



CODE MASTER™

INSTRUCTION MANUAL

Ignite Your Mind!®

AGES
8 to adult
single player

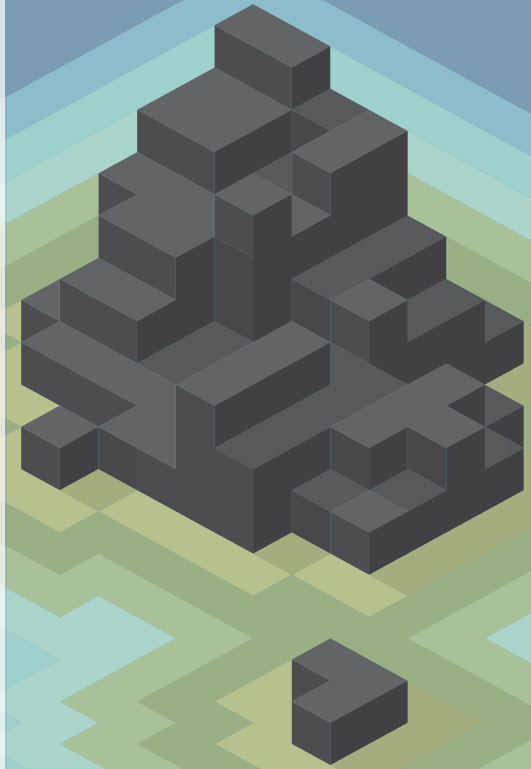
Welcome, Code Masters!

In Code Master, your Avatar will travel to an exotic world in search of Power Crystals. To collect the Crystals your Avatar needs your help.


You'll be given maps showing: 1) where your Avatar will start, 2) the Crystal locations, and 3) the location of the Portal to the next level. Using a Guide Scroll and a specified number of Action Tokens, you'll write a program that powers your Avatar across the map to reach the Portal with all the Crystals in hand.

Only then can your Avatar transport to the next level and harvest the next batch of Crystals.


Visit **[ThinkFun.com/CodeMaster](https://www.thinkfun.com/code-master)** for more resources.




Includes:



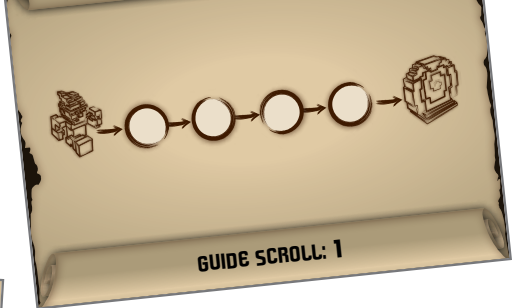
Avatar



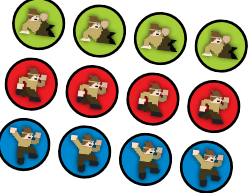
6 Crystals




Portal



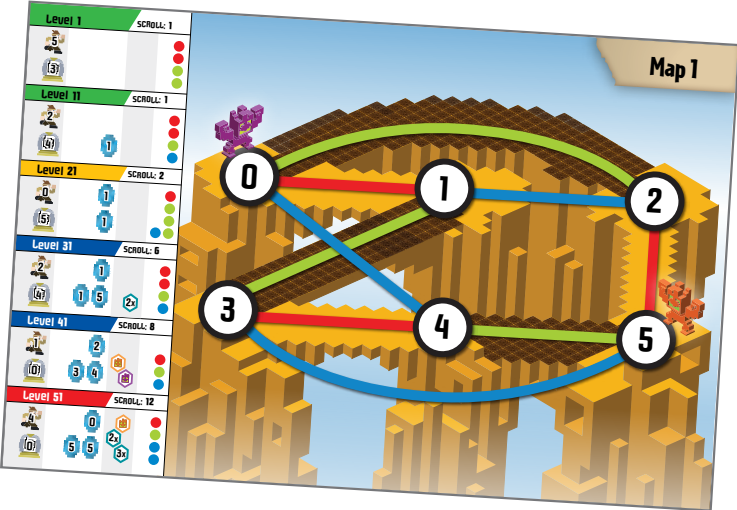
12 Guide Scrolls



12 Action Tokens



8 Conditional Tokens



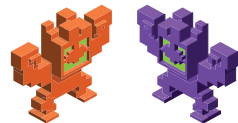
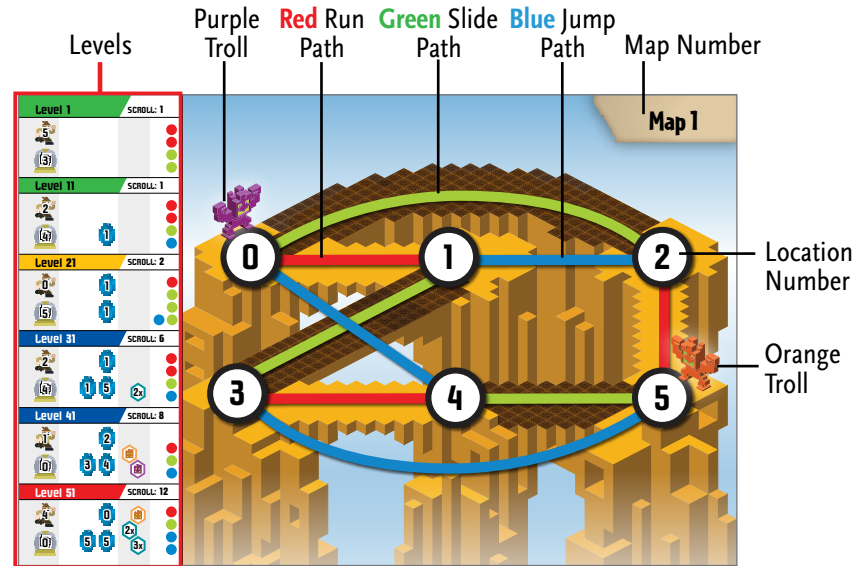
10 Maps (with 60 levels)

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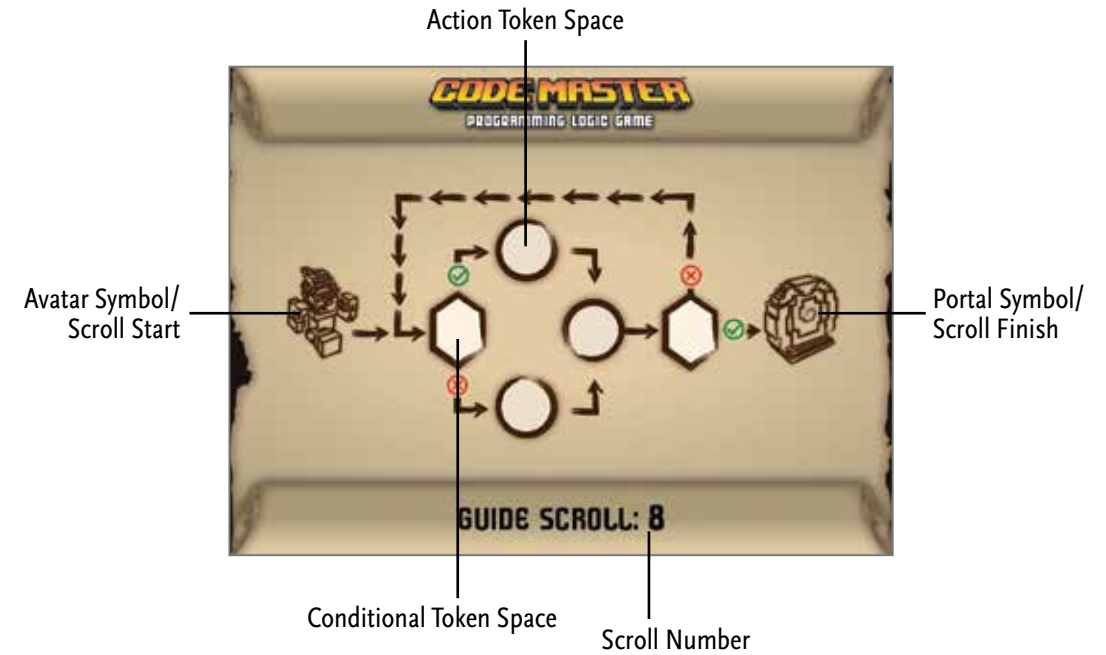
Map Key

