

# Coding

(an intro for K to 3<sup>rd</sup> graders)

Erik Riedel, PhD

November 2015

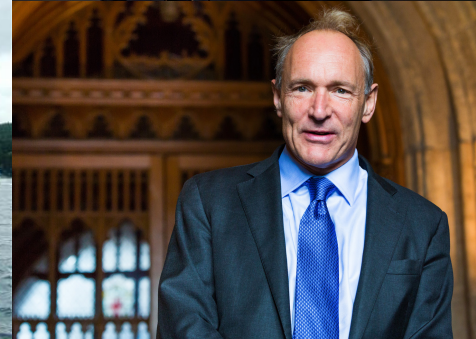
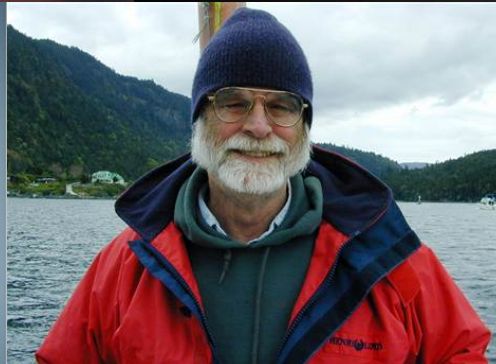
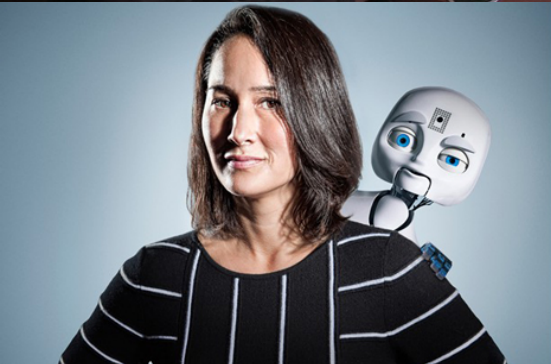
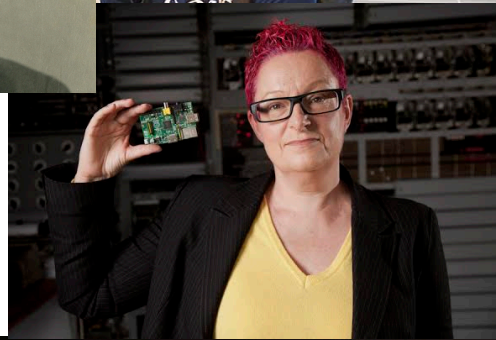
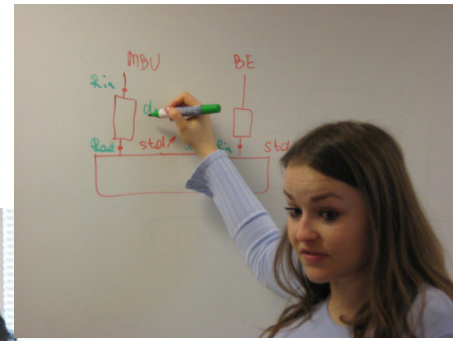
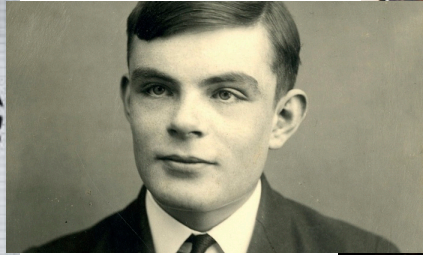
# Computer Science

The **art** of blending human  
**ideas** and digital **tools** to  
increase **problem solving**  
power

# Computer Scientist

A **person** who is **skilled** at  
modifying **problems** for  
digital **solutions**

# Computer Scientists





# Computer Scientists

Grace  
Hopper

Alan  
Turing

Christopher  
Hocutt

Sabrina  
Williams

Kataryna  
Wac

Maya  
Gokhale

Picard  
research  
glasses

Sue  
Black

Brewster  
Kahle

Gail  
Carmichael

Rosalind  
Picard

Cynthia  
Breazeal

Jim  
Gray

Tim  
Berners-Lee

Annie  
Easley

# Data

Information, including:  
facts, samples, **names**,  
and **numbers**

# Programming

Writing **instructions**  
for a digital tool

# Comstock®



FOR YOUR  
VERY OWN  
PIE!

