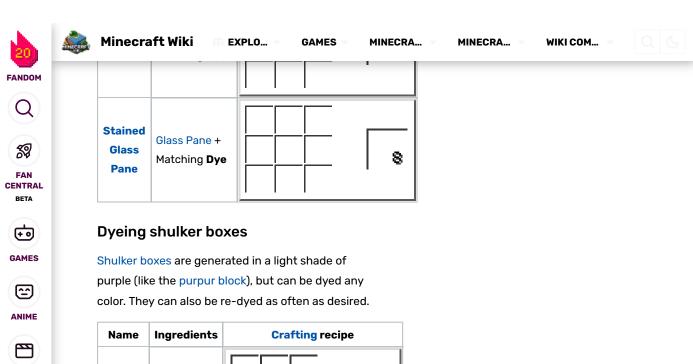
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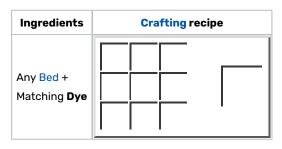
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Name	Ingredients	Crafting recipe				
Shulker Box	Any Shulker Box + Matching Dye					

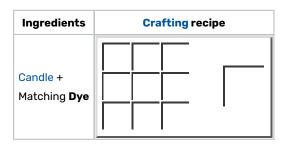
Dyeing beds

Players can dye beds by placing a bed and any color dye in a crafting grid.



Dyeing candles

Players can dye candles by placing an undyed candle and any color dye in a crafting grid.



Banner patterns

Main article: Banner § Patterns

Dyes are used in most banner patterns to determine the pattern and color displayed.

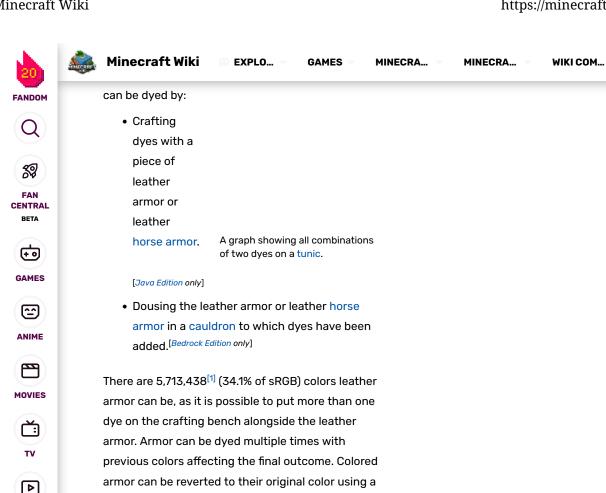


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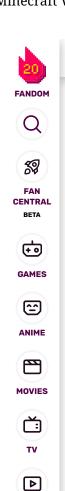
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cauldron with undyed water.

The game has a specific formula for calculating the color of dyed armor: each color, in the RGB color model, has a red value, green value, and blue value. For each dye in the crafting grid, and the armor itself (if it is already dyed), the red, green, and blue values are added to running totals. In addition, a running total of the highest value (be it red, green, or blue) is also kept. After this, each total is divided by the number of colors used. This effectively produces the average red, green, blue, and maximum values. The maximum value of the average RGB values is also calculated. Finally, each average RGB value is multiplied by the average maximum value and divided by the maximum of the average RGB values. The modified average RGB values are then used as the final color. This procedure can be summed up with the following equations:

```
for each color (all "total" variables
start at 0 before counting):
 totalRed = totalRed + redValue
 totalGreen = totalGreen + greenValue
 totalBlue = totalBlue + blueValue
 totalMaximum = totalMaximum +
max(redValue, greenValue, blueValue)
numberOfColors = numberOfColors + 1
averageRed = totalRed /
numberOfColors
averageGreen = totalGreen /
numberOfColors
averageBlue = totalBlue /
```



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maximumOfAverage = max(averageRed,

maximumOfAverage = max(averageRed, averageGreen, averageBlue) gainFactor = averageMaximum / maximumOfAverage

resultRed = averageRed * gainFactor
resultGreen = averageGreen *
gainFactor

resultBlue = averageBlue * gainFactor

Due to the way this formula works, the resulting color can never be darker than the average of the input colors and is often lighter and more saturated. Of course, the resulting color can never be lighter or more saturated than the lightest or most saturated input color. In addition, this formula never creates an RGB value higher than 255 (which would be invalid in the 8-bit RGB color model).

