SUMMER BOREDOM BUSTER CHALLENGE

Code

CODE

Explore the language of computers through crafts and codes.

Did You Know?

- The Z1 was the first programmable computer. It was invented by Konrad Zuse in Germany between 1936 and 1938..

- There are over 250 programming languages in the world. Python, C++, and Java are three of the most commonly used languages today.

FUN FACTS

STEAM FUNNIES

Why did the computer squeak?

Because someone stepped on it's mouse.

STEAM SNACK

Computer Chips & Dip

What's the STEAM behind it?

A computer chip is the brains inside your electronics. It's a piece of electric circuitry that holds the processing and memory inside your computer, phone, or tablet.

Ingredients

- Chips
- Dip

Recipe

Set out a plate of your favorite potato, corn, apple, or veggie chips and some dip. Some fun flavors are peanut butter and honey, ranch, or hummus.
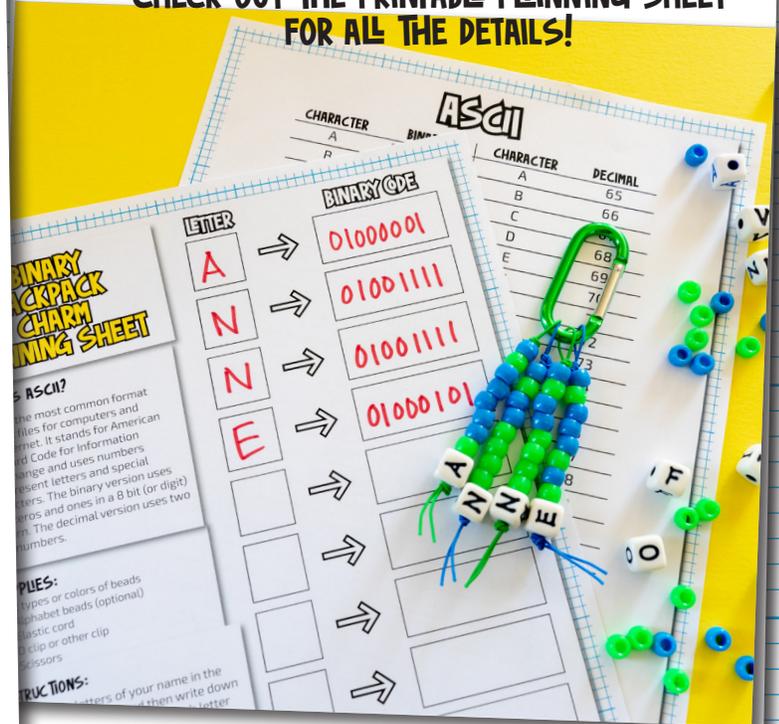
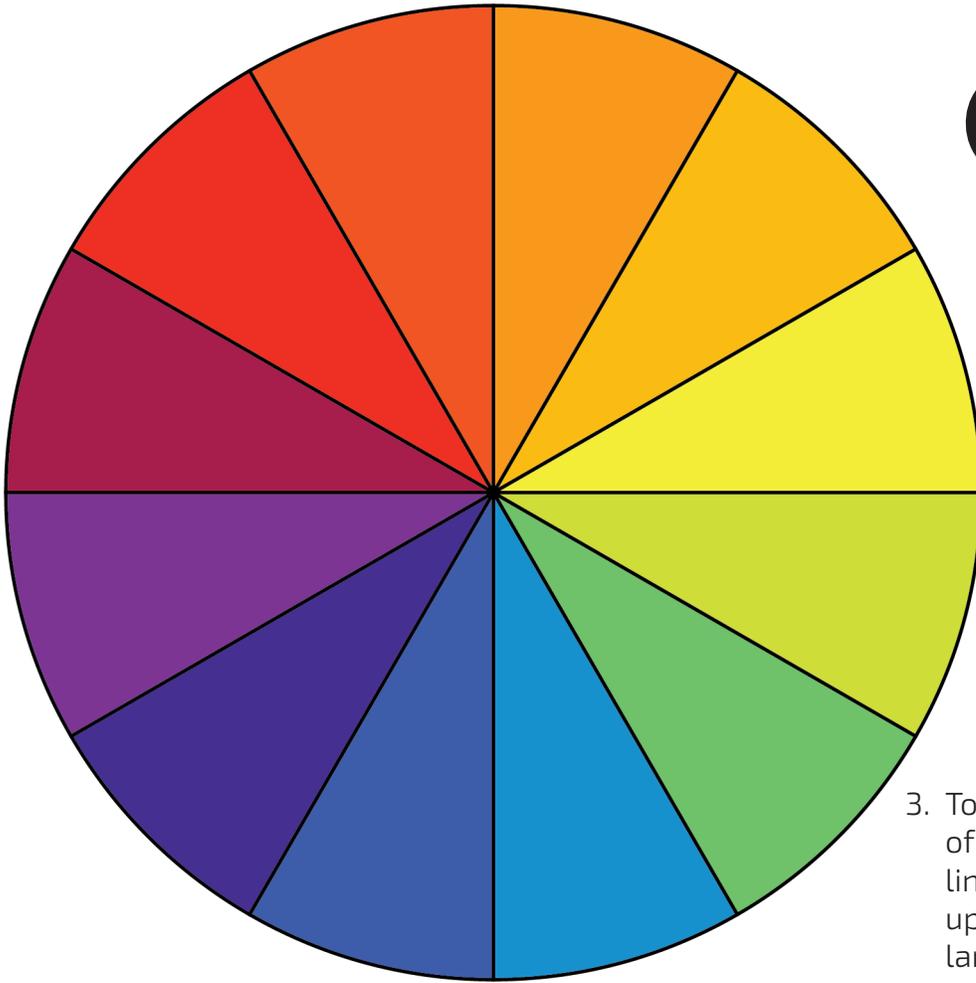## Color Wheel Code Breaker