## Blueberry PIE FILLING

NET WT 21 OZ (1 LB 5 OZ) 595 g

### Comstock Blueberry PIE FILLING

READY FOR YOUR CRUST—NOTHING TO ADD

#### RESOLUTION PUDDIN' CAKE (Makes 1 cake; 1½ cups sauce)

1 pkg (16 oz) pound cake mix  
1 can (21 oz) Comstock Blueberry  
Pie Filling  
¼ cup butter or margarine  
1 tablespoon RealLemon Reconstituted  
Lemon Juice

Prepare pound cake mix according to package directions. Drain pie filling; reserve syrup. Fold blueberries into batter. Turn into greased and floured 9 x 5-inch loaf pan. Bake according to package directions. In small saucepan, combine reserved syrup, butter and lemon juice. Bring to a boil; simmer 3 minutes. Serve sauce over cake slices.

#### BLUEBERRY STREUSEL COFFEE CAKE (Makes 12 squares)

**Cake:**  
1½ cups sifted all-purpose flour  
¾ cup sugar  
3 teaspoons baking powder  
½ teaspoon salt  
¼ cup shortening  
½ cup milk  
1 egg  
1 teaspoon vanilla  
1 can (21 oz) Comstock Blueberry  
Pie Filling

**Topping:**  
¼ cup firmly packed light brown sugar  
1 tablespoon all-purpose flour  
1 tablespoon butter or margarine,  
melted

Cake: In large bowl, sift together flour, sugar, baking powder and salt. Cut in shortening. Add milk, egg and vanilla. Spread ½ of batter in greased 13 x 9-inch baking dish. Top with pie filling. Carefully spread remaining batter over blueberries.

Topping: In small bowl, combine brown sugar, flour and butter. Sprinkle over batter. Bake at 350° for 30 to 35 minutes.

INGREDIENTS: BLUEBERRIES, WATER, CORN SYRUP, MODIFIED FOOD STARCH, SALT, MALIC ACID (FOR TARTNESS), AND CITRIC ACID (FOR TARTNESS).

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A DIVISION OF CURTICE-BURNS, INC.



#### DIRECTIONS:

Just pour and bake—  
Prepare pastry for 2-  
crust, 8 inch pie or use  
9 inch frozen pie shell.  
Pour contents of this  
can into unbaked pie  
shell. Cover with your  
favorite style top crust.  
Crimp edges. Bake at  
425° F for 30 min. or  
until crust is golden  
brown.