If leather armor is renamed on an anvil, it retains its name when dyed or undyed.

Mixing Samples

+ = #FED83D

+ + = #C898BE

+ + = #B56D51

Dyeing firework stars

A firework star can have a single color or a combination of up to eight colors when crafted with dyes. Adding one or more dyes to a crafted firework star adds a "fade to color" effect to it, overwriting any existing fade colors.

Name	Ingredients	Crafting recipe [hide]
Firework Star	Gunpowder + Any Dye (1–8) + Extra ingredient (optional)	
Firework Star	Matching Firework Star + Any Dye	

Creating balloons

Dye can be used to craft balloons.

[Minecraft Education only]

Ingredients Crafting recipe

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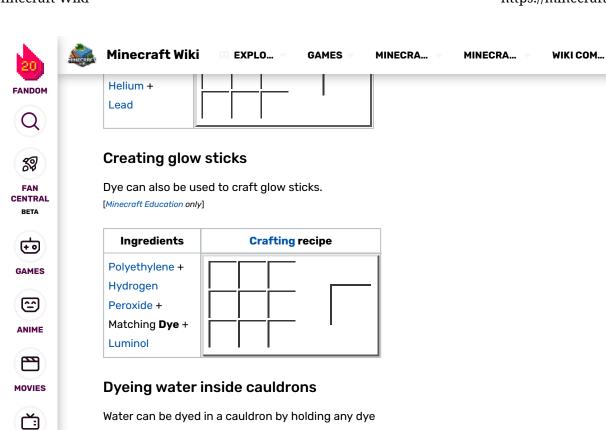
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Water can be dyed in a cauldron by holding any dye in the hand and pressing <u>use</u> on a cauldron filled with water.[Bedrock Edition only]

Signs

Dye can be <u>used</u> on a sign or a hanging sign to change the text color. In *Bedrock Edition*, ink sacs cannot be used for this purpose; black dye must be used to change the text to black.

Trading

Apprentice, journeyman and expert-level shepherd villagers buy any of the 12 dyes for an emerald.

Color values

The "color codes" are used to determine the color imparted on sheep, wolf and cat collars, firework stars, beacon beams, and dyed leather armor. The hex value is shown in the extended tooltips of dyed leather armor; however, to set the color using an NBT data tag in a command, the decimal value must be used instead. The color values for firework stars are slightly different from the ones listed below, and use these values instead.

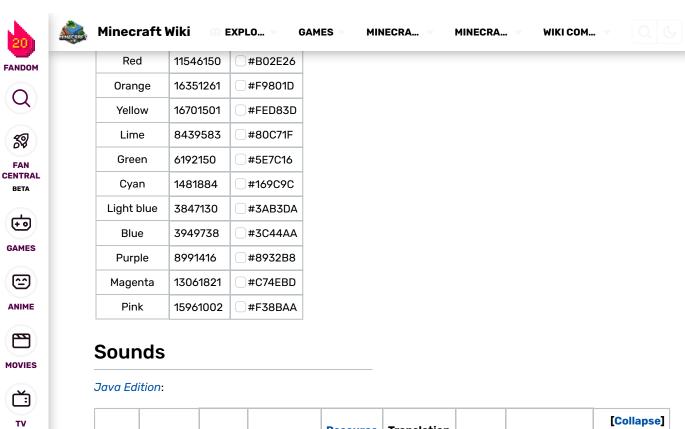
Description	Color Code				
Description	Dec	Hex			
White	16383998	#F9FFFE			
Light gray	10329495	_#9D9D97			
Gray	4673362	_#474F52			
Rlack	1002001	─ #1□1□21			

