# Code Project Resources

**Project Based Learning - How do codes affect our lives and the ways we communicate?**

The following resources can be used to help guide the discovery of codes in our world.

## Online Resources


- [https://www.tynker.com/school/.com/school/](https://www.tynker.com/school/.com/school/) Online lessons cover a wide range of subjects, like using coding to create a map of Pangea splitting apart for geography or an animation to quiz peers on types of government systems in social studies

- [https://www.cia.gov/kids-page](https://www.cia.gov/kids-page) Explore the CIA kids page to discover how the CIA uses codes

- Code Videos:
  - How does Morse Code work?:
    - [https://youtu.be/iy8BaMs_Ju](https://youtu.be/iy8BaMs_Ju)
  - Tedx Talk - Coding: By a kid, for kids:
    - [https://youtu.be/vOsdfRbrNck](https://youtu.be/vOsdfRbrNck)


## Printed Leveled Readings

- The Impossible Escape
- Ancient Egyptian Writing
- History of @
- Morse Code
- Pigpen Cipher
- Sending Messages
Code Project Resources

Project Based Learning- How do codes affect our lives and the ways we communicate?

Articles For Parents and Caregivers

- Education World: Welcoming Family Diversity in the Classroom:

- Edutopia: How Teachers Can Support PBL at Home:
  - https://www.edutopia.org/article/how-teachers-can-support-pbl-home

- Edutopia: Strategies for Differentiated Instruction in Project Based Learning:
  - https://www.edutopia.org/blog/differentiated-instruction-strategies-pbl-andrew-miller
Joe Simpson and Simon Yates were best friends and expert climbers. In 1985 they decided to climb Siula Grande, a mountain in Peru that is over 6,300 meters high!

Joe and Simon carefully planned their climbing trip. They decided to climb up the western side of the mountain. It was a very dangerous and difficult climb. After a long, tiring day, they finally reached the top. Joe and Simon felt great! They made history that day. They were the first climbers to reach the summit by climbing up the western side.
"We need to hurry," Simon said. "We don't have any gas to heat water, and the weather isn't good." It was very windy and snowy.

Joe finished packing the equipment. They needed to descend the mountain quickly. They wanted to tell the world about their success, and they wanted to be warm and safe again.

It was difficult to climb down. There was a lot of ice, and soon it started snowing hard. It was very cold and windy. The clouds passed by them, and sometimes they couldn't see through the thick clouds. But they continued in the bad weather because they needed to reach base camp.
Joe put his foot on a rock. He prepared to take a step. Suddenly, he fell and began to slide down the side of the mountain! He was sliding very fast, and he couldn’t stop!

"Joe!" Simon yelled to him.

Joe was sliding down the mountain. The ice was slippery and he couldn’t stop. Suddenly, his foot hit a rock and he stopped. Ouch! He felt a strong pain in his leg and knee. His leg and knee were broken!

Simon climbed down to Joe. Simon was worried. It was almost impossible to climb this mountain. Nobody could rescue them. Then he looked at their ropes and had an idea.

“We can use our ropes to climb down the mountain,” Simon explained. “I can help you. Base camp isn’t far away,” he added to encourage Joe. Simon attached himself to a rock and lowered Joe with his rope. Joe was in terrible pain, but he had to keep moving. They had to get back to base camp before dark!
Simon slowly lowered Joe down with the ropes, until Joe was one hundred meters below him. More and more clouds were coming in. All of a sudden, Simon and Joe were surrounded by thick clouds, and they couldn't see anything!

Then Joe suddenly dropped over the side of a cliff! "Simon! Simon! Stop!" Joe screamed. There was white all around him, but nothing under his feet. He hung on the rope, suspended in the air. "Simon! Pull me up!" Joe yelled. But Simon was too far above Joe and couldn't hear him. There was no answer.
TO START THE GAME

Use the QR Code

OR

Use This Link
bit.ly/2Rd2g8K
CAN YOU BREAK THE CODES?

