Make:

SKILL SEEKER
MAKER EDITION

15 SKILL AREAS, including hands-on and tech skills!

best friend
me
me last year

Track skills with **friends and family!**

CNC & CAM
Metalworking
Robotics
Computing Basics
Dev Boards
Sewing
Electronics
Laser Cutting
Automotive
3D Printing
Woodworking
3D Modeling
Coding
Crafting
Entrepreneurship

Color in the boxes and **gamify** your progress!

skill_seeker.exe

A practical way to track your growth, identify skill gaps, and level up your maker skills.

OK

STEPH PIPER

Make: SKILL SEEKER: MAKER EDITION

LOOKING FOR A POWERFUL TOOL TO HELP YOU UPSKILL AND IMPROVE? TRY SKILL TREES!

Ever wanted to learn new skills, but with the satisfaction of earning points and viewing progress on a video game dashboard? *Skill Seeker* is a new, powerful tool to help you level up your skills, identify your skill gaps, and self-reflect on your goals. Color in each tile as you progress and visualize your growth in a satisfying, colorful skill tree. *Skill Seeker* breaks up interest areas into small, achievable goals, milestones, and experiences that you can color in as you go.

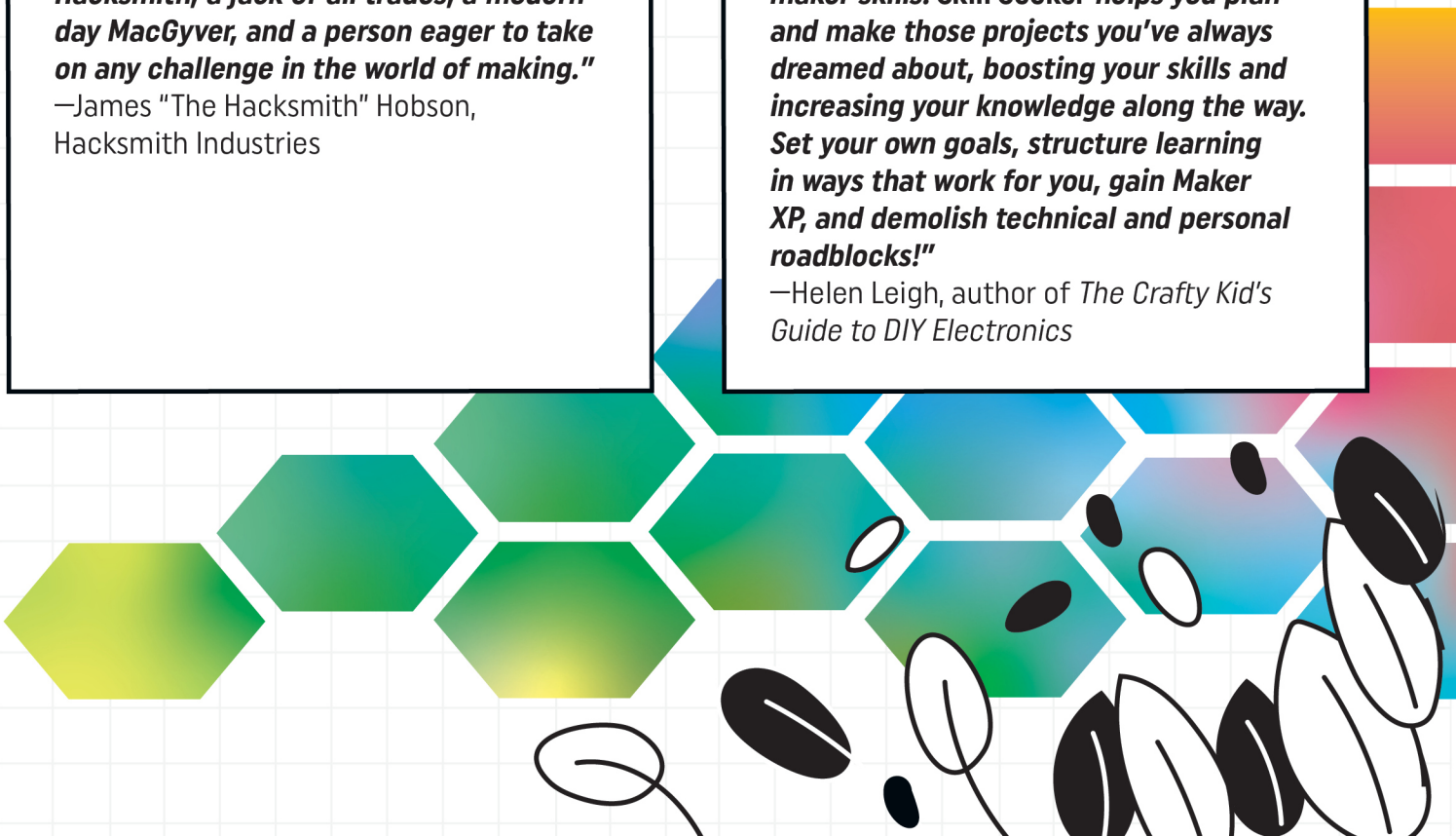
Tally up your points and calculate your Maker XP (experience) score, complete fun video game–inspired self-reflection activities, and set your own personal goals. Use *Skill Seeker* to track years of growth across 15 maker skill areas as you evolve into who you are yet to become. Find a huge trove of 50-plus other skills online based on the popular open-access Skill Trees Project.

Level up with friends and family and get on the same page by swapping scores and goals. Plan unique, new experiences and learning opportunities that target your growth. Get competitive and find out who has the higher score and who can level up faster. Collect stamps, stickers, and memories of places and events in the passport section.

This book is for both beginners and experts, and those who love the addictive power of games but desire more off-screen experiences.

"There's no better book to help guide you on your journey to become a well-rounded Hacksmith, a jack of all trades, a modern-day MacGyver, and a person eager to take on any challenge in the world of making."
—James "The Hacksmith" Hobson, Hacksmith Industries

"Steph Piper's* Skill Seeker *is the perfect book for anyone looking to level up their maker skills.* Skill Seeker *helps you plan and make those projects you've always dreamed about, boosting your skills and increasing your knowledge along the way. Set your own goals, structure learning in ways that work for you, gain Maker XP, and demolish technical and personal roadblocks!"
—Helen Leigh, author of *The Crafty Kid's Guide to DIY Electronics*



SKILL SEEKER
MAKER EDITION

Color In, Level Up, and Get Inspired

By Steph Piper

Make:
SKILL SEEKER: MAKER EDITION
By Steph Piper

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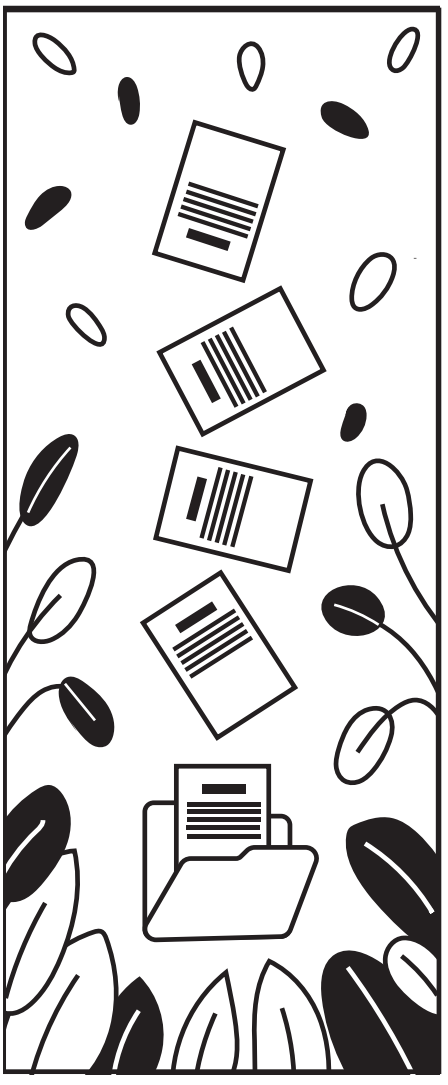

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ACCEPT


growth.png
flow.png
LOADING

startup.exe _ ☐ X

SKILL SEEKER

This book belongs to:

Start date:

settings.exe _ ☐ X

SETTINGS

Graphics: Black and White

Add Friends

PVE (Player vs. Environment)

PVP (Player vs. Player)

Controller: Pen and Highlighter

extra_content.exe _ ☐ X

FREE DLC

(downloadable content)

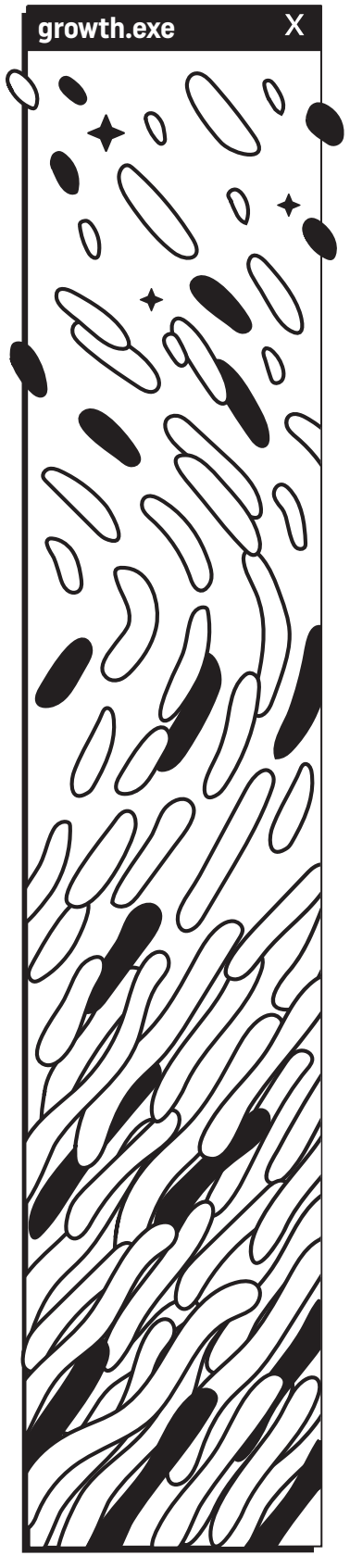
For even more skill trees, check out the MakerSkillTree Github page.
Including game dev, travel, knitting, Linux, reading and writing, astronomy, and much more!

github.com/sjpiper145/MakerSkillTree

OK

Turn page to start ▸

CONTENTS




tutorial.exe
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A journey awaits.
Small steps to becoming your future self
Build a life of rich experiences
Try different things
Learn from experts
Reflect and improve
Make new friends along the way
Track progress over time
Challenge yourself to grow
Prioritize your goals
Find your skill gaps
Get something wrong and try again
Level up with friends
Recognize your achievements
START
_ □ X
Task failed successfully.
OK

WELCOME

Introduction

There is a certain magic in learning a new skill and making something from scratch. Trying new things is a challenging and rewarding habit to build, making us more capable along the way. What if every skill we learned could be visualized on a video game dashboard, with a path to future goals revealed? This book aims to do just that, with a collection of video game–inspired "skill trees" that lay out a set of milestones for a range of skill areas.

To use a skill tree, color in the tiles of anything you've already completed. Start at the base of the skill tree and work your way up, moving from basics to advanced skills. With 73 tiles per tree, these are designed to meet you wherever you are on your journey. Get the satisfaction of coloring in the boxes and visualize how far you've come. Identify your skill gaps and get inspired to try new things. You don't have to complete things in a set order, and not every tile needs to be completed. There's no time limit for completion; work at your own pace. You can customize the base skill trees to suit your personal journey. Calculate your Maker XP score and level up with friends.

This book gives just enough detail as a starting point for you to check the glossary, search, and find out more. Each tile is best used as a springboard for connecting with expert friends, searching how-to videos, attending workshops, and guiding your progress. All skills are aimed at hobbyist level, for adults, young adults, and secondary students as they grow. Pair this book with other how-to books for best results.

All skill trees in this book are available for you to download and print from the Maker Skill Tree GitHub repository. You're also welcome to create your own from templates and even contribute new ones to the repository for others to use. They are available under a Creative Commons open educational resource license, CC BY-NC-SA 4.0, which means you are free to download and use for personal use but not for commercial use.

github.com/sjpiper145/MakerSkillTree

Gamification
The concept of badges has been around for a long time, and those familiar with the Scouts or Guides movement know about the joy of receiving a competency badge. Many of you are likely already familiar with the concept of skill trees in video games: Collect XP (eXperience points), and level up your character to gain new skills, unlock abilities, and make the game more fun to play. This book uses gamification techniques to lay out a path ahead and allows you to collect badges, view your progress dashboard, and calculate a Maker XP score. With these tools, you can track personal growth and use this book as a powerful self-reflection and goal-setting aid.

A Tool for Upskilling, Planning, and Reflective Journaling
In our modern world, it's easy to get bombarded with screens and algorithm-tailored feeds that drain our time away. Taking regular time to get away, think, and reflect is super important. There is an abundance of large, blank note pages in this book aimed at giving you space to sketch project ideas and write reflections. Using this book as a tool for reflective journaling is a powerful way to process your learning and plan for the future. Do not hold yourself to perfectionist levels when using this book, and let your thoughts, ideas, and drawings spill out unhindered onto the pages.

There is often a disconnect between the goods we use and our understanding of how they are made. It's so easy to head to the store, pick up what you need, and not put a thought to what tools, materials, and processes were used to make them. The art of making takes us back to these roots and gives us the tools we need to truly make, hack, and own the things we have. While it undoes the mystery it also gives us the magic to make such creations ourselves.

As you fill out each skill tree and gauge your skill level, you'll be piecing together an accurate reflection of your current self. Take the time to be proud of your progress and analyze patterns in your skill gaps. Often, we may have skill areas that are our comfort zones; it's easy to get stuck in our ways and become resistant to improvement: If your only skill is using a hammer, then every problem looks like a nail.

We each have our own unique roadblocks in our path while moving from basic to more advanced skills. Some of these may include constraints around time, location, finances, disability, and culture. Our ability to upskill can be affected by these factors, and high skill levels may be an indicator of privilege. Also, this book is written from a Western perspective, and customization is encouraged to tailor the base skill trees to your personal journey.

While leveling up, you might also grapple with other complex obstacles such as impostor syndrome, gate-keepers, learned helplessness, perfectionism, and tall poppy syndrome, among others. Giving a problem a name and understanding it is one of the first steps in overcoming it, and here are some definitions.

Impostor Syndrome: The experience of doubt and negative self-talk, even though you may be excelling in your area. You may feel like you'll be found out or exposed as a fraud because you feel like you aren't as competent as you portray yourself to be.

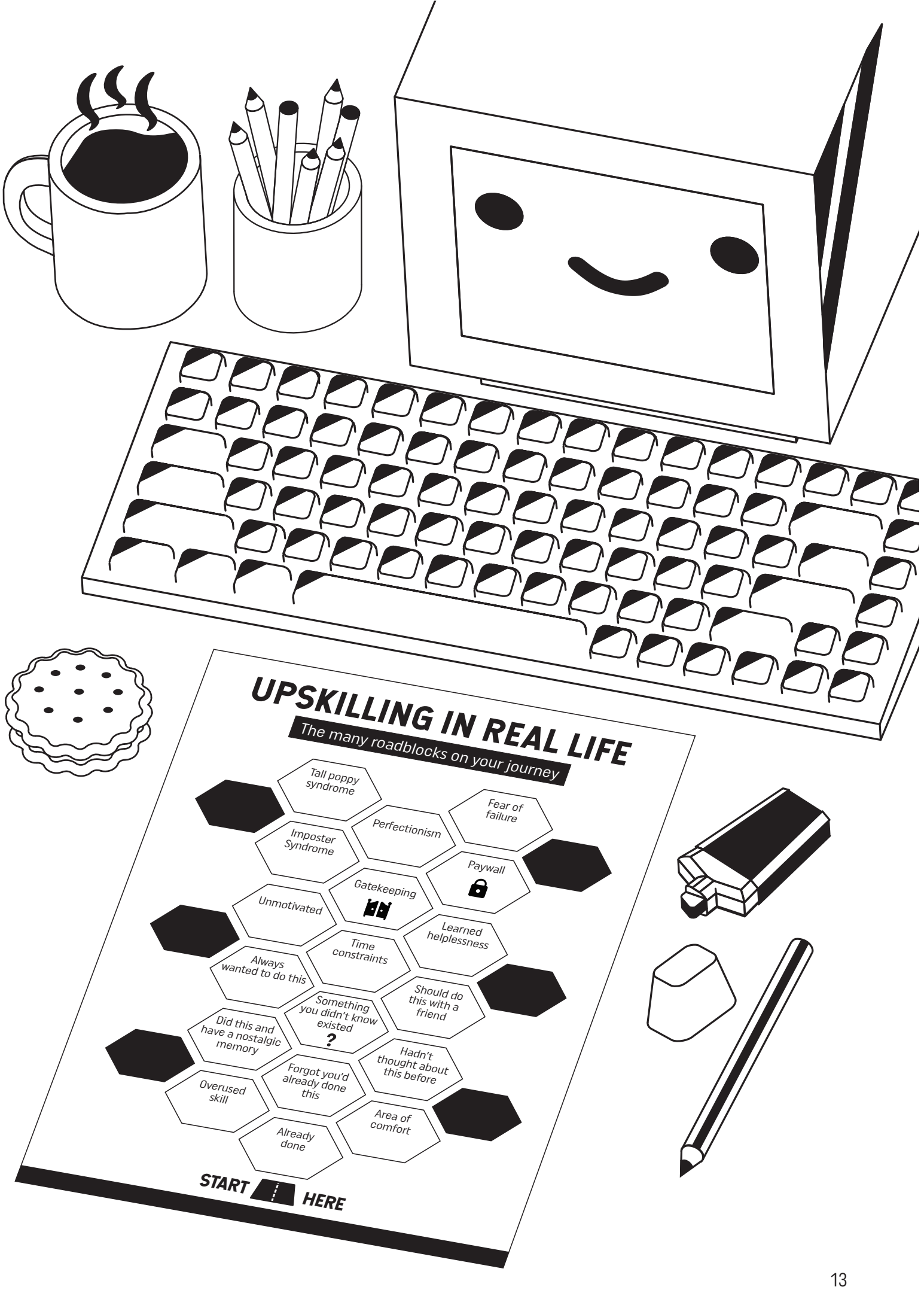
Gatekeeping: Controlling access to something, such as knowledge, skills, resources, power, and opportunities and deciding who is worthy of receiving them. This may happen when an expert, in order to keep a skill exclusive, refuses to disclose information or teach others.

Learned Helplessness: When you repeatedly face a negative situation beyond your control and stop trying to change your circumstances, even when you have the ability to do so. Examples are failing exams repeatedly after studying, repeatedly trying to quit smoking and not succeeding, and being told repeatedly that you are too young, too old, or do not belong in tech or the kitchen, and no longer trying.

Perfectionism: Holding yourself to unreasonably high standards, expecting flawless performance as the norm despite that level of achievement being excessive for what is required.

Tall Poppy Syndrome: Receiving unwarranted criticism when experiencing success (known as "cutting down the tall poppies"). This may include downplaying success, others taking credit, or being left out or ignored.

Some of these definitions may resonate with your experiences. The vision of this book is to make upskilling pathways radically inclusive, open, and accessible to all. If you like this idea, you may also enjoy visiting a makerspace, library, tool library, men's shed, repair café, Maker Faire, or other local community space aimed at teaching skills, providing tools, and building community. These low-cost, grassroots-level spaces are some of the best ways to get started with this book.