Level Difficulty	
█	Beginner
█	Intermediate
█	Advanced
█	Expert



Trolls are used as landmarks on the Maps. Not every Map has both Orange & Purple Trolls, and not every level uses them.

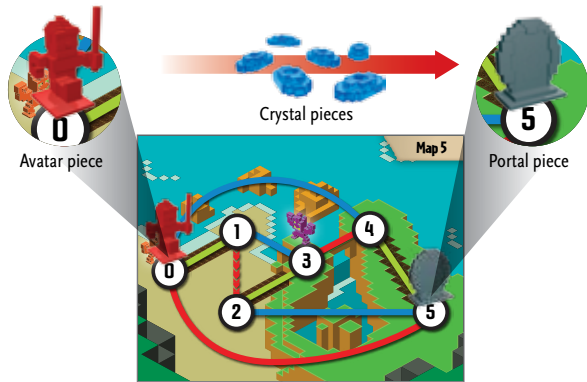
Guide Scroll Key



How to Play

Your Goal

On each level, program your Avatar to collect all the Crystals and land at the Portal. In levels where there are no Crystals, your Avatar just needs to get to the Portal.



Select a Level

Levels are printed on the left side of your Maps. You'll find that each Map contains six levels. It's important to play through the levels in order; you'll have to flip through the Maps, one by one, to do so.

Set Up a Level

To begin playing, gather your tokens and set up your Map. Each level tells you exactly which Guide Scroll to use, which tokens to use and how to prepare the Map. Use the example below to guide you in setup:

Figure 1: Level

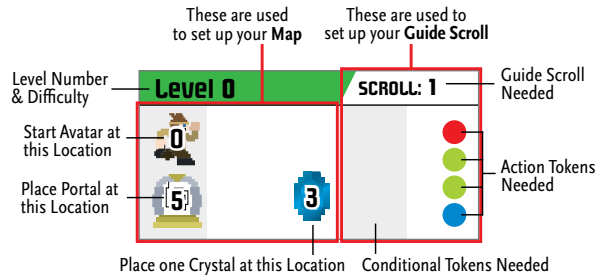


Figure 2: Map is set



Write Your Program

To write your program, place the colored Action Tokens onto the indicated Guide Scroll. The Guide Scroll acts as a program controller that will guide your Avatar across the colored paths of the Map to pick up the Crystals and land at the Portal.

Here are some things to consider as you write your program:

1. You must fill all the spaces on the Guide Scroll. The Level Setup gives you the specific Action Tokens to use; your job is to figure out how to place them on the Guide Scroll.



Figure 3: Guide Scroll & Action Tokens



- The color of each token tells your Avatar which colored path to follow on the map.
- When your Avatar lands on a location with a Crystal, he automatically collects it. Remove it from the Map and place it on the Avatar's staff.
- In some levels, your Avatar will land on a location that contains more than one Crystal. However, he can only collect one Crystal at a time. To collect the remaining Crystal(s), you'll need to plan a path that causes him to leave and come back, revisiting that location as many times as needed to collect all the Crystals.
- If the level has no Crystals, your goal is simply to get your Avatar to finish at the Portal.
- Your Avatar must run through the full program. If he reaches the Portal before you get to the Portal symbol on the Guide Scroll, you must continue the program by moving him according to the remaining Action Token(s).

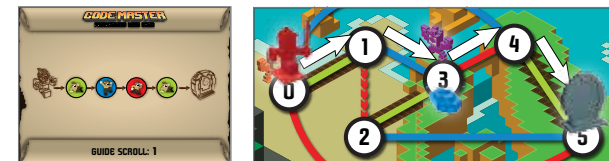
Run Your Program

Once you have filled your Guide Scroll and are confident that you have a successful program, try running it to see how it works.