Write the answers.
The letters in the circles will give you your 7 Digit Code.

1. Who are the main characters? (The climbers – Best Friends?)
   
   [Circles and Dashes]

2. What is the name of the mountain?

   [Circles and Dashes]

3. Where is this mountain?

   [Circles and Dashes]

SECTION 1
CAN YOU BREAK THE CODES?

Match the pictures with the words. The letters are your 5 Digit Code.

1 - HEAT
2 - BASE CAMP
3 - SLIDE
4 - SUMMIT
5 - EQUIPMENT

SECTION 2
CAN YOU BREAK THE CODES?

Read and match.
The letters are your 6 Digit Code.

1. Joe and Simon climbed up Siula Grande.
2. Joe and Simon reached the top of the mountain.
3. Joe packed the equipment.
4. Joe and Simon descended the mountain.
5. The clouds passed by them.
6. Joe started to fall down the mountain.

X  Z  B
V  H  R

SECTION 3
Are these sentences True (T) or False (F)?

The letters T and F make your 6 Digit Code.

1. Joe and Simon decided to climb a mountain in Canada.  □
2. They were the first climbers to climb Siula Grande.  □
3. Joe and Simon needed to get to base camp quickly.  □
4. The weather was cold and rainy.  □
5. Sometimes they couldn’t see through the clouds.  □
6. Simon fell and began to slide down the mountain.  □

SECTION 4
CAN YOU BREAK THE CODES?

Read and match.
The letters will give you your 6 Digit Code.

1. Joe stopped falling when
2. Joe felt a lot of pain because
3. Simon was worried because
4. Joe yelled to Simon but
5. Simon had a plan

^ his leg was broken
B. to lower Joe down the mountain with ropes.
C. his foot hit a rock.
D. Simon couldn’t hear him.
E. nobody could rescue them.

SECTION 5
Answer Key

Section 1: EPOEUAR
Section 2: LSTKY
Section 3: HVRBZX
Section 4: FTTFTTF
Section 5: CAEDB
Ancient Egyptian Writing
by ReadWorks

Hieroglyphs in stone

In English, we write with letters. The letters stand for sounds. We put them together to make words. Later, we can read the words. We can also share them with others. This is one way people remember and share things.

In ancient Egypt, people wrote things too. But they did not use letters and words like English writing. They used pictures or signs
instead. These signs are called hieroglyphs (HIE-row-gliffs).

Some hieroglyphs were pictures of the things they stood for. Other ones stood for gods, people, or events. And some hieroglyphs stood for sounds.

This kind of writing was written from right to left. It was often carved into stone. It can be found on sculptures and structures from thousands of years ago!
**GROWTH MINDSET HIDDEN QUOTE**

Instructions: Use the Pigpen Cipher to decode the message.

```
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
```

**EXAMPLE:**

```
GROWTH MINDSET
```

```
- KID PRESIDENT
```

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```

```
```

---
Instructions: Use the Pigpen Cipher to decode the message.

Example: GROWTH MINDSET

KID PRESIDENT
**GROWTH MINDSET HIDDEN QUOTE**

**Instructions:** Use the Pigpen Cipher to decode the message.

<table>
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<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>E</td>
<td>F</td>
</tr>
<tr>
<td>G</td>
<td>H</td>
<td>I</td>
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<td>J</td>
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<td>L</td>
</tr>
<tr>
<td>M</td>
<td>N</td>
<td>O</td>
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<td>Q</td>
<td>R</td>
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<tr>
<td>S</td>
<td>T</td>
<td>U</td>
</tr>
<tr>
<td>V</td>
<td>W</td>
<td>X</td>
</tr>
<tr>
<td>Y</td>
<td>Z</td>
<td></td>
</tr>
</tbody>
</table>

**Example:**

```
GROWTH MINDSET
```

```
>T<<<E V >><P< <C<<
```

"**IF AT FIRST YOU**

```
> C C C C C
```

"**DON'T SUCCEED**

```
> V < L L L
```

"**YOU'RE NORMAL**

```
< C < F R R R R
```

-KID PRESIDENT"
thank you
for your purchase and support!