UPSKILLING IN REAL LIFE
The many roadblocks on your journey
Tall poppy syndrome
Fear of failure
Perfectionism
Imposter Syndrome
Paywall
Gatekeeping
Unmotivated
Learned helplessness
Time constraints
Always wanted to do this
Should do this with a friend
Something you didn't know existed
?
Did this and have a nostalgic memory
Hadn't thought about this before
Forgot you'd already done this
Overused skill
Area of comfort
Already done
START HERE

Here's a map of how all the skills in this book interconnect, to give you an idea of where to start. If you are inexperienced within the tech space, I recommend starting with the Computing Basics skill tree. It's designed as a pathway into the more technical spaces with the absolute basics for those who are not as familiar with using a computer. However, skill areas can be completed in any order and are best chosen based on your aspirations and passions.

While the skill links here show well-known connections, skills can be connected in unexpected ways. Sometimes a project is most innovative when it crosses between skill areas that are not traditionally linked. For example, electronics and sewing combine into the young and exciting space of wearable technology. You'll also notice that some tiles are present in a few different skill trees, which is an indicator that it's a powerful base skill that's useful in a range of spaces—for example, learning to solder and using basic hand tools.

Here's an overview of each skill in this book:

3D Modeling: Create three-dimensional models on your computer in specialized software for a variety of purposes, including 3D printing, animation, CNC, and game dev. This tree has a balance of 3D-modeling skills across CAD modeling for engineering and sculpting, texturing, and artistic 3D modeling.

3D Printing: Make the most of a standard desktop or resin 3D printer with this skill tree. Get started with printing your first model using different materials and level your way up to fixing your machine yourself. Try out different kinds of projects for fixing things, molding and casting or adding electronics.

Automotive: Learn to drive, service, repair, and maintain your own vehicle as you progress through the automotive skill tree. Every car is different, and depending on the age, model, and make you may need to customize this tree heavily to suit, especially if your interest is in vintage or nonstandard vehicles. Just like one of the starting tiles suggests, always refer to your user and repair manuals.

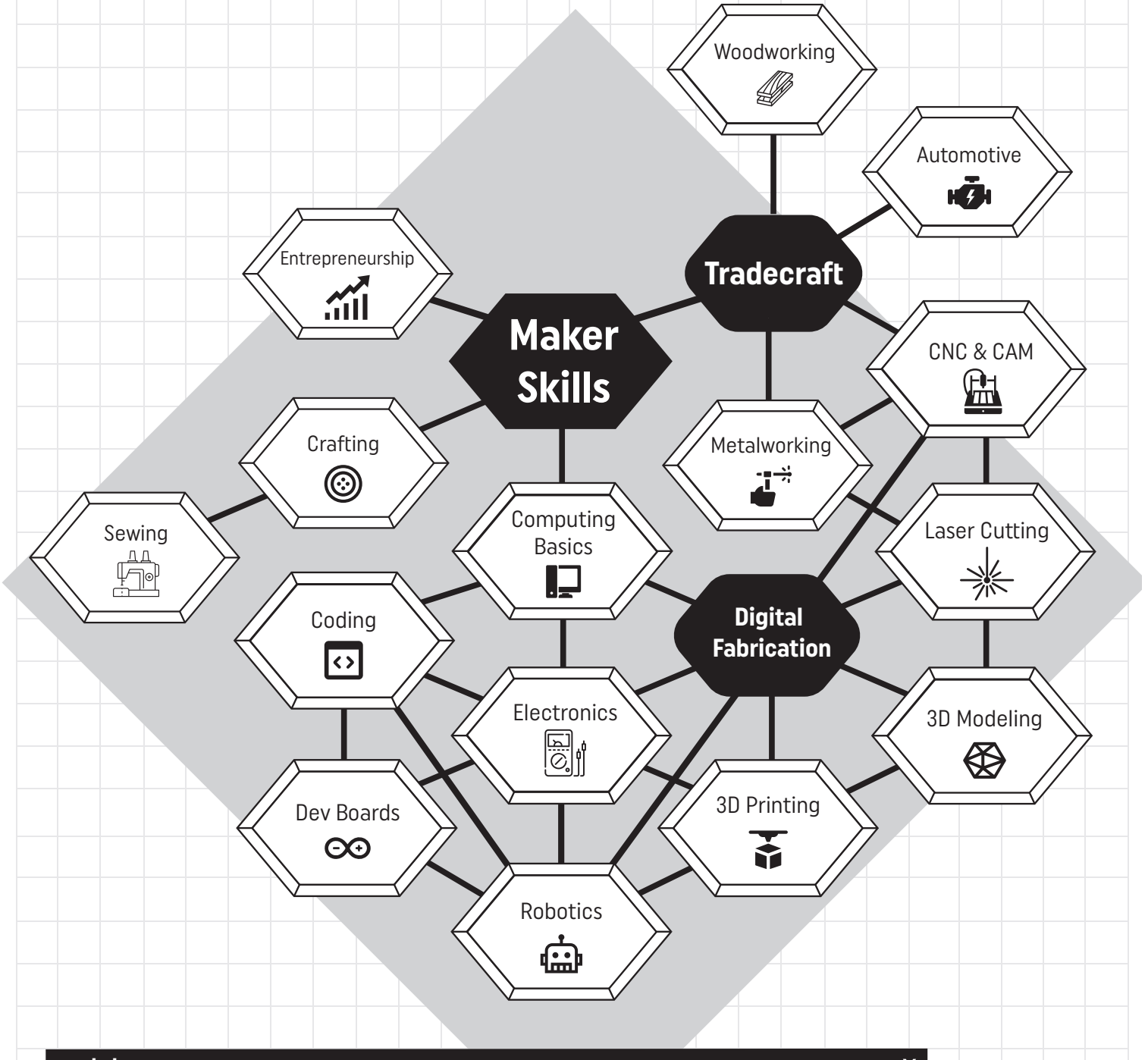
CNC & CAM: Develop skills with a Computer Numerical Control (CNC) and Computer-Aided Manufacturing (CAM) machine that can cut away at a block of material, like timber, plastic, or metal. Use this industrial piece of equipment to make stunning engraving projects, practical parts, signage, artworks, and more. Learn how to calibrate and fix your machine and try out machine upgrades and a variety of project ideas.

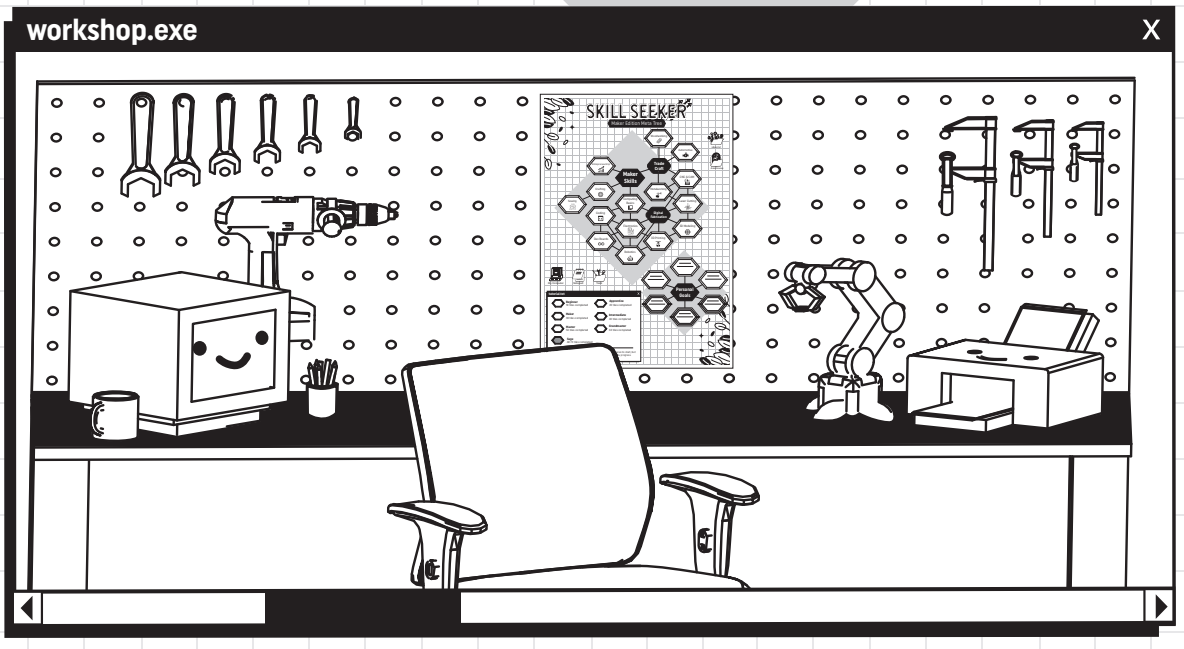
Computing Basics: The very basics of using computers, from getting a computer for the first time to setting up email, video calling friends, and using a smartphone. Get more advanced with buying a domain name, fixing your own computer, and making websites.

Coding: Make the computer do the work for you with coding skills, speaking the language of machines. Start simple with basic coding languages and syntax and work your way up to making simple programs and algorithms, and optimizing your code.

Crafting: Bring back crafternoons and get creative with a variety of crafting ideas and techniques. Start with simple classic projects like making a pom-pom, papercraft, and sewing all the way up to making a mosaic, weaving, and plush toys. Crafting is such a huge space, and there are many great things not included, so you're encouraged to swap out the base tiles to customize this tree as desired.

Dev Boards: Make your own inventions with dev boards like Arduino and Raspberry Pi. Get an introduction to the world of microcontrollers and microprocessors with a variety of parts and projects to try, from sensors to motors and more all the way up to debugging and internet-connected projects.






My Computer


Notepad


Tools

Electronics: Get an idea of how to make basic circuits with analog and digital tech. Try a range of parts and classic circuits and troubleshoot projects when something's not right. Remember, it's not magic, it's just electronics.

Entrepreneurship: Interested in making money? Build your business acumen with this skill tree, which can help you start your first side hustle. Based on the Lean Startup methodology, it's all about how you can start building a business while spending very little or no money—just time. Get customer validation and pivot your idea into something that can pay dividends (or teach you a lot along the way).

Laser Cutting: Master the art of cutting and engraving with lasers in this machine-focused tree. Learn to calibrate and fix your machine and make great practical and artistic projects with a huge range of materials and clever techniques.

Metalworking: Learn how to work with one of the toughest and most elegant materials. Create simple sheet metal projects, tap holes, and level up to learning how to weld and finish your projects with polishing and powder coating.

Robotics: Roll your experience with electronics, dev boards, digital fabrication, and coding together into one of the most challenging and rewarding spaces, robotics. Build simple bots and carboard automata and level up to autonomous robots, drones, and submarines.

Sewing: Become one with your sewing machine and create marvelous projects in a range of fabrics. Make a quilt, clothing, gifts, and more from scratch with the power of needle and thread. Learn to fix holes, tailor clothing, and make your own patterns.

Woodworking: Create wonderful heirloom projects with timber, a beautiful and natural material. Use hand tools and power tools to create furniture, jigs, and practical pieces for the home. Learn joinery techniques and design your own plans for projects.

In summary, at its core, this book is about three things:

Reflective Journaling: Reflective practice is one of the most powerful techniques we have to unpack who we are, our goals, and what we want out of life. Using this book, away from a screen, can be a great tool to reflect on where we are and where we want to be.

Social Connection: Make new friends and connect with friends and loved ones while sharing our passion areas. It's tough to stay connected, and you can use this book as an excuse to reach out to others. There's always so much to learn, and everyone has something great to share.

Upskilling & Growth: Get ideas on how to move forward and advance your skills with detailed pathways and over 1,000 tiles to complete. Break up goals into small, achievable tiles and customize your journey to align with your interests. Become confident and independent with great problem-solving skills, with a growth mindset for continuous self-improvement.

I'm excited that you've picked up a copy of *Skill Seeker*. I hope you enjoy using it as a reflective tool to becoming your future self while enjoying the journey along the way. I encourage you to try a range of things that you might not otherwise, experiencing skills that connect us to a past humanity, current practice, and the future skills that will drive us forward. All of these will make you more capable and ready for the challenges to come.

Happy Skill Seeking!


Are you ready to go?
YES
NOT YET
Upskilling & Growth
Social Connection
Reflective Journaling

GOAL SETTING

Maker Skills

What skill areas do you want to prioritize?

- [ ] 3D Modeling
- [ ] 3D Printing
- [ ] Automotive
- [ ] CNC & CAM
- [ ] Coding
- [ ] Computing Basics
- [ ] Crafting
- [ ] Dev Boards
- [ ] Electronics
- [ ] Entrepreneurship
- [ ] Laser Cutting
- [ ] Metalworking
- [ ] Robotics
- [ ] Sewing
- [ ] Woodworking

Custom Goals

List any blank skill trees you've filled with personal goals.

- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____

Extra Skills

What other skill areas are you interested in? Grab any extras on the Github page.

- [ ] Astronomy
- [ ] Adventure
- [ ] Amateur Radio
- [ ] Animal Care
- [ ] Baking
- [ ] Boating & Fishing
- [ ] Civics & Community
- [ ] Cleaning
- [ ] Cooking
- [ ] Crochet
- [ ] Dance
- [ ] Dungeons & Dragons
- [ ] Embedded Systems
- [ ] Embroidery
- [ ] Game Dev
- [ ] Gardening
- [ ] House Building
- [ ] IT Security
- [ ] Knitting
- [ ] Kubernetes
- [ ] Language
- [ ] Linux
- [ ] Mobile App Dev
- [ ] Molding & Casting
- [ ] Music
- [ ] PCB Design
- [ ] Photo & Video
- [ ] Reading & Writing
- [ ] Renovation & Repair
- [ ] Sports & Fitness
- [ ] Survivalist
- [ ] Travel
- [ ] Visual Arts
- [ ] Website Building
- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____
- [ ] _____

Broad Goals

Prioritize with numbers from 1 to 10.

- [ ] Family
- [ ] Career or Study
- [ ] Finance
- [ ] Charity
- [ ] Self-Care
- [ ] Sports & Fitness
- [ ] Travel
- [ ] Upskilling
- [ ] Social
- [ ] Health

notes.txt

ideas.txt

dreams.exe

plans.xlsx

NOTES

Ideas, Dreams, Plans

What you get by reaching your goals is not nearly so important
as what you become by reaching them.
—Zig Ziglar

RULES

How to Use This Book

Personalize to You
The aim of this book is to serve you and your personal goals. Get a visual on how far you've come, and reflect on your journey while getting inspired to grow and try new things. Each tile can be interpreted flexibly; everyone's journey is different, and it's not intended for you to complete everything. Think about each tile as a milestone; you can swap them or skip over them if they aren't right. You also use tile stickers or sticky notes to replace a goal with your own. For example, if you aren't interested in teaching skills or selling your creations, feel free to swap those out for something else. And if you are sufficiently advanced in any of these skill areas, you might also enjoy going beyond and making expanded versions of the base trees in the Custom Goals area in the back.

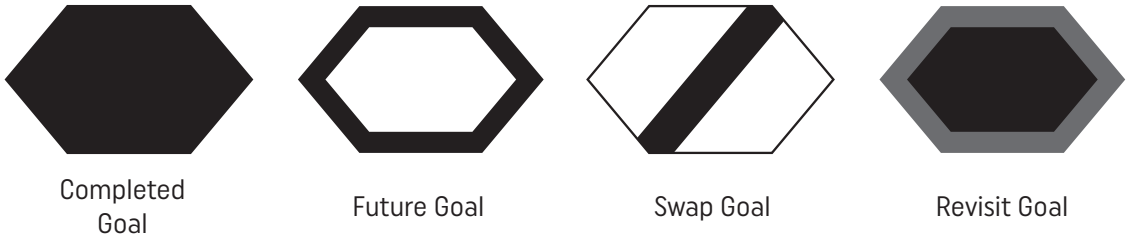
How to Design Your Own Goals
The goals in this book may not be suitable for everyone, and you can replace them with a goal better suited to your journey and add your own in the empty tiles at the top. Ask yourself:

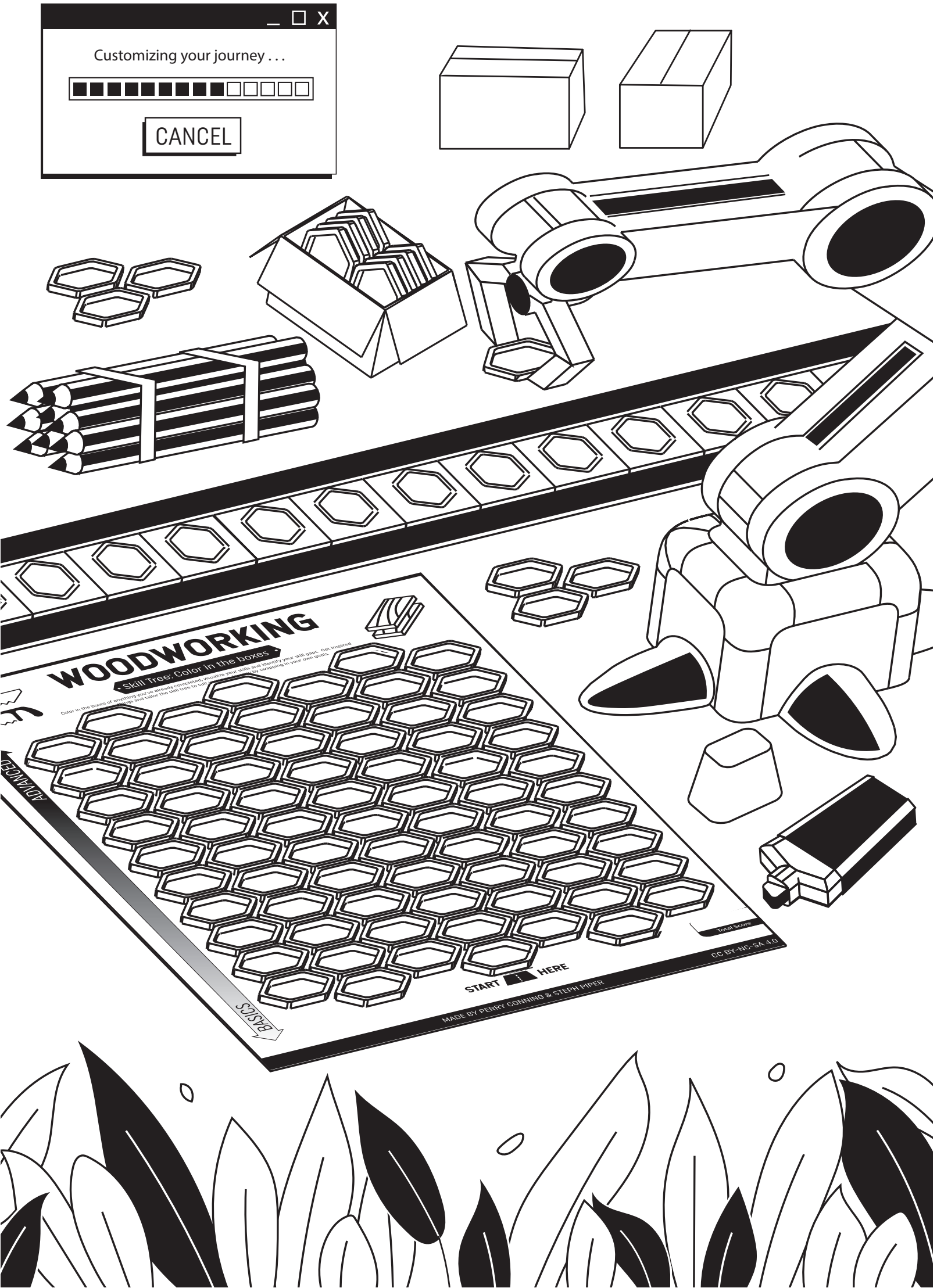
- Are you proud of a recent achievement?
- Would you like to acknowledge this milestone?
- Is there something else you'd prefer to do in the same level of difficulty or space?