STORE IN COOL, DRY PLACE



# YOUR CRUST—NOTHING TO ADD

PAKE  
sauce)  
ke mix  
k Blueberry  
rine  
n Reconstituted

mix according to  
all pie filling; re-  
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floured 9 x 5-inch  
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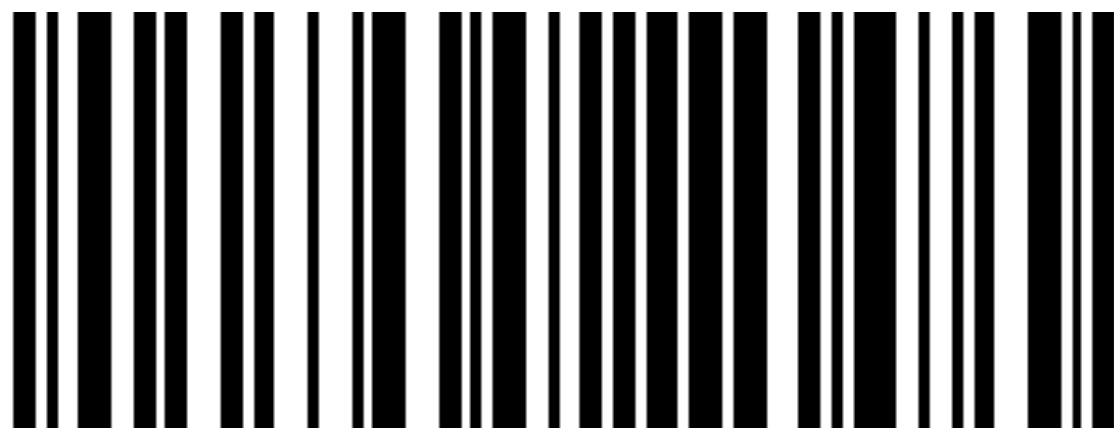
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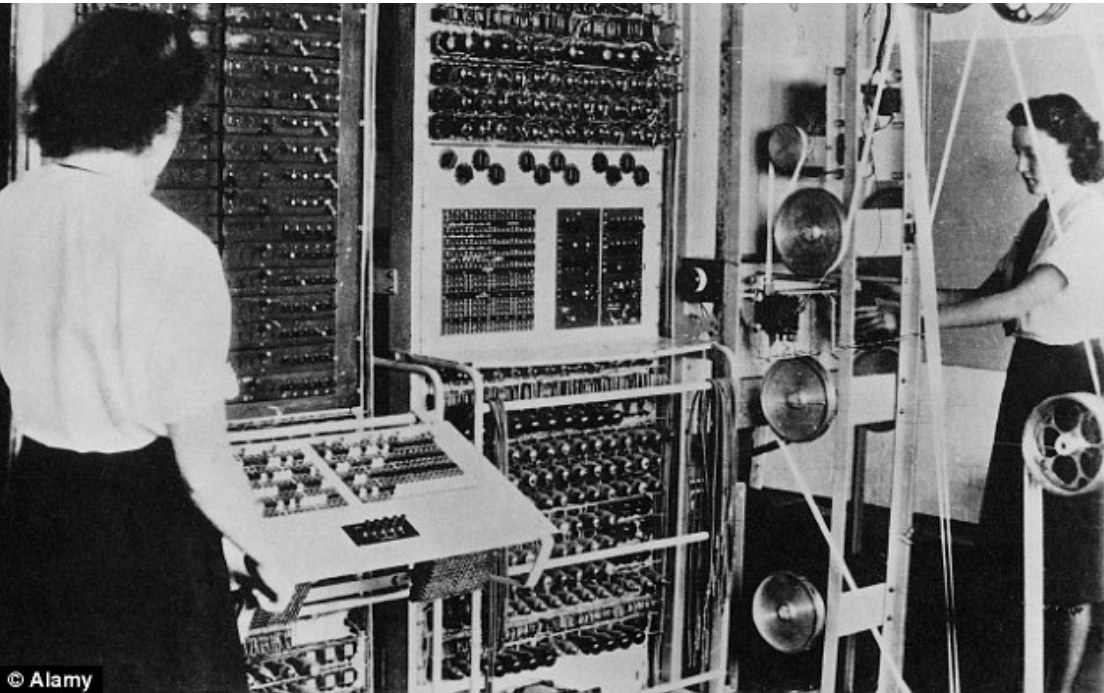






