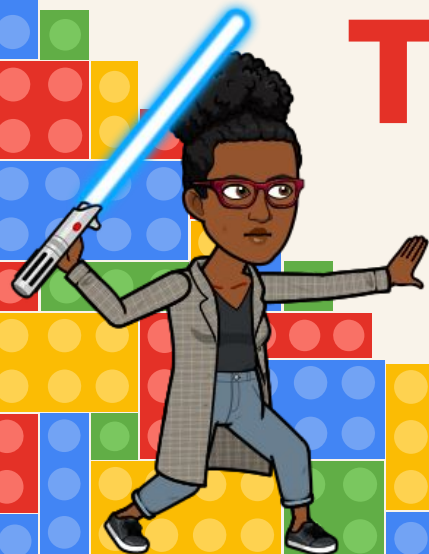
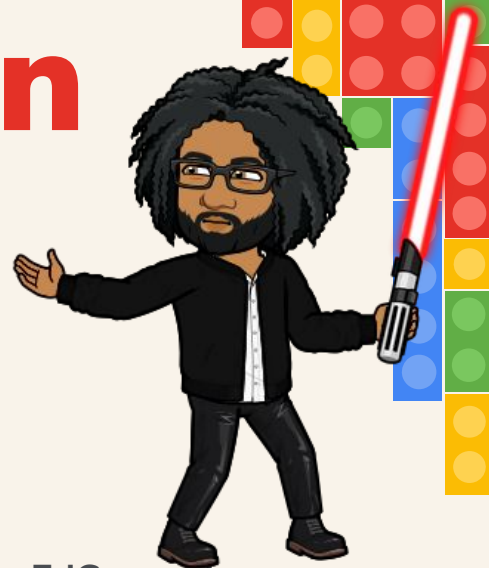


bit.ly/TheyPlayTheyLearn

If They Play, They Will Learn



Dr. Abigail Joseph
Jessie McKinley



@drabigailjoseph | @mckinj01 #MakerEdConvening

PLAY



IS



WORK



Jessie McKinley

K-4 CS/Coding/Robotics/Engineering
Madison Camelview - MSD 38
Phoenix AZ

Dr. Abigail Joseph

The Harker School (San Jose, CA)
CSTA Equity Fellow
edstoria
creative | futurists | storyteller