If so, feel free to add it in, regardless of whether it was completed in the past or is a future goal. This book is made to serve you without pushing you toward goals that aren't right for you.

Get Started
To start using this book, find yourself a highlighter, a pencil, and a beverage of your choice. Go through the Skill Trees section, starting on page 39 and color in any tiles you've already completed. Count up each tile you've completed and add it into the Maker XP score calculator as you go. After all trees are colored and counted, complete the Skills Dashboard to visualize your skill levels. Reflect on your goals, and consider making custom skill trees for your niche interest areas and short-term and long-term goals. Consider using the coloring convention shown below to make it easier to track goals.

Goal Tracking




Customizing your journey . . .
CANCEL
WOODWORKING
Skill Tree: Color in the boxes
Color in the boxes of anything you've already completed, visualize your skills and identify your skill gaps. Get inspired by others' progress and tailor the skill tree to suit your needs by swapping in your own goals.
ADVANCED
BASICS
START HERE
Total Score
MADE BY PERRY CONNING & STEPH PIPER
CC BY-NC-SA 4.0


W
A
S
D
Press to move

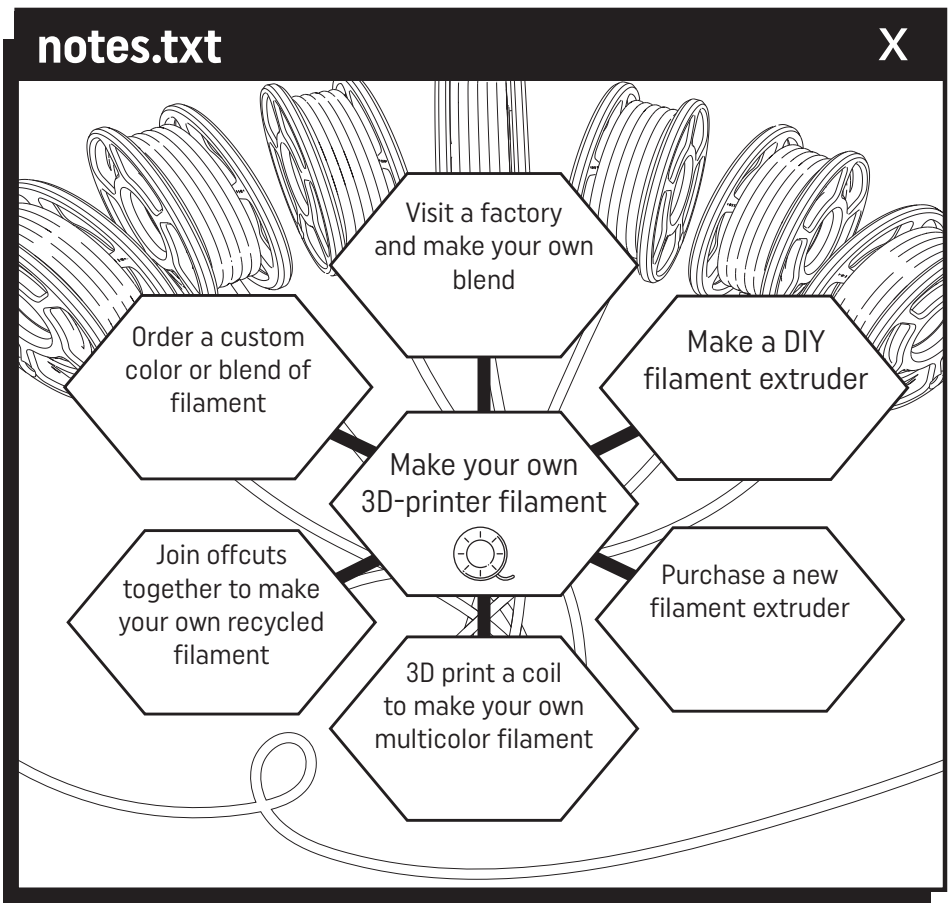
RULES

How to Use This Book

Some tiles are worded for flexible interpretation, and there is no single correct way to complete these goals. Creative interpretation is encouraged. See the example below of the spectrum of possible interpretations of the "Make your own 3D-printer filament" tile. One of these options might be a perfect fit for you to try out, matching up with your interests, budget, and time. If not, you can park the goal for later or swap it for something else.

Each one of the options for completing this goal may fall somewhere different on the scale between basics and advanced, and that's all right too. It would be very difficult to make a tree with a precise difficulty scale, and many experts have their own objective opinions on difficulty. It's one of the concessions of this goal-setting format.

It is normal for goals to be completed out of order without completing the tiles before it, and you will likely notice this trend in some of your skill areas. Tiles can be completed in any order, but if you're a beginner, it's best to start at the base in the basics.



MAKER XP SCORE

Calculate Your Progress

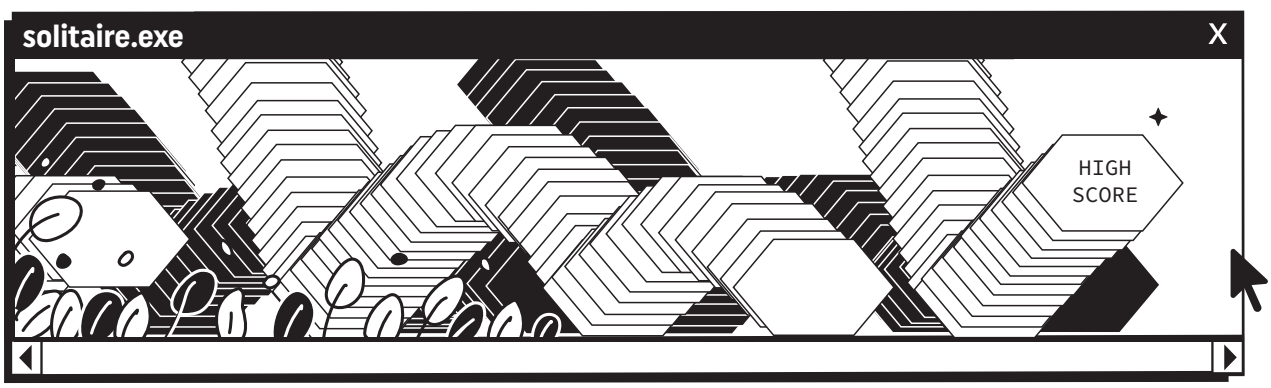
Tally Your Scores
In this section, you can calculate your Maker XP score. This allows you to quantify your growth over your chosen time period, reflect on your goals, and reprioritize. You can also add in your own skill trees in this area in the blank spaces. These might include "My Goals for This Year," "Roller Derby Skills," "Life Goals," or anything else you might like to achieve, split up into actionable goal tiles.

How It Works
Count your tiles and tally up your scores across each major skill area. For example, if twenty tiles are colored in on the electronics skill tree, that's twenty points. You can use this to compare current growth to past scores, inspire some competitiveness between friends, or set a specific numerical goal. It's normal to see zero skills in some areas. Learning new skills is tough, and sometimes we don't have the time, energy, or funds to spend. Be gentle and realistic with yourself.

How Often to Reflect and Review?
Every six to twelve months is a great time to reflect and review your progress and goals, but you are welcome to do this as often as you like. If you've also experienced significant change—for example, moving to a new city, starting a new job, or changing any other circumstances—it's a great time to replan for what's possible in your future. As time goes on, our physical, financial, and motivational abilities and goals change. It's good to review regularly and change things up if something isn't working.

Example Custom Skill Tree Ideas
- Skill Goals: Learn retro computing, cake baking, or minifig painting
- Family Goals: Things to do as a couple or with kids
- Social Goals: Remember birthdays, catch up with friends
- Career Goals: Finish a project, try for a promotion
- Side Hustle Goals: Get customer feedback, research competitors
- House Goals: Clean out the shed, redecorate guest room
- Personal Goals: Organize thirtieth birthday party, buy new winter clothes

See more ideas in the Custom Goals section on page 68.



MAKER XP SCORE

Tally your points and calculate your Maker XP score.

Skill Areas	Date Started:	Date Reviewed:	Date Reviewed:	Date Reviewed:
3D Modeling				
3D Printing				
Automotive				
CNC & CAM				
Coding				
Computing Basics				
Crafting				
Dev Boards				
Electronics				
Entrepreneurship				
Laser Cutting				
Metalworking				
Robotics				
Sewing				
Woodworking				
Custom Goals				
Custom Goals				
Custom Goals				
Mini Custom Goals				
Mini Custom Goals				
Mini Custom Goals				
Maker XP Score				
Custom Goals Score				
Total Score				

MAKER XP SCORE

Tally your points and calculate your Maker XP score, continued.

Skill Areas	Date Reviewed:	Date Reviewed:	Date Reviewed:	Date Reviewed:
3D Modeling				
3D Printing				
Automotive				
CNC & CAM				
Coding				
Computing Basics				
Crafting				
Dev Boards				
Electronics				
Entrepreneurship				
Laser Cutting				
Metalworking				
Robotics				
Sewing				
Woodworking				
Custom Goals				
Custom Goals				
Custom Goals				
Mini Custom Goals				
Mini Custom Goals				
Mini Custom Goals				
Maker XP Score				
Custom Goals Score				
Total Score				

MAKER XP SCORE

Tally your points and calculate your Maker XP score, continued.

Skill Areas	Date Reviewed:	Date Reviewed:	Date Reviewed:	Date Reviewed:
3D Modeling				
3D Printing				
Automotive				
CNC & CAM				
Coding				
Computing Basics				
Crafting				
Dev Boards				
Electronics				
Entrepreneurship				
Laser Cutting				
Metalworking				
Robotics				
Sewing				
Woodworking				
Custom Goals				
Custom Goals				
Custom Goals				
Mini Custom Goals				
Mini Custom Goals				
Mini Custom Goals				
Maker XP Score				
Custom Goals Score				
Total Score				

LEADERBOARD

Get Social

Social Leveling
Tally up your points on the Maker XP score page, then add your score on the leaderboard. You can keep track of your friends' scores alongside your own, or compare your past self to present. It's a great chance to catch up socially, review goals together, and plan how you might get there. Will you teach some electronics skills in exchange for a woodworking tutorial? Go to a ceramics class together? You could tick off two goals with one activity if you have personal goals to catch up with friends regularly.

You might decide to gift these books to family or friends as a holiday activity or send one to a friend and do some reflection and goal setting together. Complete a custom skill tree to work out what's next that you could do together.

Ideas for Social Leveling
Here are some ideas for leveling up with the company of friends or family:

- Attend a workshop together.
- Do a skill swap (I'll teach you this today, and you teach me that next week).
- Plan a getaway or make-cation to get some travel goals or making goals completed.
- Work on a big project together (I'll make the dress and you install the electronics).
- Build something as part of a community project (e.g., building a set for a play, making toys for a children's hospital, building a new table for the local soup kitchen).
- Have a Skill Seeker–themed party, complete with quest invites, side quests, and opportunities to color in tiles not yet completed.
- Get competitive and set score goals:
  - Who will be the first person to earn 300 points or earn the most points during a holiday or over six months?
  - Who can get first to Master level in any skill area?
  - Speed run—who can get the most points at a Maker Faire?
- Use the book for ideas for teaching and bonding with young ones.
- Ask for ideas or introductions to experts for advanced leveling.
- Teach a workshop if you have a few friends wanting to learn from you.
- Organize some social crafting with friends to catch up while making.
- Find out what your friends or family want for Christmas or an upcoming birthday and plan a handmade gift.
- Loan or give tools to a friend who might want to try a new hobby.
- Organize a hobby swap, where you can trade tools and consumables for hobbies that you're no longer interested in for new things to try.
- Join a makerspace or other community club to make and learn together.

A true friend accepts the way you are, but also helps you become who you should be.
—Unknown

Get Social

Friend Name:	Date:	Maker XP Score:

CHARACTER SELECTION

Pick Your Fighter

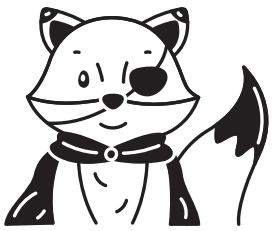
Choose up to two, color in the box(es), and continue to the next page.

Paladin X

Leadership, courage, compassion, diplomacy

Draw a crown on your profile picture, pg. 32

Rogue X



Adaptability, uncanny problem-solving, versatility

Draw a cape on your profile picture, pg. 32

Mage X

Creative technology, experimentalism, scholarly

Draw a wizard hat on your profile picture, pg. 32

Ranger X

Worldly, well traveled, adventuresome, outdoorsy

Draw a sun hat on your profile picture, pg. 32

Warrior X

Strength, endurance, discipline, athleticism, self-care skills

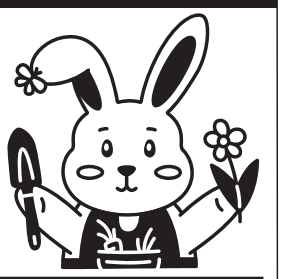
Draw a bandana on your profile picture, pg. 32

Cleric X

Spiritual, empathetic, creative helper, volunteer skills

Draw a heart on your profile picture, pg. 32

Druid X



Nature, nurturing growth, animal care, gardening skills

Draw a pot plant or pet on your profile picture, pg. 32

Artisan X

Creative arts, crafts, sewing, knitting, crochet, jewelry skills

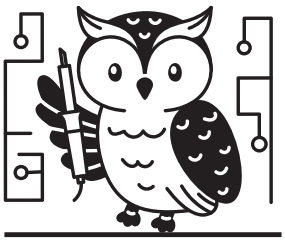
Draw an apron on your profile picture, pg. 32

Culinary Mage X

Herbalism, food, cooking, baking skills

Draw a chef's hat on your profile picture, pg. 32

Technomancer X



Technical, computing, electronics, coding skills

Draw circuit traces on your profile picture, pg. 32

Artificer X

Mechanical skills, repairing, inventing, upcycling

Draw a tool belt on your profile picture, pg. 32

Bard X

Charisma, communication, music, language skills

Draw a lute on your profile picture, pg. 32

The true test of a man's character is what he does when no one is watching.
—John Wooden

CHOOSE YOUR WEAPON

What Are Your Strengths?

Choose up to two, color in the box(es), and continue to the next page.

Courage X

Mustering strength in the face of an ordeal

Draw a lightsaber on your profile page, pg. 32

Self Discipline X

Control of behavior in the face of temptations

Draw a hammer on your profile page, pg. 32

Resilience X

The capacity to recover quickly from difficulties

Draw a shield on your profile page, pg. 32

Compassion X

Empathy and concern for the suffering of others

Draw a magic staff on your profile page, pg. 32

Persistence X

Continuing on despite difficulties or opposition

Draw a pick on your profile page, pg. 32

Patience X

Accepting difficulties or suffering without complaint

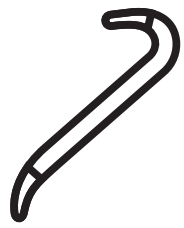
Draw a boomerang on your profile page, pg. 32

Thoughtful X

Showing consideration for the needs of other people

Draw a key on your profile page, pg. 32

Humble X



Holding yourself equal to others, not more important

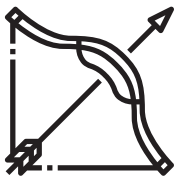
Draw a crowbar on your profile page, pg. 32

Creative X

Using imagination and ideas to create great things

Draw a spray can on your profile page, pg. 32

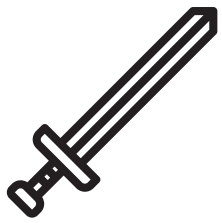
Ambition X



Possessing a strong desire to achieve great things

Draw a bow on your profile page, pg. 32

Honesty X



Free of deceit, truthful, and straightforward

Draw a longsword on your profile page, pg. 32

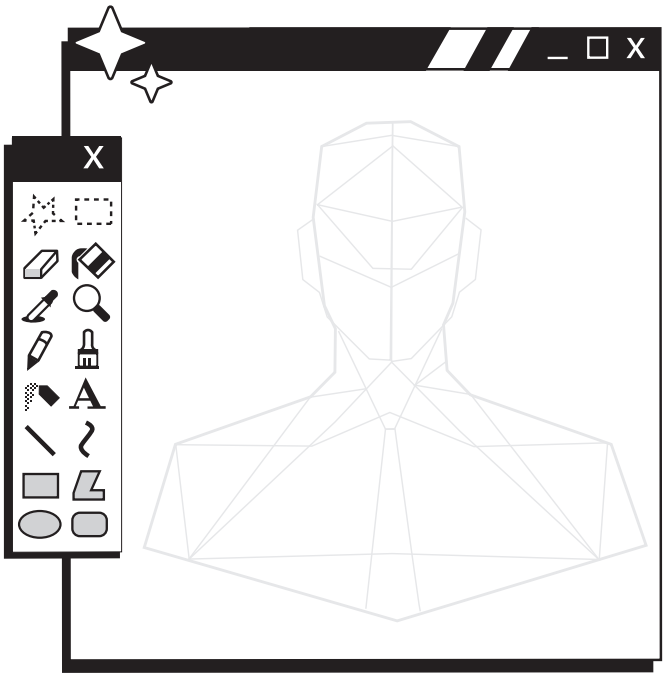
Integrity X

Adhering to strong moral ethics and values

Draw a trident on your profile page, pg. 32

Strength does not come from physical capacity. It comes from an indomitable will.
—Mahatma Gandhi

PROFILE



Sketch yourself wearing your character accessories after completing the Character Selection activity, page 30

Name: _____

Master of: _____
(Complete after finding your skill levels on the Skills Dashboard page 33)

Character Alignment: _____
(Complete after the Character Selection activity, page 30)

Weapon 1

Weapon 2

Sketch your weapon(s) after completing the Choose Your Weapon activity, page 31

Total XP Score

Date:					
Maker XP Score:					
Custom-Skill Score:					
Total XP Score:					

Add your scores after completing the Maker XP Score activity, page 24

Inventory

Search

Draw the things you already have to help you level up (e.g., sewing machine, tools, and consumables).

Quests

Main Quest:

_____

_____

_____

_____

Side Quest:

_____

_____

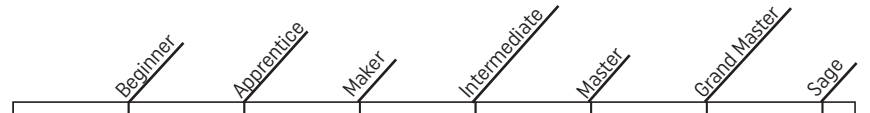
_____

_____

Add the skill areas you've prioritized after completing the Goal Setting activity, page 18.

SKILLS DASHBOARD

• Level Overview •



3D Modeling

3D Printing

Automotive

CNC & CAM

Coding

Computing Basics

Crafting

Dev Boards

Electronics

Entrepreneurship

Laser Cutting

Metalworking

Robotics

Sewing

Woodworking

Custom Goal: _____

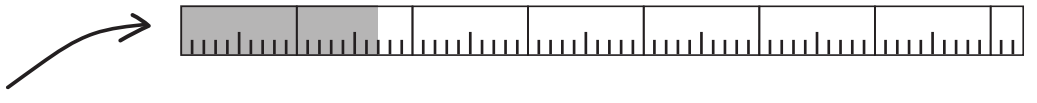
Custom Goal: _____

Custom Goal: _____

Custom Goal: _____

Custom Goal: _____

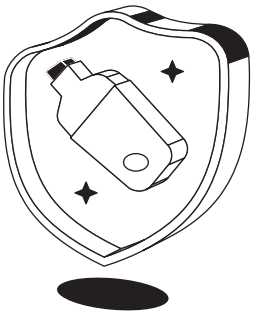
Custom Goal: _____



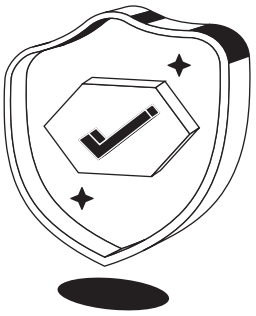
Color in sections of the progress bar as you go. Standard skill trees have seventy-three tiles, and mini skill trees have forty. Complete after coloring in the skill trees, starting on page 39.