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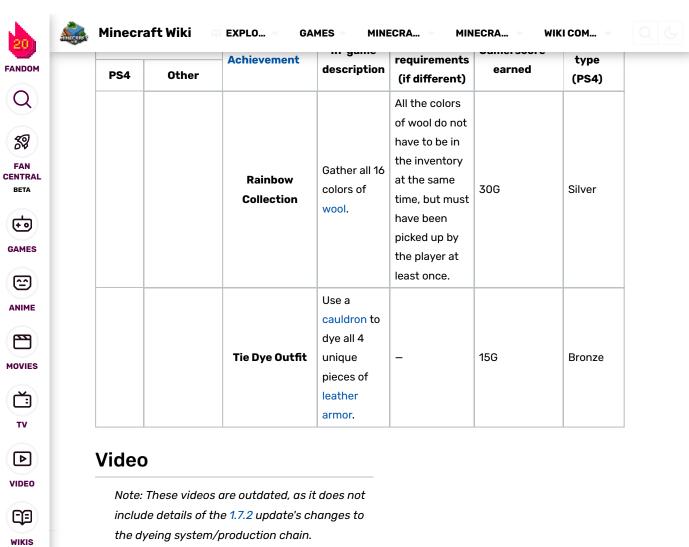
Sound	Subtitles	Source	Description	Resource location	Translation key	Volume	Pitch	[Collapse] Attenuation distance
	Dye stains	Blocks	When dye is used on a sign	item .dye .use	subtitles .item.dye .use	1.0	1.0/0.9/0.95/1.1	16
	Dye stains	Players	When dye is used on a sheep	item .dye .use	subtitles .item.dye .use	1.0	1.0/0.9/0.95/1.1	16

Bedrock Edition:

Sound	Source	Description	Resource location	Volume	[Collapse] Pitch
	Sound	When dye is used on a sign	sign.dye .use	1.0	1.0
	Blocks	When dye is added to a cauldron	cauldron .adddye	0.1	1.0
	Blocks	When armor is dyed using a cauldron	cauldron .dyearmor	0.1	1.0
	Blocks	When dye is removed from armor using a cauldron	cauldron .cleanarmor	0.1	1.0

Achievements





the dyeing system/production chain.