WHAT'S



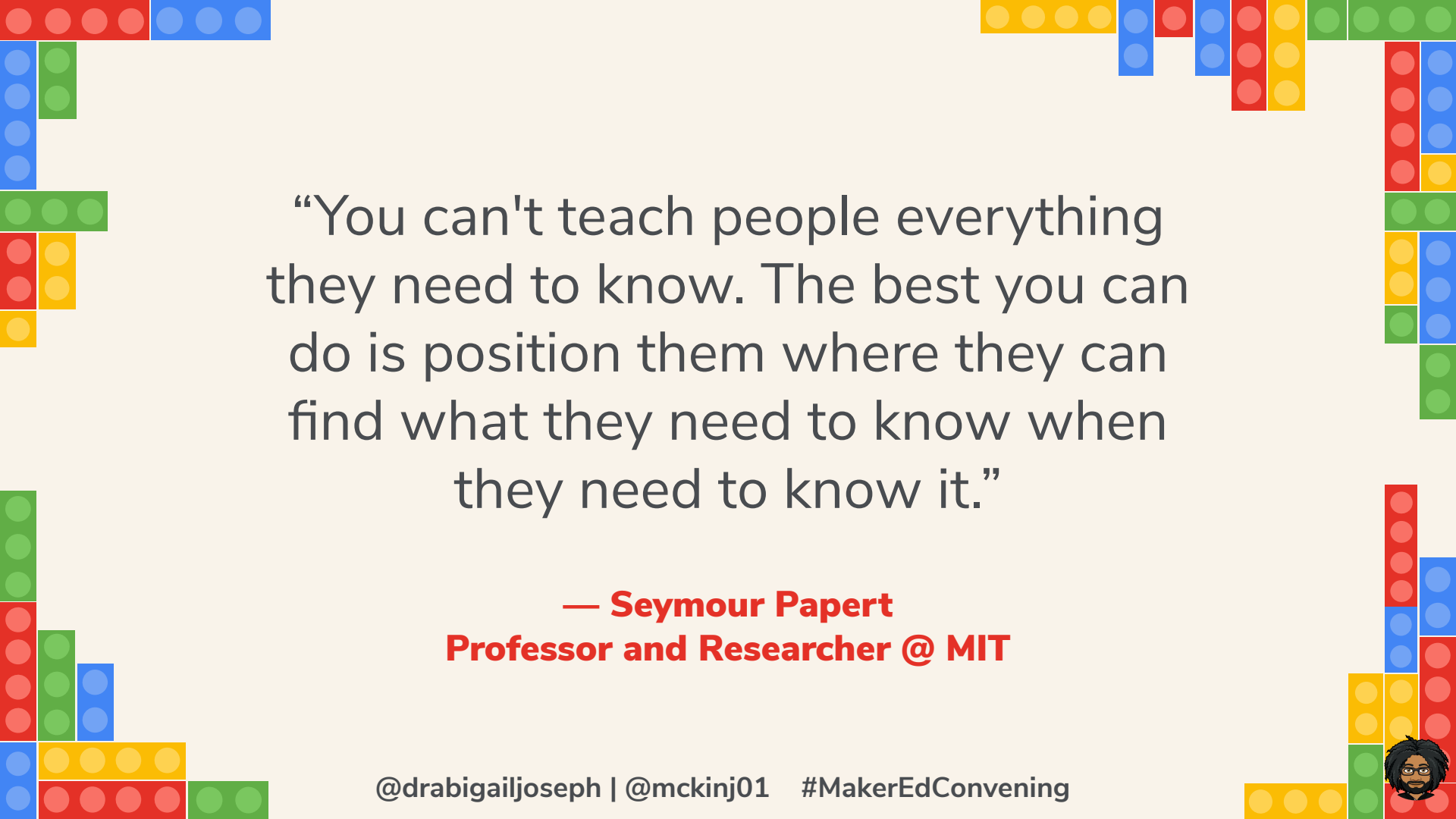
YOUR



ANGLE?



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“You can't teach people everything they need to know. The best you can do is position them where they can find what they need to know when they need to know it.”

— **Seymour Papert**
Professor and Researcher @ MIT

What is play?



Students, write your response!