ACHIEVEMENT BADGES

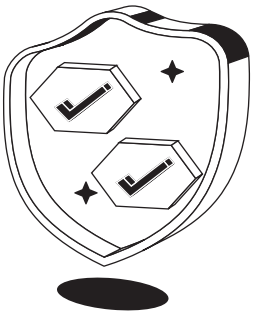
Color in Any Badges You've Completed



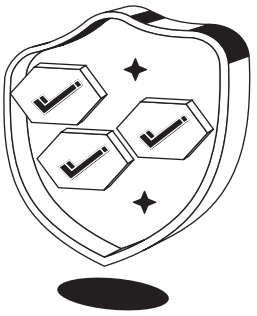
A Beginning
Start using the book and color in everything done so far



Goal Setter
Create a skill tree to track your own goals



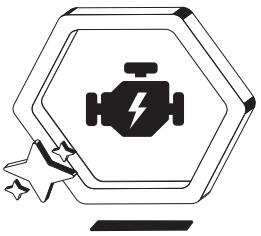
Goal Setter
Create 2 skill trees to track your own goals



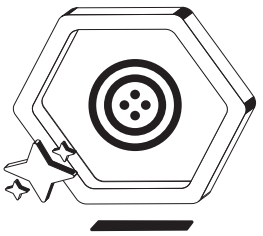
Goal Setter
Create 3 skill trees to track your own goals

Computing Boss
Reach maker level in Computing Basics

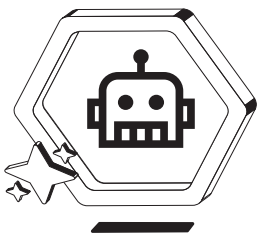
Hello World
Reach maker level in Coding



Mechanic
Reach maker level in Automotive

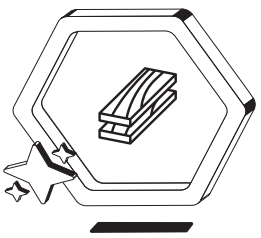


Craft Pro
Reach maker level in Sewing & Crafting



Roboticist
Reach maker level in Robotics

Entrepreneur
Reach maker level in Entrepreneurship



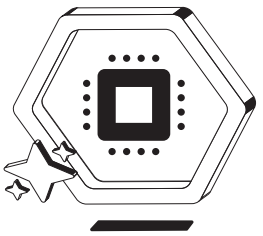
Timbercraft
Reach maker level in Woodworking

Metalcraft
Reach maker level in Metalworking

Manual Artist
Reach maker level in Woodworking & Metalworking

Digital Fabricator
Reach maker level in 3D printing, Laser Cutting, and CNC & CAM

Third Dimension
Reach maker level in 3D Modeling & 3D Printing



Electro
Reach maker level in Electronics & Dev Boards

Skill Level Guide

Beginner
10 Tiles Completed

Apprentice
20 Tiles Completed

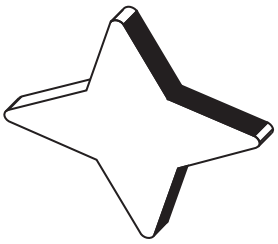
Maker
30 Tiles Completed

Intermediate
40 Tiles Completed

Master
50 Tiles Completed

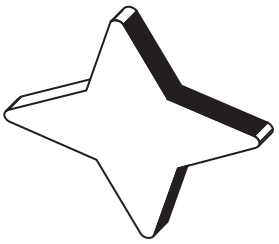
Grandmaster
60 Tiles Completed

Sage
73 Tiles Completed



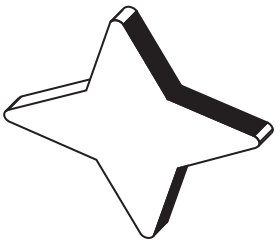
Bronze Beginner

Reach Beginner level
in 2 Maker Skill Trees



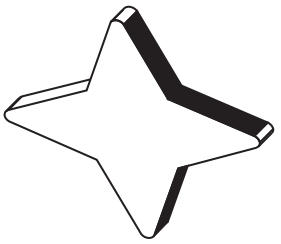
Silver Beginner

Reach Beginner level
in 3 Maker Skill Trees



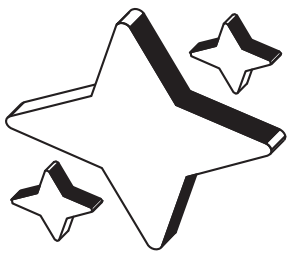
Gold Beginner

Reach Beginner level
in 5 Maker Skill Trees



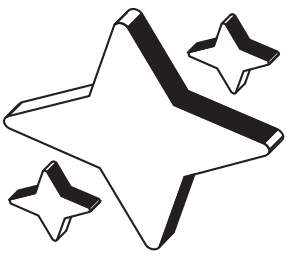
Goal Beginner

Reach Beginner level
in 1 Custom-Goal Skill Tree



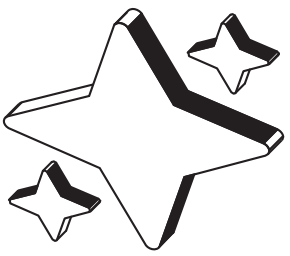
Bronze Maker

Reach Maker level
in 2 Maker Skill Trees



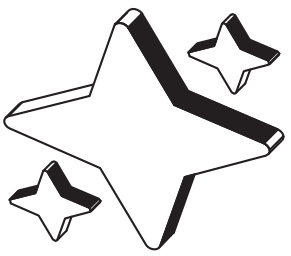
Silver Maker

Reach Maker level
in 3 Maker Skill Trees



Gold Maker

Reach Maker level
in 5 Maker Skill Trees



Goal Maker

Reach Maker level
in 1 Custom-Goal Skill Tree

Bronze Master

Reach Master level
in 2 Maker Skill Trees

Silver Master

Reach Master level
in 3 Maker Skill Trees

Gold Master

Reach Master level
in 5 Maker Skill Trees

Goal Master

Reach Master level
in 1 Custom-Goal Skill Tree

Bronze Sage

Reach Sage level
in 2 Maker Skill Trees

Silver Sage

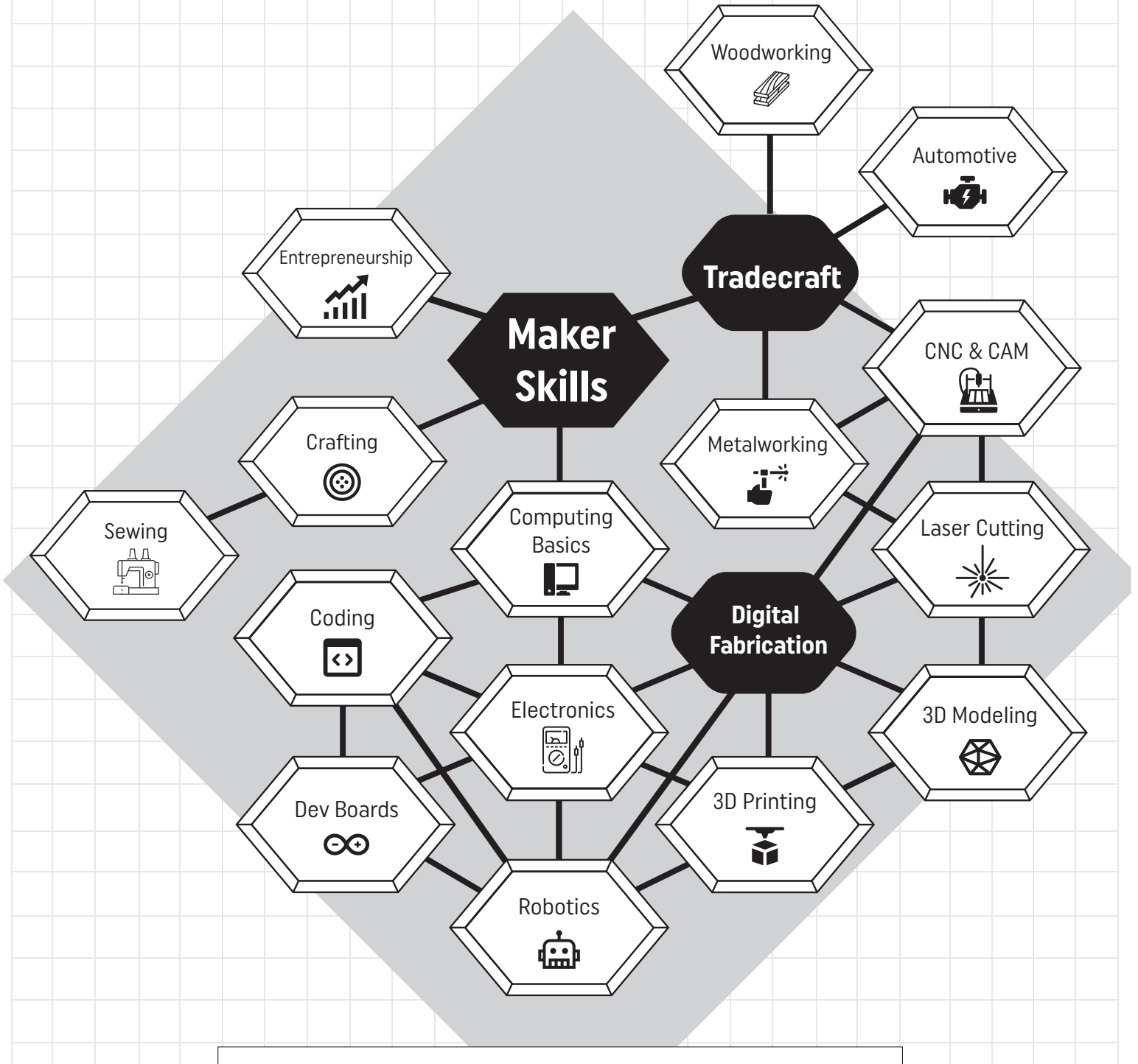
Reach Sage level
in 3 Maker Skill Trees

Gold Sage

Reach Sage level
in 5 Maker Skill Trees

Goal Sage

Reach Sage level
in 1 Custom-Goal Skill Tree



Beginner
10 tiles completed

Apprentice
20 tiles completed

Maker
30 tiles completed

Intermediate
40 tiles completed

Master
50 tiles completed

Grandmaster
60 tiles completed

Sage
All 73 tiles completed

Visual map of 15 maker skill areas and recommended places to start; but skills can be completed in any order. Color in the tiles as you progress.

SKILL TREES

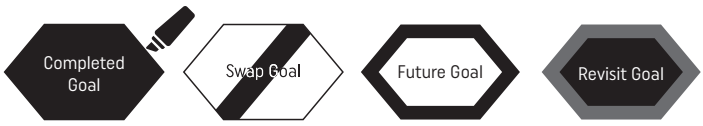
Visuallize Your Skills

Mistakes are the usual bridge between inexperience and wisdom.
—Phyllis Theroux

NOTES

Ideas, Dreams, Plans

Develop success from failures. Discouragement and failure are two of the surest stepping stones to success.
—Dale Carnegie



3D MODELING

• Skill Tree: Color in the Boxes •

Color in the boxes of anything you've already completed, visualize your skills, and identify your skill gaps.
Get inspired to try new things, and tailor the skill tree to suit your own journey by swapping in your own goals.

ADVANCED

BASICS

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

Make something for VR or AR

Teach a class on 3D modeling

Create a simple 3D game

Upload your project and workflow online

Design an articulating or print-in-place model

Try out a game engine

Sculpt something from a reference photo

Use mathematics to create a 3D model (e.g., Grasshopper with Rhino 3D software)

Design a compliant mechanism

Animate something you've sculpted

Make a CAD model of your room, office, or home

3D model something and upload it under an open source license

Create a toon shader

Use deformers to animate a model

Design, print, and assemble something with multiple parts

Create a customizable model in OpenSCAD

Rig something you've sculpted

Sell something you've 3D modeled

Stress test a model in engineering CAD software

Texture a 3D model with realistic texturing

3D model a character

Iterative design: Make improvements to a 3D model

Animate an engineering CAD model

Use bones & weight painting to rig a model

Design a custom model for cosplay

Design something to be assembled with different materials

Create a texture in a texturing package (e.g., Substance Painter, Blender, Mudbox)

Retopologize a 3D model

Design something to be 3D printed in specialized material

Reverse-engineer something in CAD software

Animate a crane rig

Make a model in sculpting software

Design something to be made from a flat material (e.g., sheet metal, papercraft)

UV unwrap a complex object (UDIMs)

Change the camera settings when rendering

Design something to be printed in two colors or materials

Design a model to embed electronics or magnets

Rig a crane object with FK/IK system

Teach a friend how to 3D model

Design something for 3D printing

Capture a texture from the real world

Use HDRIs to create realistic lighting

Render a model in engineering CAD software

Make a 2D schematic of a 3D model

Animate a 3D rig from a free model (e.g., ball or pendulum rig)

Get 3D scanned or 3D scan something

Create a model in engineering CAD software

Edit a texture in image-editing software

Light and render a 3D-object turntable

Model and make something that solves a problem

Design a custom model for a friend

Modify edge normals for low-poly asset design

Use Boolean tools in 3D software

Use an SVG file to make part of a 3D model

UV unwrap a low-poly object

Create a three-point light setup

Export a 3D model when complete: STL, PLY, 3MF . . .

Use the revolve tool in 3D software

Make a low-poly model

Assemble a 3D model with free assets

Use the extrude tool in 3D software

Apply a material type to a 3D model

Learn about different 3D-model file types: STL, PLY, 3MF . . .

Create a model in MeshMixer or TinkerCAD

Draw a detailed sketch with dimensions before 3D modeling

Know how to check size in 3D software

Choose 3D software and install

Learn to navigate a 3D interface with pan, orbit, and zoom

1 tile = 1 point

Total Score

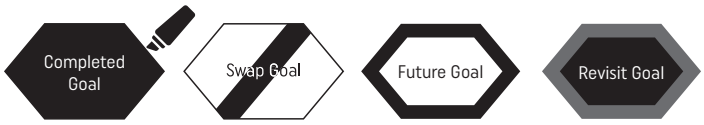
START HERE

MADE BY STEVEN MOHR, AMY KNIE & STEPH PIPER

NOTES

Ideas, Dreams, Plans

Be kind whenever possible. It is always possible.
—the 14th Dalai Lama



3D PRINTING

• Skill Tree: Color in the Boxes •

Color in the boxes of anything you've already completed, visualize your skills, and identify your skill gaps.
Get inspired to try new things, and tailor the skill tree to suit your own journey by swapping in your own goals.

ADVANCED

BASICS

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

Build your own 3D printer (e.g., Voron or RatRig)

Create a project how-to guide

Acetone smooth an ABS part

Teach a class on 3D printing or 3D modeling

Print in nylon or ASA material

Try heat annealing a part to make it stronger

Print something that isn't plastic (e.g., food, clay, pancake)

Use a multi-material 3D Printer

3D model something and upload it under an open source licence

Use heat-set threaded inserts in a part

Make your own filament

Reverse-engineer something in CAD software and print

Try a different slicing software

Print something in metal or metal-like material

Sand and paint something you've printed

Print a gift for a friend or family member

Teach a friend how to 3D Print

Get 3D scanned and print a model of yourself

Mod your 3D printer with something 3D-printed

Recycle filament or failed prints

Repair something with 3D printing

Print something again after making design improvements

Install and use a nonstandard nozzle

Make a lithophane from a photo or image

Print a mold for a casting project

Sell something you've 3D-printed

Print something for cosplay or prop making

Print in ABS or PETG material

Print in a flexible material

Assemble something large with 3D-printed parts

Use advanced slicer settings

Use PVA dissolvable support material

Print something that requires more than 1 kg of filament

Mix your own resin blend

Print something to wear

Print in two colors or materials

Upload a remix of a 3D model

Use ironing in slicing software

Embed electronics or magnets inside a 3D print

Change a nozzle for the first time

Use spiralize or vase mode to print something

3D print something on fabric

Model and print something that solves a problem

Do a hot-pull and cold-pull cycle to unclog a nozzle

Have a failed print and fix the problem

Print an articulating or print-in-place model

Print a model with tree supports

Print something functional

Learn how to do maintenance on a 3D printer

Print a compliant mechanism

Learn about Precious Plastic recycling

Send a file to a printer wirelessly

Learn how to load and unload filament or resin

Have a print failure with lots of spaghetti

Print an organizer for the home

Calibrate a resin printer

Accidentally break a print while removing support material

Print in PLA material

Use a resin printer for the first time

Print something with multiple parts and assemble

Use an FDM printer for the first time

Set up a resin-printing PPE & wash & cure station

Learn how to safely handle 3D-printer resin to avoid chemical burns

Learn about 3D-printer fumes, extraction, and safety

Visit your local makerspace

Learn to use slicing software

Pick a simple 3D model to print

Learn the differences between resin and FDM printers

START HERE

1 tile = 1 point

Total Score

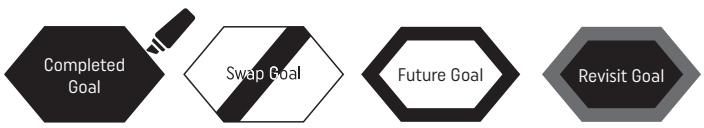
MADE BY STEPH PIPER

NOTES

Ideas, Dreams, Plans

✦

The more I learn, the more I realize how much I don't know.
—Albert Einstein



AUTOMOTIVE

• Skill Tree: Color in the Boxes •

Color in the boxes of anything you've already completed, visualize your skills, and identify your skill gaps.
Get inspired to try new things, and tailor the skill tree to suit your own journey by swapping in your own goals.

ADVANCED

BASICS

(Set your own goal)
(Set your own goal)
(Set your own goal)
(Set your own goal)
(Set your own goal)
Pull a transmission out
Pull an engine out
Remake or repair a wiring loom
Replace a clutch
Replace a timing chain or belt
Diagnose an electrical fault
Rebuild a diff
Change a solenoid in a gearbox
Replace a wheel bearing
Change a drive shaft
Fluid exchange an automatic gearbox
Replace a water pump
Adjust a handbrake
Drain, flush, and bleed a cooling system
Replace a bush
Replace a cam seal
Replace a starter motor
Bleed a brake system
Teach a friend an automotive skill
Install a catch can
Change diff fluid
Replace brake rotors and pads
Change a shock absorber
Repair a thread
Purchase a high-quality tool set
Bed in brakes
Change a rocker cover gasket and PCV
Scan a car with an OBD scanner
Change a tie rod
Paint a panel
Use an easy-out or bolt extractor
Apply window tint
Use body filler
Work on a vintage car
Work on a motorbike
Make a gasket
Install a reverse camera
Change a spark plug
Replace a serpentine belt
Fix a dent
Clean a throttle body
Accidentally strip a screw or bolt
Mod a car
Sound deaden a door
Learn to drive with a trailer
Change engine oil and filter
Install speakers, sub, and amplifier
Change a flat tire
Check brake, clutch, and transmission fluid
Change a fuel filter
Install a radio
Check radiator fluid level
Replace and program a battery
Use a torque wrench
Replace a light globe
Wax or ceramic a car
Replace a fuse
Solder or crimp a wire
Jump start a vehicle or charge a battery
Check the oil level
Change or clean an air filter
Refill windshield-wiper fluid
Change wiper blades
Check air and Inflate a tire
Use a socket wrench
Wash a car
Learn to drive
Learn to read and refer to your user and repair manuals

1 tile = 1 point

Total Score

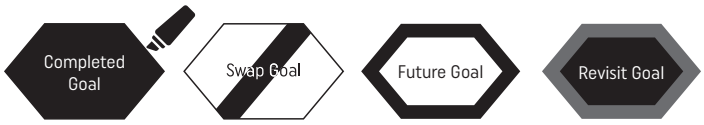
START HERE

MADE BY TOM HAMELINK, SIDNEY PAOLINI & STEPH PIPER

NOTES

Ideas, Dreams, Plans

It is not the years in your life but the life in your years that counts.
—Adlai Stevenson



CNC & CAM

• Skill Tree: Color in the Boxes •

Color in the boxes of anything you've already completed, visualize your skills, and identify your skill gaps.
Get inspired to try new things, and tailor the skill tree to suit your own journey by swapping in your own goals.

