

How to get teens into programming

Konstantin Tieber, Bonn Agile, March 11th 2020

Me

- Bonn Code Meetup co-founder
- 3x Girls'Day organizer
- 3x Internship guide
- wears a Propellerhat
- Software Engineer @LeanIX
- Blog at xkons.de



Why should you?

Coding is cool

Platforms

Girls' Day

futurecamp.digital

your company

Girls' Day

Wieder am 26. März!



Battle tested Girls' Day Agenda

9:00 Arrival, get-to-know round (name tags) and office tour

9:30 Begin individual presentations of different software roles within the company (Backend, Frontend, Design, Product Owner)

10:15 Break

10:30 Teamwork: Hour of code in teams of 2

12:15 Lunch

13:00 Develop project idea and five minute pitch in teams of 4

14:30 Project pitch

Read more: xkons.de/posts/girls-day-bei-der-webfactory

futurecamp.digital



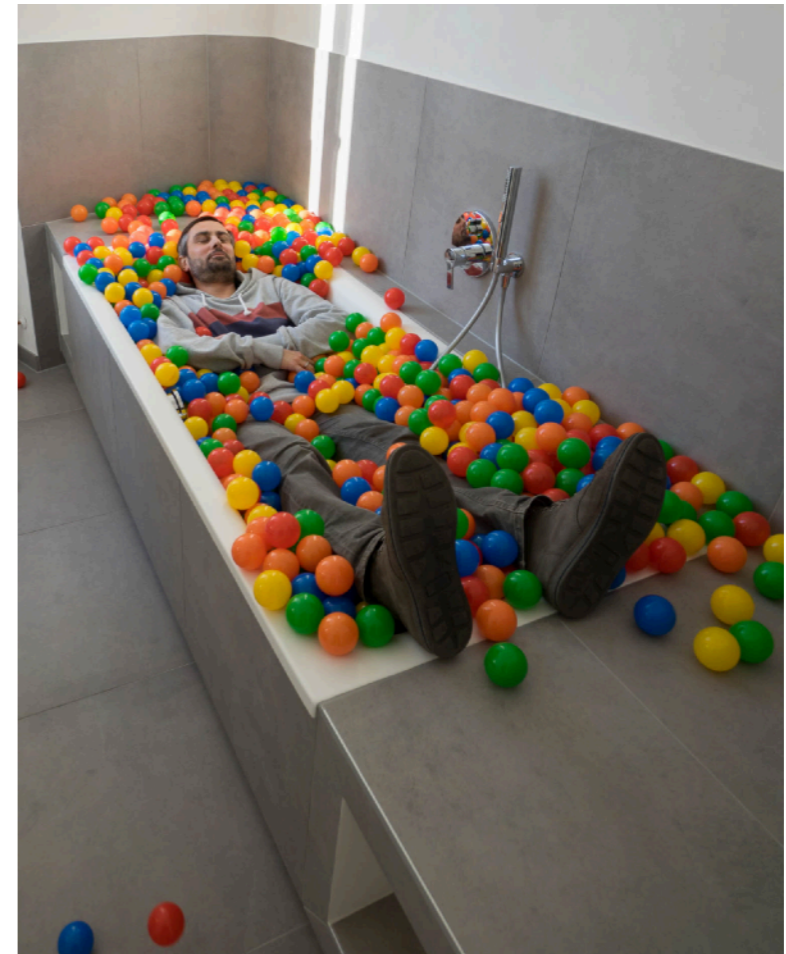
Your company

Low hanging fruits (with my guides)

- Girls'Day
- Internships

High hanging fruits

- Apprenticeships
 - requires more mentorship
 - don't do it for cheap workforce
- Self-organized workshops. Hardest part is advertising it.



