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Welcome Instructors and Workshop Leaders

Hi, and welcome to this licensed Lesson set of Construct2 and Construct3-based Education materials. This online course is tailored for Convention Workshops, Middle and Secondary School education, or after-school computer clubs.

You may customize your downloaded content in any way you wish. The PowerPoint slides **do not have themes** just for that purpose. Please further note that we do provide customization support for these materials. To request customization, please contact us directly at:

- <https://stephen-gose.com/about/contact/> or
- our author email at https://leanpub.com/cgdw/email_author/new .

I have created these materials for workshop leaders or teachers who are confident in computing technology. In your resource directory are “quick start” pamphlets to help build your confidence if lacking. I have provided CSTA standards to help integrate these materials into [STEM education](#).

If you are less confident about teaching Career Technology Education (CTE) and wish to use a fully supported Education program from you State or Province government in your class then you can find such solutions with our partner institutions at <https://www.tbcube.com>.

I hope you will find these lessons useful and that you and your students or attendees will enjoy their sessions.

Workshop Course Summary

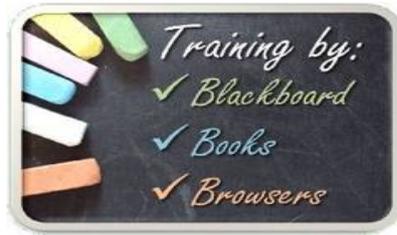
This is an introductory-level course into the **Game Design System™**, using either Construct 2 (C2) or Construct 3 (C3) web-based Gaming Framework software – or any Code-less Gaming Framework for that matter! Workshop attendees and students will discover how to create simple “2D Arcade” games while mastering the Codeless Event-driven programming architecture.

These 12 lessons are divided into lectures and activities, focused on the development of 10 games variations to the Breakout game mechanics as “Capstone Projects”. Lesson 1 may be considered as a “standalone” with each of the following lessons progressively building on the former.

Schools Grades: 6-12

Lessons: 45-60 minutes each

Recommended Software: Construct 3 (registered Edition)



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Materials Included

This [CTE standards-aligned](#) workshop comes with several resources to help you:

Lesson Plan Template and Scheme of Delivery

I am not attempting to superimpose onto your teaching or lecture style with my lessons plans. Your organization may already dictate how you should draft your curriculum or you may have a favourite format for your instruction. The “lesson plan” template merely shows a quick lecture/lesson structure at a glance with the title, duration, learning objectives, lesson overview, and resources to use.

Career Technical Education (CTE) Standards Alignment Map

This document shows all lessons and how they align to the [Computer Science Teachers Association \(CSTA\) standards](#) for middle and secondary education.

Project Timeline

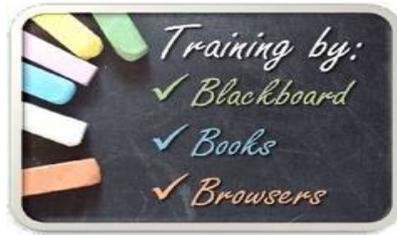
This document helps attendees and students to pace their progress during the Capstone Game Projects construction. There two methods you might consider. They are asked to raise their cards periodically to show their understanding as feedback to the instructor/lecturer; red for “need more help or information”, amber for “need further assistance” and green to show they understand. Instead of placards, a simple triangle nameplate to show their comprehension.



Individual Lesson Packages:

Each CTE STEM standard-aligned lesson includes:

- a Lecturer / Teacher lesson plan template;
- Attendee-facing presentation slides (without a theme);
- Attendee hand-out worksheets.



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Lesson Overview

The lectures are brief and should allow the majority of time for hands-on work.. There is a minimal amount of theory presented that explains (5-10 minutes) the goals in the following “hands-on work” for the remainder of the session. They focus on optional design approaches and reasons for certain development. The “45-60 minute sessions” can be extended or reduced to meet the needs of your classroom or workshop group’s aptitude. Typically, adult workshop attendees, even with little technical background, can quickly move through the course information in 20-30 minutes.

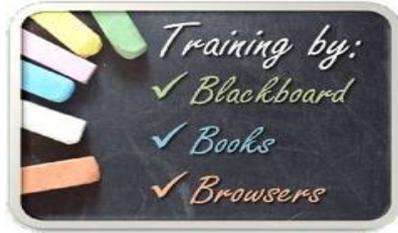
The **lesson 12 Capstone** is designed to build up a the participant’s skills with ten different game creations. There is no instruction at this point; because the students/attendees have already walked through all the steps to do what they will encounter. The purpose of the Capstone lesson is to take what they’ve learned and apply it to a new environmental setting.

- **Part II: Lessons 1-8** begin the basic introduction to the **Construct 2 editor**.
- **Part III: Lessons 1-8** begin the basic introduction to the **Construct 3 editor**.
- **Part IV: Lessons 9-10** develop the student/attendee’s knowledge even further by adding unique gaming features that have multiple scenes which interact with one another to create a [“Single Web Page Application”](#).
- **Lesson 12:** “Starting a Game Studio” is the **capstone** lesson in which students/attendees use this single “Breakout” Game Mechanics to build a variety of 10 visually different games.

Testing & Debugging!

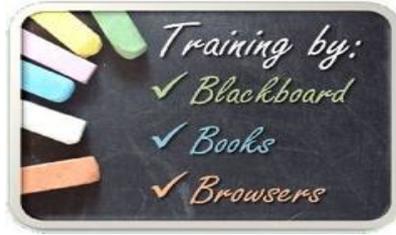
Testing is a consistent theme throughout these lessons, with students/attendees utilizing test plans after each lesson’s development. It is essential, when creating any event-driven program architecture, to test regularly and identify any issues in the newly introduced code that do not perform as envisioned.

