adversity; how food chains pop into ecosystems and societies arise. From the dazzling rainbow of colour under the ocean to the breathtaking diversity of a rainforest, getting to grips with how life works is among the most life-affirming of avocations.

Learn how knowledge is created

The endgame of learning about life, the universe, and everything is to see the big picture in context. How it affects the human experience—within families, cultures, and societies—and how different practices and beliefs lead to the creation and communication of new ideas. In other words, to turn your objective understanding into a **personal philosophy**.

(Being a solo freelancer, interacting with all society's planes and layers, is a great vantage point: a lone wolf understands society far better than any social insect. Standing apart lets you watch from above.)

A word on **philosophy**. Most of it is just wordplay. But the Great Philosophers can each be summarised on a single page, however mad, bad, dead, or German; understanding them doesn't take years. So look deeply into their ideas and criticise them, hard. You'll be on your way to a solid belief system of metaphysics, epistemology, ethics, values, politics, and aesthetics, a unifying superstructure that brings meaning to your whole life.

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LEVERAGE LIFE-ENHANCING TECHNOLOGY . . .

One theme of **100 Days, 100 Grand** is that off-the-shelf software and websites like Word and LinkedIn can do great things for you. Technology *magnifies human potential*. Use it to the max for an edge inside *and* outside work.

Happily, tech is now mobile. Everybody knows about Apple and Android **apps** (itunes.apple.com and play.google.com/store/apps.) Take them further with less-known add-ons that do just what you want; there are huge developer communities around both. Then delete those you don't use. Make your laptop, phone, and pad *yours*, and you'll get more out of them.

Like the great outdoors? Film your exploits with a **GoPro** action camera (gopro.com); models do everything from flat stills to 360° VR. Even point-and-shoot digital cameras take excellent pix: some zoom to 50x and beyond. And check out **drones**. Parrot (parrot.com) offers easy-to-fly hardware that puts the plane's point of view in your VR goggles; DJI (dji.com) offers folding flyables no bigger than your hand, with hi-res 4K video.

Ski-ing, cycling, surfing, even skating are all high-tech sports; look at the major brands in each and see how they use tech to enhance the experience.

Nike+ (nikeplus.nike.com) and FitBit (fitbit.com) track your performance across a variety of activities, with terrific web-based backup and sharing—letting you compete for real without ever going near a stadium.

Like cars? Test drive a **Tesla** (teslamotors.com). Ride a bike? Check out the battery of wonders from **Mission** (mission-motorcycles.com) and **Zero** (zeromotorcycles.com) or the head-up displays from **Nuviz** (ridenuviz.com). It's not just the machine, but the experiences you add to it.

Into **food**? Look into off-kilter kitchen appliances like smokers, dehydrators, and freeze dryers; they add new options for cooking. Make juices and smoothies with a blender, your daily loaf in a breadmaker, even your own beer. The best kitchen knives (Global has a great range) let you develop primal skills like boning and jointing and keep it fun, but most minimalist of all is to prep with a single Chinese **chopper**. A good one will last a lifetime.

A side benefit of being an enthusiastic technology user is that you'll get to know some of the coolest companies out there—which gives you a chance to turn them into clients. So learn the principles of leveraging technology to your own ends; you'll soon find yourself customising everything you own with the extra bits that work for you . . . making each object *yours*.

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. . . AND TAKE DIY TO THE MAX

Taking it up a notch: if you're less studious, there are ways to learn by **doing**. (Usually the best way to learn in any case.) There are diverse populations around many skills-and-knowledge-based hobbies; here are a few to look at.

Join technology communities

There have always been communities of interest around technical pastimes; today, the internet broadens them. Everything from formal societies to mailing lists can lead you to friendly and skilled individuals who can help you get your hands dirty. It's about more than shared interests and fun weekends; the people and communities you connect with through hobbies become prospects for the **offer** you defined in **Part 2**.

Explore programming with open-source software

If you're going the whole way into homebrewing, using **open-source software** like **Linux** (linux.org) and **LibreOffice** (libreoffice.org) gives you a feeling of mastery over machines that everyday use of Windows and MacOS can't match. There are thousands of free applications, and using them connects you to a vast and friendly community of indie developers. Who knows, among them may be your next customer.

While you don't have to learn programming to understand computers, **coding your own website** gives you a great sense of how software works. Learn the basics of HTML and CSS (introduced on Days **2** and **3**) then look at the software that makes them possible: web servers like Apache, programming environments like C++.

Many are simpler than they look; with the right learning methods you can gain basic skills in a month. (Mastery is far harder, but it's surprisingly easy to get a grip on the fundamentals.)

Learn electronics by building a computer

There's nothing like that feeling when you first switch on a machine you've made yourself. And it's simpler than you think. Two options are to **build your own desktop PC from parts**, or **explore computing with Raspberry Pi**.

Homebrewing a PC needs just a couple of hundred £ for a capable desktop box. The basics are a **case** with **power supply**, into which goes a **motherboard** (with **processor**, **memory**, and **expansion slots** for a **graphics card**) and a **hard drive** plus **connectors** for networks and broadband. Outside go **keyboard** and **screen**. Install a free operating system like **Linux**, and you're good to go.