@mckin01 Joseph | @mckin01

#MakerEdConvening

Pear Deck Interactive Slic
Do not remove this b



AGENDA



**CODE
TRANSLATION
PLAY**



PLAY IS HARD
A Framework for Play

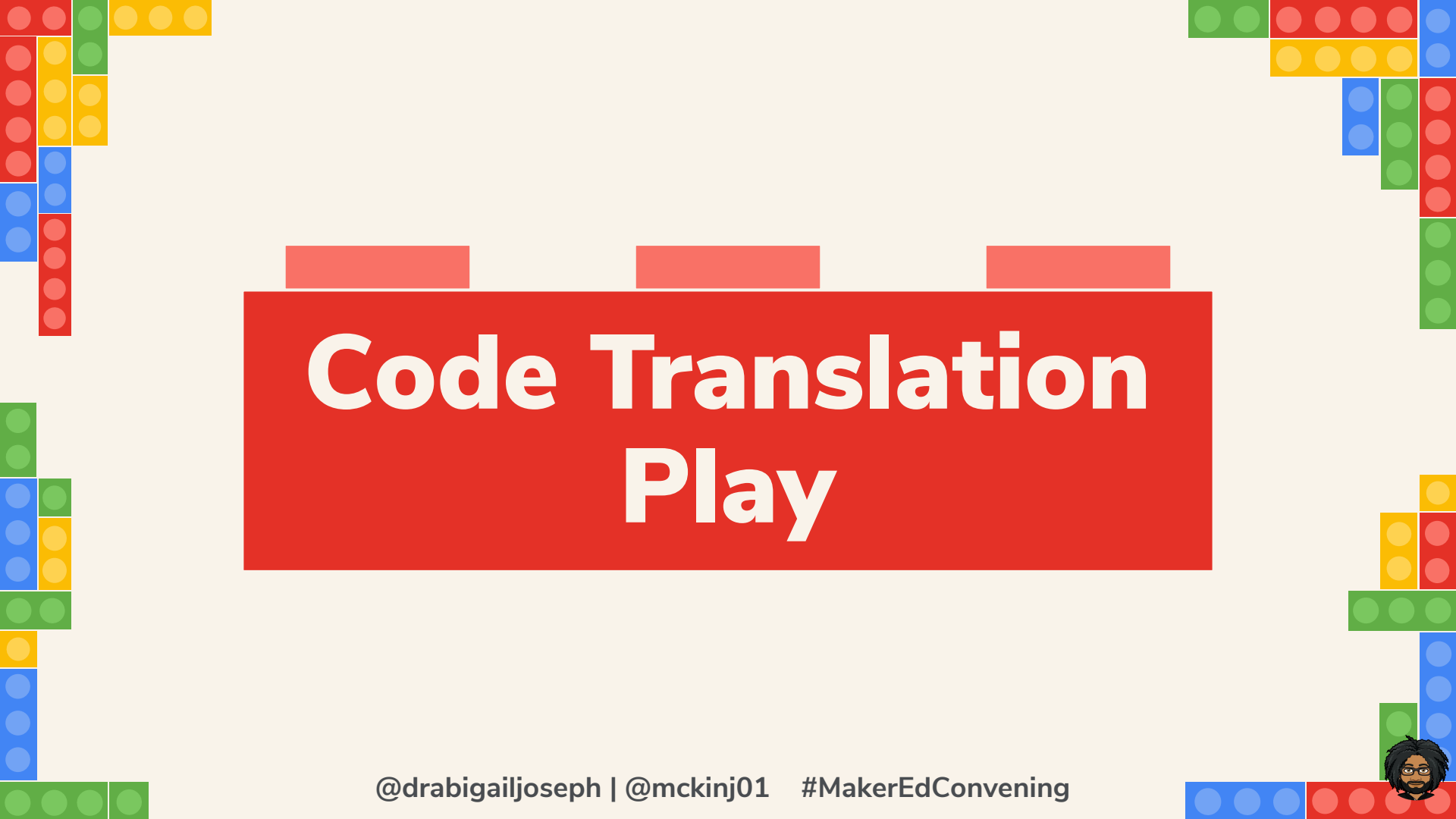


**EXAMPLES OF
PLAY**



Q & A





Code Translation Play

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10 PRINT
20 PRINT
30 PRINT

SYSTEM RESPONSE MAY BE SLOW AT TIMES. CURRENTLY RUNNING ON 192K OF MEM
READY

[Link to BASIC Book Code](#)



9



Basic Letter Game - Demo

Applesoft BASIC in Javascript

By Joshua Bell | [Source](#) | [README](#) — Applesoft BASIC Quick Reference
Related projects: [Logo in Javascript](#) | [Streaming video to an Apple II - vnuic](#)

Applesoft BASIC in Javascript

```
S!  
LET'S PLAY AGAIN....  
O.K. I HAVE A LETTER. START GUESSING.  
WHAT IS YOUR GUESS?LETTER - 1978  
CREATIVE COMPUTING MORRISTOWN, NEW JERSE  
Y  
  
LETTER GUESSING GAME  
I'LL THINK OF A LETTER OF THE ALPHABET,  
A TO Z  
TRY TO GUESS MY LETTER AND I'LL GIVE YOU  
CLUES  
AS TO HOW CLOSE YOU'RE GETTING TO MY LET  
TER.  
  
O.K. I HAVE A LETTER. START GUESSING.  
WHAT IS YOUR GUESS?*
```