ADVANCED

BASICS

(Set your own goal)
(Set your own goal)
(Set your own goal)
(Set your own goal)
(Set your own goal)
Modify a postprocessor
Use heatshrink tooling
Make a custom workholding jig
Machine an unknown material
Teach a CNC class
Build your own CNC machine
Cut a 3D contour
Use a chamfer tool
Use a CNC lathe
Use a fixture plate
Machine stainless steel
Teach a friend CNC skills
Repair a CNC after a crash
Engrave text
Use a boring tool
Fill an engraving with wax or resin
Make soft jaws
Machine a used part
Sell something you've made
Upgrade your CNC machine
Use a finishing cycle
Use a fly cutter
Accidentally misalign the second side of a job
Use a vice
Machine steel
Make multiple parts that fit together
Tram or align your CNC machine
Machine a pocket
Use a facemill
Hit a tight tolerance
Use work stops for multiple parts
Machine a composite
Make something as a gift
Check machine alignment
Cut a 2D contour
Use a keyless chuck
Clean down a CNC
Add tabs to a part
Machine brass or copper
Make a part to repair something
Use multiple work offsets
Face off a part
Use a collet chuck
Use material that is too small
Use a vacuum table
Machine aluminum
Design and upload a project online
Use a digital probe to set origins
Use peck drilling
Use a ball mill
See "chatter" in your part
Manually edit a G-code file
Machine plastic
Make a mechanical part or tool
Use tool offsets
Generate your first G-code file
Use a drill bit
Break a tool
Fix stock with clamps or screws
Machine timber
Make a 3D art piece
Touch off material manually
Use a feeds-and-speeds calculator
Use an endmill
Use a CNC for the first time
Visit your local makerspace or woodworking club
Get safety gear and learn CNC safety
Understand the limits of your machine

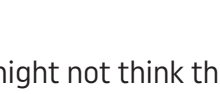
START HERE

1 tile = 1 point

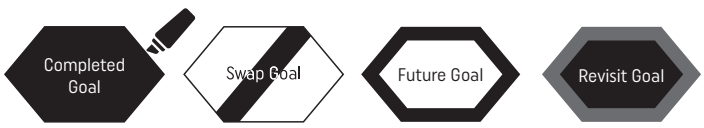
Total Score

NOTES

Ideas, Dreams, Plans



You might not think that programmers are artists, but programming is an extremely creative profession. It's logic-based creativity.
—John Romero



CODING

• Skill Tree: Color in the Boxes •

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Get inspired to try new things, and tailor the skill tree to suit your own journey by swapping in your own goals.

ADVANCED

BASICS

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

Fix a race condition

Learn multithreading

Teach a class on coding skills

Write a program to accept commands over a UART from a terminal

TX RX

Learn three or more coding languages

Participate in an open source project

Write a streaming program using UDP and a custom protocol

Write detailed documentation for your coding project

Make a recursive function nonrecursive

Use a performance profiler to identify and fix hot spots

Use bitwise operators for speed improvements

1 0 1 1 0

Write a concurrent program using thread synchronization

Learn about project management styles (e.g., waterfall vs. agile)

Collaborate on a project with others

Use recursion

Test and improve your code

Write functional code

JS

Teach a friend a coding skill

Earn money from coding

Use a graph data structure

Write a TCP/IP server

Use a second programming language in the same project

Participate in a hackathon

Write object-oriented code

Write an iOS Hello World program

Use a tree data structure

Write an Android Hello World program

Write a Linux Hello World program using GTK+

Write a quick sort algorithm

Use a design pattern (e.g., Gang of Four)

Write a Windows Hello World program

Write a web application

www

Write a MacOS Hello World program

Use version control

Run into circular dependency with your files

Use a logical shortcut in a condition

&&

Get confused reading your own code

Implement a sort algorithm

Convert code from floating-point math to integer/fixed-point math

3.141592

Document your program

Use a linter

Optimize the memory footprint of a program

Use a set instead of a list

Use an API in a project

API

Use a Git repository to share code

Create a CLI tool with parameters

Spend a long time trying to find a trivial bug

Use a keyboard shortcut to run your program

Generate art with code

Complete a learn-to-code class or book

Explain your code with comments

Use a debugger

Write a function

fx

Use a keyboard shortcut to save your code

Look up an error message on stack overflow

Reassign a value to a variable

Write something in a markup language

Adjust example code for a project

Download a code library

Use node-based coding

Iterate over a list/array with a loop

Find a bug and fix it

Learn HTML basics

Learn core syntax for a language

Use the command line

Write a Hello World program

Split your code into multiple files

Use block-based coding

1 tile = 1 point

Total Score

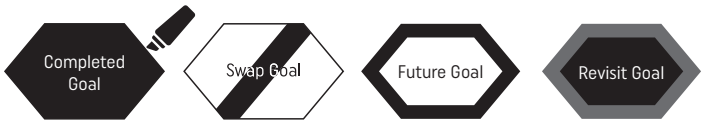
START HERE

NOTES

Ideas, Dreams, Plans

✦

I think it's fair to say that personal computers have become the most empowering tool we've ever created. They're tools of communication, they're tools of creativity, and they can be shaped by their user.
—Bill Gates



COMPUTING BASICS

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ADVANCED

BASICS

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

Build a computer

Teach a class on computer skills

Set up an online store

Upgrade a computer with better parts

Make a website

Try a different operating system

Install an operating system

Research a computer build

Set up a domain email address

Help someone fix a problem

Teach a friend a computer skill

Buy a domain name

Sign up for 'Have I been pwnd?'

Edit a PDF file

Set up a blog

Edit a photo

Use AI to help you with a task

Lodge taxes online

Get a VPN

Sell second-hand items online

Find a good tech support person

Order a meal online

Learn how to spot misinformation and check sources

Use cable management at your workstation

Play an online video game

Upload a video online

Video call someone in a different time zone

Make a spreadsheet

Order groceries for delivery online

Recover something you deleted

Set up an adblocker

Play an offline video game

Install a web browser extension

Video call with a friend

Mange your privacy settings on social media

Set up two-factor authentication or a passkey

Send a meeting request via email

Fix a problem yourself

Take a selfie to use as a display picture

Listen to an audio book or read an e-book

Attend a workshop or read a book

Get more than one screen

Make a social media account

Pay a bill online

Use internet banking

Purchase and install new software

Scan a QR code

Spot a scam

Buy something online

Set up a password manager

Set up a printer

Organize your files

Set up cloud storage

Pin your most-used programs to your taskbar

Set up an ergonomic workspace

Send photos from your phone to your computer

Email photos or documents

Listen to digital radio

Google an error message

Find news and weather online

Learn to type on a keyboard

Stream a movie or TV show

Find something on Google

Set up an email

Change your desktop wallpaper

Set up internet

Get a smartphone

Get a computer

1 tile = 1 point

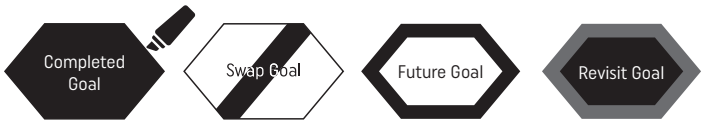
Total Score

START HERE

NOTES

Ideas, Dreams, Plans

Some people look for a beautiful place. Others make a place beautiful.
—Hazrat Inayat Khan



CRAFTING

• Skill Tree: Color in the Boxes •

Color in the boxes of anything you've already completed, visualize your skills, and identify your skill gaps.
Get inspired to try new things, and tailor the skill tree to suit your own journey by swapping in your own goals.

ADVANCED

(Set your own goal)
(Set your own goal)
(Set your own goal)
(Set your own goal)
(Set your own goal)
Sell something you've made
Teach a crafting class
Make something to organize crafting supplies
Craft something including electronics
Make a plush toy
Design your own knitting or crochet pattern
Design your own embroidery pattern
Make something with weaving
Make a candle or soap
Make a craft-project tutorial
Do a cosplay project
Paint a miniature
Make a mosaic or stained glass project
Use resin in a project
Make a practical ceramic project
Make something with plaster or concrete
Sew something practical
Make something you can wear
Use laser cutting in a project
Make something large with cardboard
Do a collaborative craft project
Do a tufting or punch-needle project
Use 3D printing in a project
Make and bind a book
Make something with beading
Use a vinyl cutter in a project
Finish a knitting or crochet project
Make a badge with a badgemaker
Use the visible-mending technique to repair clothing
Tie dye fabric
Learn to use a sewing machine
Do a botanical-press project
Do an upcycling project
Make a project with knitting or crochet
Make your own upcycled paper
Do a cross-stitch or hand embroidery project
Make a gift for a friend
Use watercolor pencils or paints
Make something with felt
Try a craft from a different culture
Paint a rock or something from nature
Use calligraphy in a project
Make something with macramé
Make a hanging project
Make something festive
Use chalk or pastels in a project
Make your own stamp
Teach a friend a craft skill
Make something with paper quilling
Do a jewelry project
Use a hot-glue gun
Use paper for a layered effect
Make something with tissue paper
Try scrapbooking
Make something from clay
Make something for the home
Make a pom-pom
Make something with pipe cleaners
Use googly eyes in a project
Make something with buttons
Make a paper collage
Use paper cutting in a project
Make something using a jar
Make something with paper craft
Learn to use cutting tools safely
Make a greeting card
Assemble a craft-project kit
Make something with origami

BASICS

START HERE

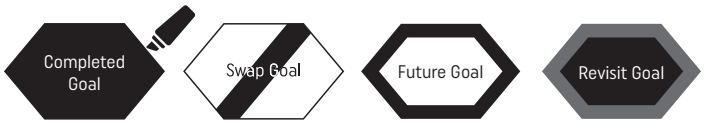
1 tile = 1 point

Total Score

NOTES

Ideas, Dreams, Plans

Change your thoughts and you can change the world.
—Norman Vincent Peale



DEV BOARDS

ARDUINO, RASPBERRY PI & MORE

• Skill Tree: Color in the Boxes •

Color in the boxes of anything you've already completed, visualize your skills, and identify your skill gaps.
Get inspired to try new things, and tailor the skill tree to suit your own journey by swapping in your own goals.

ADVANCED

BASICS

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

Do an autonomous robotics project

Design your own Arduino HAT/RasPi shield/dev board

Release a tutorial on a project you've made

Create an FPGA project

Use TinyML in a project (e.g., object detection)

Make an open source project

Send data with LoRaWAN, NB10t, or others

Teach a class on a dev board

Turn a home appliance into a smart device

Do a robotics project

Make a gift for someone with a dev board

Make a wearable-tech project with a dev board

Use encoders to measure motor rotation

Make something for gaming

Debug voltage drops

Run out of memory in a project

Reprogram the bootloader on a dev board

Make a project with a camera

Send data to an online server (e.g., MQTT)

Use PWM to control the speed of a DC motor

Use sleep mode to save power

Use RFID in a project

Use MIDI files in a project

Make a project for everyday use

Send data wirelessly using BLE

Use an RTOS with a dev board

Use a joystick or gamepad in a project

Use a screen in a project

Use Python in a project

Use a PID controller

Participate in a hackathon

Use an LED matrix in a project

Use renewable energy in a project

Monitor your environment with a dev board

Use an interrupt in a project

Use an LED strip in a project

Use a dev board to wirelessly control an IoT PowerPoint

Detect a person with a sensor

Teach a friend a dev-board skill

Schedule a task for Raspberry Pi or another SBC

Make a project that moves

Use the real-time clock for scheduling

Use a sensor to trigger an action

Use an SBC to receive MQTT messages from a dev board

Use an Arduino shield

Use environmental sensors in a project

Use WiFi to send data from a dev board

Build your own enclosure for a project

Let the smoke out of a dev board accidentally

Get a project wrong and try again

Use a Raspberry Pi hat

Use a rotary encoder and a stepper driver to move a stepper motor

Use a multimeter to measure voltage or current

Make an LED blink with Python

Use a servo motor in a project

Use the Arduino Serial Monitor

Learn to solder and soldering safety

Print "Hello World" on Raspberry Pi

Use TinkerCAD to code and simulate an Arduino project

Use a multimeter to measure circuit continuity

Use a Raspberry Pi command line for the first time

Use a button or a switch in a circuit

Alter example Arduino code

Use Ohm's law to select a resistor for an LED

Set up a Raspberry Pi for the first time

Blink an LED

Learn to use a breadboard

Select and flash a Raspberry Pi OS on an SD card

1 tile = 1 point

Total Score

START HERE

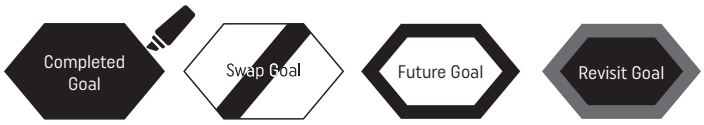
MADE BY @createcodeandgo & STEPH PIPER

NOTES

Ideas, Dreams, Plans

✦

Any sufficiently advanced technology is indistinguishable from magic.
—Arthur C. Clarke



ELECTRONICS

• Skill Tree: Color in the Boxes •

Color in the boxes of anything you've already completed, visualize your skills, and identify your skill gaps.
Get inspired to try new things, and tailor the skill tree to suit your own journey by swapping in your own goals.

ADVANCED

(Set your own goal)
(Set your own goal)
(Set your own goal)
(Set your own goal)
(Set your own goal)
Design a 3-plus layer PCB
Create an FPGA project
Use capacitive touch in a PCB design
Teach a class on electronics
Make a switch-mode power supply
Make something with PCB art
Use a pick-and-place machine
Release a tutorial on a project you've made
Make an electronic sculpture
Design a PCB SAO or badge for a conference
Build a radio-frequency (RF) project
Make a PID circuit with op-amps
Order a PCB with your design
Apply solder paste to a PCB with a stencil
Use a frequency analyzer for a project
Use automatic gain control
Repair a mistake on a PCB
Filter unwanted noise from a signal
Use a MOSFET instead of a relay in a project
Learn PCB design software
Look at an audio input on an oscilloscope
Use a surge diode to project a circuit
Make a regulated power supply
Make an open source project
Measure voltage with an oscilloscope
Make something with a seven-segment display
Measure capacitor equivalent series resistance
Make an antenna
Make something with solar panels
Teach a friend an electronics skill
Use a crowbar circuit to protect against overvoltage
Make a motor controller with an H bridge
Make a counter with logic gates
Use a shift register in a project
Accidentally let out the magic smoke
Measure frequency with a multimeter or oscilloscope
Make your own USB cable
Build a robot
Use a 555 timer in a circuit
Use a relay to switch something on at a higher voltage
Make an Internet of Things (IoT) project
Amplify a sound or signal
Make a project with a Raspberry Pi
Learn to solder surface-mount parts
Fix something that's broken
Use an LED matrix in a project
Turn something on using a sensor
Use a diode to protect your circuit from reverse voltages
Make an oscillator that makes noise
Measure current with a multimeter
Make a voltage divider to lower the voltage for a project
Use addressable RGB LEDs in a project
Turn a breadboard circuit into a schematic and vice versa
Get a circuit wrong and try again
Learn to read a datasheet
Learn about different types of batteries
Measure voltage with a multimeter
Learn to desolder a through-hole component
Learn about voltage, current, and resistance
Make something with Arduino or a dev board
Make a DIY capacitor
Learn about Ohm's law
Learn to use wire strippers
Complete an electronics kit
Learn to use a breadboard
Learn to read a schematic
Light up an LED
Learn to solder and soldering safety

BASICS

START HERE

1 tile = 1 point

Total Score

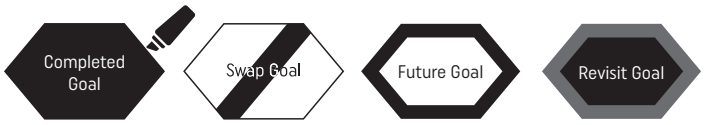
MADE BY BRODIE FAIRHALL & STEPH PIPER

NOTES

Ideas, Dreams, Plans

✦

The reason most people do not recognize an opportunity when they meet it is because it usually goes around wearing overalls and looking like Hard Work.
—unknown



ENTREPRENEURSHIP

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Get inspired to try new things, and tailor the skill tree to suit your own journey by swapping in your own goals.

ADVANCED

BASICS

(Set your own goal)
(Set your own goal)
(Set your own goal)
(Set your own goal)
(Set your own goal)
Achieve your original business goal
Teach an entrepreneurship class
Become a mentor
Sell your business
Work and travel as a digital nomad
Create a passive-income channel
Get professional photos taken for your business
Open-source an idea
Travel for business
Create resources to help others succeed
Diversify your income with multiple streams
Crowdfund a product
Have a physical storefront or market stall
Scale your business
Lodge a business tax return
Run a startup event
Pitch your idea at a competition
Do social good with your business
Get investment or grant money
Find ways to minimize your business environmental impact
Create a video on your product or service
Get 1,000 followers on your business social media
Launch a business without spending any money
Create a budget projection
Sell something to someone overseas
Sell something via preorder
Send an invoice
Advertise your business
Use an SEO research tool (e.g., eRank, Sale Samurai)
Find a mentor
Sell a digital product
Help a friend with a business
Get accounting software
Teach a friend a business skill
Create a business website and email
Open a business bank account
Pay a freelancer to help with your business (e.g., Fiverr, Upwork)
Understand different business structures
Get feedback and improve your product or service
Import something to sell
Find a business partner or friends to help
Pivot your business idea
Create an online store
Get great business reviews online
Go to a networking event
Sell your first service
Sell a physical product
Visit a coworking space
Analyze your market size
Make a social media account for your business
Profile your average customer and find their pain points
Set a vision, a mission, and values for your business
Create a style guide for your branding
Fill out a value-proposition canvas
Create an elevator pitch
Ask an expert for advice
Analyze your target market
Participate in a startup program
Conduct market research
Research business competition
Create a logo
Reflective journal your why, strengths, and weaknesses
Make a business name
Do customer validation
Create a minimum viable product (MVP)
Learn lean startup methodology
Have a business idea
Fill out a lean canvas

1 tile = 1 point

Total Score

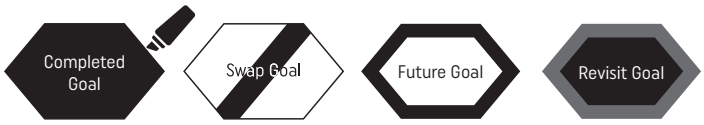
START HERE

MADE BY STEPH PIPER & SCOTT MILLAR

NOTES

Ideas, Dreams, Plans

Experience is a hard teacher because she gives the test first, the lesson afterwards.
—Vernon Law



LASER CUTTING

• Skill Tree: Color in the Boxes •

Color in the boxes of anything you've already completed, visualize your skills, and identify your skill gaps.
Get inspired to try new things, and tailor the skill tree to suit your own journey by swapping in your own goals.