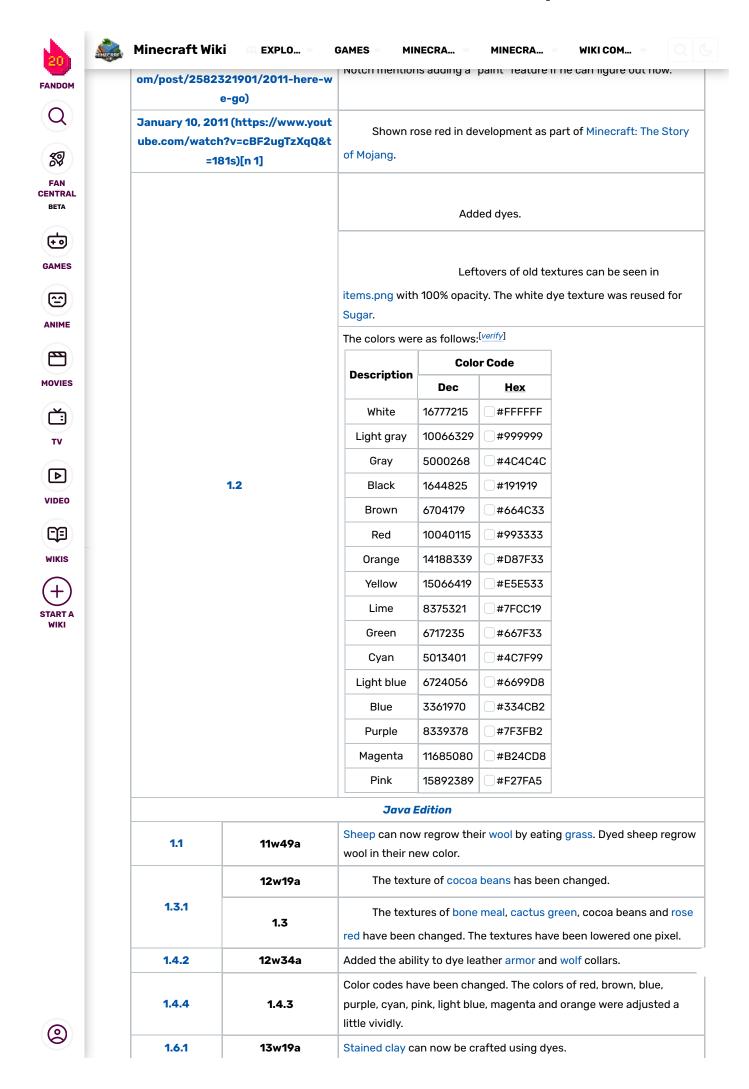
History



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Java Edition Beta

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crafted using dyes.				
Il lapis lazuli, all dyes	s have becor	me fully		
renewable. Added banners, which can be dyed.				
be dyed indirectly b	oy applying a	a matchin		
, , , , , , , , , , , , , , , , , , , ,	., ., ., .,			
ange the color of shu	ulker boxes.			
ft concrete powder.				
nanged. All colors are	e adjusted n	nore vividl		
ows:				
Code Sample	New Co	lor Code		
Hex	Dec	Hex		
#FFFFFF	16383998	#F9FFF		
#99999	10329495	#9D9D9		
#4C4C4C	4673362	#474F5		
#191919	1908001	#1D1D2		
#664C33	8606770	#83543		
#993333	11546150	#B02E2		
#D87F33	16351261	#F9801		
#E5E533	16701501	#FED83		
#7FCC19	8439583	#80C71		
#667F33	6192150	#5E7C1		
#4C7F99	1481884	#169C9		
#6699D8	3847130	#3AB3[
#334CB2	3949738	#3C44		
#7F3FB2	8991416	#8932B		
#B24CD8	13061821	#C74EB		
#F27FA5	15961002	#F38BA		
ass, and stained glas				
means that they sti	till use old co	olors. ^[2]		
to white beds.	h			
for the dye ID have	e been split	up into th		
oa beans and lapis la	ızuli are no lo	onger		
lded white, black, bro	own and blu	ie dyes.		
ellow" and "Cactus G	reen" have t	peen		
ello	ow" and "Cactus G	ed white, black, brown and blu ow" and "Cactus Green" have I ow Dye" and "Green Dye", resp		

	1.14		The textures of light gray, gray, red, orange, yellow, lime, green, cyan, light blue, purple, magenta, and pink dyes, have been changed. The color texture for light blue dye was not changed to reflect the updated colors from 1.12. ^[2]			
		18w44a	The color of the text on signs can now be changed with dye.			
		18w49a	Yellow dyes can now be found in chests in village mason houses.			
		18w50a	Green dyes can now be found in chests in desert village houses.			
		19w05a	Added the wandering trader, which can sell any type of dye.			
		19w11a	All 16 types of dyes can now be bought by shepherd villagers.			
			Reversed the order of dyes to match other colored items in the Creative inventory. ^[3]			
	1.16.2	Pre-release 2	Regrouped dyes in the Creative inventory such that white, blue, brown, and black dyes are within and not cocoa beans, ink sacs, lapis lazuli, and bone meal. ^[4]			
		20w45a	Added candles, which can be dyed.			
	1.4	21w03a	Added a sound for applying dyes.			
	1.17	21w19a	Candles can no longer be dyed.			
		Pre-release 1	Candles can now once again be dyed.			
		22w42a	The color of the text on hanging signs can now be changed with dye			
	1.20 (Experimental)	23w07a	Torchflowers can now be crafted into orange dye.			
			Pink petals can now be crafted into pink dye.			
			Pitcher plants can now be crafted into cyan dye.			
		23w12a	Blue, light blue, orange, white, and yellow dye can now be found in suspicious gravel and suspicious sand in trail ruins.			
		23w14a	Pitcher plants can now craft two cyan dye instead of one.			
	1.20		Blue, light blue, orange, white, and yellow dye no longer generates in suspicious sand in trail ruins.			
		23w16a	Due to the split of the archaeological loot tables for the suspicious gravel within the trail ruins; blue, light blue, orange, white, and yellow dye now are in the common loot.			
	Pocket Edition Alpha					
	v).3.0	Added dyes. Only dandelion yellow and lapis			
			lazuli are currently obtainable and have functionality.			
	v	0.3.2	Cactus green is now obtainable by smelting cacti.			
	v0.3.3		Bone meal is now obtainable via crafting.			
			Cyan dye, light blue dye, lime dye, magenta dye, orange dye, pink dye and purple dye are now obtainable via crafting.			
			Rose red is now obtainable by smelting red mushrooms.			
			All available dyes, excluding bone meal, can now be used to craft the respective wool color.			
		build 1	The texture of cocoa beans has been changed.			