Battle tested internship Plan

Day 1 to 4

- Get to know the intern
- Explain what coding is and why it's interesting
- Hands on learning with Hour of code and codeacademy
- Enable them to find answers themselves (google)

Day 5 to 10

- Come up with personal project idea
- Build project (VSCode, git)

Read more: xkons.de/posts/two-week-software-development-internship-guide/

Tools

Hour of Code

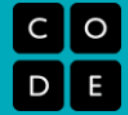
codecademy

Phaser CE

Stackblitz

codecombat

Hour of Code



Learn

Teach

Projects

Stats

Help Us

About

Create ▾

Sign in



All grades

Pre-reader

Grades 2-5

Grades 6-8

Grades 9+

Beginner

Comfortable

Sort by

Most popular

Created by

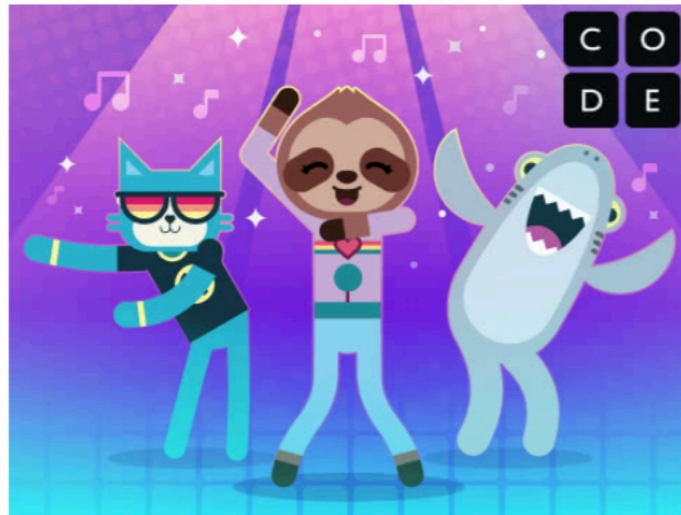
All

Classroom technology

- Computers
- Android
- iPad/iPhone
- Poor or no internet
- No computers or devices

Topics

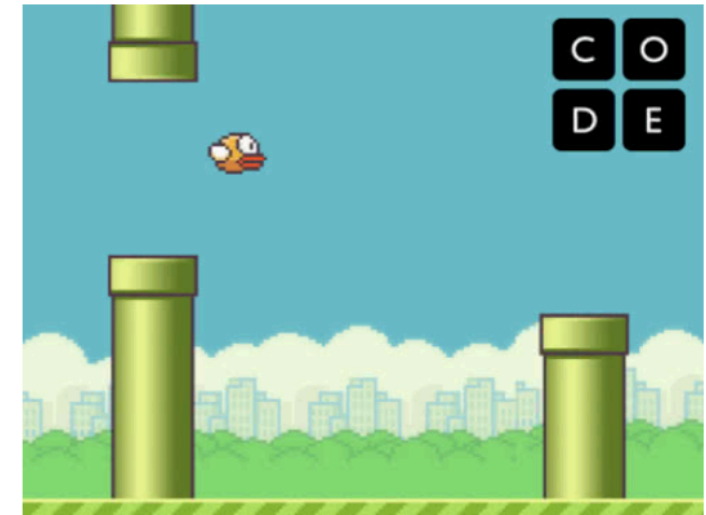
- Science
- Math
- Social Studies
- Language Arts
- Art, Media, Music
- Computer Science only



Dance Party
Grades 2+ | Blocks



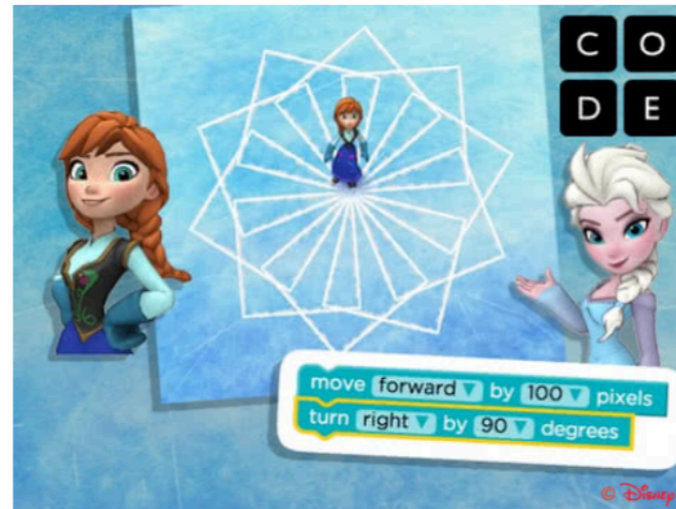
Minecraft Hour of Code
Grades 2+ | Blocks