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Thank you for respecting my work!

raul 😊
credits

inkley
The Curious History of @

We use this symbol every day without a thought. It makes email possible. The @ sign may have began in an ancient monastery, but it is the most futuristic of symbols.

Sign On

Some historians believe that monks created the @ sign as a shorthand for the Latin word for “to,” “at,” or “towards.” However, the first documented use of @ was in 1536 in a merchant’s letter regarding a shipment of goods by boat. In this letter, @ was shorthand for the Italian word amphora which means “bottles.”

16th century merchants, like this one in Germany, kept handwritten records of goods shipped and received.

A Sign Seldom Seen

By the 20th century, few people still used the sign. It seemed as if the @ was going the way of the ¢ (cents) symbol on keyboards.

On this keyboard, the @ and ¢ shared a little used key.

continued on next page
A Sign Saved!

In 1971, computer scientist Ray Tomilson invented the email address. He was looking for a little-used symbol to link people's names and computers. His eye fell on the @ sign on his keyboard. He sent a message to another computer using the @ sign. His idea worked. Think of all the email addresses in the world. There are hundreds of millions. All that is needed is a name and a domain: name@aol.com, name@gmail.com, name@hotmail.com, name@yahoo.com, and so many more.

Ray Tomilson saved the @ sign.

A New Respect

The Museum of Modern Art (MOMA) in New York City added the @ sign to its art collection. However, this is just a symbolic gesture. No one really owns the @ sign. Anyone can use it.

This symbol is considered by many to be a work of art.
Learn Morse Code

You can write Morse code, or send it via sounds or lights. Dots represent a short sound or light, and dashes a long sound or light.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>.-</td>
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<td>J</td>
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<td>Q</td>
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<td>V</td>
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<td>Z</td>
<td>0</td>
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<td>---</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>
Learn The Pigpen Cipher

This is a very old code that is easy to write. Can you work it out?

<table>
<thead>
<tr>
<th>A</th>
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<th>C</th>
<th>J</th>
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</tr>
</tbody>
</table>

S T U V
W X Y Z
How to solve PigPen Ciphers

PigPen Ciphers are similar to Morse code where you have to substitute symbols for letters of the alphabet.

The letter N would be symbolized as a square with a dot inside. Where as the letter T would look like the greater than symbol.

![PigPen Cipher Key](image)

PigPen Cipher Key
Write Your Own Secret Code!

Create a symbol for each letter and number and write or draw them in the boxes below. When you are done write a message in your very own top secret code!
MESSAGES
SENDING

LEVEL 1 READER

Word Count: 528
A Reading A-Z Level L Leveled Reader

Sending Messages

Illustrated by Maria Vors
Written by Julie Harting
WE'RE MAIL!

TEXT FROM LAME
MY BALL LINE

VISIT WWW.READING-A-Z.COM
FOR THOUSANDS OF BOOKS AND MATERIALS.

WWW.READING-A-Z.COM
SENDING MESSAGES

Written by Julie Harding
Illustrated by Marfa Vorns

Learning Zone
Learning Zone, Inc.
1930 E. River Road #121
Phoenix, AZ 85018
© 2002 Learning Zone, Inc.
Level 1 Learning Reader
Sending Messages

www.learningzone.com
and faster
people to send messages further
over time. Each change has allowed
way we send messages has changed
send messages to each other. The
people have always found ways to
If so, you were sending a message.
Have you ever sent an email?
Have you ever written someone a

Introduction

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Introduction ................................ 4
met something different. Smoke was also used to send messages. A blanket was placed over a smoking fire. When the blanket was removed, a puff of smoke rose into the air. Each pattern of puffs was recognized as a different message. Another way to send a warning of danger was by using drums and beating on a drum was one of the earliest ways to send a message. Messages could be heard several miles away. Different drumbeats might announce that a meeting was going to take place. One might also mean different things. Sometimes signals a long distance. Sometimes with large sticks, this sent hollow logs. People beat on the logs with large sticks. This sent messages from long ago.
the total distance.