Enter code:

```
20 PRINT "CREATIVE COMPUTING MORRISTOWN, NEW JERSEY"  
30 PRINT:PRINT:PRINT  
100 PRINT "LETTER GUESSING GAME": PRINT  
210 PRINT "I'LL THINK OF A LETTER OF THE ALPHABET, A TO Z."  
220 PRINT "TRY TO GUESS MY LETTER AND I'LL GIVE YOU CLUES"  
230 PRINT "AS TO HOW CLOSE YOU'RE GETTING TO MY LETTER."  
310 LET L=65+INT(RND(1)*26)  
320 LET G=0  
340 PRINT: PRINT "O.K. I HAVE A LETTER. START GUESSING."  
410 PRINT: PRINT "WHAT IS YOUR GUESS";  
420 LET G=G+1  
430 INPUT A$: A=ASC(A$): PRINT  
440 IF A=L THEN 500  
450 IF A>L THEN 480  
460 PRINT "TOO LOW. TRY A HIGHER LETTER.": GOTO 410  
480 PRINT "TOO HIGH. TRY A LOWER LETTER.": GOTO 410  
500 PRINT: PRINT "YOU GOT IT IN"; " " G " "; "GUESSES!"  
504 IF G <= 5 THEN 508  
506 PRINT "BUT IT SHOULDN'T TAKE MORE THAN 5 GUESSES!": GOTO 515  
508 PRINT "GOOD JOB!!!"  
510 FOR N = 1 TO 15: PRINT CHR$(7);: NEXT N  
515 PRINT  
520 PRINT "LET'S PLAY AGAIN...."  
530 GOTO 310  
999 END
```

Links

- Real emulators in JavaScript: Apple IIs, Apple //se, Apple2JS, and many more
- 6502asm.com - a 6502 assembler/emulator in JavaScript
- Quite BASIC - a similar project aimed at teaching programming

Match the Code to the Definition

Commands

Definitions

PRINT ●

● Go to line indicated

RND() ●

● Prompts the user for input.

INPUT ●

● Displays strings, constants and variables

GOTO ●

● Returns the ASCII value of the first character in the string argument

ASC ●

● Returns a random number between 0 and 2nd number

CHR ●

● Converts ASCII value of the first character in the string argument

Students, draw anywhere on this slide!

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Pear Deck Interactive Slide

Do not remove this box



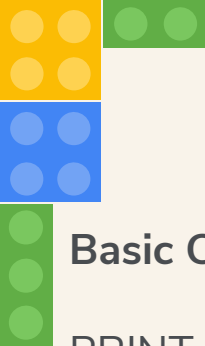
How can you update this game to 2020?



Depends on your Focus

- **Explore a new environment**
- Translating code from one language to another
- Remixing or reinventing





Let's explore Scratch

Basic Commands to Understand

PRINT - Displays strings, constants and variables

INPUT - Prompts the user for input

GOTO - Go to line indicated

RND() - Returns a random number between 0 and 2nd number

ASC - Returns the ASCII value of the first character in the string argument

LET - Assigns value of expression to variable

CHR - Converts ASCII value of the first character in the string argument

[Scratch Starter Project](#)

[Link to BASIC Book Code](#)

[ASCII Binary Character Table](#)



OKAY



AMAZING

How was your play?



