# VOLUME 1 C0) ) CDNG 

10 @LOR BY NUMBER ACTIVIIIES WITH BINARY BUILT IN

Left
Brain $\}\left\{\begin{array}{l}3 \\ \text { Graft } \\ \text { Brain }\end{array}\right)$

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## WHAT IS STEAM?

## STEAM IS THE ABBREVIATION FOR SCIENCE, TECHNOOGGY, ENGINEERING, ART, § MATH.

It's an integrated approach to learning that encourages students to think more broadly about real-world problems.

## WHY DO WE NEED THE A IN STEAM?

Because art makes STEM better! Here are some of the concrete benefits of incorporating the arts into science:

- It helps remove idea inhibition (there's no wrong answer in art!).
- It focuses on the process which helps drive innovation.
- It teaches the power of observation, of people and your surroundings.
- It helps hone spatial awareness and mathematical concepts like geometry.


## SAFETY FIRST!

STEAM EXPIORERS PROJECTS ARE INTENDED TO BE PERFORMED UNDER ADULT SUPERVISION. Although Color by Coding is a low risk activity, we like to leave this here... Appropriate and reasonable caution is recommended when activities call for any items that could be of risk, including, but not limited to: sharp tools, hot glue, chemicals, batteries, scissors, and small items that could present a choking hazard. If you are unsure of the safety or age appropriateness of an activity, please consult your child's doctor.

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## WHAT'S INSIDE?

## INSIDE THIS @IOR BY @DING EBOOK IS:

- 10 different printable coloring pages (there's something for everyone, all year round!)
- ASCII binary and decimal decipher the color code pages
- ASCll code sheet
- Answer keys
- Teacher guide with additional learning recommendations
- What's the STEAM Behind It? background learning page


## What is



STEAM Explorers is a monthly digital magazine plus kid-safe online project portal filled with STEAM. It's loaded with a monthly activity calendar, fun articles to read, jokes to tell, projects to do, printables to color, videos to watch, and more. Kids will enjoy making, playing, discovering, and learning their way through each month's issue!

## YOU CAN EARN MORE ABOUT STEAM EXPLORERS HERE: EFTBRAINCRAFTBRAIN.@M/EXPLORESTEAM

## HOW TO JOIN THE STEAM EXPLORERS § EFT BRAIN CRAFT BRAIN ©MMUNITY

STEAM Explorers (and Left Brain Craft Brain, too) is a global community! Come get activity ideas, chat about STEAM, and share your pictures with us on both Facebook and Instagram. We love to see all of the ways you incorporate STEAM into your kids' worlds!

## EFT BRAIN CRAFT BRAIN FACEBCOK PAGE

## EFT BRAIN CRAFT BRAIN ON INSTAGRAM

## MATERIALS

- Paper
- Printer
- Printable coloring page, code sheets, and ASCII code guide
- Art supplies like crayons or markers in red, orange, yellow, green, blue, and brown.
- Rulers (optional, but can help kids find the codes easier)


## PREPARATION

1. First decide whether to use the binary or decimal versions of the codes. The binary codes are significantly harder than the decimal codes. You can offer a choice to the children if desired.
2. Print out worksheets. Code pages can be printed on the back of the Christmas tree coloring page, but make sure that the ASCII codes list is on a separate sheet for ease of use.
3. Gather materials, 1 set per child or group into station quantities.

GOALS: Students will decipher a code using ASCII and then complete a coloring page.
EXPLIN: Describe the project they will be completing. Show how the colors in the color by number page need to be deciphered by figuring out the letters in each color's name. Show them where to find the codes to decipher the color codes sheet on the ASCII code list.

DISCUSS: Talk to the students about the language of computers. Describe how all computer languages are built on the premise of $0=0 F F$ and $1=0 \mathrm{~N}$. Switching lights on and off is a great demo to do while explaining. See What's the STEAM Behind It? section for more information.