The first mail carriers ran a part of each runner ran a part of a group of runners carried a piece by foot. These runners ran long distances to carry mail. Sometimes

Mail

The first mail sent. Written messages became written language. This meant that over time, people developed
is now carried on trucks and planes.
Mail is still carried today. Most mail
is carried by trucks today. Many years ago,
express trains were used to carry mail.

Carrying mail was called the Pony
Express. Trains then replaced horses.

Later, horses were used to carry mail.
In the United States, this way of
carrying mail was called the Pony
Express.

You write your name in Morse code.
Letters. Look at the chart below. Can

different patterns stand for different
dots and dashes. Each dot or
dash was heard as a signal.
Morse code. This code was invented
by Samuel Morse. His invention was called the Telegraph.

Over 150 years ago, a man found a

Telegraph
"walk and talk." You could "use it. You did not have to stay in one place to talk like it. It got its name because you invented. One kind was the walkie-talkie. New kinds of message senders were invented. Once people found ways to send signals through the air without wires. The walkie-talkie and cell phones are just one way to do this.

Telephone

A little more than 30 years after the invention of the telephone, someone using the telephone, people could send voice messages over a wire. This person was named Alexander Graham Bell.
Email is the latest way to send messages is the Internet. Internet messages are called electronic mail. Email is sent from one computer to another. It is much faster than regular mail. An email can be sent to someone on the other side of the world.

Today, many people carry wireless telephones called cell phones. These phones are very small and can be carried in a pocket. How people can make phone calls from just about anywhere.

In an instant, in an instant.
messages will be sent in the future? Were first sent. How do you think
Great deal since early messages
Message sending has changed a
always send messages to each other.
One thing is certain. People will

Conclusion

Index
Solve each problem.

Debby and her friends were comparing the amount of candy they received on Halloween. They recorded their information in the pictograph below.

**Candy Haul**

<table>
<thead>
<tr>
<th></th>
<th>Debby</th>
<th>Maria</th>
<th>Rachel</th>
<th>Carol</th>
<th>Katie</th>
<th>Faye</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>★★★★★★★★</td>
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<td>★★★★</td>
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<td>★★★</td>
</tr>
</tbody>
</table>

= 4 kilograms of candy

1) Who got the most candy?
2) Who got the least amount of candy?
3) Who got more candy, Maria or Carol?
4) How many kilograms of candy did Maria get?
5) How many kilograms of candy did Rachel get?

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= 9 kilograms of candy

6) Who got the most candy?
7) Who got the least amount of candy?
8) Who got more candy, Faye or Katie?
9) How many kilograms of candy did Katie get?
10) How many kilograms of candy did Rachel get?
Solve each problem.

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Thank you for downloading “Code & Go Robot Mouse Challenge Sheets – Freebie!” I hope this document is helpful in your classroom!

Follow my store for updates on free and affordable items: https://www.teacherspayteachers.com/Sellers-Im-Following/Add/Crazy-Old-Teacher

The Learning Resources® Code & Go™ Programmable Robot Mouse is a fantastic resource for teaching coding basics. The pages included here are meant to provide an extension and challenge to the basic mazes provided with the Robot Mouse Activity Set. The pages can be used without the robot mouse, but the activity set does provide a good way for students to test and prove their code.

Get more challenge sheets by purchasing the full set of 16 from my TPT Store! https://bit.ly/2sCkAeq

...and a second set of 16 challenge sheets: https://bit.ly/2S76ZKR

Happy Teaching!
Contents...

