

CODING FOR YOUNGSTERS

A Coding Guide for kids and teens



**Global Information Security Society
for Professionals of Pakistan**



At forty, I was too old to work as a programmer myself anymore; writing code is a young person's job.” — Michael Crichton, Prey



PREFACE

Our Kids are our future and it really hurts to see when we see them wasting time in playing video games or watching YouTube videos. In most cases, it happens because we as parents do not have enough time to spend with our children. In some cases, we believe that if kids play video games, they will learn something out of it. That might be true for some games but most of the games out there are created for an 18 plus audience and are full of violence, bloodshed and foul language. By compiling this guide, we believe that we are playing our part in order to guide our younger generation in a more symmetric way. CODING FOR YOUNGSTERS is an attempt to play a little part in the intellectual growth of our young ones. The contributors mentioned below have compiled the data and added information from personal experience in order to add value to the document. The document is classified as '**Public**' and should be shared among Pakistani kids and teen agers; whereas the reproduction of this guide with any other name or any part of the content is strictly '**PROHIBITED**'.

For any feedback and comments, Kindly share via feedback@gispp.org

SHAHZAD SUBHANI



ABOUT GISPP

GISPP (Global Information Security Society for Professionals of Pakistan) is a small but conscientious group of Pakistani Professionals working worldwide and endeavor to be a leading cyber security platform to make Pakistan and rest of the world a safe cyber space and continue earning distinctive reputation for Pakistani Cyber Security Professionals worldwide.

GISPP is an initiative of Mr. Shahzad Subhani along with a group of Pakistani Information Security professionals living and working in Saudi Arabia. Despite being a humble start, GISPP is now actively present on different social connectivity platforms including WhatsApp, Facebook, LinkedIn and on Telegram.

GISPP's Vision

To be a leading cyber security platform to make Pakistan and rest of the world a safe cyber space and continue earning distinctive reputation for Pakistani Cyber Security Professionals worldwide.

GISPP's Objectives

- Develop a culture of knowledge sharing and seeking by engaging and educating INFOSEC aspirants.
- Provide diverse forum for exchange of views and experiences on Information Security.
- Initiate a wide range of educational programs related to Information Security.
- Promote expansion of Information Security Industry at all levels.
- Offer a professional networking, collaboration and knowledge sharing platform.
- Help GISPP members and member organizations in finding suitable jobs or skilled employees.
- Promote Open Source Technologies usage for Information Security, wherever possible.
- Promote the ethnic development in Information Security.
- Advise and influence policy makers for the best interest of community at large.
- Bridge the gap between local and international Initiatives and communities.

Connect with GISPP

If you are a Pakistani and working in Information security field anywhere in the world, you are welcome to join or like GISPP by following the links mentioned below.

LinkedIn: www.linkedin.com/groups/10314172

Facebook: www.facebook.com/groups/976571862396454/

Facebook Page : <https://www.facebook.com/gispp.org>

Website: <https://www.gispp.org/>



ACKNOWLEDGEMENTS

We would like to express our gratitude to the contributors for this guide for giving their precious time and worked on this guide with interest.

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Introduction

Programming is very creative and interesting activity and it is believed to improve one's cognitive ability. If introduced to children at young age, this can significantly increase their skills and ability to understand and interpret new concepts and promote "out of the box thinking". Regardless of the career path children may choose later in their lives, ability to code, can play a vital role in their lives because it helps them push their brains to the limits that ordinary curriculum may not be able to. As Apple founder Steve Jobs is quoted



*Everyone should know how to program computers because it teaches
You how to think –Steve Jobs*

From the perspective of children in Pakistan, we believe it is even more important to provide them with options to make healthy use of their screen times every day, activities that do not make them "kill time" rather motivate them to make use of that time to develop themselves.

The idea behind this initiative is to encourage skill building in a fun and productive way and in longer run helping produce next generation of cyber professionals and entrepreneurs.



*Any fool can write code that a computer can understand. Good
programmers write code that humans can understand. – Martin Fowler*

Online Free Learning Resources

There are many free resources available online for the children of different ages, where they can learn to code from very early ages. This can be done supervised or even unsupervised, though it is always encouraged that it should be supervised. Some of the online resources are listed below:

1. Khan Academy Kids (Age 2 years – 6 years)

It has been recently launched and is good for kids who are not going to school yet and need to be familiarized with alphabets and numbers. This is not related to coding or programming; however, it has been included here in case you want your kid to use useful online resources. Parents need to create an account first using their email address and then can make a profile for their toddlers.



