

GPU Paint Race

One fast painter or 64 slow ones? Race them and see why AI runs on GPUs.

OBJECTIVE

Five painting jobs. For each one, pick the crew you think finishes first: one fast CPU painter, or a GPU crew of 64 slower painters who all do the same step at once. Then watch them race. The last job is a real neuron on a million dots.

PLAY FREE AT [HIBOT.SPACE/GAMES/GPU-PAINT-RACE/PLAY](https://hibot.space/games/gpu-paint-race/play)

- 1 Read the job, then pick a crew: CPU or GPU. On job 4 you can also split the job between them.
- 2 Press Race. Both walls fill at the same time. Skip to end jumps to the finish.
- 3 The lights come on with the tick counts. Pick the winner to clear the job; Race again to try another pick.
- 4 Toy numbers, so you can count them: the CPU paints 1 pixel a tick. The GPU crew has 64 painters; each step they all paint one pixel together and it takes 4 ticks, plus 16 ticks to send the job over first. Real GPUs have thousands of painters.

THE FIVE JOBS (ANSWER KEY)

- 1 Paint the wall one color. CPU 1,536 ticks · GPU crew 112 ticks. GPU crew wins, 14x faster than the CPU.
- 2 Brighten every pixel of a photo. CPU 1,536 ticks · GPU crew 112 ticks. GPU crew wins, 14x faster than the CPU.
- 3 Follow the trail. CPU 200 ticks · GPU crew 816 ticks. CPU wins, 4.1x faster than the GPU crew.
- 4 The mixed job. CPU 1,536 ticks · GPU crew 900 ticks · Split 200 ticks. Split wins, 4.5x faster than the GPU crew.
- 5 Finale: a neuron on a million dots. CPU 1,000,000 ticks · GPU crew 62,516 ticks. GPU crew wins, 16x faster than the CPU.

WHAT THE RACE TEACHES

- 1 A CPU has a few fast, clever cores. A GPU has thousands of simpler ones that all do the same step at once.
- 2 Jobs where every piece is the same small sum, like pixels or AI math, split across the GPU's painters.
- 3 Jobs where each step waits for the one before don't split. Extra painters just wait.
- 4 AI models are millions of multiply-and-add sums, which is why they train and run on GPUs.

NO SCREENS? PLAY IT UNPLUGGED

- 1 No screens? Draw a 10x10 grid. One player colors every square alone while the class times it.
- 2 Cut a second grid into strips, one per player. A caller says one color at a time, everyone colors only that color, and nobody moves on until all hands are up. Time it.
- 3 Now a trail: each square gets the number of the square before it plus one. Split it into strips and see why the team can't go faster.