

Answer key:

1. Cartesian duh. Don't assign the delta to them. Cartesian uses x,y,z coordinates to guide printer head along linear rails/belts that correspond directly to axis. Delta converts the 3 arm length/rail height using trig. into x,y,z coordinates of the printer head. Answer doesn't need to go into the math.

2. X is left-right. Y is back-front. Z is up-down.

3. CoreXYZ: similar to cartesian printer but print bed move in Z, and extruder move in X and Y.

Polar: use polar coordinates, bed spins around Z axis and extruder move in a plane perpendicular to print bed.

Scara: origin moves up-down along Z, 2 arms connected together by a joint only rotating about Z axis comes out of that origin, works like a human arm.

4. You have eyes bruh.

5. Stepper motors: use for precise movement (stepping) in x,y,z axis.

Timing belts: use for x and y axis, cheap and easy to use.

Threaded rods: use for z axis, low maintenance and precise.

Glass plate: popular choice for printer bed because price and how flat it is.

Bed heater: keeps bed hot so prints sticks.

Electronics box: keeps control element (Arduino) and power source for printer heat elements.

Endstops: switch to tell printer where's the max movement for x,y,z axis.

Extruder assembly: where filament gets melted and extruded into layers.

Hot end: metal nozzle where filament can get heated, connected to heating block.

Fans: keep other parts of extruder assembly cool.

Thermistors: check temperature of heating block for precise temperature.

Levelling sensor: sense distance from its laser, checks distance from extruder to bed for different points in bed.

6. Sample answer, not in real order:

Printer moves to home, where stepper motor rotates and the gears on the timing belt/threads on threaded rods converts rotation to linear motion. Extruder assembly and glass bed heat to initial temperature, where electronic box (Arduino) gets temperature from thermistors and controls when to stop increasing heat, and fans automatically turns on to keep other parts of extruder assembly cool. Electronic box controls levelling sensor as it goes around the bed and gets a mesh of the print bed. When print starts, filament is pushed by a stepper in the extruder assembly through hot end. If the gcode tells the printer to move a lot in any direction when printing, the endstops can tell where is the max/min of where the movements should go.