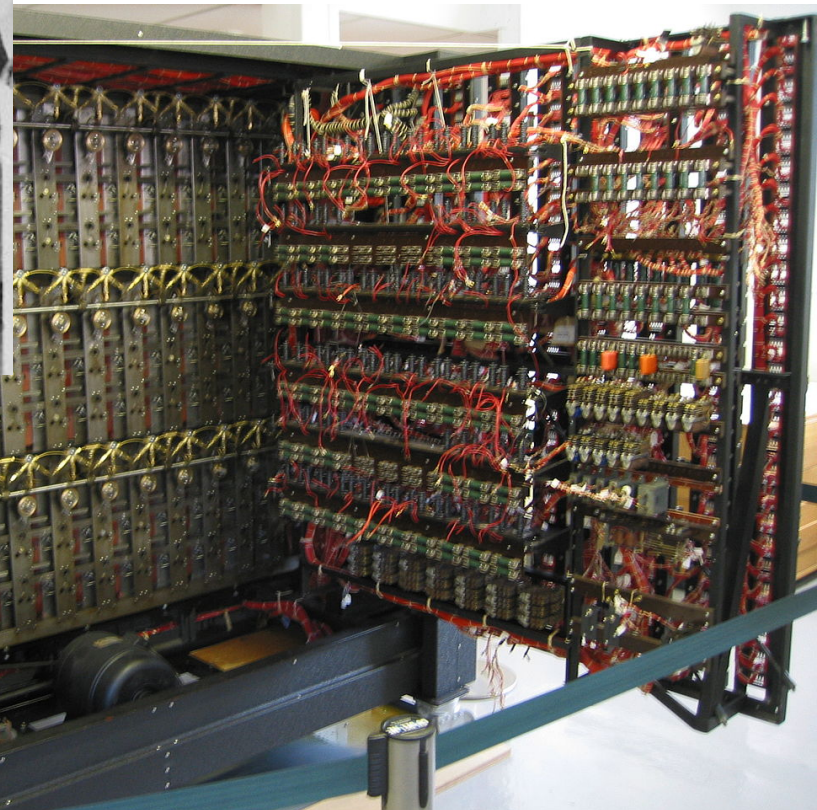
3 1 4 1 5 9 2 6 5 3 5 9

# The Start of Coding



<http://www.businessinsider.com/bletchley-park-veteran-remembers-working-during-wwii-2015-1>  
(Bletchley Park Trust)

[https://commons.wikimedia.org/wiki/File:Bletchley\\_Park\\_Bombe\\_IMG\\_3559.JPG](https://commons.wikimedia.org/wiki/File:Bletchley_Park_Bombe_IMG_3559.JPG)  
(by Magnus Manske, October 2005)