## EXTENSIONS (CILK TO ACCESS):

- Want to add some learning to your holiday coloring? Grab another Christmas Color by Coding coloring page and other fun math-infused Christmas coloring pages in the STEAM KIDS CHRISTMAS OLORING BOOK. Or try this CANDY CANE ODING CRAFT.
- Play the IF-THEN CDING GAME, another screen-free way to learn about code.
- Want a new Color by Coding coloring page every month? JOIN STEAM EXPLORERS! The coolest new adventure for kids is a monthly digital magazine plus project portal. It's filled with handson STEAM projects, printables, recipes, and more. It's perfect for classrooms, libraries, and home!


## OTHER RESOURCES:

## CMB B Clise

## INSTRUCTIONS

Figure out the colors in this coloring page by finding the matching letters on the ASCII code sheet. Then color the picture with the numbers noted on the picture. There are two different code options, BINARY and DECIMAL. The binary coloring page is harder, so pick which one is best for you.

## WHAT'S THE STEAM BEHIND IT?

There's a lot of talk today about coding being the language of the future. But what exactly is it and why is it important? Coding makes it possible for us to tell computers how to do stuff, like run our phone, play a video game, and make a website. Any app you use on your phone or computer is possible because of code.

## WHAT IS ASCII?

Computers speak the languages of zeroes and ones, essentially on and off signals to computer parts called transistors. These zeroes and ones have been translated into codes called the ASCII Binary code where every letter, number and character has an 8 digit combination of zeroes and ones. ASCII is the most common format for text files for computers and the internet. It stands for American Standard Code for Information Interchange and uses numbers to represent letters and special characters. The binary version uses only zeros and ones in an 8 bit (or digit) pattern.

But it would take too long to do anything if we had to code in just zeroes and ones, so computers use other languages now, that are all based upon binary.


## ASCII

| CHARACTER | BINARY | CHARACTER | DECIMAL |
| :---: | :---: | :---: | :---: |
| A | 01000001 | A | 65 |
| B | 01000010 | B | 66 |
| C | 01000011 | C | 67 |
| D | 01000100 | D | 68 |
| E | 01000101 | E | 69 |
| F | 01000110 | F | 70 |
| G | 01000111 | G | 71 |
| H | 01001000 | H | 72 |
| I | 01001001 | I | 73 |
| J | 01001010 | J | 74 |
| K | 01001011 | K | 75 |
| L | 01001100 | L | 76 |
| M | 01001101 | M | 77 |
| N | 01001110 | N | 78 |
| O | 01001111 | 0 | 79 |
| P | 01010000 | P | 80 |
| Q | 01010001 | Q | 81 |
| R | 01010010 | R | 82 |
| S | 01010011 | S | 83 |
| T | 01010100 | T | 84 |
| U | 01010101 | U | 85 |
| V | 01010110 | V | 86 |
| W | 01010111 | W | 87 |
| X | 01011000 | X | 88 |
| Y | 01011001 | Y | 89 |
| Z | 01011010 | Z | 90 |
|  |  |  |  |

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3

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$2=\frac{}{01000111} \frac{}{01010010} \frac{}{01000101} \frac{}{01000101} \frac{}{01001110}$


NaME: $\qquad$

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4

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$=$ $01000111010100100100010101000101 \quad 01001110$

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(1) (1) 1 (1) (2)

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01001100
01000101

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## ANSWERS





ロロロ Qロロ ロロロ 0


## ＠LOR BY＠DING


INSTRUCTIONS
Figure out the colors in this color by number
coloring page byy letters on the ASClin code sheet DECIMAL letters on the ASCl code sheet DECIMAL
column．Then color the picture with the
numbers noted on the picture． uses two digit numbers．
${ }_{69} \frac{Y}{89}$