Students, drag the icon!  @mckinj01 #MakerEdConvening

Pear Deck Interactive Slic
Do not remove this be





Share your discoveries

<https://scratch.mit.edu/studios/27533984/projects/>





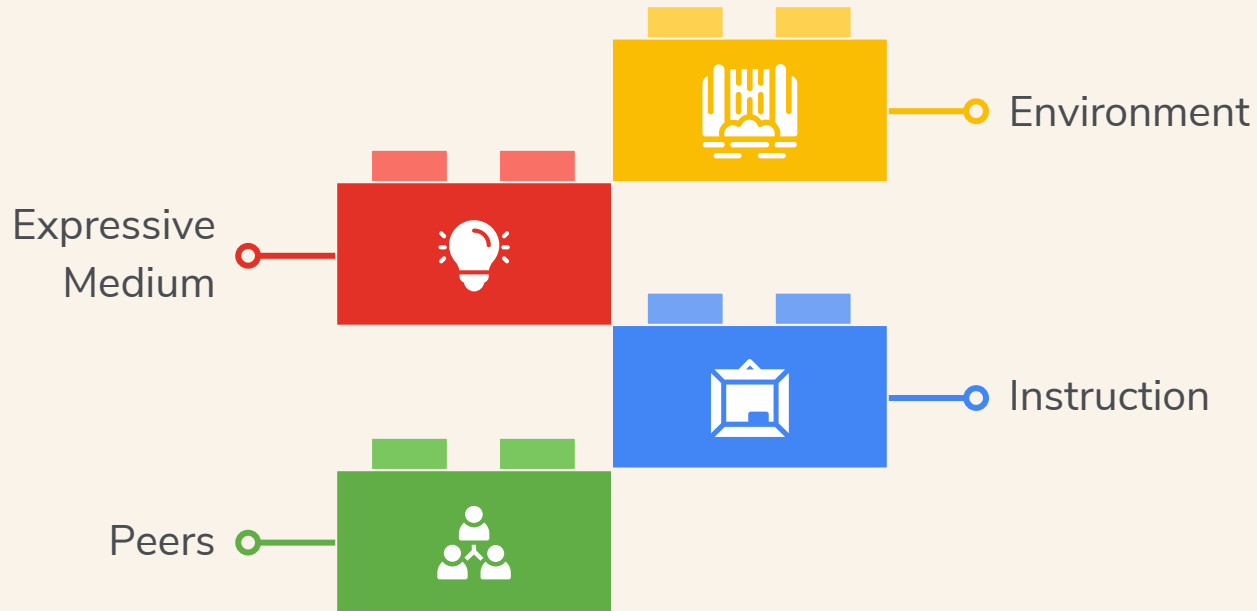
Play is Hard Work

A Framework for Play

@drabigailjoseph | @mckinj01 #MakerEdConvening



PLAY IS HARD WORK



PLAY IS HARD WORK

ENVIRONMENT

Visible Thinking

- Exploring of questions
- Anticipatory Artifact

Play Pen

- set of objects
- defined criteria and constraints

CS Playground

- Open-ended
- Voice and choice driven

CS + Makerspace CS + X Playground

- Extension of CS playground
- cross-curricular



PLAY IS HARD WORK

EXPRESSIVE MEDIUM

Low Floor (Entry Level)

- Code-N-Go
- Out of the Box
- No training time
- Little to no instruction

Block-based environments

- Focus is on exploring and building

Hybrid environments (block-based and text-based)

- Voice and choice

High Ceiling (Text-based environments)

- High need to be observant of details



PLAY IS HARD WORK

INSTRUCTION (ROLE OF THE TEACHER)

Demo

- Direct Instruction
- Workshop model
- Show then follow

Inquiry - guided instruction

- Show
- Pose question
- Student tell

Storytelling

- Interweaving play into a story that relates to students
 - Outcomes of play are part of story context
- * equity moment

“Guided” Self-paced

- Questions for exploration
- Artifact for reflection on process and results

Coaching/ Facilitation

- Open-ended
- Guide on the side
- Teacher redirection when needed



PLAY IS HARD WORK

PEERS

By Myself

“I’m going to just watch what you do and jump in when I’m ready.”

Step-by-Step with you, partner

“I’m going step by step and may be slightly ahead.”