QUICK STEAM

Build the code breaker on the next page to send secret messages to your friends and family. These code breaker wheels are called ciphers and have been used since ancient times to hide secrets.

BINARY BACKPACK CHARM

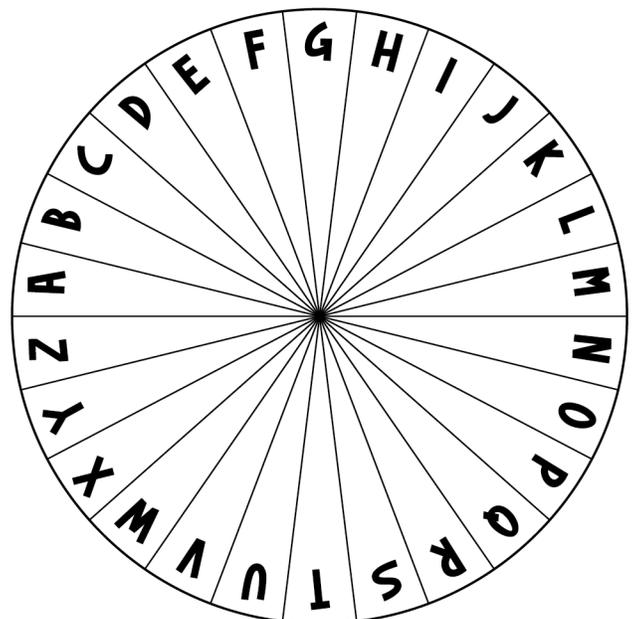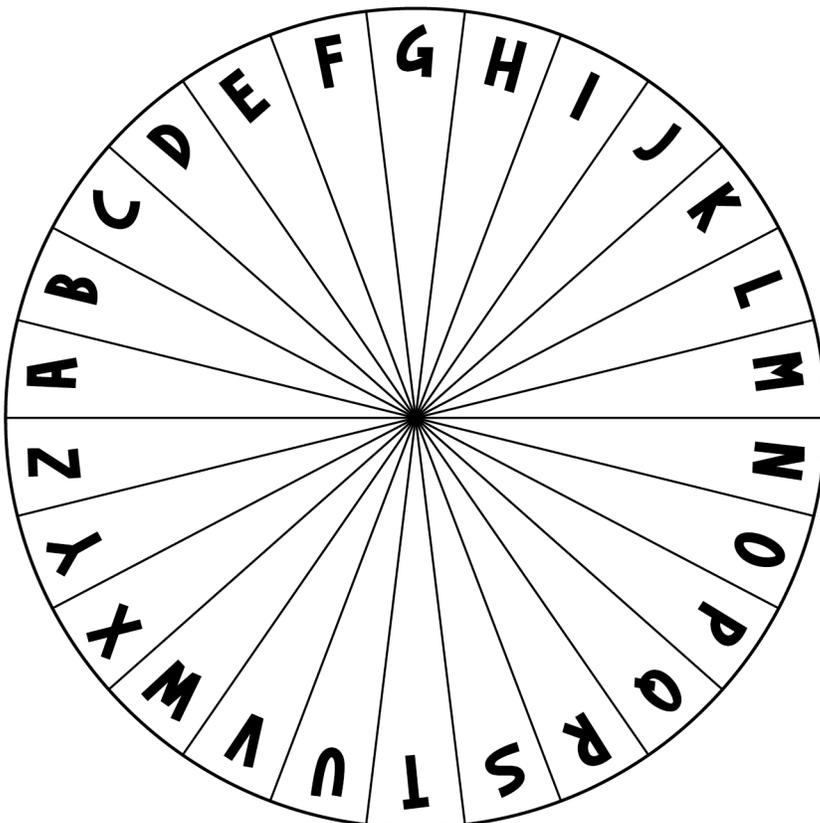### Check out the printable planning sheet for all the details!