$2=\frac{\mathbf{P}}{80} \frac{\mathbf{U}}{85} \frac{\mathbf{R}}{82} \frac{\mathbf{P}}{80} \frac{\mathbf{L}}{16} \frac{\mathbf{E}}{69}$
$3=\frac{\mathbf{O}}{19} \frac{\mathbf{R}}{82} \frac{\mathbf{A}}{65} \frac{\mathbf{N}}{18} \underset{n}{\mathbf{G}} \underset{69}{\mathbf{E}}$
$4=\frac{\mathbf{G}}{n} \frac{\mathbf{R}}{82} \frac{\mathbf{E}}{69} \frac{\mathbf{E}}{69} \frac{\mathbf{N}}{18}$
$5=\frac{\mathbf{W}}{87} \frac{\mathbf{H}}{12} \frac{\mathbf{I}}{13} \frac{\mathbf{T}}{84} \frac{\mathbf{E}}{69}$
$0=\frac{\mathbf{B}}{66} \frac{\mathbf{L}}{16} \frac{\mathbf{U}}{85} \frac{\mathbf{E}}{69}$

## ©LOR BY＠DING



INSTRUC TIONS
Figure out the colors in this color by number coloring page by finding the matching letters
on the ASCl code sheet DECIMAL column．Then color the picture sith the numbers noted on the
picture．

| 1 | B | L | 0 | E |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | ${ }^{60}$ | 16 | ${ }^{85}$ | 69 |  |  |
| 2 | P | U | R | P | L | E |
|  | ${ }^{80}$ | ${ }^{85}$ | ${ }^{82}$ | ${ }^{80}$ | 16 | 6 |
| 3 | P | 1 | $N$ | K |  |  |
|  | 80 | 13 | ${ }^{18}$ | ${ }^{15}$ |  |  |
| 4 | 0 | R | A | N | G | E |
|  | 19 | ${ }^{82}$ | ${ }^{6}$ | ${ }^{18}$ | ＂ | 6 |
| 5 | Y | E | L | L | 0 | W |
|  | ${ }^{8}$ | 69 | 16 | 16 | 19 | ${ }^{81}$ |
| 6 | G | R | E | E | N |  |
|  | $n$ | ${ }^{82}$ | 6 | 69 | ${ }^{78}$ |  |

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INSTRUC TIONS
 on the ACCII code sheet DECCIMAL colum．Then
color the picture with the numbers noted on the
$1=\frac{B}{60} \frac{\mathbf{L}}{16} \frac{\mathbf{U}}{{ }_{85}} \frac{\mathbf{E}}{69}$
$2=\frac{\mathbf{P}}{80} \frac{\mathbf{U}}{{ }^{85}} \frac{\mathbf{R}}{82} \frac{\mathbf{P}}{{ }^{80}} \frac{\mathbf{L}}{{ }^{60}} \frac{\mathbf{E}}{69}$
$3=\frac{B}{60} \frac{\mathbf{L}}{76} \frac{\mathbf{A}}{65} \frac{C}{67} \frac{K}{15}$
$4=\frac{\mathbf{W}}{87} \frac{\mathbf{H}}{12} \frac{\mathbf{I}}{13} \frac{\mathbf{T}}{84} \frac{\mathbf{E}}{69}$
$5=\frac{\mathbf{Y}}{89} \frac{\mathbf{E}}{69} \frac{\mathbf{L}}{16} \frac{\mathbf{L}}{76}{ }_{79}^{\mathbf{O}} \underset{87}{\mathbf{W}}$
$6=\frac{\mathbf{G}}{n} \frac{\mathbf{R}}{82} \frac{\mathbf{E}}{69} \frac{\mathbf{E}}{69} \frac{\mathbf{N}}{78}$


## BE SURE TO CHECK OUT OUR HOLDAY @LOR BY @DING @LORING PAGES TO!

## CHRISTMAS

## THANKSGiving

EARTH DAY

PLUS MORE @MING SCON, TOO! SHOP.EFTBRAINCRAFTBRAIN.OM