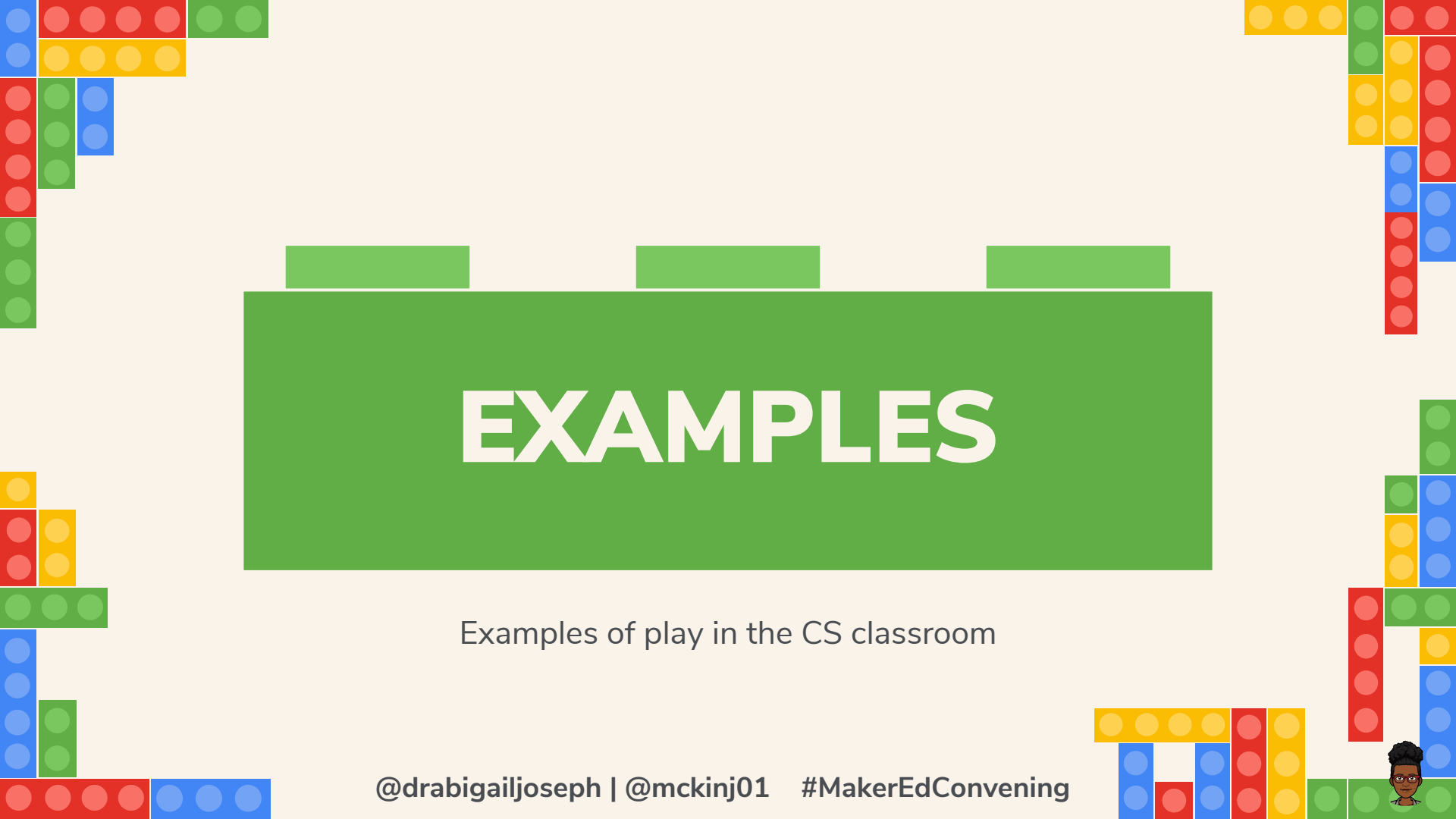
Side-by-Side with you, partner

“I’m ‘kinda, sorta’ with you and I’ll meet you at the end.”

With you and the group

“I’m working on my part to contribute to the group.”

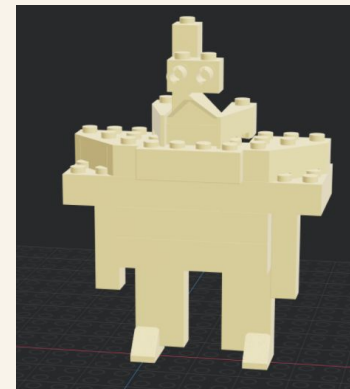
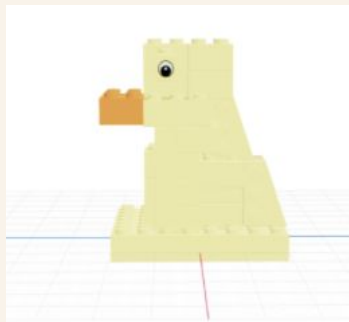