To run your program follow these steps:

- Make sure that your Map is set up correctly with the Avatar, Portal and Crystals in the right place.
- Carry out all the steps on your Guide Scroll beginning at the Avatar symbol and following the direction of the arrows until you end at the Portal symbol. Move your Avatar along the Map's colored paths based on the Action Token sequence you've laid out on the Guide Scroll. It can be helpful to use a pointer, to point at each Action Token and hold your place while you execute the actions and move your Avatar on the Map.
- Try running your program with a partner. One person calls out the instructions, while the other moves your Avatar on the map and picks up the Crystals.
- If your Avatar reaches the Portal on the Map, has collected all the Crystals, AND you are at the Portal symbol on your Guide Scroll, YOU WIN!! Now you can turn to the next map and move on to the next level.

Figure 4: Guide Scroll solution with Map



Debug Your Program

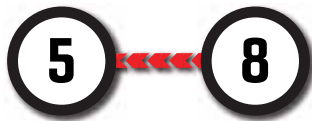
Sometimes you may think that a program is going to work, but when you run it, something goes wrong. That's okay, just reset the Avatar and Crystals to their initial locations and try again with a different program. Which tokens are you sure about, and which ones can be swapped? Check the Map for other possible pathways.

You know your program is broken and needs to be debugged if:

- Your next action token says to follow a certain colored path, but there are no paths of that color coming from the location where the Avatar is.
- You reach the end of your program and your Avatar isn't at the Portal.
- You reach the end of your program and your Avatar is at the Portal, but there are still Crystals on the map.

Special Paths

One Way paths indicate that your Avatar can only move in the same direction the arrows are pointing.



Loop paths bring your Avatar right back to his current location.



Action Tokens Defined



Run Tokens

These tokens allow your Avatar to **run** between two locations that are connected by a **red** path on the Map.



Slide Tokens

These tokens allow your Avatar to **slide** between two locations that are connected by a **green** path on the Map.



Jump Tokens

These tokens allow your Avatar to **jump** between two locations that are connected by a **blue** path on the Map.

Ready to Play!

Right now, you do not need to read on. Go play the beginner levels and come back to read about Conditional Tokens once you reach the upper levels.

Upper Level Challenges

Conditional Tokens

Once you get to the intermediate levels, you'll notice that some of the Guide Scrolls have hexagon-shaped spaces. These are for Conditional Tokens.

Conditional Tokens depict a yes-no question that will determine which instruction to execute next on the Guide Scroll.

If you answer "No" to a question, follow the arrows leading from the **red X**. If you answer "Yes", follow the arrows leading from the **green ✓**.

Figure 5: Conditional Tokens



Conditional Tokens Defined



Crystals Collected Tokens

These tokens ask how many Crystals you have collected on your current level. If you have the exact number (in this case, 2), follow the Guide Scroll arrow with the **green ✓**. If not, follow the arrow with the **red X**.



Orange Troll Token

This token asks if there is an Orange Troll on the current Location your Avatar is on. If there is, follow the Guide Scroll arrow with the **green ✓**. If not, follow the arrow with the **red X**.



Purple Troll Token

This token asks if there is a Purple Troll on the current Location your Avatar is on. If there is, follow the Guide Scroll arrow with the **green ✓**. If not, follow the arrow with the **red X**.

Writing a program with Conditional Tokens

Just as before, all the spaces on the Guide Scroll must be filled. When placing a Conditional Token note that:

1. If the level has only one Conditional Token (and, therefore, one hexagonal space) you know where to place that token.
2. If there is more than one Conditional Token your job is a little trickier; you must decide which Conditional Token goes on which hexagon-shaped space.

Message for Parents & Educators

The idea that all kids should learn coding skills is one of today's fastest growing educational movements. Code Master is a fun, hands-on way to develop computational thinking abilities and to build the mental skills necessary to understand the concept of coding.