			Rose red can now be obtained from beetroots.	
			Cocoa beans can now be obtained from cocoa pods.	
		build 1	The rose has been removed and replaced with a new poppy flower that can be crafted into rose red.	
	v0.9.0	build 3	All new flowers can now be crafted into dyes. Because of this, many secondary and tertiary dyes are now primary dyes.	
			Gray dye and light gray dye can now be obtained in survival.	
		build 11	Stained clay can now be crafted using dyes.	
			Ink sacs can now be obtained from squid.	
	v0.11.0	build 1	Added the ability to dye wolf collars.	
	v0.12.1	build 1	Red mushrooms can no longer be smelted to obtain rose red.	
	v0.14.0	build 1	Cauldrons now used for leather dyeing, by applying a dye to a water filled cauldron.	
	v0.16.0	build 1	Cocoa beans can no longer be crafted.	
			Pocket Edition	
			Added a <i>Dye</i> button for sheep.	
	1.0.0	alpha 0.17.0.1	Added shulkers, which can be dyed.	
	1.0.0	аірна 0.17.0.1	Added stained glass. Stain glass cannot be crafted, but purple glass generates in end cities.	
			Dyes can now apply color to a white beds.	
	1.1.0	alpha 1.1.0.0	Dyes are now used to craft concrete powder.	
			The color palette has been changed.	
	Bedrock Edition			
		beta 1.2.0.2	Dyes can now be used for banner crafting.	
	1.2.0		Dyes can now be used to craft firework stars.	
			Stained glass is now craftable, using dyes.	
	1.4.0	beta 1.2.20.1	Lime dye can now be obtained from smelting sea pickles.	
	11-710		Dyes can now used to craft glow sticks and balloons.	
		beta 1.8.0.8	Dyes can now be used to dye cat collars.	
			Added white, brown, black and blue dyes,	
	1.8.0	beta 1.8.0.10	which can be crafted from lapis lazuli, bone meal, cocoa beans and ink sacs. This, however, the later four still use as dyes. ^[5]	
			"Rose Red", "Dandelion Yellow" and "Cactus Green" have been renamed to "Red Dye", "Yellow Dye" and "Green Dye", respectively.	
	1.9.0	beta 1.9.0.0	Blue and white dye can now be obtained from cornflowers and lily o the valleys.	
			Glass panes and carpets can now be dyed.	
			Only a single dye is now required to apply a banner pattern in a loon	
			Various dyes except black dye, white dye, brown dye and blue dye a	
	1.10.0	beta 1.10.0.3	now sold by wandering traders.	

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Pre-release dye textures hidden within Items.png.

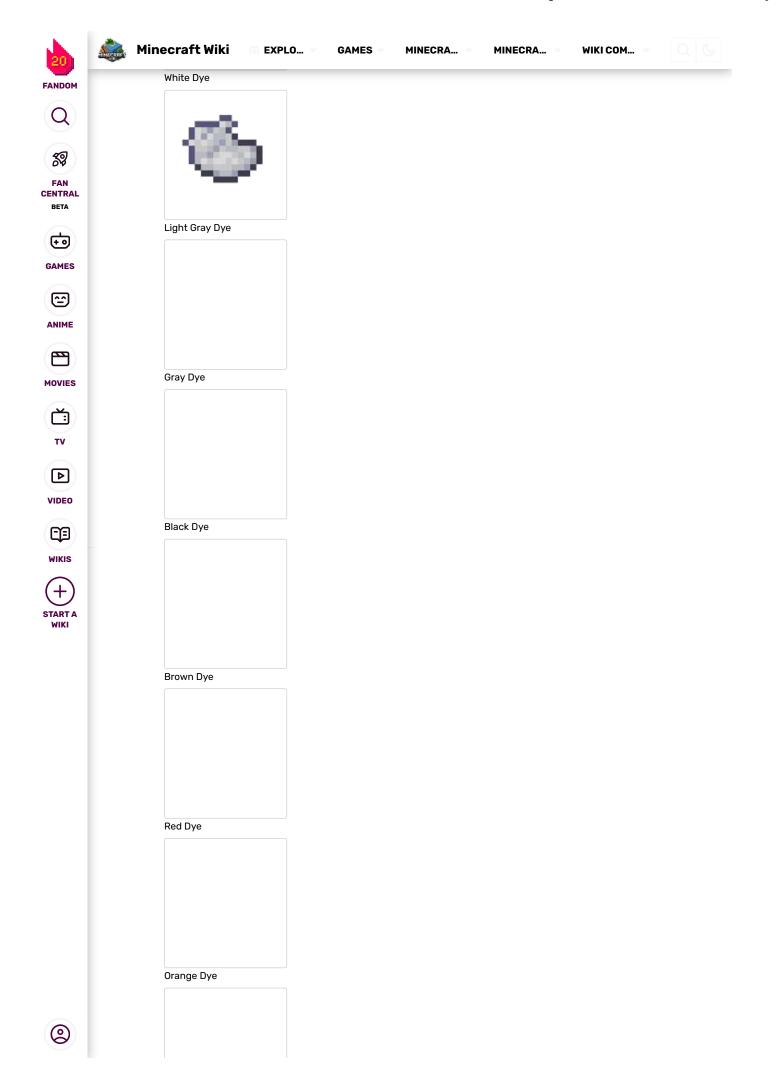
Notes

 Supposed time when fragment was filmed.
 Based on modified date of client.jar/gui/ trap.png in Beta 1.2.