ADVANCED

BASICS

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

Make a laser-cut project that's bigger than yourself

Use a rotary laser to engrave a curved object

Use a galvo fiber laser cutter

Teach a workshop on laser cutting

Upload a design online

Optimize a repetitive job for speed

Make a hard material bend with living hinges

Cut a non-standard material (e.g., leather)

Use a 3D-engraving technique (e.g., depth map)

Engrave metal

Use 3D-design software to create a complex fitted part

Create a complex design from scratch using vector software

Use a single-line font

Aa

Make a custom workholding solution or jig

Make something from laser cut fabric or leather

Combine laser cutting with hardware (bolts, hinges, etc.)

Nest parts for maximum material efficiency

Learn how to use Boolean tools effectively

Add paint or color to a project

Sell a laser cut project

Make something with a few different materials

Fix a laser cutter when something goes wrong

Convert something from one vector format to another

Fit something to a real-life object (use a photo or scan)

Learn the kerf settings for your laser

Combine laser cutting and 3D printing in the same project

Use multiple passes to cut through a thick material

Do a marquetry project

Solve a real-life problem with laser cutting

Teach a friend a laser-cutting skill

Make something for a friend

Use a camera mounted to your laser to position your jobs

Add electronics to a laser-cutting project

Optimize a design for engraving

Engrave ceramic, tile, or stone

Use tabs to keep small pieces in a design in place

Have an idea and make it in less than one hr

Mod your laser cutter (air assist, add camera, change firmware, etc.)

Find perfect image-/photo-engraving settings

Make something from upcycled materials

Use a box generator and laser cut a box

Make a design using stacked materials

Make a stencil

Reverse-engineer something for a project

Buy something premade and laser etch it

Make an organizer with laser cutting

Cut something from acrylic

Use a material test file to test a new material

Find perfect cut settings for a new material

Use an auto-trace function to turn pixels into vectors

Make a simple design in vector software

Make something from multiple laser-cut parts

Cut something from timber

Get a design wrong and try again

Learn about the different types of laser cutters

Prototype a project with cardboard

Calibrate a laser

Use cutting and engraving in the same project

Learn what kind of laser you are using

Customize a design using vector software

Make a tool with laser cutting

Set up an exhaust or air-filtration system

Learn about the dangers of unenclosed laser cutters

Upload a file to your laser-interface software and cut

Learn which materials are unsafe to cut

Make sure safety equipment is in place for using your laser

Learn your laser-interface software

Find a premade file online to use with your laser cutter

1 tile = 1 point

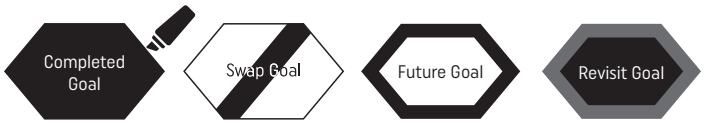
Total Score

START HERE

NOTES

Ideas, Dreams, Plans

You must do the things you think you cannot do.
—Eleanor Roosevelt



METALWORKING

• Skill Tree: Color in the Boxes •

Color in the boxes of anything you've already completed, visualize your skills, and identify your skill gaps.
Get inspired to try new things, and tailor the skill tree to suit your own journey by swapping in your own goals.

ADVANCED

BASICS

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

Learn G-code commands

Design something and upload instructions online

Teach a welding class

Teach a metalworking class

Use anodizing in a project

Make a very large metalworking project

Engrave a project

Use metalworking in a robotics project

Use powdercoating in a project

Do a corner-joint or tee-joint weld

Include electronics in a metalworking project

Add timber to a metalworking project

Use TIG welding in a project

Use a plasma cutter

Fix a machine or tool when it breaks

Sell something you've made

Do a butt-joint or lap-joint weld

Learn a blacksmithing skill

Use a CNC lathe

Use stick welding in a project

Use brazing to join two parts

Make something to organize your tools

Learn to use a metal lathe

Make your own tools and heat treat them

Learn to join and add fittings to pipes

Use a surface grinder in a project

Use MIG welding in a project

Make your own metalworking jig

Use a CNC machine

Use a micrometer to measure accurately

Teach a friend a metalworking skill

Make a project in steel

Make something as a gift

Use spot welding in a project

Melt or break a drill bit

Learn to use a mill for metalworking

Make a project in brass

Get something wrong and try again

Tap a hole

Learn to sharpen a drill bit

Learn to bend a tube

Create a large piece of furniture

Use a hydraulic press in a project

Learn to use a CAD software

Make something with upcycled materials

Polish a metal project

Make art with metal

Use a vertical band saw

Restore an old, rusty tool

Use soldering for sheet metal

Learn about feeds and speeds

Learn to use a rotary tool

Learn to use a die grinder

Learn to secure a project correctly before working on it

Use a horizontal band saw

Learn to use an angle grinder

Make a project in aluminum

Learn to sharpen and maintain a tool

Learn to fold sheet metal

Get a good pair of safety glasses

Research correct PPE to use for metalworking

Finish a sheet metal project

Use a rivet gun

Learn to use marking-out and measuring tools

Learn to drill a hole in metal

Make something with metal extrusion

Assemble something from metal parts

Learn to cut sheet metal

1 tile = 1 point

Total Score

START HERE

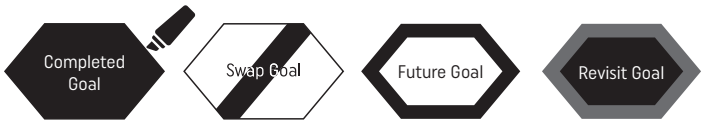
MADE BY OLIVER KINDER & STEPH PIPER

NOTES

Ideas, Dreams, Plans

✦

The road to success and the road to failure are almost exactly the same.
—Colin Davis



ROBOTICS

• Skill Tree: Color in the Boxes •

Color in the boxes of anything you've already completed, visualize your skills, and identify your skill gaps.
Get inspired to try new things, and tailor the skill tree to suit your own journey by swapping in your own goals.

ADVANCED

BASICS

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

Participate in a robotics competition

Teach a class on robotics

Integrate AI in a robot build

Make a tutorial on a robot project

Build robots that can work together

Make a waterproof robot

Build a robot that can recognize voice or gesture

Use soft robotics in a design

Use machine learning in a project

Design a custom PCB for a robot

Make a robot with metal parts

Build a battle-bot in a team

Make a robot that can balance

Solve a problem with a robot build

Build a robot with LiDAR

Build a pick and place robot (e.g., LumenPnP)

Build a drawing machine or art robot

Build a large open source robot (e.g., InMoov)

Use kinematics in a project

Join a robotics club or group

Build a drone

Build an autonomous robot

Simulate your robot in software (e.g., Gazebo or V-REP)

Build a racing robot (e.g., Donkey Car)

Program a robot with the Robot Operating System

Make a robot dance

Make mods to an off-the-shelf robot or part

Contribute to an open source robotics project

Use an LED matrix or screen in a robot

Build a robot with a camera

Rebuild a robot after it breaks

Build a robot with wheels or tracks

Use pneumatics in a build

Build a floating robot

Use upcycled e-waste in a project

Use OpenCV in a project

Send commands wirelessly

Read a book or attend a workshop

Use a PID controller in a project

Build a companion robot

Teach a friend a robotics skill

Build a fighting robot (e.g., Sumo or Battlebots)

Write software to run on a robot

CNC a robot part

Calibrate a robot build

Use an IMU in a project

Use a game controller in a project

Visit a robot restaurant

Build a biped robot (e.g., Ottobot)

Make a CAD model of a robot project

3D print a robot part

Program a robot arm

Learn CAD software

Use an infrared sensor in a project

Build a line-following robot

Learn to use a multimeter

Build a robot with more than one motor

Laser cut a robot part

Use Raspberry Pi in a project

Make a cardboard robot

Learn about PWM control

Use an ultrasonic sensor in a project

Blink a light with Arduino

Control a servo motor

Learn to solder and soldering safety

Make a cardboard automata

Build a robot from a kit

Learn about different kinds of motors

1 tile = 1 point

Total Score

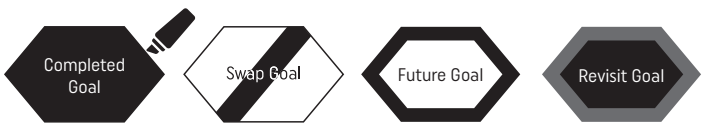
START HERE

MADE BY LUKE HENDERSON & STEPH PIPER

NOTES

Ideas, Dreams, Plans

True magic happens when we create with our hands and dream from our hearts.
—Betsy Greer



SEWING

• Skill Tree: Color in the Boxes •

Color in the boxes of anything you've already completed, visualize your skills, and identify your skill gaps.
Get inspired to try new things, and tailor the skill tree to suit your own journey by swapping in your own goals.

ADVANCED

BASICS

(Set your own goal)
(Set your own goal)
(Set your own goal)
(Set your own goal)
(Set your own goal)
Draft your own sewing pattern
Teach a sewing class
Adjust a pattern to suit
Make a custom design with machine embroidery
Write a set of instructions for a sewing project and upload it
Use an overlocker/serger
Share your sewing projects online
Use machine embroidery
Use a long-arm free-motion quilting machine
Sew something in silk fabric
Sew something with a zipper
Combine sewing with electronics in an e-textiles project
Sew a set-in sleeve
Sew a mitered corner
Sew a French seam
Sew an improv quilt
Sew something in heavyweight fabric
Learn how to gather
Make bias binding
Use interfacing in a project
Use snap fasteners in a project
Cut and sew a facing
Finish a quilting project
Use hardware such as buckles and fasteners in a project
Sew a pocket
Sew a collar
Learn how to do a blind hem
Sew a button with a sewing machine
Sew your first garment piece
Machine quilt layers together
Use Velcro in a project
Teach a friend a sewing skill
Sew a pleat
Sew something with knit fabric
Sew a gift for someone
Sew a curved seam
Combine quilt top, batting, and back together
Sew a fabric with a directional print
Sew an upcycled project
Use custom labels or tags for a project
Sew something with a woven fabric
Use a tailor's clapper with a steam iron
Learn how to select the correct needle for fabric used
Finish a quilt top
Sew with lightweight fabric
Alter clothing to fit (e.g., take up a pair of long pants)
Sew a dart
Learn to use a mannequin
Use a sewing pattern
Use appliqué in a project
Machine sew a patchwork block
Transfer markings from pattern to fabric
Baste a seam before sewing it
Unpick something that's not right
Visit your local fabric shop
Mend something with sewing skills
Change a needle on a sewing machine
Hand piece a quilting block
Sew something for the home
Sew a bag
Sew a buttonhole
Print or trace a sewing pattern
Use different types of hand stitching
Wind your own thread onto a bobbin
Learn to cut fabric with a rotary cutter
Use a zigzag stitch on a sewing machine
Hand sew on a button
Learn sewing machine basics and safety

1 tile = 1 point

Total Score

START HERE

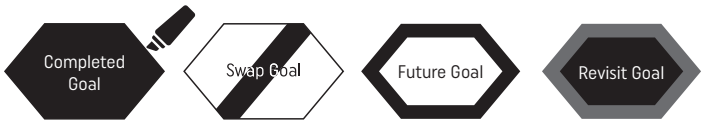
MADE BY @createcodeandgo, TRACEY HEBINGER & STEPH PIPER

NOTES

Ideas, Dreams, Plans

✦

Furniture is nothing but practical sculpture.
—Michael Cullen



WOODWORKING

• Skill Tree: Color in the Boxes •

Color in the boxes of anything you've already completed, visualize your skills, and identify your skill gaps.
Get inspired to try new things, and tailor the skill tree to suit your own journey by swapping in your own goals.

ADVANCED

BASICS

(Set your own goal)

(Set your own goal)

(Set your own goal)

(Set your own goal)

Teach a woodworking class

Design something and publish instructions for others to use

Create furniture with hidden hardware

Make a very large woodworking project

Mill and dry your own lumber from a tree

Use a live edge in a project

Fit drawers in a storage project

Learn to steam bend timber

Make your own vise or clamp

Sell something you've made

Make something on the lathe with resin

Create a new woodworking design in software

Teach a friend a woodworking skill

Make a project with marquetry or parquetry

Create a large piece of furniture

Build something you've designed

Use a multifunction vibrating cutter

Use a table saw

Make something without using screws or nails

Visit your local woodworking club

Make a project using quality timber

Make something to organize your tools

Create a new woodworking design on paper

Use resin in a project

Use a belt sander in a project

Use tongue-and-groove in a project

Use wood burning in a project

Laminate different timbers together in a project

Fix a machine or tool when it breaks

Learn to use a lathe

Get something wrong and try again

Use a router for edge profiling

Make something for the home

Use timber veneer in a project

Learn to use a planer or thicknesser

Learn to use a doweling jig

Make something as a gift

Use only hand tools in a project

Use a handheld router plane

Use a pocket-hole jig

Make a wooden mallet

Make your own woodworking jig

Make a tool with woodworking

Use mortise-and-tenon joints

Use a band saw or jigsaw in a project

Make something for the kitchen

Create a small piece of furniture

Use an electric sander

Cut a lap joint

Use a dremel or other oscillating multitool

Use a hand plane and a spokeshave

Make a wood carving

Learn about the properties of different timbers

Make something using dovetail joints

Upgrade or repair existing furniture

Learn to use a miter saw

Make a wooden miter box

Use upcycled timber in a project

Learn to use a drill

Finish a project with oil, lacquer, or stain

Use a chisel in a project

Use glue in a project

Learn measuring and marking techniques

Use a miter box to cut timber to size

Learn to sharpen and maintain your tools

Get safety gear

Learn to use hand tools safely

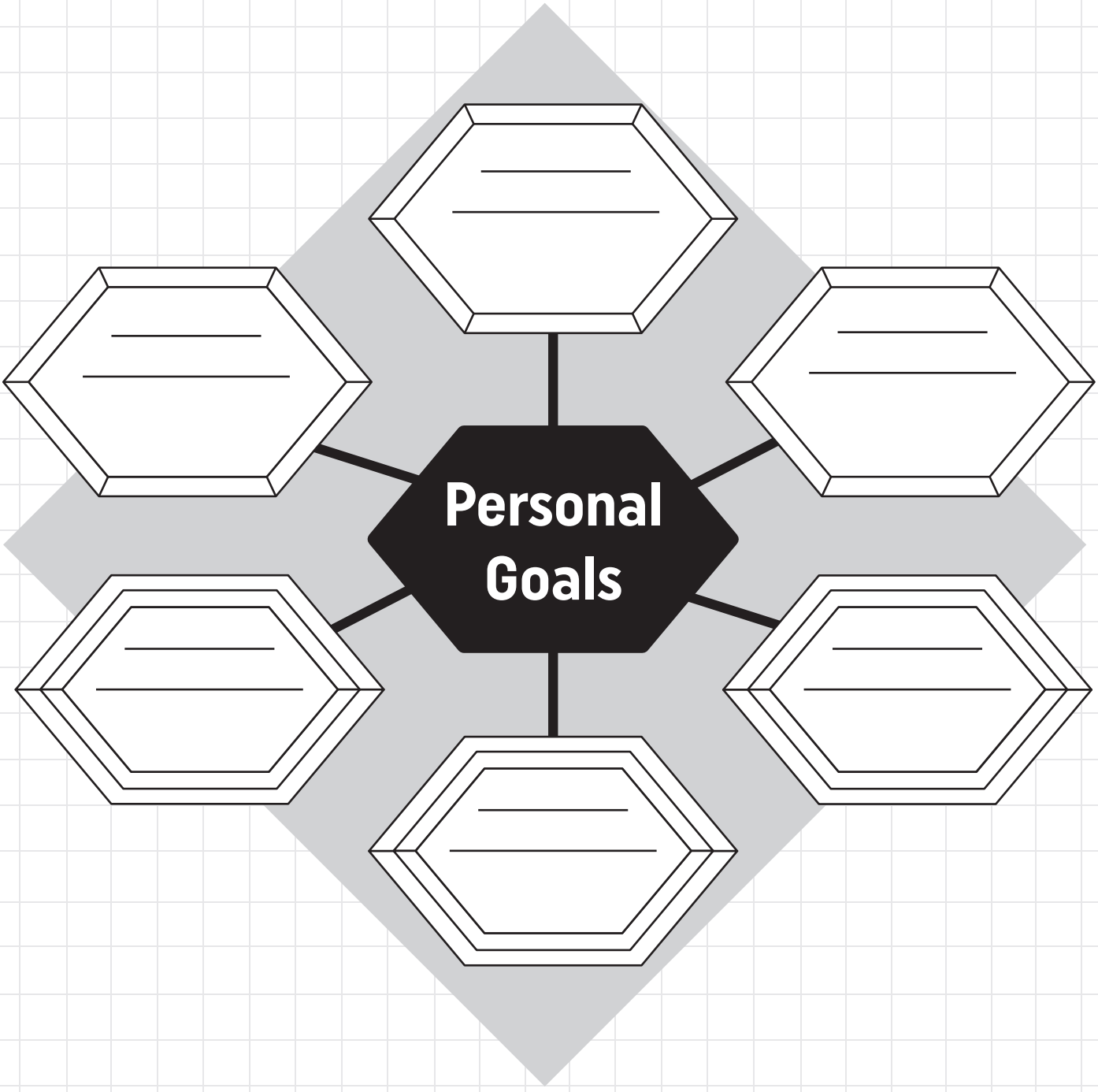
Use sandpaper to sand something by hand

1 tile = 1 point

Total Score

START HERE

MADE BY PERRY CONNING & STEPH PIPER



Standard Tree Guide

- 10 tiles completed
- 20 tiles completed
- 30 tiles completed
- 40 tiles completed
- 50 tiles completed
- 60 tiles completed
- All 73 tiles completed

Mini Tree Guide

- 10 tiles completed
- 20 tiles completed
- 30 tiles completed
- 40 tiles completed

A visual map of your custom skill areas, including three standard size and three mini size skill trees. Color in as you progress.

CUSTOM GOALS

Make Your Own Skill Trees

Hexagons are the bestagons.
—CGP Grey

CUSTOM GOALS

Design Your Own Skill Trees

Goal Setting: Personal Goals
This next section is full of blank skill trees, in standard 73-tile and mini 40-tile sizes. This is a great place to reflect on your goals for the future and can include personal goals, skill-oriented goals, or milestones. It's important that you make these goals achievable and within your control: For example, you can try for a promotion at work, but it's not a guarantee.

Custom Skill Tree Ideas

Family Goals:
- Date activities for couples
- Things to do with kids, milestones, experiences, and things to teach
- Plan outings with family members, bring around baked goods, support a family member who needs help

Social Goals:
- Remember birthdays, catch up with friends
- Plan group travel, activities with friends, gifts for Christmas

Bucket Lists:
- Travel locations, local and overseas
- Movies to watch, books to read, food to try, bands to see

Career Goals:
- Finishing a project, trying for a promotion
- Learning project-management skills, professional development
- Leadership skills, practicing listening, and hard conversations

Side Hustle Goals:
- Get customer feedback, research competitors
- Start an online store, have first market stall
- Reevaluate and pivot business

House Goals:
- Clean out the shed, organize the kitchen ingredients
- Re-decorate guest room, clean out old clothes and take to charity
- Sand back and re-paint wardrobe, fix the laundry tub
- Weed the garden, plant tulips for spring

Personal Goals:
- Organize birthday party, take days off for self-care
- Buy new winter clothes, get new bedsheets
- Cook with more veggies, go for walks while on phone calls

Things You're Proud of Doing:

- Things you didn't expect to do that you add afterward
- Milestones you want to remember and are proud of
- Gratitude list—a reminder of things you're grateful for

You may also decide to change the scale from "basics to advanced" to "short term to long term," "this year and next year," or something else to suit.