Research suggests that one primary skill required to be a successful programmer is the ability to emulate the step-by-step execution of a sequence of instructions in your mind's eye and visualize how the instructions will play out. With Code Master, players learn to do exactly that.

Much of the educational power of the game comes from the Guide Scroll – really a heavy-duty flowchart – and the variety of layouts which introduce fundamental programming control constructs like “while” loops (e.g. Scroll 7) and “if-then-else” conditional branching (e.g. Scroll 8). Code Master's rules of program execution mimic the way real computers execute programs, stepping through a procedure contained in the computer's memory, where some instructions are “actions” and others are conditional tests that determine where the instruction pointer should jump to next. Running Code Master programs by hand, players will build a powerful mental model of how computers operate.



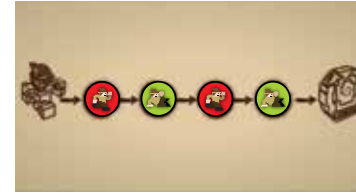
Mark Engelberg

About the Inventor

Mark Engelberg is the inventor of ThinkFun's award-winning Chocolate Fix® as well as one of the challenge developers for ThinkFun's blockbuster game Rush Hour®. To create Code Master™, he drew on his experience as a programmer of virtual reality simulations for NASA, as well as his many years of experience as a teacher of computer science and mathematical logic. Mark believes that kids of all ages can and should learn how a computer executes programs – entirely through play!

Solutions

Level 1 - Guide Scroll 1



5 2 0 1 3

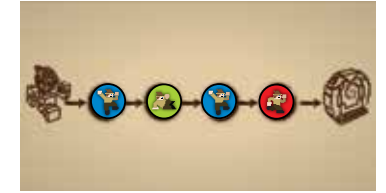
These are the Locations, in order, your Avatar will follow and any Crystals you will pick-up along the way.