Make a Flappy game
Grades 2+ | Blocks



Star Wars: Building a Galaxy with...
Grades 2+ | Blocks, JavaScript



Code with Anna and Elsa
Grades 2+ | Blocks



Write your first computer program
Grades 2+ | Blocks

Understanding basic concepts



MINECRAFT



Run

Instructions

Build a wall of **prismarine** around the black concrete. This will activate the **conduit** and complete your challenge!

Less



Blocks

Workspace:

Start Over

Show Code

move forward

turn left

place prismarine

if standing on sand

repeat until conduit completed

repeat 5 times

do

when run

move forward

repeat 5 times

do

place prismarine

move forward

if standing on sand

turn left

codecademy

Sprite Sheets

One common tool used to create animations is a sprite sheet that contains all the images that depict how a sprite can move. Take for instance:



As we move through the *frames* (individual images) of the sprite sheet, Codey starts walking!

To implement an animation in our game we need to:

1. Load in the sprite sheet.
2. Create the sprite object.
3. Create the animation by selecting specific frames from the sprite sheet.
4. Play the animation.

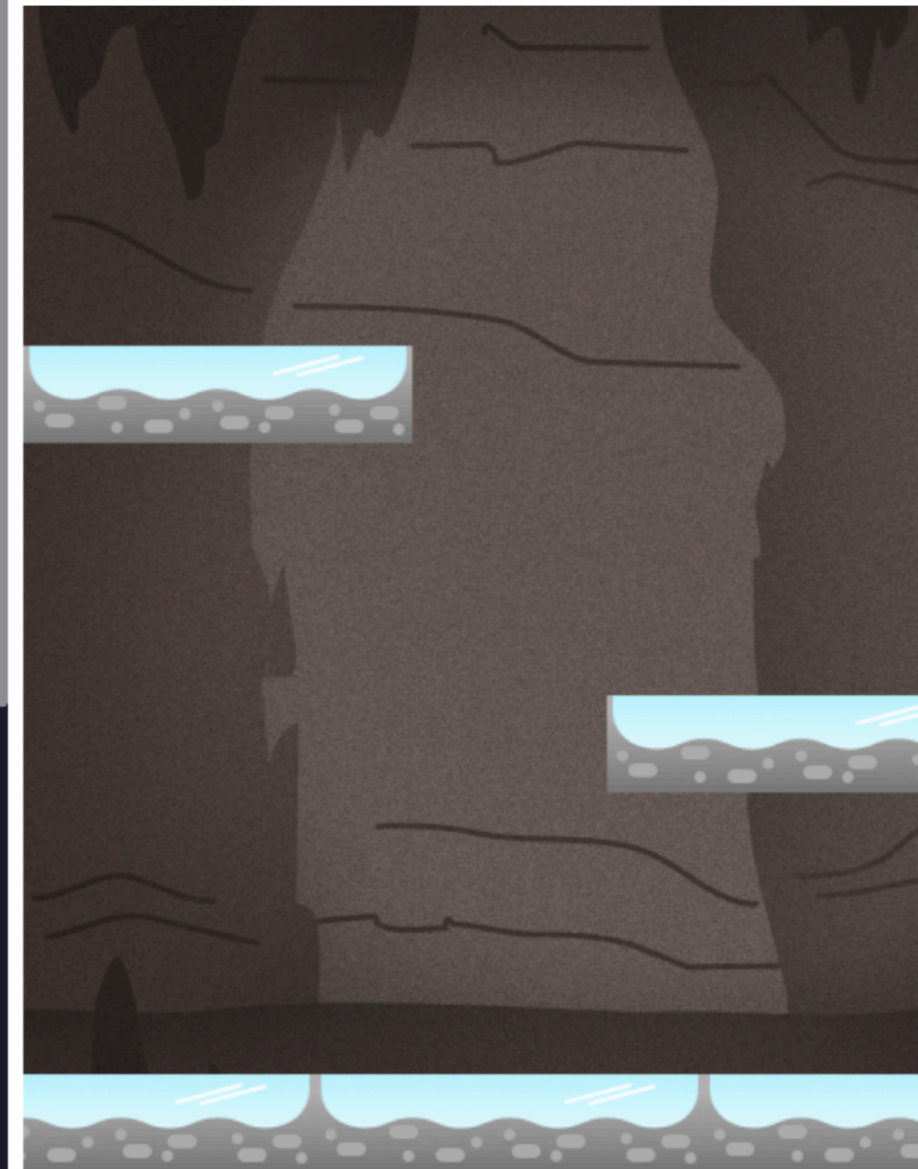
Let's focus first on loading in our sprite sheet:

game.js

```
1  const gameState = {};  
2  
3  class GameScene extends Phaser.Scene {  
4  constructor() {  
5      super({ key: 'GameScene' });  
6  }  
7  
8  preload() {  
9      this.load.image('cave',  
10         'https://s3.amazonaws.com/codecademy-  
11         content/courses/learn-  
12         phaser/Cave+Crisis/cave_background.png');  
13  
14         this.load.image('platform',  
15         'https://s3.amazonaws.com/codecademy-  
16         content/courses/learn-  
17         phaser/Cave+Crisis/platform.png');  
18  
19         // Load in the sprite sheet below:  
20  
21     }  
22  
23     create() {  
24         // gameState.active is true if the game is  
25         // playable (not game over)  
26         gameState.active = true;  
27  
28         // Creates the background image  
29         this.add.image(0, 0, 'cave').setOrigin(0, 0);  
30  
31         // Creates platforms group  
32         const platforms = this.physics.add.staticGroup();
```

Run

http://localhost:8000/



Phaser Community Edition

The image shows a web-based code editor interface for a Phaser game. The editor is titled "@BastiTee / noodlejump" and includes a "Fork" button and a "Share" link. The URL in the browser is "https://noodlejump.stackblitz.io".

The code editor displays the following JavaScript code in `index.js`:

```
80
81 /**
82  * Diese Funktion programmiert die Bewegung des Helden
83  * in Abhängigkeit davon,
84  * welche Tasten man drückt.
85  */
86 heldBewegen() {
87   let touchEingabeAktiv = this.spielerEingabenAuswerten
88   ()
89
90   // Das Spiel hat begonnen wenn..
91   // - Touch-Eingabe verwendet
92   // - Pfeil-oben gedrückt wurde
93   // - bereits einmal gesprungen wurde
94   var spielBegonnen = touchEingabeAktiv ||
95   this.cursor.up.isDown || this.anzahlSpruenge > 0;
96
97   // Sprung des Helden programmieren
98   if (spielBegonnen && this.held.body.touching.down) {
99     // Beim ersten Sprung wird die Punktzahl auf 0
100    gesetzt
101    if (this.anzahlSpruenge === 0) {
102      this.punktzahl = 0;
103      // Danach um 1 erhöht
104    } else {
105      this.punktzahl += 1;
106    }
107
108    // Nach jedem 10-ten Sprung..
109    if (this.anzahlSpruenge !== 0 &&
110    this.anzahlSpruenge % 10 === 0) {
111      // .. mache etwas - zum Beispiel das Spiel
112      schwerer ;)
113    }
114  }
```

The right side of the image shows a live preview of the game. It features a blue background with a yellow and white soccer ball at the bottom center. Several black rectangular obstacles are scattered across the scene. The game is running in a browser window with the URL "https://noodlejump.stackblitz.io".