Gallery







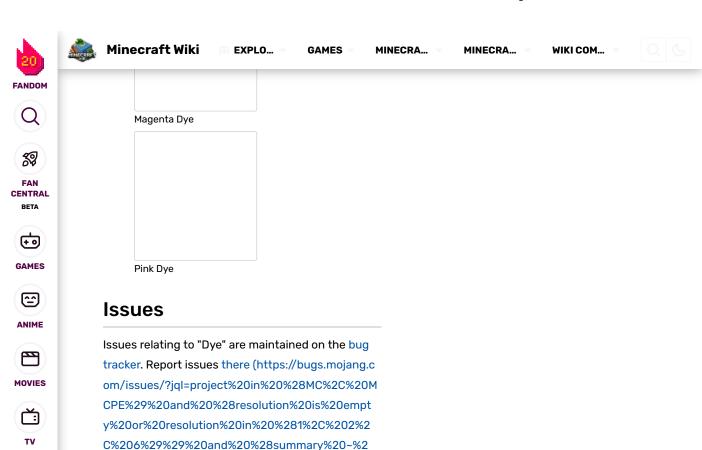
Cyan Dye Light Blue Dye Blue Dye	Negros N	Minecraft Wiki	EXPLO	GAMES	MINECRA	MINECRA	WIKI COM	Q
Green Dye Cyan Dye Light Blue Dye Blue Dye		Yellow Dye						
Green Dye Cyan Dye Light Blue Dye								
Green Dye Cyan Dye Light Blue Dye Blue Dye								
Green Dye Cyan Dye Light Blue Dye Blue Dye								
Cyan Dye Light Blue Dye Blue Dye		Lime Dye						
Cyan Dye Light Blue Dye Blue Dye								
Cyan Dye Light Blue Dye Blue Dye								
Cyan Dye Light Blue Dye Blue Dye								
Light Blue Dye Blue Dye		Green Dye						
Light Blue Dye Blue Dye								
Light Blue Dye Blue Dye								
Light Blue Dye Blue Dye								
Blue Dye		Cyan Dye						
Blue Dye								
Blue Dye								
Blue Dye								
		Light Blue Dye						
Purple Dye		Blue Dye						
Purple Dye								
Purple Dye								
Purple Dye								
		Purple Dye						

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Trivia

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 Players can obtain each one of every color with 1 cocoa bean, 2 yellow dye, 2 ink sac, 3 green dye, 4 lapis lazuli, 4 red dye, and 6 bone meal (2 bones).