Level 2 - Guide Scroll 1



3 2 0 1 5

Level 3 - Guide Scroll 1



4 5 2 1 0

Level 4 - Guide Scroll 2



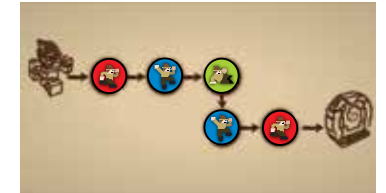
1 2 3 4 4 5

Level 5 - Guide Scroll 1



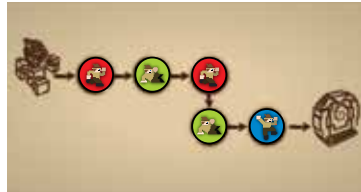
2 3 1 2 5

Level 6 - Guide Scroll 2



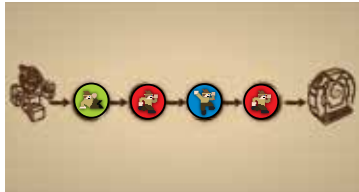
5 3 1 4 2 0

Level 7 - Guide Scroll 2



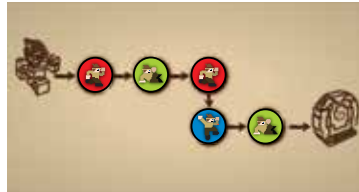
0 3 2 5 7 8

Level 8 - Guide Scroll 1



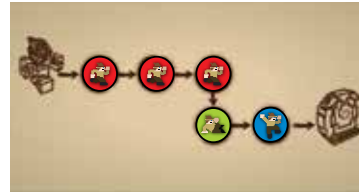
7 2 3 1 4

Level 9 - Guide Scroll 2



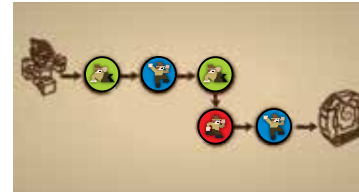
9 0 6 7 8 4

Level 13 - Guide Scroll 2



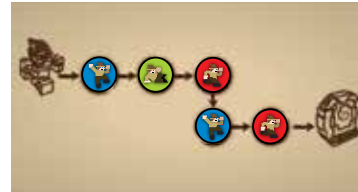
5 4 5 4 3 0

Level 14 - Guide Scroll 2



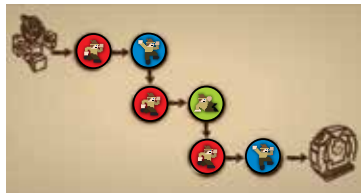
0 1 2 5 4 4

Level 15 - Guide Scroll 2



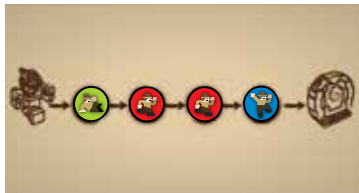
4 0 1 2 5 5 0

Level 10 - Guide Scroll 3



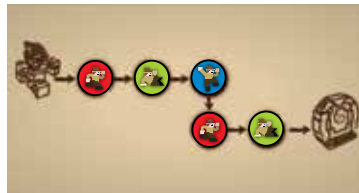
2 2 3 4 11 10 6

Level 11 - Guide Scroll 1



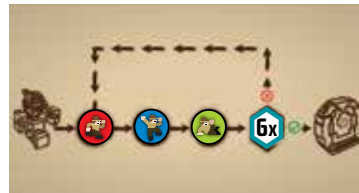
2 0 1 0 4

Level 12 - Guide Scroll 2



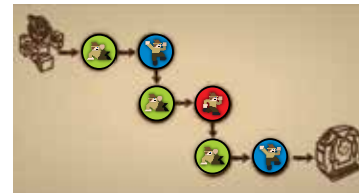
5 1 2 3 4 0

Level 16 - Guide Scroll 4



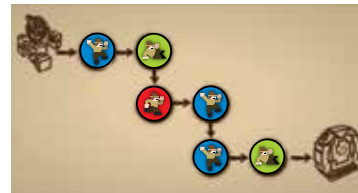
1 2 4 3 4 3 4 3

Level 17 - Guide Scroll 3



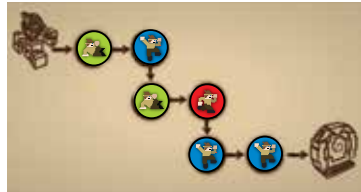
3 2 0 1 4 4 6 5

Level 18 - Guide Scroll 3



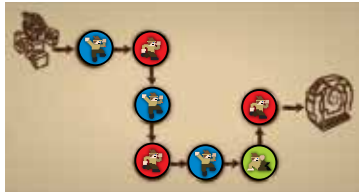
9 10 6 7 11 7 7 2

Level 19 - Guide Scroll 3



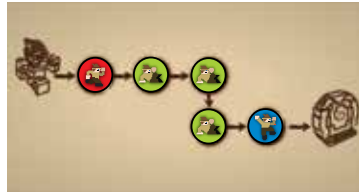
2 0 1 3 4
7 8

Level 20 - Guide Scroll 5



6 10 11 4 3 2
1 0

Level 21 - Guide Scroll 2



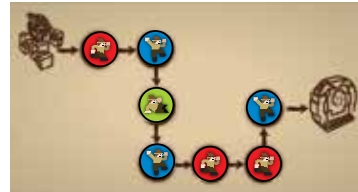
0 1 3 1 3 5

Level 25 - Guide Scroll 4