Noodlejump is Open Source

BastiTee / noodlejump-stackblitz Template

Watch 1

Star 0

Fork 1

Code

Pull requests 5

Actions

Security

Insights

is:pr is:open

Labels 9

Milestones 0

New pull request

5 Open ✓ 5 Closed

Author ▾

Label ▾


Projects ▾

Milestones ▾

Reviews ▾

Assignee ▾

Sort ▾

 **Verschiedene Views: Start, Spiel, Game Over**

#10 opened on 5 Oct 2019 by xkons

 **Vollständiges Spiel mit dem größten Spaß und allen wichtigen Features**

#9 opened on 4 Oct 2019 by xkons

 **Nach jedem 10-ten Sprung einen Punktemultiplikator anwenden**

#8 opened on 25 Sep 2019 by BastiTee

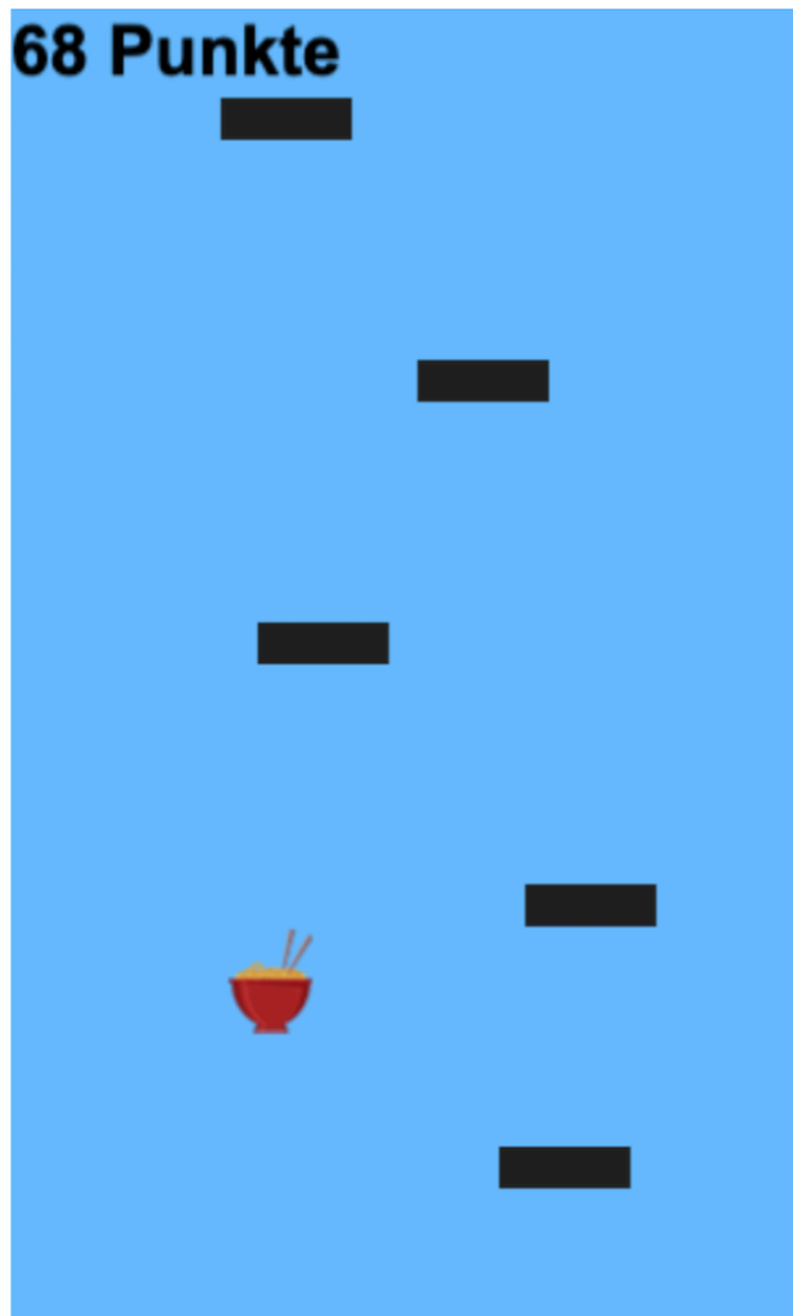
 **Nach jedem 10-ten Sprung Geschwindigkeit des Spiels erhöhen**