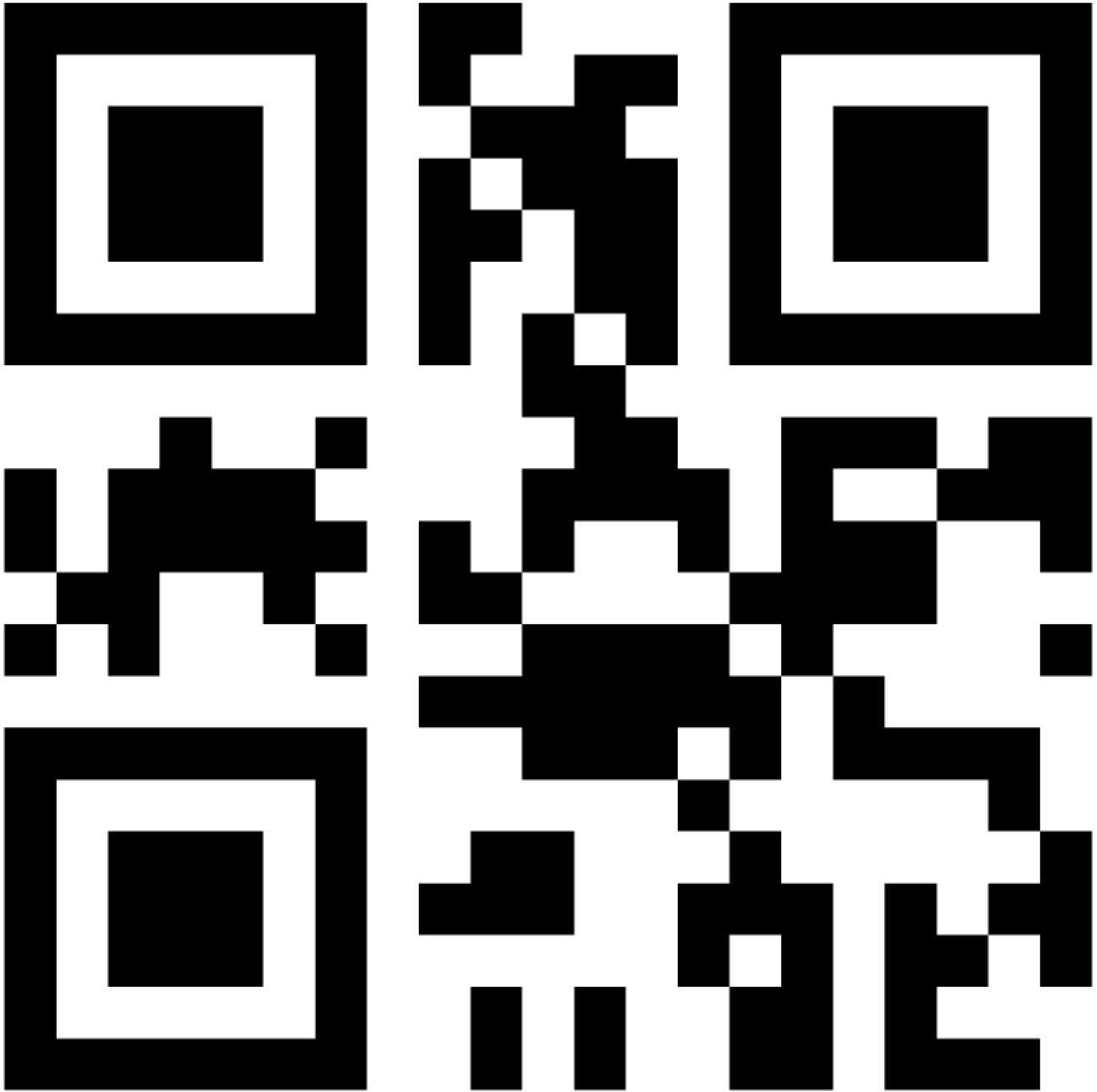


© Alamy

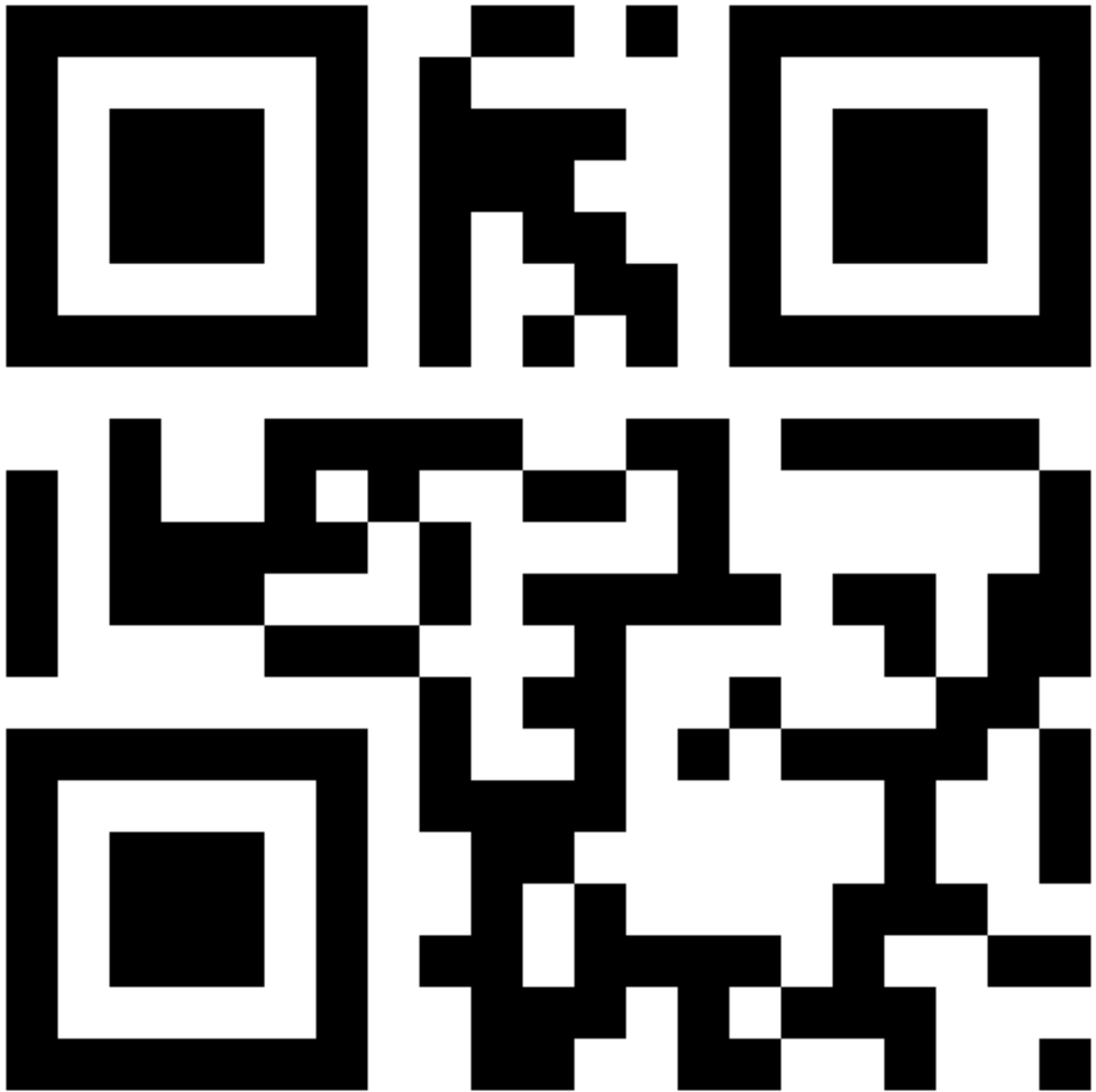








Code



School





Scituate High School

Scituate, Massachusetts 02066

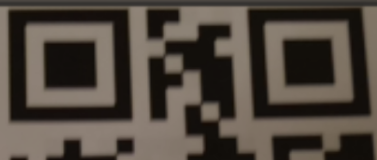


Four score and seven years ago our fathers brought  
forth on this continent, a new nation, conceived in  
Liberty, and dedicated to the proposition  
that all men are created equal. (200 letters)