Figure 1 Khan Academy Kids

2. Blockly Games (Age 3 years – 7 years)

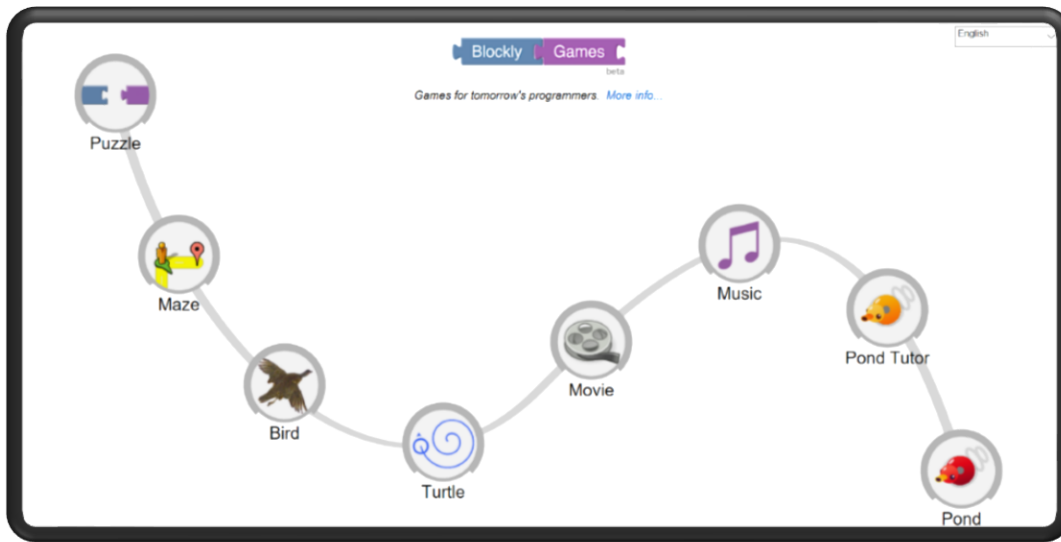


Figure 2 Blockly Games

Blockly Games is a series of educational games that teach programming. It is designed for children who have not had prior experience with computer programming. By the end of these games, players are ready to use conventional text-based languages.

3. ScratchJr. (Age 5 years – 7 years)

With ScratchJr, young children (ages 5-7) can program their own interactive stories and games. In the process, they learn to solve problems, design projects, and express themselves creatively on the on the computer. It is available as a Mobile App ([Android](#)/[ios](#)) and is highly recommended.



Figure 3 ScratchJr.

4. Khan Academy (Age 10 years – 15 years)

Khan Academy is for elder children as they have not gamified the platform, so younger children find it boring as soon they start hitting arrays. Khan Academy offers practice exercises, instructional videos, and a personalized learning dashboard that empower learners to study at their own pace in and outside of the classroom- the best thing about khan academy is that it will send parents a report how much time is used to work on any specific exercise. You must create parents account and then create your children's account

5. Code.org (Age 5 years – 17 years)

It is a very good website. you can visit to the website and then click on Start Learning to create your account. You should start by watching this motivational video.

<https://www.youtube.com/watch?v=nKlu9yen5nc>

6. Scratch (Age 10 years – 15 years)

Scratch is a free programming tool by MIT. A lot of schools in Europe use this and it is very good way to teach programming to young generation.

7. Coderdojo (Age 6 years onwards)

CoderDojo is a true global movement and phenomenon. Volunteers all around the world help young people build a positive future through coding and community. There is one CoderDojo Center available in Karachi which is offering services for free and can be reached at dojokarachi@gmail.com. We advise you to reach them out and see what they are offering.

Facebook : <https://www.facebook.com/CoderDojoKarachi>

8. KANO (Age 5 years -10 years)

This is a very good website and provide some free trainings for coding . It offers many paid options as well .

9. CodeCombat (Age 12 years onwards)

CodeCombat is a platform for students to learn computer science while playing through a real game. It has some free as well as some paid options.



Figure 4 Code Combat

10. Python (Age 12 years onwards)

Python is a general-purpose language, which means it can be used to build just about anything, which will be made easy with the right tools/libraries. Professionally, Python is great for backend web development, data analysis, artificial intelligence, and scientific computing. It might be difficult for a kid to learn it right away but if he starts with smaller assignments and keep moving up the ladder ,it can be helpful in the long run . You can find many free ebooks on Python using the above mentioned link.