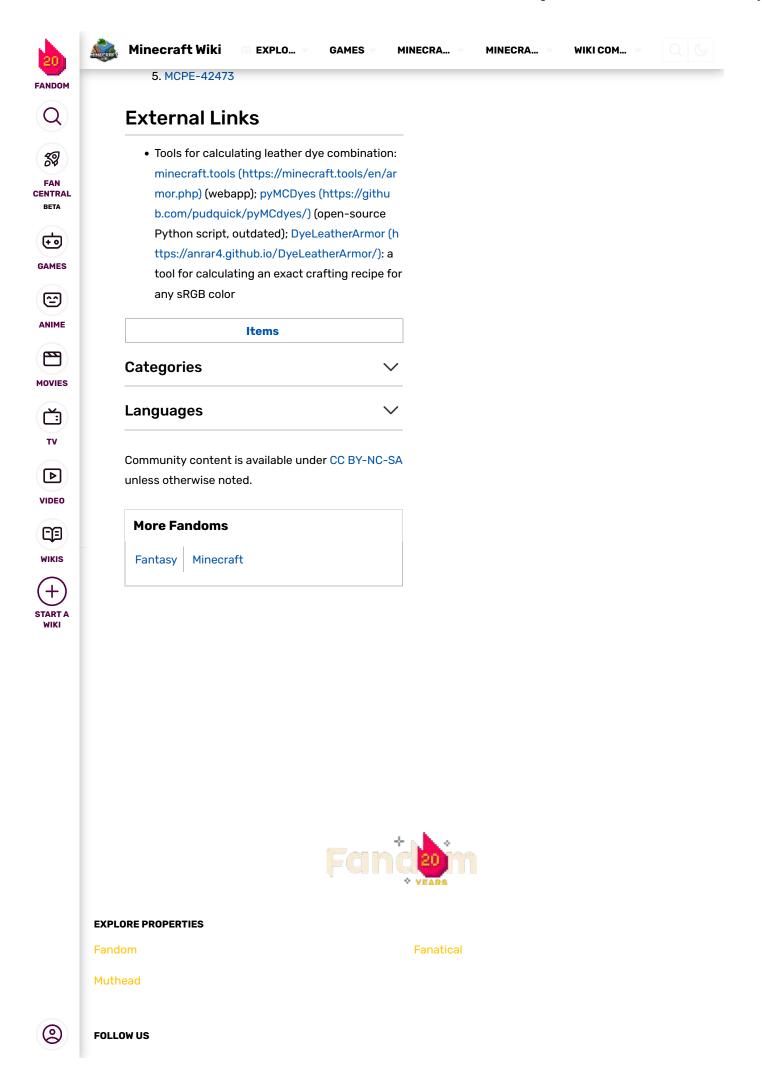
0%22Dye%22%29%20order%20by%20resolution%2

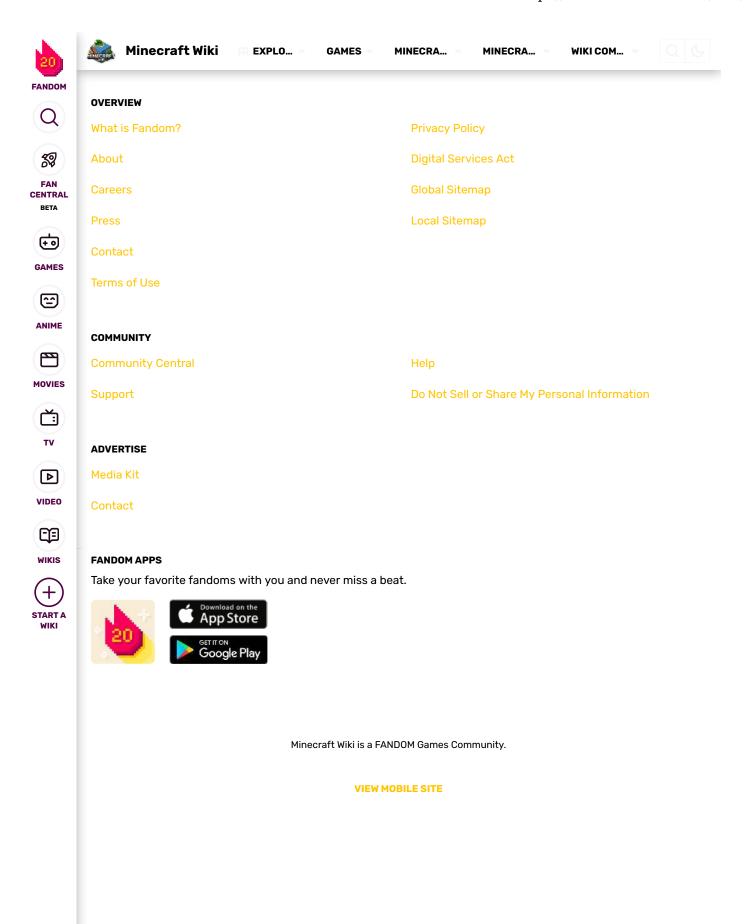
- The dyed sheep breeding behavior mirrors Lamarck's theory, in which the organisms evolve inheriting the external changes and adaptations of the previous generation, transmitting them to their offspring.
- In Bedrock Edition, tertiary colors, along with their regular crafting recipes, can be crafted with primary colors. E.g.: Magenta can be crafted with one rose red and two bone meals.
- The colors of the dyes match the chat colors in color codes except for brown (dye only), light aqua, and gold (color codes only).
- The texture for light blue dye still uses the color from prior to the 1.12 World of Color update.^[2]

References

- 1. https://anrar4.github.io/DyeLeatherArmor/
- 2. MC-214643 MC-214641







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