

CHAPTER PROJECT - PRE-ALGEBRA

About the Chapter Project

A special sculpture stands outside the headquarters of the United States Central Intelligence Agency (CIA) in Langley, Virginia. Carved in the copper sculpture is a message in secret code. The code is so complex that for many years even CIA agents could not figure it out. The sculptor, James Sanborn, provided the secret agents with a challenge they could appreciate.

In this chapter project, you will learn about a code used by computers and write in a code used by Julius Caesar. Then, you'll invent a code of your own and make a poster to display your code.

List of Materials:

A large sheet of paper
Several marking pens in different colors

Activity 1: Reading

American Standard Code for Information Interchange (ASCII) is a code used by computers. In ASCII, a number represents each English character. Use the tables below to decode the ASCII message at the right.

ASCII Number	32	46	65	66	67	68	69	70	71	72	73	74	75	76
English Character	space	.	A	B	C	D	E	F	G	H	I	J	K	L

ASCII Number	77	78	79	80	81	82	83	84	85	86	87	88	89	90
English Character	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

7765847269776584736783
3273833284726932766578
7185657169327970328472
6932857873866982836946

1. Translate the secret message
2. Write your own message in ASCII code

Activity 2: Writing

A cipher is a secret code. To decode it, you must know the key. Caesar Cipher, used by Julius Caesar, substitutes one letter for another by shifting each letter in the alphabet three places: **A** becomes **D**, **B** becomes **E**, and so on. In Caesar Cipher, **dog** is written **grj**. Write a letter to a friend in Caesar Cipher.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

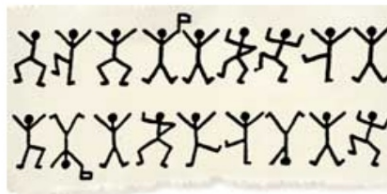


MATH
↓ ↓ ↓ ↓
J X Q E

1. Write your own message in Creaser Cipher Code

Activity 3: Creating

Codes don't always use numbers or letters. In "*The Adventure of the Dancing Men*," the detective Sherlock Holmes used deductive reasoning to decipher a code that substituted stick figures for letters. Using the substitution symbols of your choice, invent a cipher. Use it to write a message. Don't forget to provide the key in the form of a table like that in Activity 1.



A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

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Finishing the Chapter Project

Make a poster to display the cipher you invented. Explain how it works. Include a sample of the cipher and its English translation. You may wish to use a table like the one below to illustrate the cipher's key.

<i>English</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>
<i>Cipher</i>	—	—	—	—	—

Reflect and Revise

Ask a friend or someone at home to review your poster. Are your explanations and illustrations clear? If necessary, make changes to improve your poster.

Chapter Project Checklist

Have you done all of the following?

Replaced each number with a letter

Written the letter in regular English first

Been creative in choosing your symbols, but kept them easy to draw

Been sure to clearly explain how your cipher works and included a sample

Scoring Guide

3 You translate the ASCII code accurately and use the Caesar Cipher correctly to write a letter. Your poster is complete, descriptive, well organized, and easy to read. Your cipher is creative, accurate, and not overly complicated.

2 You make minor errors in translating the ASCII code, in using the Caesar Cipher, or in inventing your own code. Your poster is complete and descriptive, but could be better organized or easier to read.

1 You translate codes incorrectly. Your poster is incomplete and lacks organization.

0 Major elements of the project are incomplete or missing.

Title of the Project - "Cipher Code"

Student Name: _____

Message in English: Minimum of 10 words

Part 1: ASCII

ASCII Table

The Message in
Cipher Code

Part 2: Caesar Cipher

Caesar Discs

The Message in
Cipher Code

Part 3: Creating Code

Your Own Code

The Message in
Cipher Code