EXAMPLES

Examples of play in the CS classroom

MecaBricks.com Duck Challenge



ENVIRONMENT

CS + Makerspace
CS + X Playground



EXPRESSIVE MEDIUM

Low Floor (Entry
Level)



INSTRUCTION

“Guided”
Self-paced



PEERS

By Myself



Python Play with Repl.it

*Emily Thomford @thegrene

 repl.it/languages/python_turtle

main.py

1 | Not sure what to do? Run some [examples](#) (start typing to dismiss)

Hello

```
import turtle

t = turtle.Turtle()

for c in ['red', 'green', 'yellow', 'blue']:
    t.color(c)
    t.forward(75)
    t.left(90)
```



ENVIRONMENT

Visible Thinking



EXPRESSIVE MEDIUM

High Ceiling -
Text-based
environments



INSTRUCTION

Inquiry - guided
instruction



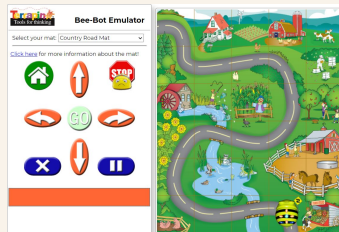
PEERS

Side-by-Side with
you partner

@drabigailjoseph | @mckinj01 #MakerEdConvening



Kinders - BeeBot Emulator



ENVIRONMENT

Play Pen



**EXPRESSIVE
MEDIUM**

Low Floor



INSTRUCTION

Inquiry - Guided
Instruction

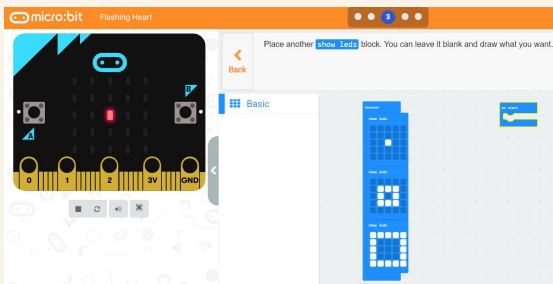


PEERS

Side by side



MakeCode



Tutorials

New? Start Here!

Flashing Heart



Name Tag



ENVIRONMENT

PlayPen & CS
Playground



EXPRESSIVE MEDIUM

Block-Based



INSTRUCTION

“Guided” Self
Paced

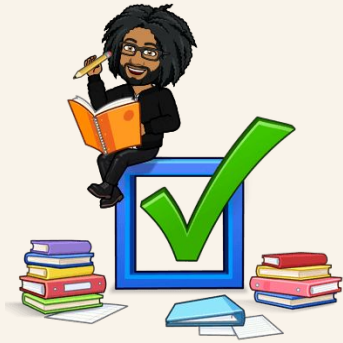


PEERS

Step-by-Step
&
Side -by-Side



Final Considerations



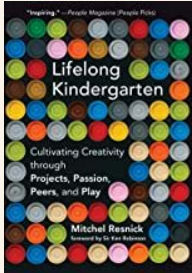
Framework for play = Choose your own adventure

In-Person: materials to use, social distancing,

Remote: limited Peer interaction, managing experiences and opportunities

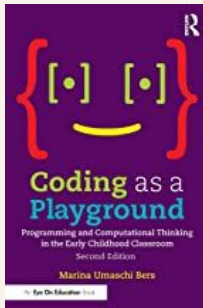
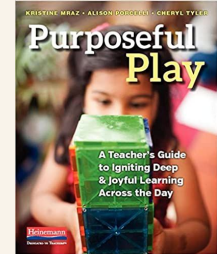


RESOURCES



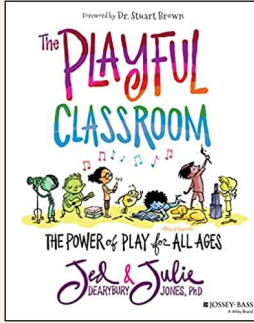
Lifelong Kindergarten: Cultivating Creativity through Projects, Passion, Peers, and Play by Mitchel Resnick