AT&T CodeScanner

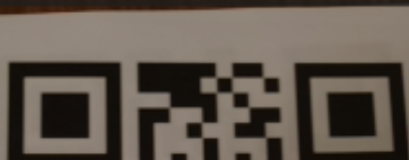


Code

Ok



AT&T CodeScanner



Science

Ok



AT&T CodeScanner

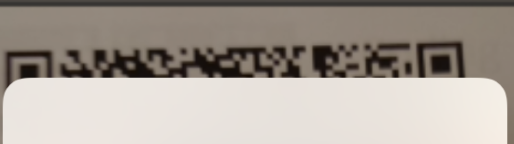


Scituate High School, Scituate,  
Massachusetts 02066

Ok



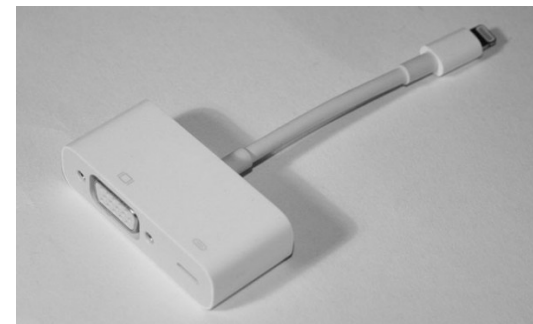
AT&T CodeScanner



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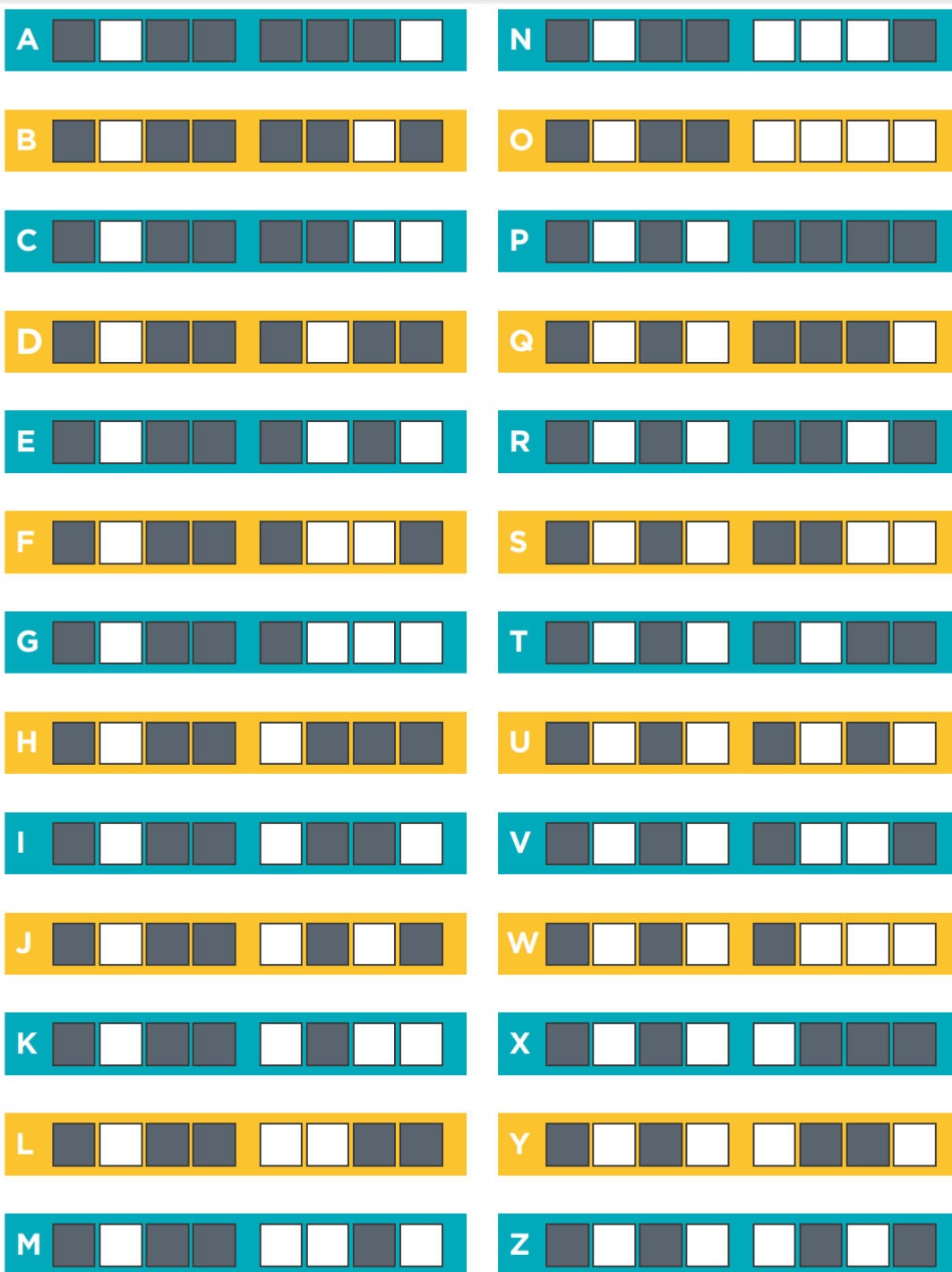