#7 opened on 25 Sep 2019 by BastiTee

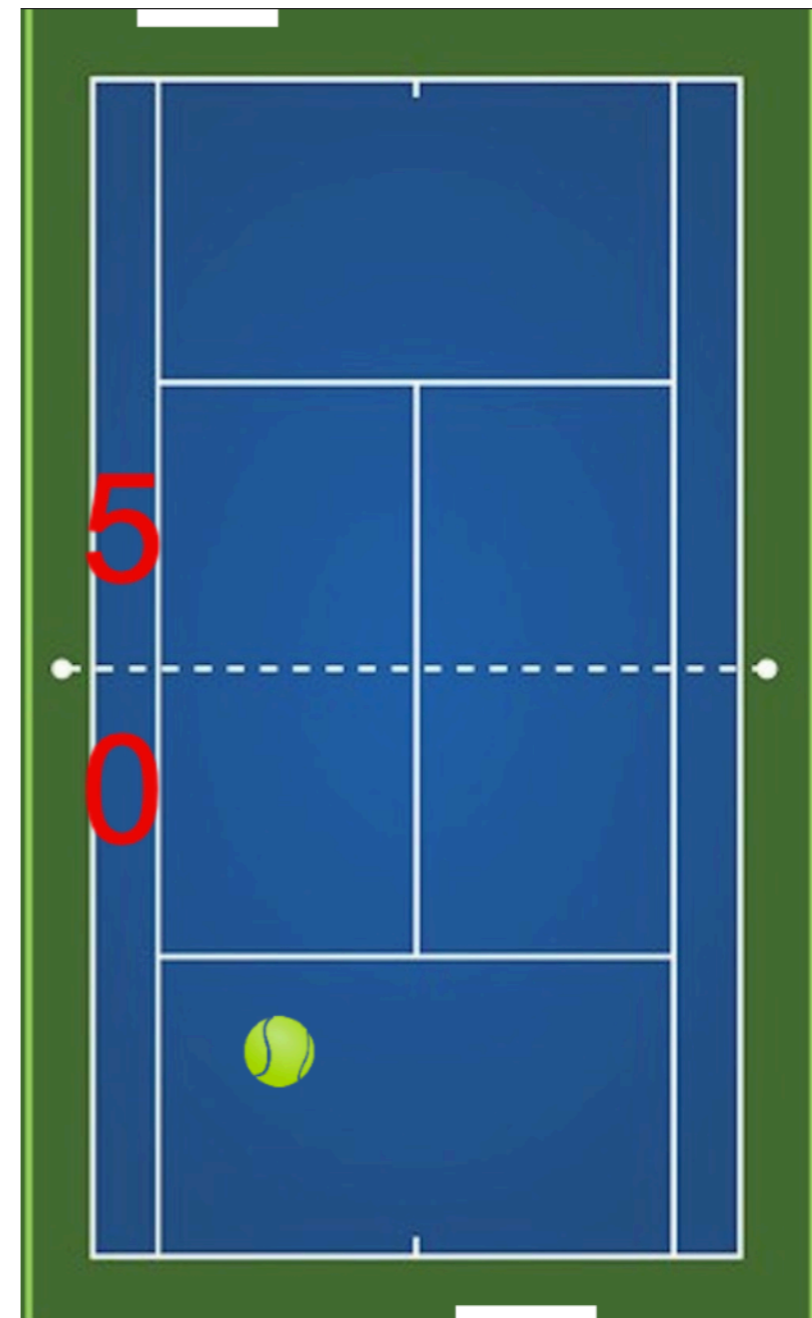
 **Punktzahl anzeigen**

#6 opened on 25 Sep 2019 by BastiTee

Phaser Projects



Noodlejump:
xkons.de/noodlejump/states



Pong:
sidneyk1.github.io/pong

Happy Teaching!

Resources

- Hour of code code.org/learn
- codeacademy www.codecademy.com
- codecombat codecombat.com/
- Phaser Community Edition photonstorm.github.io/phaser-ce/
- Software internship guide by me:
xkons.de/posts/two-week-software-development-internship-guide/
- Learn programming with Phaser and Noodlejump (german):
github.com/BastiTee/noodlejump-stackblitz/
- Girls' Day agenda by me (german):
xkons.de/posts/girls-day-bei-der-webfactory