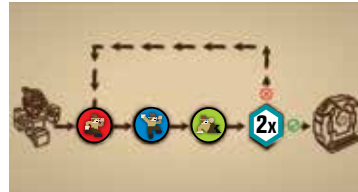
5 4 3 1 0 5 2 3
4 0

Level 26 - Guide Scroll 5



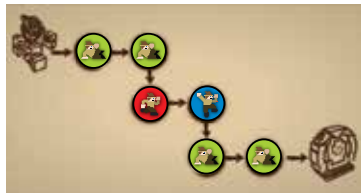
0 1 3 2 4
5 3 1

Level 27 - Guide Scroll 4



0 3 4 6 8 7 5
2 0 1

Level 22 - Guide Scroll 3



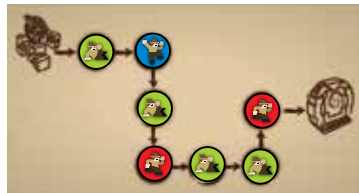
5 3 5 1 0 4
0

Level 23 - Guide Scroll 4



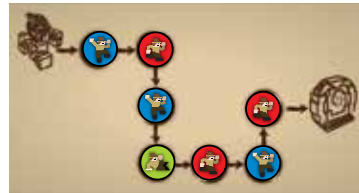
2 1 0 1 2 3
4

Level 24 - Guide Scroll 5



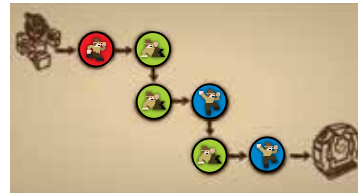
0 1 2 5 4
3 4 5

Level 28 - Guide Scroll 5



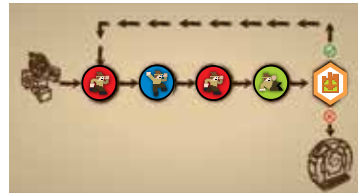
9 10 11 7 2 3
1 4

Level 29 - Guide Scroll 3



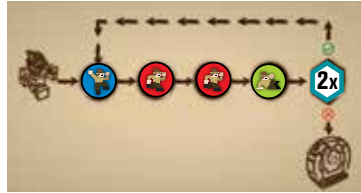
5 2 0 6 9
5 8

Level 30 - Guide Scroll 6



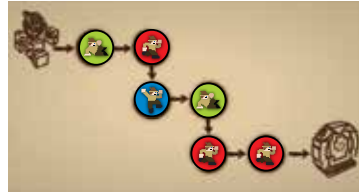
6 5 1 0 7 8 9 9
10 11 4 3 6

Level 31 - Guide Scroll 6



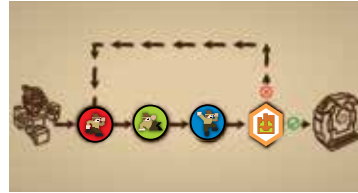
2 1 0 1 3 5
2 5 4

Level 32 - Guide Scroll 3



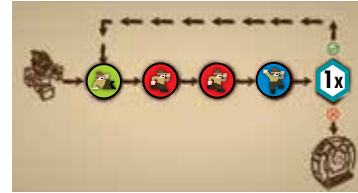
4 0 2 3 5 1
5

Level 33 - Guide Scroll 4



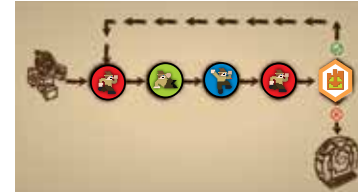
1 0 1 2 3 4 5
4 3 0 1 0 3
2 5 4

Level 37 - Guide Scroll 6



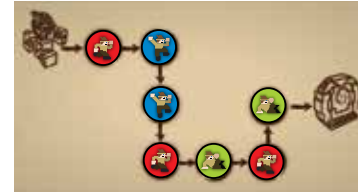
1 0 3 0 2 3 0
3 4 6 8 6 5

Level 38 - Guide Scroll 6



8 9 5 4 9 8 4 5
3 2 1 3 2

Level 39 - Guide Scroll 5



3 4 7 8 9 5
2 0

Level 34 - Guide Scroll 7



3 5 2 1 0 1 2
3 4 4

Level 35 - Guide Scroll 8



4 5 0 1 2 5
0

Level 36 - Guide Scroll 7



2 4 3 2 1 4 3
2 0 1

Level 40 - Guide Scroll 9



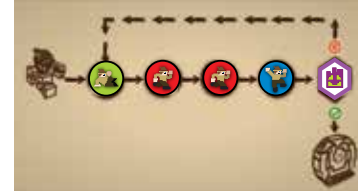
8 9 10 6 5 1 2
3 4 11 10 6

Level 41 - Guide Scroll 8



1 2 5 4 3
5 2 1 0

Level 42 - Guide Scroll 10



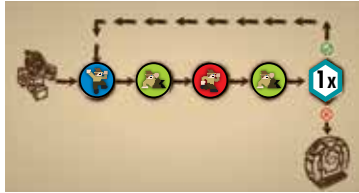
0 4 3 4 5
3 4 3 2

Level 43 - Guide Scroll 8