11. Raspberrypi

Raspberrypi website can be used for building budget computers with raspberrypi. It may not be relevant to Pakistani market where cheap second-hand computers are available and can turn out to be cheaper than a basic raspberry pi project but in terms of learning, raspberry pi has some very interesting projects that go beyond just coding such as automating tasks with different hardware etc.)

12. Roblox (Age 14 years onwards)

This is little advanced that allows you to develop the game . you must Download and install Roblox Studio with the help of your father or elder brother .Please make sure to maintain your privacy while going online .

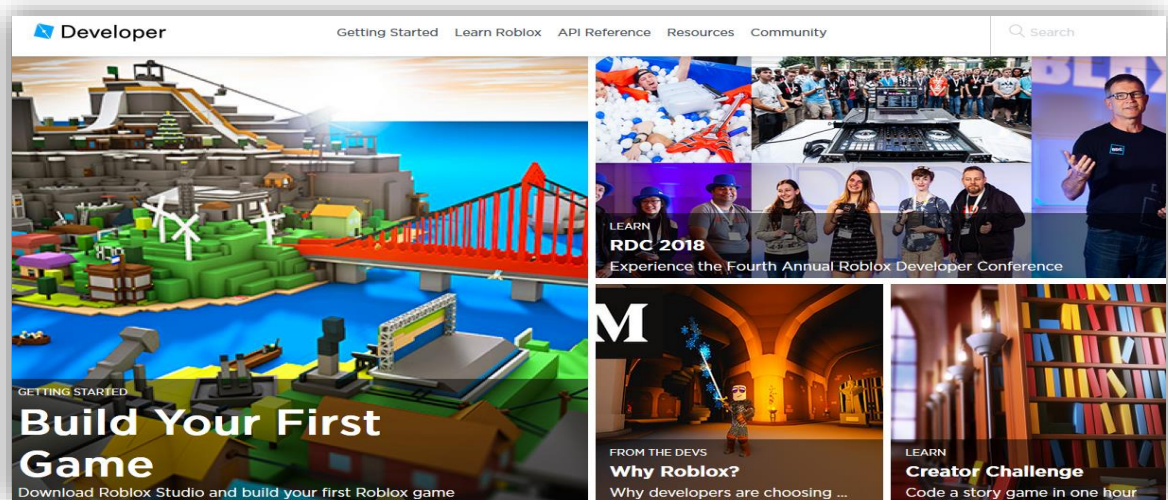


Figure 5 Roblox

Online Paid Resources

1. Minecraft (Age 5 years onwards)

Minecraft: Education Edition provides standards-aligned curriculum, training and coding in Minecraft. However, in order to use it ,one needs an Office 365 education account . You can check with your kids' school if they have registered for any such education program . More details can be found on this link below .

<https://education.minecraft.net/get-started/>

2. GAME Code (Age 14 years onwards)

If you want to learn programming while playing video game or test your code writing skills than This puzzle game is here for you . In Code World you control the robot that can walk around the world and send messages to devices. Every device reacts on those messages according to its Python code.



Figure 6 Code World



3. While True: learn() (Age 14 years onwards)

In this game ,you are a machine learning specialist who makes neural networks but your cat seems to be better at it. Now you must solve puzzles to build a cat-to-human translation system (who knows what else this cat is capable of!).