In tandem, explore the Raspberry Pi, a deliberately bare-bones hobbyist computer the size of a deck of cards. Many can substitute for a full PC. But the joy of Pi is **GPIO**, a set of input/output pins you can customise to connect and control almost anything—surrounded by a subculture just as diverse. As with the PC, there are thousands of bits (called HATs) that extend and expand it.

Building your own box also teaches you a great deal about the *physical* side of computing: **electricity** and **electronics**. What amps, volts, and watts do; the small set of parts—resistor, capacitor, diode, transistor, amplifier—that join together to make logic gates and integrated circuits; the standards that let different devices talk to each other.

The most complex computer is just a big assemblage of these bits, and learning how they work gives you a healthy understanding of the machines the world runs on. Explore electronics.

Get into virtual worlds with computer graphics

With an understanding of code, among the most absorbing areas to explore is **computer graphics**. How pixels and triangles relate to voxels and vertices; how realistic three-dimensional worlds result from texture maps and how augmented reality is blurring the real and unreal.

A top-end **graphics card** in your PC is the start; graphics chips are designed to handle visual elements and nothing else, and with other applications like AI

driving the growth curve, there's no end in sight for performance. And you don't need to code your own experiences from the ground up. Countless games, from single-player sandbox shooters to massively interactive MMORPGs, have free development kits that let you build your own maps and landscapes in the world of the game. It's all just dots, but it's also an enjoyably creative act.

The endgame—taking vast computing crunch, but enabling you to experience complete artificial worlds with a headset—is **virtual reality**. Facebook's **Oculus** (oculus.com) is one among many.

It's now clear where the technology's going—towards immersive worlds with their own laws of physics where most teaching, learning, designing, and building will one day happen—and it's going to be a wild ride.

Magnify your senses with robotics

Arduino (arduino.cc) is an open-source hardware and software platform in the same spirit as Raspberry Pi; it lets you create and control everything from LEDs to walking robots with LEGO-like enjoyment. Its culture is the **Maker Movement** active from Silicon Valley to Shenzhen.

Whatever you build, projecting your senses away from your body—with rolling rovers, flying drones, or mobile cameras—is exhilarating and informative.

Understand electromagnetism with radio

The world is swathed in radio waves. Mobile phones, WiFi networks, local stations and satellite traffic crisscross the atmosphere side-by-side with FM radio and broadcast TV. And with just a USB dongle these messages and images and data can be seen and heard far from their intended markets.

That's why even in the age of the web, the number of licensed amateur radio station operators or **hams** is *growing*. Simply because it's fun. The hobby goes back to the days of vacuum tubes and wooden crates, and at the cheap end there's a subset of enthusiasts doing as much as they can with as little gear as possible. Today, **software defined radios** (SDRs) can tune into a far wider range of frequencies than old FM—from 24Mhz to over 2Ghz.

Like building your own computer, learning radio *teaches*. With even the simplest transceiver and antenna, you'll learn about atmospheric conditions, information theory, the electromagnetic spectrum, communications protocols, and more.

Bouncing longwave off the Northern Lights for increased DX (distance)? Using the ionosphere to talk to people on the other side of the planet? Why do sunsets and rain and the weather on the surface of the sun matter? Curiosity and wonder are the best drivers of learning.

At the other end of the scale, hams are joining the dots with whole wireless internets, megabit broadband connections reaching across Asia, the Atlantic, and both Poles. You can contribute to your nation's emergency services, too—many governments have deals with hams to provide communications infrastructure in the event of natural disasters.

Get moving with dynamics by creating a kit car

Kit vehicles are the mechanical equivalent of ham radio: there are huge communities around cars like Chapman's classic **Lotus 7** (caterhamcars.com) and rugged off-roaders like **Jeep** and **Land Rover**. It's a practical way to explore the **dynamics** half of engineering, or moving parts.

Many can be built by beginners if you can follow a textbook and consult web resources. And you can choose what level to start at, from nuts-and-bolts up to prebuilt engines and final assembly. Building is the purest way of learning.

Get a hold on statics by building a house

A home doesn't need to be a wired-and-watered family dwelling, or even on the grid. If you own land—from a back garden to a thousand acres of desert—it's legal in most places to erect temporary structures. As long as it's not anchored permanently in the landscape, it can stay for months or years—and you'll learn about the other broad area of engineering, **statics**.

Truck trailers, shipping containers, all-season sheds, and many other dwellings can be customised by one person. Solar panels, rainwater harvesting, and composting toilets give you all the comforts of home, with the bonus you're treading lightly on the planet. Browse **#tinyhouse** and **#vanlife** tags for wonderful sub-37sqm buildings on trailer beds and tiny homes on wheels (THOWs). The Tiny Movement isn't about buildings—it's a state of mind, minimalist living with less stuff.

Dig into agriculture by working the land

Away from the electronic and mechanical, **gardening** and **farming** are great skills to develop. It takes surprisingly little space; you can get started in a square foot. And homegrown beats *anything* from a supermarket. Even rough soils can give you hardy **staples** like potatoes, parsnips and carrots, while countless fruit and veg will grow just fine with some tender loving care.

Start with **companion planting**, where growing different crops side-by-side helps to repel pests; carrots with leeks, radishes with lettuce, broccoli with peppermint. And with cover, **salads** will thrive; greenhousing can deliver citrus and stonefuit even in temperate zones. While medicinal **herbs** add life *and* health to every meal: ginger, garlic, lavender, and a sackful of others.