Ok

With the above QR codes printed on pieces of paper, can use the Scanner app on iPhone and display the words on the big projector screen, using this adapter:



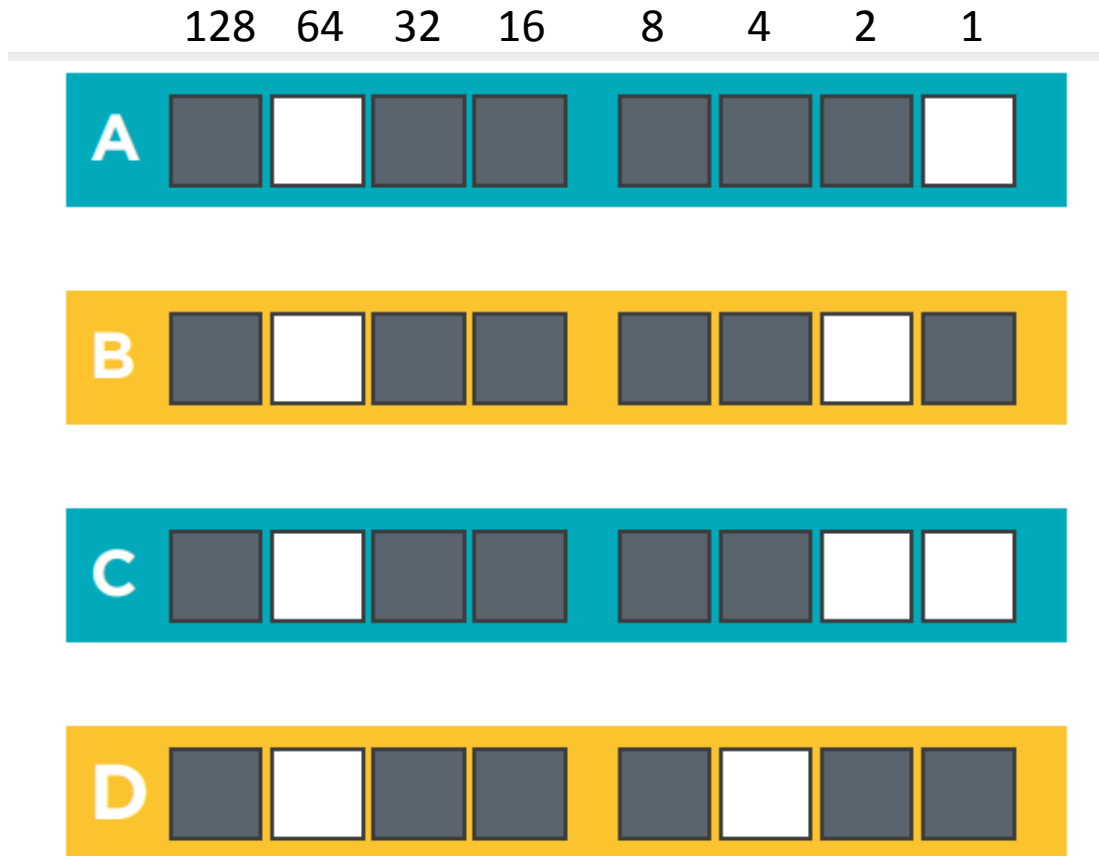
“this is how the computer can read the codes from a piece of paper, now let’s try it as an experiment yourselves..”