Color Wheel Code Breaker

SUPPLIES:

- White cardstock
- Scissors
- Brass fastener

INSTRUCTIONS:

1. First make the code breaker cipher wheel by cutting out the three wheels.

2. Poke a hole in the center of each circle and stack the circles with the largest on the bottom and the smallest on top. Connect with a fastener.

3. To use the code breaker, pick a pair of letters that will set the code and line up the circles. For example, line up A on the small wheel and J on the large wheel.

4. To write a message, find the letter in your desired word on the large wheel. Then find the corresponding letter on the small wheel. Write the small wheel on the message. Be sure to give the person receiving your message the code breaker cipher wheel and the letter pair.

COLOR WHEEL CODE BREAKER

SUPPLIES:
- White cardstock
- Scissors
- Brass fastener
- Markers

INSTRUCTIONS:

1. First make the code breaker cipher wheel by cutting out the three wheels. Color in the color wheel.

2. Write the alphabet in the blank spaces in both the large wheel and small wheel.

3. Poke a hole in the center of each circle and stack the circles with the largest on the bottom and the smallest on top. Connect with a fastener.

4. To use the code breaker, pick a pair of letters that will set the code and line up the circles. For example, line up A on the small wheel and J on the large wheel.

5. To write a message, find the letter in your desired word on the large wheel. Then find the corresponding letter on the small wheel. Write the small wheel on the message. Be sure to give the person receiving your message the code break cipher wheel and the letter pair.
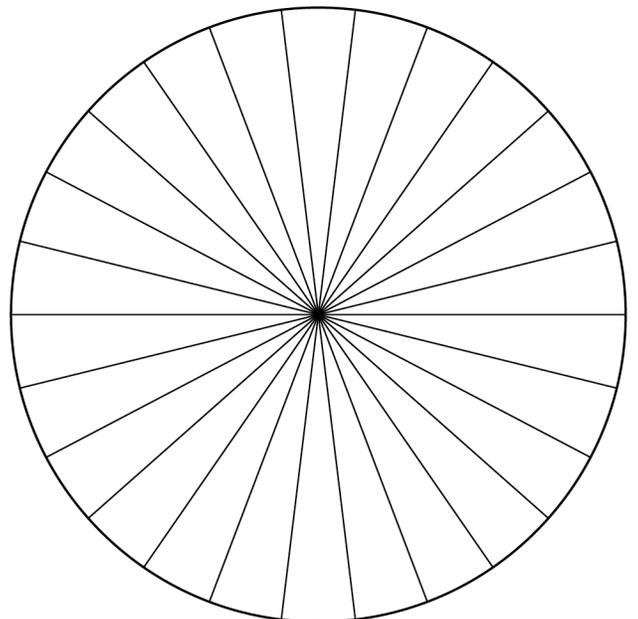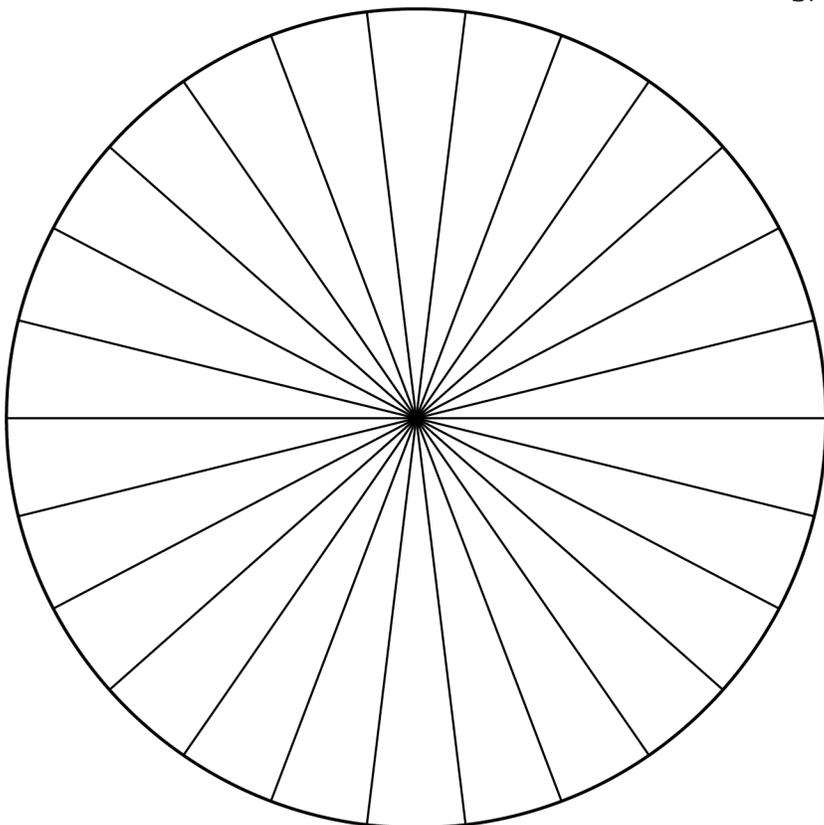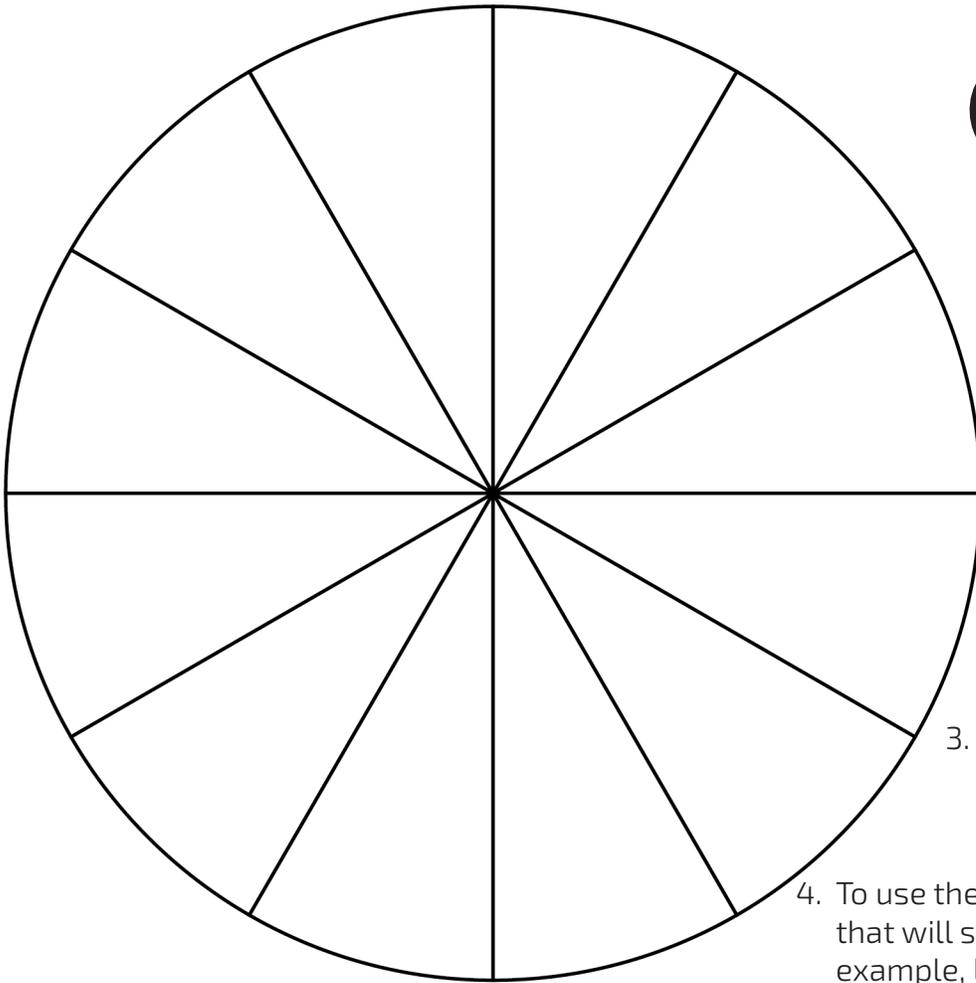
BINARY BACKPACK CHARM PLANNING SHEET

WHAT IS ASCII?

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 a 8 bit (or digit) pattern. The decimal version uses two digit numbers.

SUPPLIES:

- 2 types or colors of beads
- Alphabet beads (optional)
- Elastic cord
- D clip or other clip
- Scissors

INSTRUCTIONS:

1. Write the letters of your name in the boxes to the right and then write down the ASCII Binary codes for each letter using the code list on the next page.
2. Pick one color or shape of bead for zeros and a different color or shape of bead for ones.
3. Cut a 12" long piece of elastic cord. Fold in half and tie a knot on the doubled end, leaving a small loop that can be placed on the D clamp or ring.
4. Thread beads for the first letter in your name onto the elastic cord. Follow the binary pattern you listed on the planning sheet.
5. Add an alphabet bead if desired. Tie a knot in the end of the elastic to secure the beads and cut off the excess elastic.
6. Repeat steps 3-5 for the other letters in your name.
7. Hook bead strands onto the D clamp.

LETTER → BINARY CODE

Zero Bead = ☐   One Bead = ☐

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	O	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