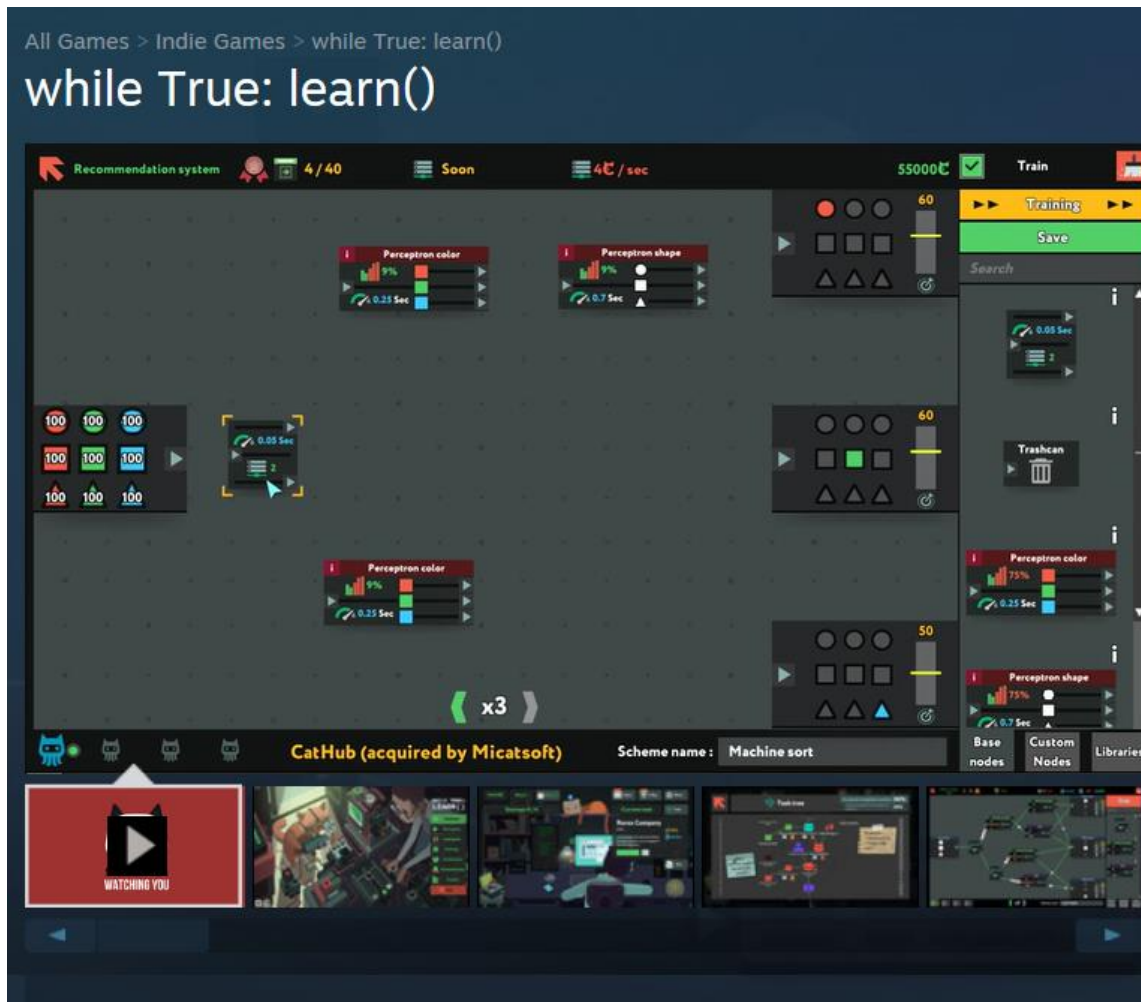


Figure 7 While True

4. Hacker Evolution Source Code (Age 14 years onwards)

If you ever wanted to see how the popular Hacker Evolution games were made? Here is your chance with this package which contains all 3 Hacker Evolution games and their source code.