Other Usage Ideas

Use skill trees for these activities:

- Training new staff members
- Students working on self-directed activities with self-grading
- Recruitment or competency checking
- Event-specific activities, scavenger hunts, stamp collection (on completion)
- High school or university education, encouraging engagement in noncompulsory extracurricular activities

Goal Setting: Skill Goals

If you'd like to create a skill tree for your expert skill area, here's some guidance:

- Use flexible goals rather than ones that are too specific; everyone's journey is different. For example, rather than "Create a cardboard dinosaur," try "Create something large in cardboard."
- Include options for tools that aren't cost- or availability-restrictive: for example, "Use a photo-editing tool" rather than "Use [specific software]"

With a total of 73 tiles, there's a lot to fill in! Here are some questions to ask yourself about your skill area:

- What's the first few things you do in this area? How might you teach a child or beginner?
- What safety considerations or equipment do you need?
- What materials might you use at basic, intermediate, and advanced levels?
- What tools might you use at basic, intermediate, and advanced levels?
- What techniques might you use at basic, intermediate, and advanced levels?
- What might go wrong, and how would you fix it?
- Where might you visit to learn more and get involved in a community?
- What interdisciplinary techniques could you try (electronics plus textiles equals wearable tech)?
- Gifting a friend something made from this skill
- Teaching a class or friend on this skill
- Releasing a project log or online tutorial on this skill

Share it!

If you create a custom tree of your own area, submit a picture to the Github page—it could be added to the main repository for everyone to use! You're also welcome to peruse the collection for other niche skill trees not included in this book, including Adventure, Amateur Radio, Molding and Casting, and much more.

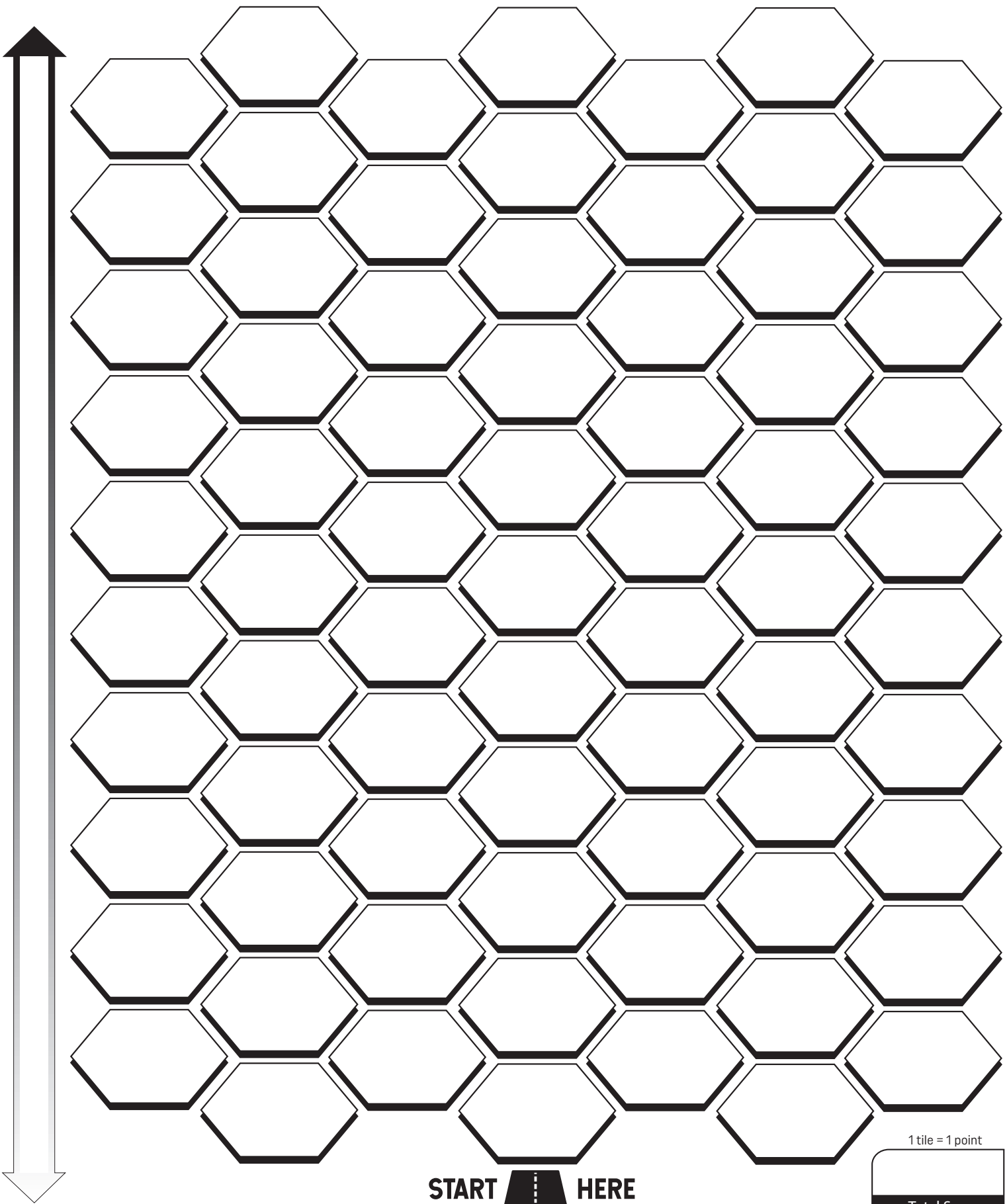
NOTES

Ideas, Dreams, Plans

Out of difficulties grow miracles.
—Jean de la Bruyère

Title: _____

• Skill Tree: Set Your Own Goals •



1 tile = 1 point

Total Score

Name: _____

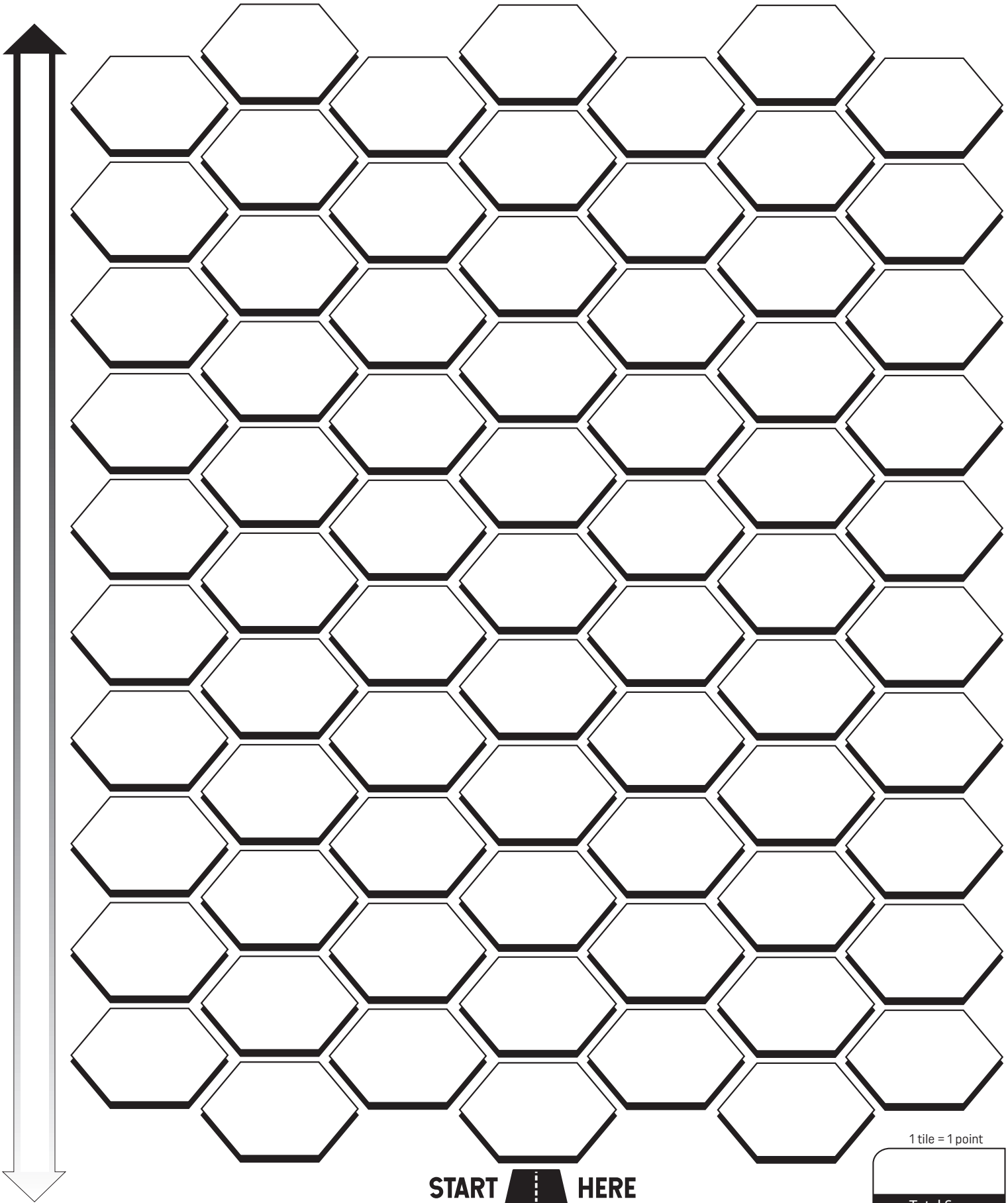
NOTES

Ideas, Dreams, Plans

You cannot cross the sea merely by standing and staring at the water.
—Rabindranath Tagore

Title: _____

• Skill Tree: Set Your Own Goals •



1 tile = 1 point

Total Score

Name: _____

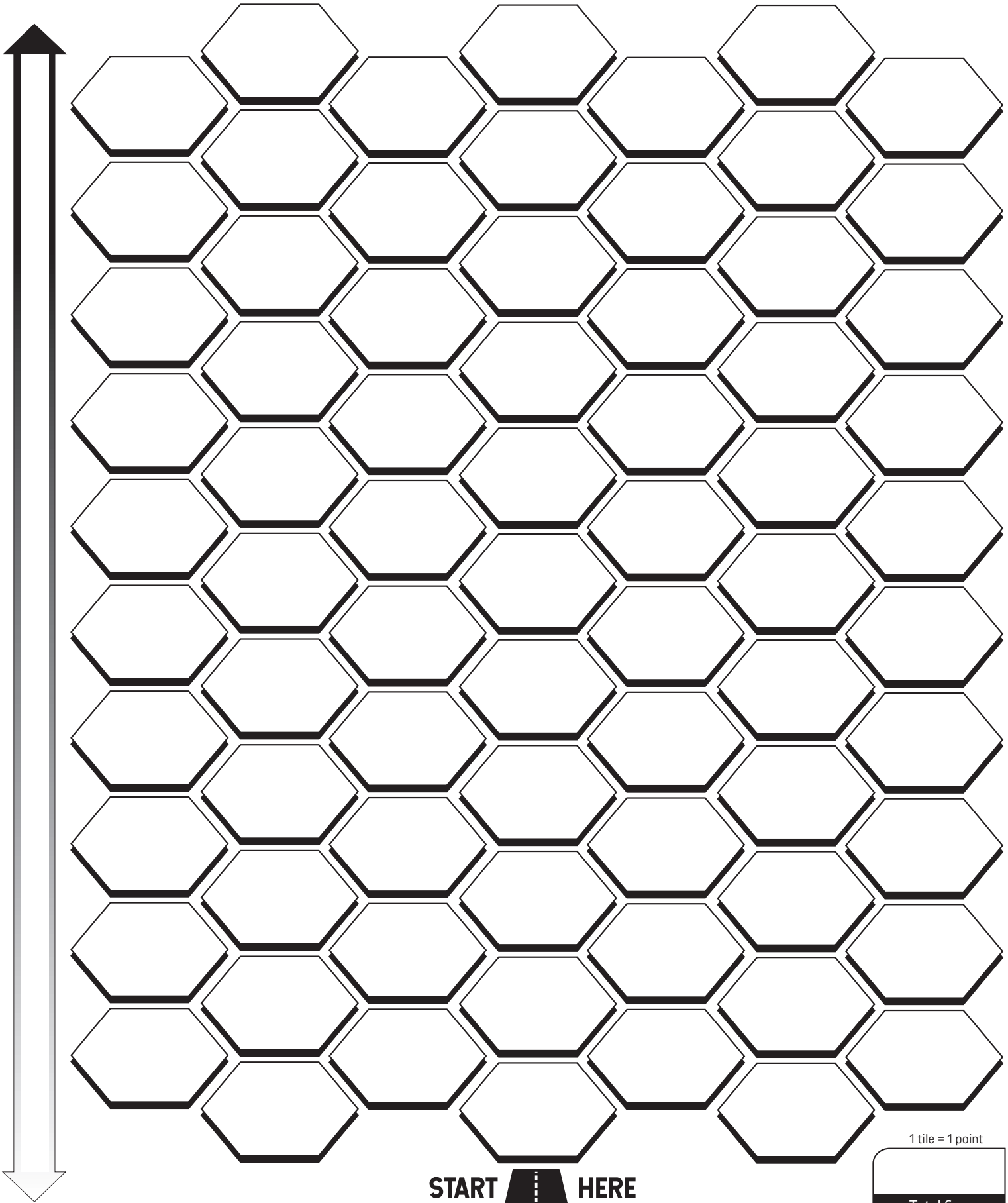
NOTES

Ideas, Dreams, Plans

The only person you are destined to become is the person you decide to be.
—Janet Champ and Charlotte Moore