# Coding Letters





# Coding Letters with Bits

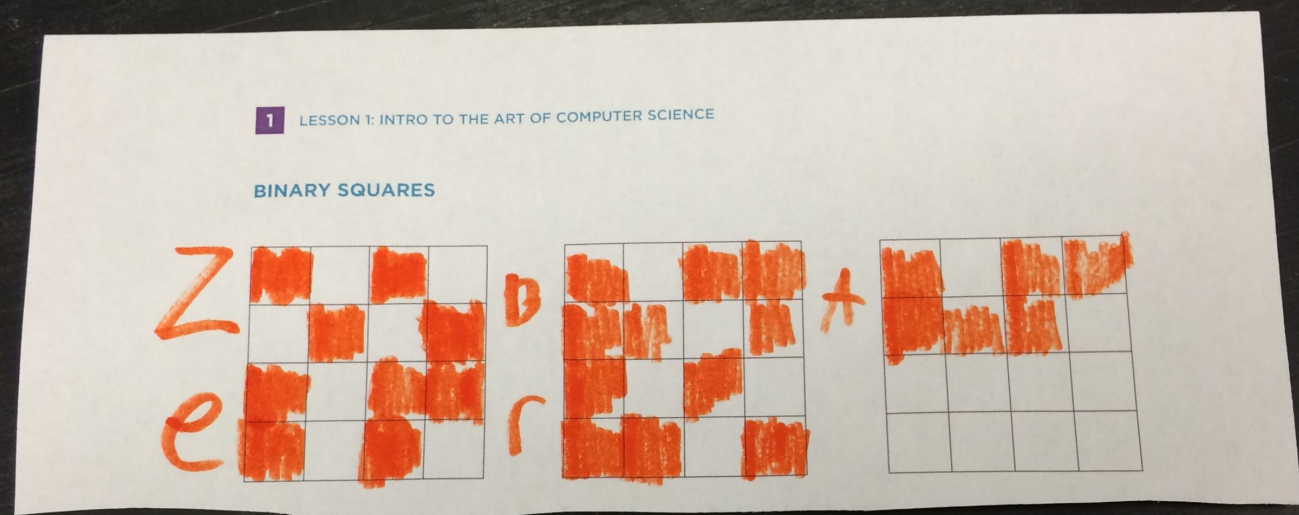


Intro to the Art of Computer Science  
<https://studio.code.org/unplugged/unplug1.pdf>

Thanks  
code.org for  
the inspiration  
and teaching  
materials!

Student computer scientists encode their two initials by following the binary key for encoding letters

Advanced students can do denser codes for as many letters as they want





Thanks Scituate Science Spectacular & Science Exploration Club 2015



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**Science Exploration Club**