Documenting these tests -- with “what is being tested”, “what was expected to happen”, and “what actually happened” -- will support these debugging stages and ensures that the game prototype has a solid foundation for the next [“SCRUM Sprint” iteration](#).



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	Lesson	Learning focus
Course Overview & Introduction		<ul style="list-style-type: none"> • Course Introductions
		<ul style="list-style-type: none"> • Online Course Navigation
		<ul style="list-style-type: none"> • Download Course Assets
		Introduction to the Game Design System™
Part 2	Process Umbrella > Construct 2 (C2) Production	
	1	Game Project Launch
	2	Scaling Objects & Layouts
	3	Loading and Placing Items
	4	Game Management
	5	Bouncing Off the Walls!
	6	Play Ball!
	7	Build the Playing Field
	8	Adding "Game Lost or Won" Scenes



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Part 3	Process Umbrella > Construct 3 (C3) Production	
	1	Game Project Launch
	2	Scaling Objects & Layouts
	3	Loading and Placing Items
	4	Game Management
	5	Bouncing Off the Walls!
	6	Play Ball!
	7	Build the Playing Field
	8	Adding "Game Lost or Won" Scenes
Part 4	Expanding this Game Prototype	
	9	Adding Unique Features
		<ul style="list-style-type: none"> • Play Again?
		<ul style="list-style-type: none"> • A Better "Game Start"
		<ul style="list-style-type: none"> • Integrating Multiple Languages
		<ul style="list-style-type: none"> • Extra Balls?
		<ul style="list-style-type: none"> • Multi-Player Game Mode
		<ul style="list-style-type: none"> • Bricks that Live?
		<ul style="list-style-type: none"> • Using "Families"
		<ul style="list-style-type: none"> • Ball Modifications?
		<ul style="list-style-type: none"> • Touch & Mouse Controls!
		<ul style="list-style-type: none"> • More "Eye Candy"?
Game Publication	Starting a Game Studio	
	10	Randomizing the Game Area
	11	One "Game" to Rule them all
	12	Capstone: Exchanging Artwork Themes



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CTE and CSTA Standards Alignment

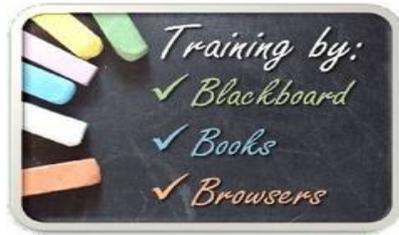
CSTA Standards

These lessons are aligned with the CSTA Standards for middle and secondary schools. Within the CSTA standards there are five areas:

1. Computing systems – secondary focus.
2. Networks and the Internet – secondary focus.
3. Data and Analysis – secondary focus.
- 4. Algorithms and Programming – primary focus.**
5. Impacts of Computing – secondary focus.

The Workshop focuses on the “**Algorithms & Programming**” strand within all standards **2-AP-10 to 2-AP-19**.

Concept	Sub-concepts	Code	Level 2 (Ages 11-14) By the end of Grade 8, students will be able to ...
Algorithms & Programming	Algorithms	2-AP-10	Use flowcharts and/or pseudocode to address complex problems as algorithms.
	Variables	2-AP-11	Create named variables that represent different data types and perform operations on their values.
	Control	2-AP-12	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals
	Modularity	2-AP-13	Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.
		2-AP-14	Create procedures with parameters to organize code and make it easier to reuse.
	Program Development	2-AP-15	Seek and incorporate feedback from team members and users to refine a solution that meets user needs.
		2-AP-16	Incorporate existing code, media, and libraries into original programs, and give attribution.
		2-AP-17	Systematically test and refine programs using a range of test cases.
		2-AP-18	Distribute tasks and maintain a project timeline when collaboratively developing computational artifacts.
		2-AP-19	Document programs to make them easier to follow, test, and debug.



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Workshop Management and Distance Learning

Pair Programming

To develop industry-standard skills, pair programming can be utilized and benefit learners in their progress. To use this effectively, two students are placed together with each taking on a role.

The **driver** takes a seat at the computer and creates the project code, where the **navigator** observes and looks for errors and aids in the development of the project.

I recommend that the roles are swapped within the lesson to allow both learners to develop their own skill sets.

Distance learning

If you are delivering this course by either synchronous distance learning, I suggest that you provide online “breakout rooms” for your student pairs, in which students can share screens while coding. This “break rooms” are substituted for asynchronous distance learning with student-to-student communications.

Managing Online Workshop licenses.

The student’s online course provides testing and automatic grading. Successfully passing the certification examinations provides a personalized certificate of completion. Many corporate Human Resources require course completion certificates as proof of attendance **per ISO9001**. Each learner must register for the online course access. You will earn commissions for each course purchased with your identification code. The online course materials follow the instructor’s materials.

Managing “Full-featured” Construct 3 licenses.

Construct 3 licenses are allocated to a master www.construct.net account. From there you may allocate those licenses to other accounts directly or by use of Access Codes. You can set up one or more groups of your licenses under an Access Code for any duration you choose. Learners are able then to log in using their Access Code and use the full functionality of Construct 3. The advantage of this method is that Construct records nothing concerning the user’s Personal Information and **this is the recommended method for using licenses in a school or convention workshop environment.**

You can find further information about assigning licenses through either direct assignment to an account or through the use of Access Codes here:

- <https://www.construct.net/en/make-games/education/licensing>
- <https://www.construct.net/en/tutorials/construct-education-2303>