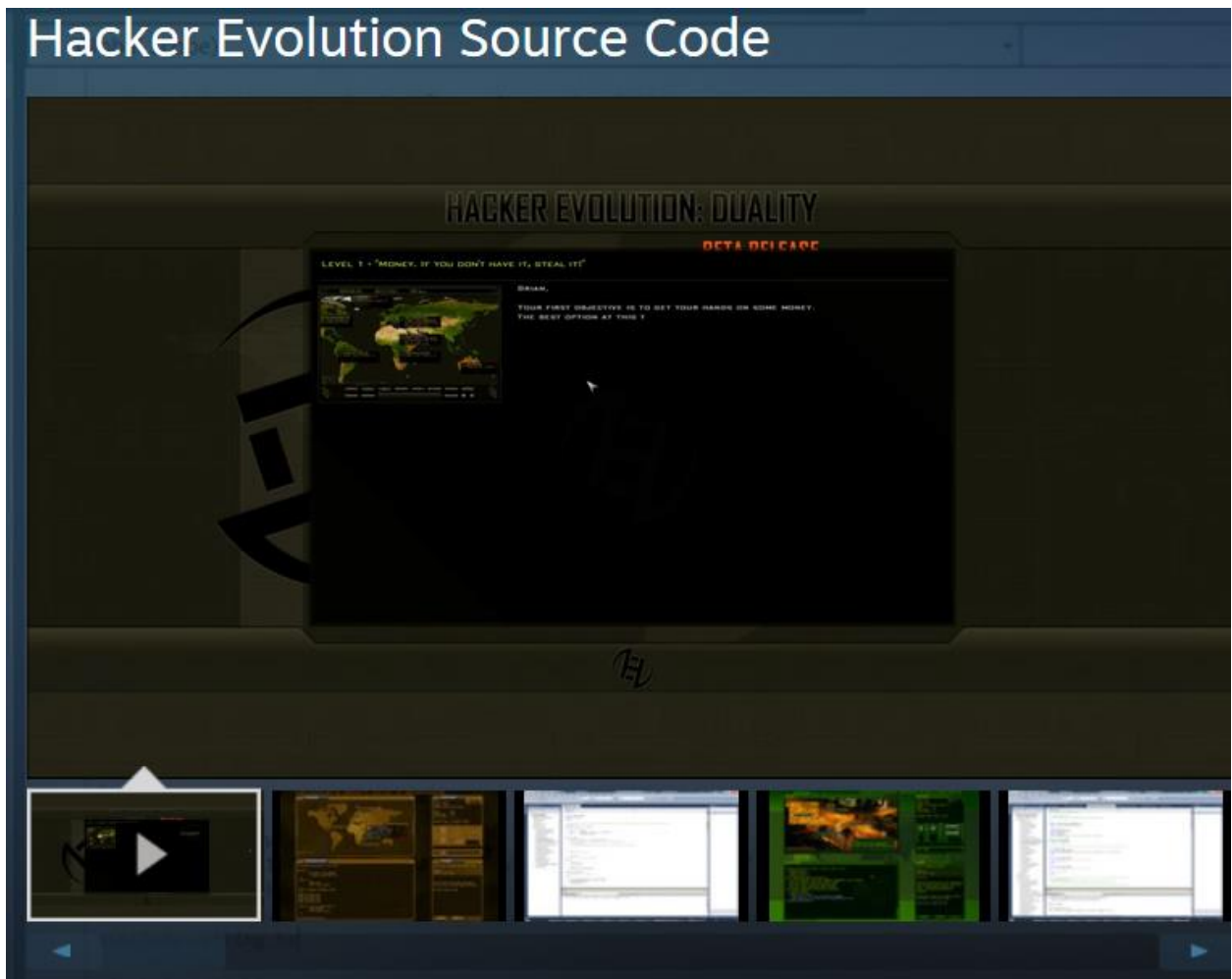


Figure 8 Hacker Evolution

Brain Training Games

There are few mobile apps which are paid but can be used free with some limitations . We strongly advise the following apps to be tried

1. Peak (Android / iOS)

Peak is a very good brain-training app available, with a collection of mini-games covering subjects including memory, language, mental agility and attention .There are more than 30 to play in total .