Purposeful Play: A Teacher's Guide to Igniting Deep and Joyful Learning Across the Day by Kristine Mraz, Alison Porcelli, Cheryl Tyler



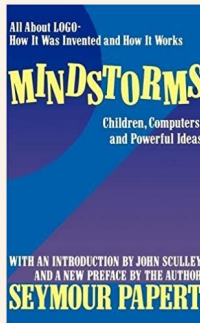
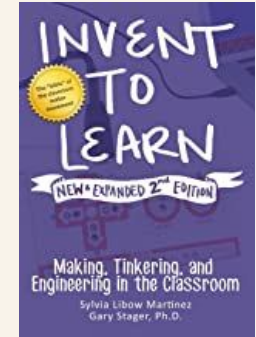
Coding as a Playground (Eye on Education) by Marina Umaschi Bers

RESOURCES



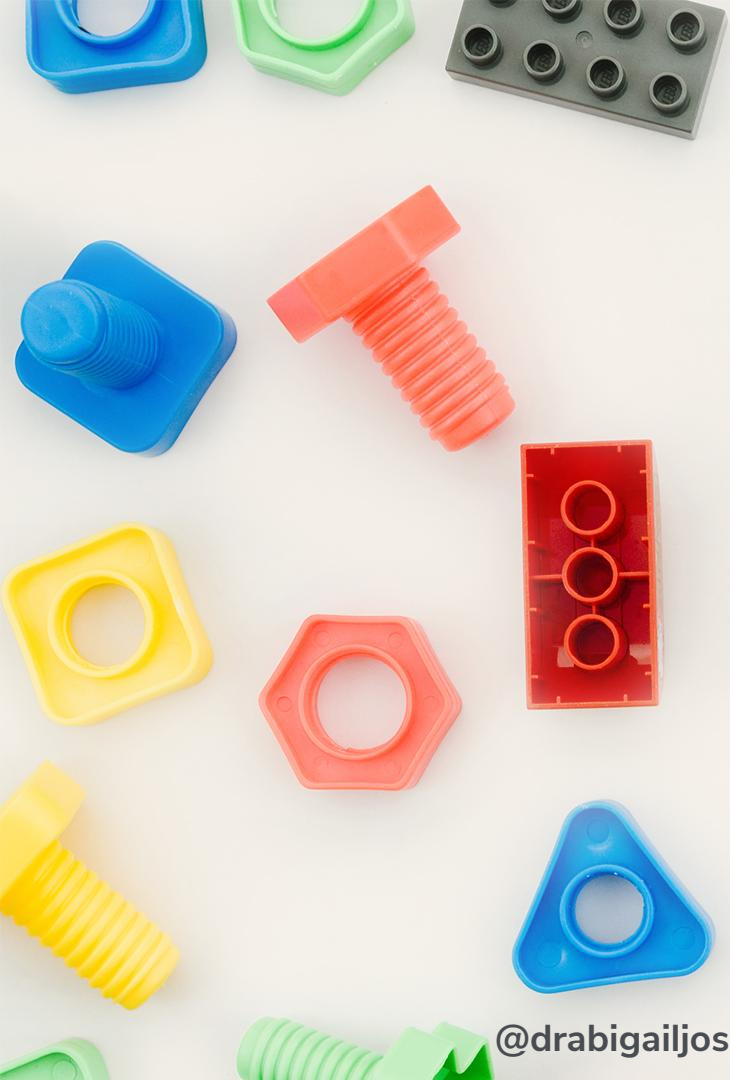
The Playful Classroom 1st Edition by Jed Dearybury and Julie P. Jones

Invent to Learn: Making, Tinkering, and Engineering in the Classroom by Sylvia Libow Martinez and Gary S. Stager Ph.D.



Mindstorms: Children, Computers, And Powerful Ideas 2nd Edition by Seymour A. Papert





Questions?

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Let's continue the conversation



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