5 4 5 2 1
0 3

Level 44 - Guide Scroll 6



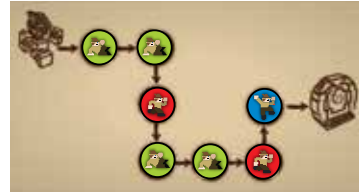
2 1 0 1 0 0 1
0 1 2 5 4 3

Level 45 - Guide Scroll 11



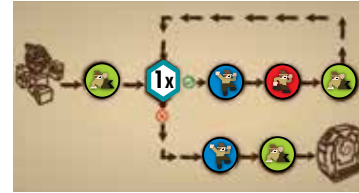
2 3 1 2 3 1
2 3 1 2 3 4 3

Level 49 - Guide Scroll 5



1 3 1 2 0 6
7 8

Level 50 - Guide Scroll 7



8 5 1 0 7 0 1
2 3 4 11 4
11

Level 51 - Guide Scroll 12



4 3 5 3 5 4
0

Level 46 - Guide Scroll 12



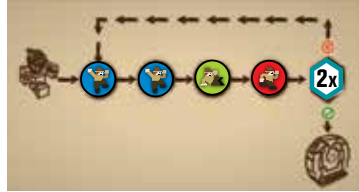
3 1 2 1 2 0
1 3 4

Level 47 - Guide Scroll 7



0 1 4 3 2 5 6
4 6 8

Level 48 - Guide Scroll 10



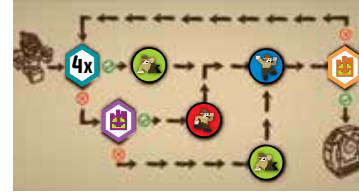
1 3 1 0 0 2 0 1
4 5 4 8 9 10 7 2
3 1 3 6 7 11
7 2 3

Level 52 - Guide Scroll 7



5 1 2 1 0
4 3

Level 53 - Guide Scroll 12



4 3 0 1 2 3
0 1 2 5 4

Level 54 - Guide Scroll 11



3 2 5 2 3 4
3 2 1 0

Level 55 - Guide Scroll 11



0 4 0 5 2 3
 4 0 1 2 5 4 3
 1 0 5

Level 56 - Guide Scroll 9



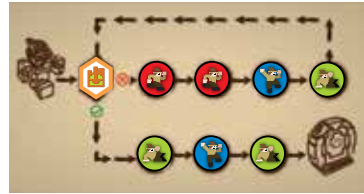
4	5	3	blue	1	blue	2	blue
0	1	blue	3	blue	4	3	2
blue	1						

Level 57 - Guide Scroll 11



0 1 4 3 2
5 6 4 3 4 6
8 7 5 2 0

Level 58 - Guide Scroll 9

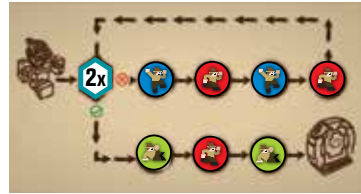


Level 59 - Guide Scroll 11



0 1 2 3 4 5 6 7 8 9

Level 60 - Guide Scroll 9



8	9		9	8	7	0	1
5	6	10	11	4	3	2	
2	3	4	11	10	9		

ThinkFun's Mission is to Ignite Your Mind!®

ThinkFun® is the world's leader in addictively fun games that stretch and sharpen your mind. From lighting up young minds to creating fun for the whole family, ThinkFun's innovative games and mobile apps make you think while they make you smile.



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