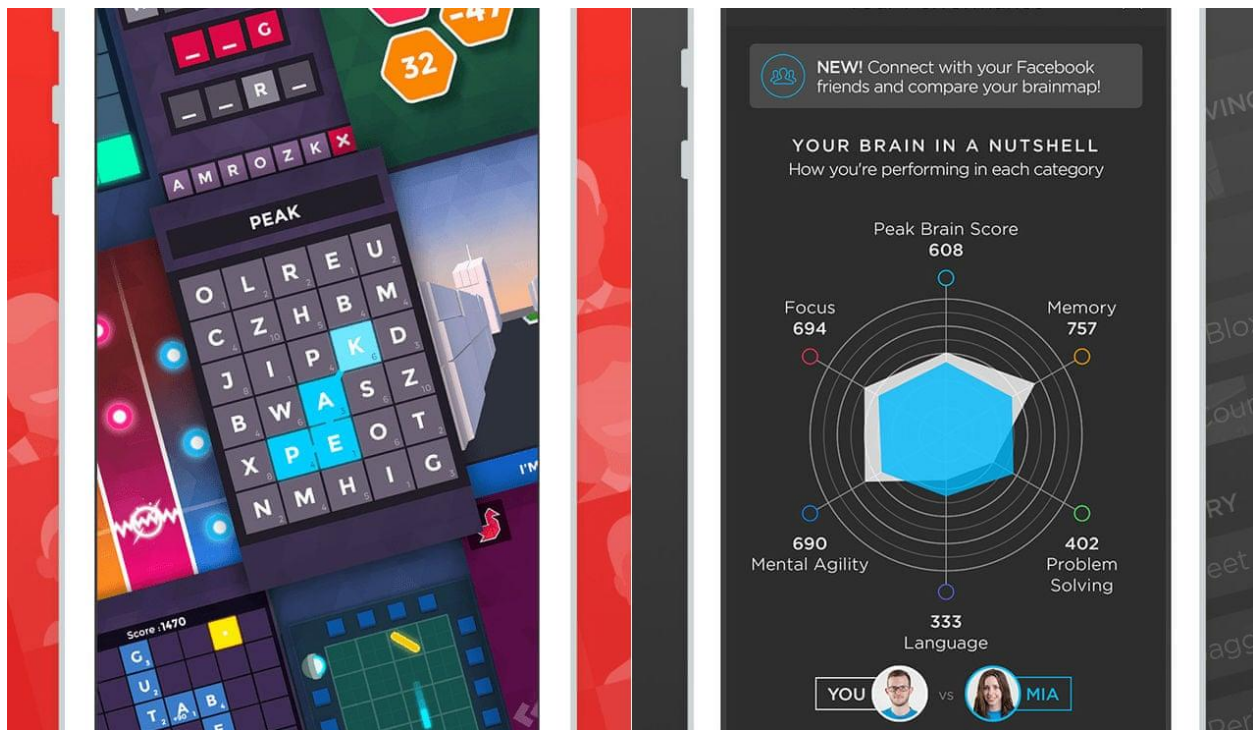


Figure 9 Peak

2. Elevate (Android / iOS)

Elevate is a very good app and a strong rival to Peak . There are more than 30 here testing memory, focus, maths, comprehension and other mental skills.

The app keeps you interested and is keen to get you logging in regularly, tracking your “streaks” on its calendar, and tweaking the difficulty levels as you become more adept. Here too, a Pro subscription unlocks more games, and lets you play them as often as you like.

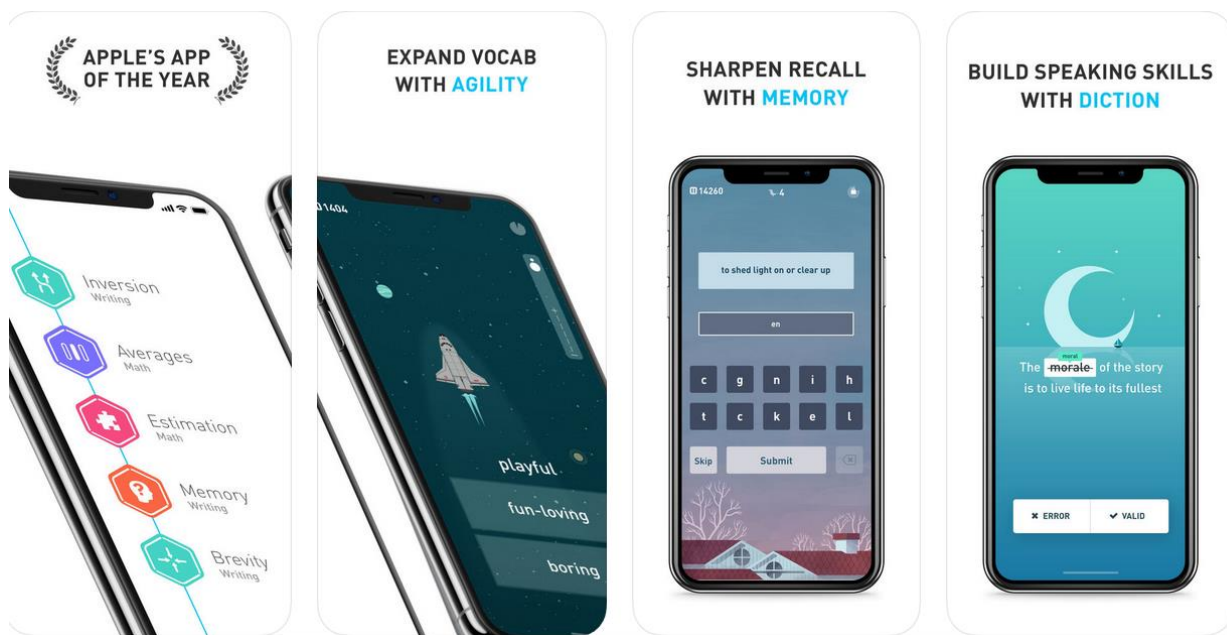


Figure 10 Elevate

3. Lumosity (Android / iOS)

This app has a selection of mini-games which are mixed and matched into a daily programme. It has also a stat-tracking system to show your improvement over time.

It also has a monthly subscription however in this case , it unlocks more games and features. On mobile, Lumosity is more expensive, but the fact that you can use its website from your computer is an appealing option .



Figure 11 Lumosity