Title: _____

• Skill Tree: Set Your Own Goals •



1 tile = 1 point

Total Score

Name: _____

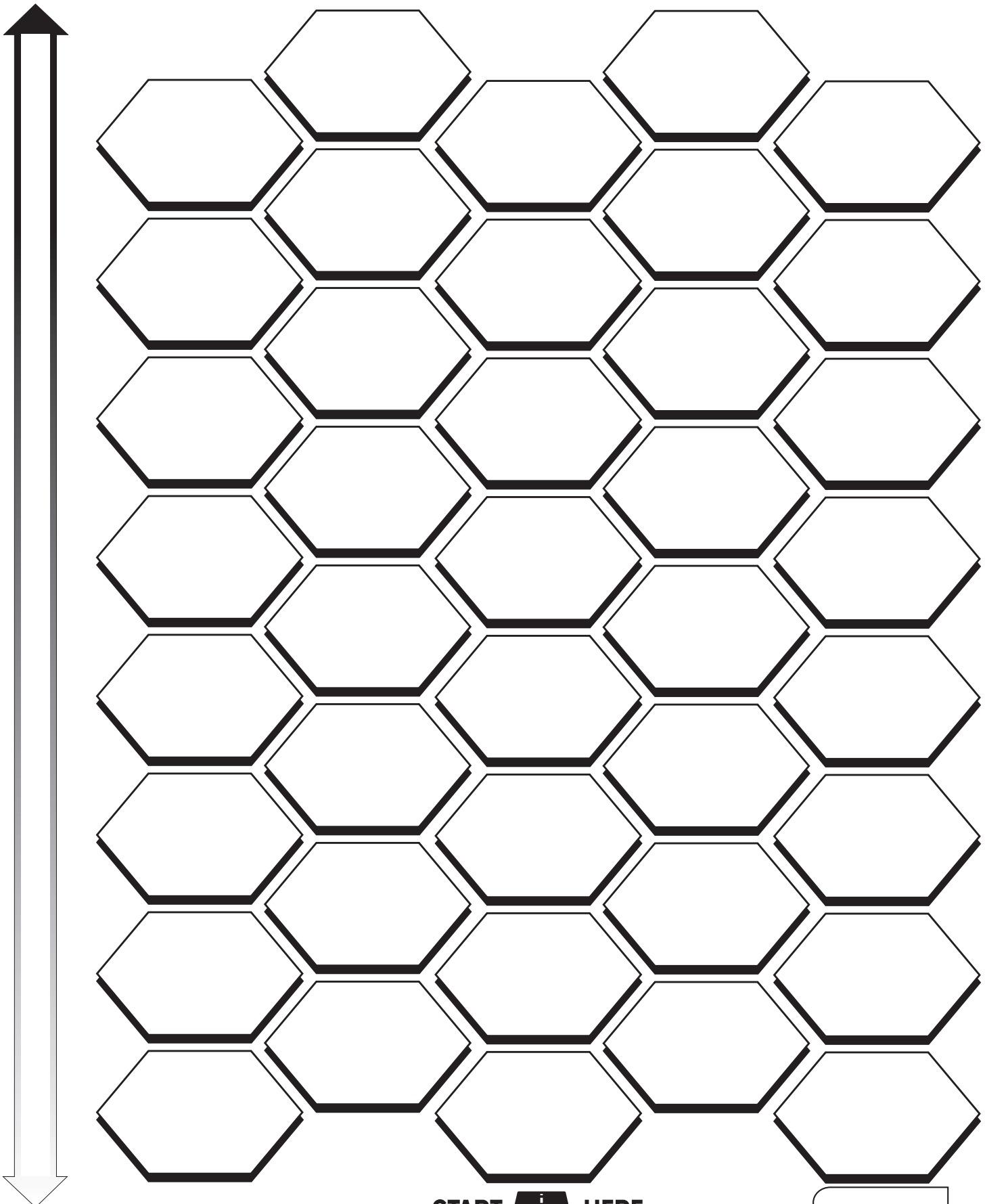
NOTES

Ideas, Dreams, Plans

Believe you can and you're already halfway there.
—Theodore Roosevelt

Title: _____

• Skill Tree: Set Your Own Goals •



Name: _____

1 tile = 1 point

Total Score

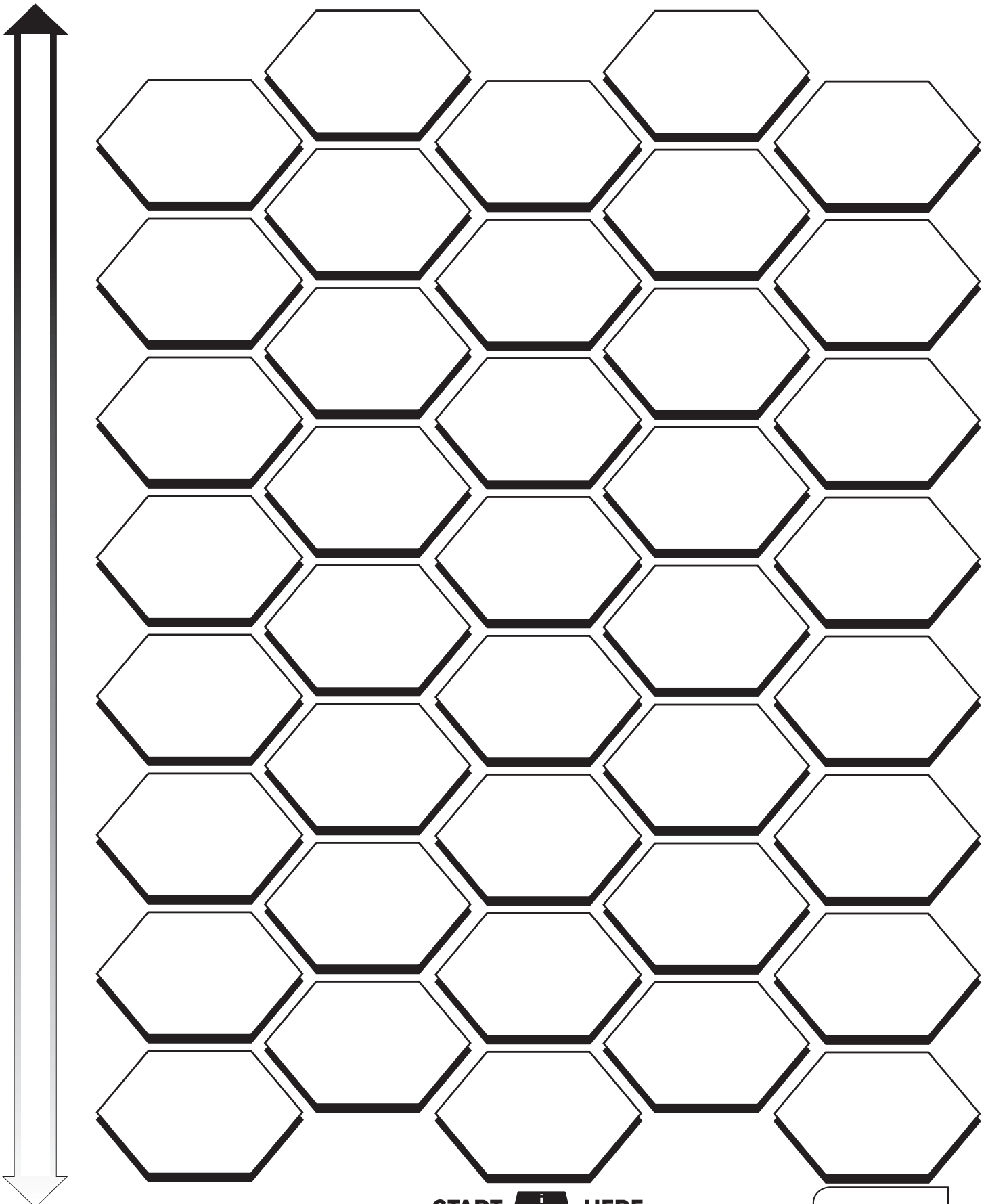
NOTES

Ideas, Dreams, Plans

Learning never exhausts the mind.
—Leonardo da Vinci

Title: _____

• Skill Tree: Set Your Own Goals •



Name: _____

1 tile = 1 point

Total Score

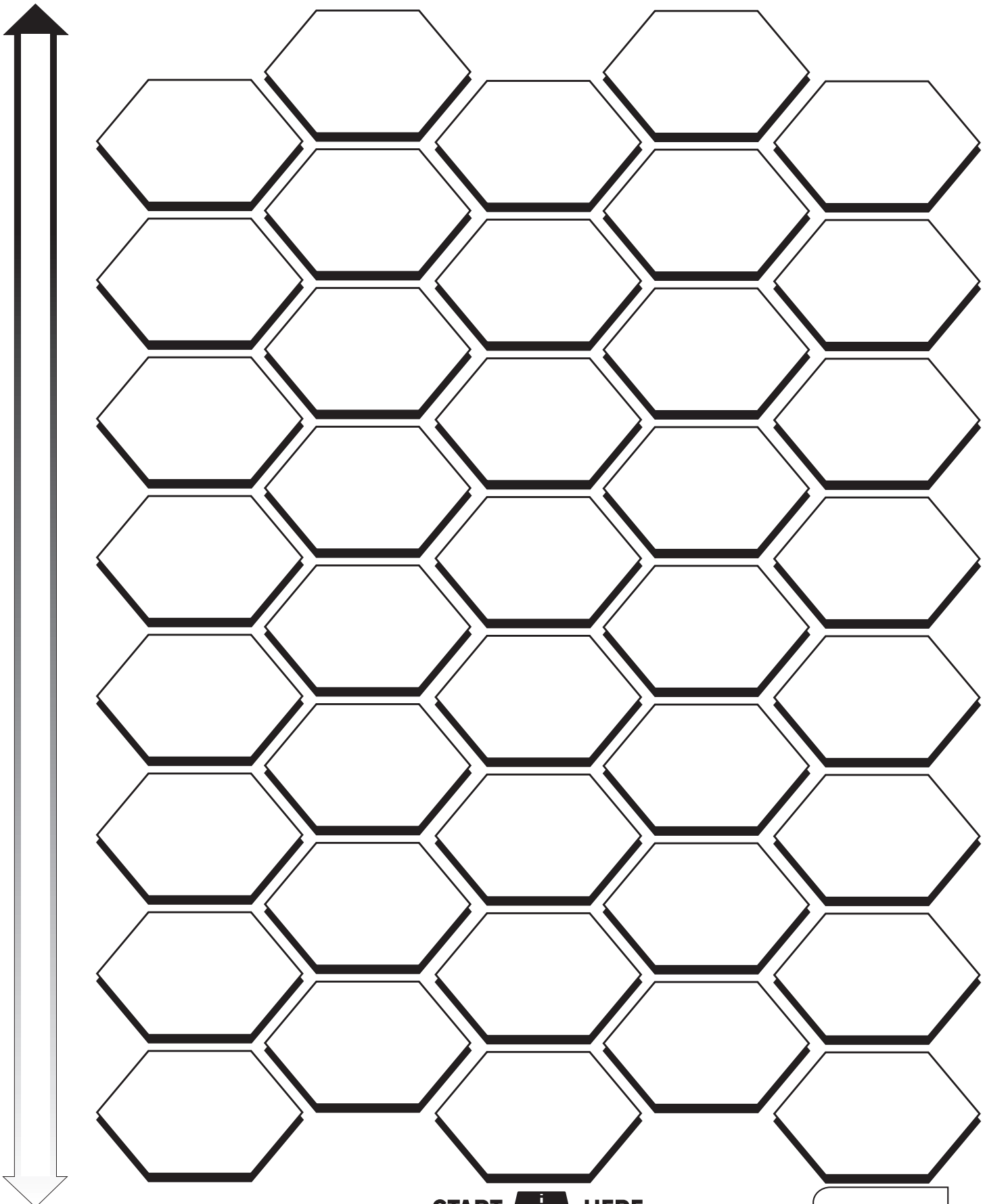
NOTES

Ideas, Dreams, Plans

Almost everything will work again if you unplug it for a few minutes, including you.
—Anne Lamott

Title: _____

• Skill Tree: Set Your Own Goals •



Name: _____

1 tile = 1 point

Total Score

GLOSSARY

• Explained in Simple Terms •

ABS: Acrylonitrile butadiene styrene, a tough and durable plastic material often used in 3D printing and injection molding.

API: Application programming interface, a type of software interface that allows two applications to talk to each other. For example, connecting to the API on a weather website allows you to display the temperature on your website.

AR: Augmented reality, an interactive combination of the physical and digital worlds. View a camera feed of your environment around you with superimposed digital elements, where the table in front of you might now contain a digital game of chess.

Arduino: An open-source platform including software and hardware to build inventions with electronics. The hardware is a microcontroller that can be programmed with the Arduino software.

ASA: Acrylonitrile styrene acrylate, a plastic material developed for 3D printing as an alternative to ABS with improved weather resistance.

Bitwise Operators: A way to calculate with binary that can be completed much faster or with less power than standard addition, subtraction, multiplication, and division.

BLE: Bluetooth Low Energy, a wireless technology designed to use less power and last for months or years on battery power.

Breadboard: An electronics part that can be used to connect wires without soldering, allowing fast prototyping of circuits.

Bubble-Sort Algorithm: In computer programming, swapping adjacent elements until they are in the correct order.

CAD: Computer-aided design, computer software that can be used to create 3D models for 3D printing, CNC machining, and much more.

CAM: Computer-aided manufacturing, using software that can control a CNC machine.

CLI/Command Line: Command-line interface, a text-based way of interacting with a computer and executing commands.

CNC: Computer numerical control, a machine that can cut into a block of material with a tool to mill a part out of wood, metal, or other materials and can be programmed, similar to a 3D printer, to cut a part automatically.

Cosplay: Wearing a costume of a character from pop culture that is often made to be worn to events like Comic-Con.

CTF: Capture the Flag, a computer-security game where a "flag," or string of text, is hidden in a vulnerable website or device that can be hacked to be found.

Debugger: A computer software that can detect errors, suggest corrections, and test software when it's being created.

Design Pattern: A common solution to a common problem to eliminate the need to reinvent the wheel when designing software.

Dev: Developer, someone who is creating new products or writing new code.

Dev Boards: Electronics boards that can be used for projects and prototyping, including Arduino, Raspberry Pi, Orange Pi, ESP, and many more.

Digital Fabrication: Using a computer to control a machine for precise making, including 3D printers, CNC machines, vinyl cutters, and laser cutters.

Digital Nomad: Someone who travels the world while working, often on an online business that can be run on a laptop while working within coworking spaces.

DLC: Downloadable content, extra content that can be used with a base video game.

ESP: A series of microcontrollers famous for Wi-Fi and Bluetooth capability, made by Espressif Systems. (The term is not an acronym but an abbreviation for the company name.)

FDM: Fusion deposition modeling, the standard kind of desktop 3D printer that melts plastic filament and deposits layers to build up a final object.

Floating Point: In computer programming, floating-point numbers are decimal numbers that can be represented with a great deal of precision with fast processing times.

FPGA: Field-programmable gate array, a configurable circuit that can be programmed to create custom CPUs, GPUs, and other custom logic used for prototyping specialized electronics.

Gatekeeping: Controlling access to something, such as knowledge, skills, resources, power, and opportunities, and deciding who is worthy of receiving them. This may be an expert refusing to disclose information or teach others in order to keep the skill exclusive.

G-code: The programming language used to control digital fabrication machines such as 3D printers and CNC machines. It consists of M commands and X,Y, and Z coordinates to control the position of the tool head.

GIT: A version-control system that can track changes in software and projects that are made collaboratively in teams.

Graph Data Structure: A way of structuring data into interconnected nodes to make it easier to find patterns in complex relationships and often used in social networks and recommendation systems.

Hackathon: A competition where participants form teams to solve problems, generally over a weekend in a short space of time, to gain experience and win prizes.

HTML: Hypertext Markup Language, the standard coding language for displaying text in the web browser.

Impostor Syndrome: Experiencing doubt and negative self-talk even though you may be excelling in your area. You may feel like you'll be found out or exposed as a fraud, as you feel like you are not as competent as you portray yourself to be.

IMU: Inertial measurement unit, a sensor that can measure the specific force, angle, and orientation of an object using a combinator of accelerometers, gyroscopes, and sometimes magnetometers.

IoT: Internet of Things, devices that are often wirelessly connected with sensors and software to allow smart-home and smart-city functionality—for example, turning a heater on automatically when a smartphone GPS detects that you're on your way home.

Laser Cutter: A computerized machine that uses a laser to cut materials such as acrylic sheets, timber, cardboard, and much more.

LaTeX: Software for creating documents in a simple coding language, often used by academics for theses or scientific papers.

Learned Helplessness: When you repeatedly face a negative situation beyond your control and stop trying to change your circumstances, even when you have the ability to do so—for example, failing exams repeatedly after studying, repeatedly taking up smoking after trying to quit, or no longer trying after being told that you are too young, too old, or do not belong in tech or the kitchen.

LED: Light-emitting diode, an electronics part that can emit light.

LiDAR: Light detection and ranging, a sensing system that determines its surroundings by measuring the time it takes for a laser light to reflect and return to the receiver.

Linter: Software that can help you improve your code by checking syntax, cleaning the code style and structure, and suggesting potential security problems.

LoRaWAN: Low-power, wide-area networking, a wireless technology that allows communication in small packets over long distances.

Makerspace: A community space for hands-on making, often with digital fabrication equipment.

Markdown: A simple coding language used for making formatted text on the web.

MIDI: Musical Instrument Digital Interface, a computer protocol used for musical instruments and projects.

MOSFET: Metal-oxide semiconductor field-effect transistor, an electronics part that can be used like an electronics switch to control the flow of electricity.

Multimeter: A device that can be used to measure voltage, resistance, current, and more by connecting probes to a circuit. This can help with troubleshooting electronics projects.

Object-Oriented Code: A type of computer programming that organizes software around data or objects rather than functions and logic.

Open Source: A software, project or hardware created in an open way to allow collaboration by a community to improve the project.

OS: Operating system, the program used to control a computer, managing all the hardware and software.

OSHWA: The Open Source Hardware Association, which allows creators to indicate that their products meet the standard for open source compliance.

PCB: Printed circuit board, a board with built-in wires to run electronics.

PETG: Polyethylene terephthalate glycol, a strong and durable plastic material used in 3D printing.

PID Controller: Proportional-integrational-derivative controller, a control-loop programmed code that is designed to react based on sensor readings. If the device is too hot, a PID controller can adjust fan speed to keep it at a precise temperature.

PLA: Polylactic acid, a cornstarch-based plastic material that is popular for ease of use in 3D printing.

Perfectionism: Holding yourself to unreasonably high standards, expecting flawless performance as the norm despite it being excessive for what is required.

POSIX: The Portable Operating System Interface, a family of standards specified by the IEEE Computer Society for maintaining compatibility between computer systems.

PPE: Personal protective equipment, safety gear that can be worn, such as safety goggles, gloves, and more.

PVA: Polyvinyl alcohol, a plastic material and water-soluble glue used in 3D printing as dissolvable support material.

PVE: Player versus environment, in the context of video games, when the player is competing against computer-generated challenges rather than other players.

PVP: Player versus player, in the context of video games, when the player is competing against other players rather than computer-generated challenges.

Race Conditions: A problem that occurs in programming where two processes run at the same time and attempt to access the same resource, which can have unintended results.

Raspberry Pi: A single-board computer that can be used for creating electronics projects that require more "thinking power" than the Arduino can provide.

Recursion: A type of programming that divides a problem into smaller, simpler problems until it's manageable to solve.

RFID: Radio-frequency identification, a tag using electromagnetic fields to track and identify objects and people—for example in ID cards and library books.

RGB LEDs: red-green-blue light-emitting diodes, electronics components that can emit the spectrum of colors, often able to be programmed to control the light.

SBC: Single board computer—for example Raspberry Pi, Orange Pi, and others.

Set: In programming, sets are used to store multiple items in a single variable—for example: myset = {"fruit", "bread", "pasta"}. A set may have a different name in different programming languages.

Shortcut: A logical shortcut (also called a short circuit) is a coding-convention operator that can optimize a program. If three things must be true to proceed, you do not need to check conditions 2 and 3 if condition 1 is already known to be false.

Slicing Software: Computer software that can convert a 3D model to G-code to run on a 3D printer.

Soldering Iron: A hand tool for soldering, where the metal end heats up to over 300 degrees Celsius to melt solder. It's used to connect electronics components to a circuit board, providing an electrical connection between the parts with the melted and solidified conductive solder metal.

SVG: Scalable vector graphics, a vector file made up of lines. SVG files can be used to create images that can scale to any size without any quality loss.

Tall Poppy Syndrome: Receiving unwarranted criticism when experiencing success—when the tall poppies are cut down. This may include others downplaying your success or taking credit, or your being left out or ignored.

TCP/IP: Transmission Control Protocol/Internet Protocol, a suite of communication protocols used to let network devices communicate on the internet or an intranet or extranet.

TinyML: Tiny machine learning, a machine learning model that can run on smaller, less powerful devices.

Tree Data Structure: A data structure that consists of a central node, structural nodes, and subnodes, with the result map resembling tree roots, branches, and leaves. This makes it easier to navigate and search data.

UART: A universal asynchronous receiver-transmitter, part of an integrated circuit that can be used to communicate with another device through serial transmission.

UDP: User Datagram Protocol, a connectionless communication protocol for transporting packets between networks.

Visible Repair: Using embroidery, knitting, crochet, or other crafting techniques to repair something with a decorative feature rather than trying to hide the repair.

VR: Virtual reality, an immersive experience viewed through VR goggles to simulate a world around you digitally.

XP: Experience points, used in the context of video games, are points that you can earn to level up your character after completing quests, exploring new areas, and playing the game.

PASSPORT

Remember the Spaces and Events

Get a stamp, drawing, or mark in the boxes below to commemorate the makerspaces, camps, and events you've visited and people you've met. Consider making your own custom stamp, sticker, or drawing with a picture and a social media handle!

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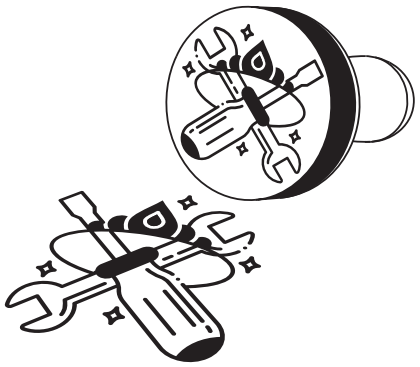

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PASSPORT

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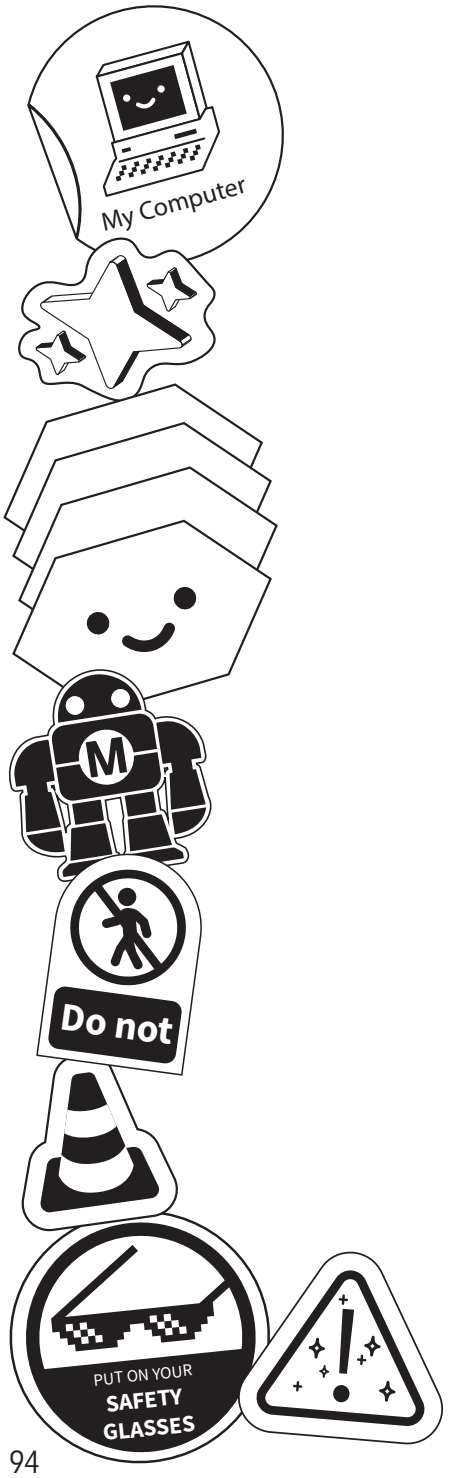
STICKER SHOWCASE

Keep Favorite Stickers on Display



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May your *Skill Seeker* journey be just the beginning of many great things to come.

—Steph

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Use the hashtags **#skilltrees** and **#skillseeker** online to tag resources and posts

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About the Author.txt X

Steph Piper is a creative technologist based in Queensland, Australia. She's passionate about makerspaces, edutech, and learning new things. She loves to make PCB art and makes beautiful electronics kits under the brand name Maker Queen. Most of all, she's interested in exploring ways to make learning new things easy and fun.

For more info, visit **makerqueen.com.au**

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github.com/sjpiper145/MakerSkillTree