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Page 3 – Contents
Pages 4-5 – Maze Sheets
Pages 6-7 – Maze Keys
**Code Mouse Challenge**

**1**

**Coding** is writing clear steps to accomplish a goal. Your goal is to write code which will lead the mouse to the cheese. Write your code by adding symbols to the boxes above.

**Rules:**
- The mouse must stay on the grid, and must not cross a wall.
- The mouse must travel to each action square, and perform an action at that square before moving on.
- The mouse must pass under each tunnel.
*Try to reach the goal in the most efficient way possible (the fewest steps).*

Use these symbols to write your code:

- **↑** Forward
- **↓** Backward
- **←** Turn Left
- **→** Turn Right
- **⚡** Action

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Mouse Challenge

Coding is writing clear steps to accomplish a goal. Your goal is to write code which will lead the mouse to the cheese. Write your code by adding symbols to the boxes above.

Rules:
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**Code Mouse Challenge**

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Use these symbols to write your code:
Four Girl Scouts sold cookies for one month. The list below shows how many boxes were sold by each Girl Scout.

- Isabella - 40 boxes
- Emma - 15 boxes
- Sam - 35 boxes
- Grace - 50 boxes

Use the information from the list to complete the pictograph below and answer the questions.

<table>
<thead>
<tr>
<th>Name</th>
<th>Cookie Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isabella</td>
<td></td>
</tr>
<tr>
<td>Emma</td>
<td></td>
</tr>
<tr>
<td>Sam</td>
<td></td>
</tr>
<tr>
<td>Grace</td>
<td></td>
</tr>
</tbody>
</table>

**KEY**

Each 😐 = 5 boxes

1. How many boxes of cookies did the girls sell in all?

2. How many more boxes of cookies did Isabella sell than Emma?

3. Which two girls sold a total of 75 boxes of cookies?

4. Half of the cookies sold by Grace were Thin Mints. How many boxes of Thin Mints did Grace sell?
Four Girl Scouts sold cookies for one month. The list below shows how many boxes were sold by each Girl Scout.

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<tbody>
<tr>
<td>Isabella</td>
<td><img src="image" alt="Cookies" /></td>
</tr>
<tr>
<td>Emma</td>
<td><img src="image" alt="Cookies" /></td>
</tr>
<tr>
<td>Sam</td>
<td><img src="image" alt="Cookies" /></td>
</tr>
<tr>
<td>Grace</td>
<td><img src="image" alt="Cookies" /></td>
</tr>
</tbody>
</table>

**KEY**

Each Ⓞ = 5 boxes

1. How many boxes of cookies did the girls sell in all? 140

2. How many more boxes of cookies did Isabella sell than Emma? 25

3. Which two girls sold a total of 75 boxes of cookies? Isabella and Sam

4. Half of the cookies sold by Grace were Thin Mints. How many boxes of Thin Mints did Grace sell? 25
Bioglyphs

Use these symbols to create your bioglyph diagram.

**Face Shape:**
- ○ Male
- ○ Female

**Hair Color:**
- ❅ Blonde
- ❄ Black
- ❏ Brunette
- 🌸 Red

The # of strands indicates the month of birthday.

Long strands indicate long hair, while short strands represent short hair.

**Eye Color:**
- ◯ ◯ Green
- ◯ ◯ Blue
- ◯ ◯ Brown
- ◯ ◯ Hazel

An oval eye shape indicates glasses or contacts. A circular shape indicates perfect vision.

**Eyebrows:**
- (Favorite color)
  - ♀ ♀ Red
  - ♀ ♀ Blue
  - ▲ ▲ Green
  - ♀ ♀ Purple
  - — Other

**Nose:**
- △ Rides bus to school
- ◐ Rides in car
- ○ Rides bicycle
- □ Walks

**Necklace:**
- ○ On a sports team
- □ Member of band or chorus
- ★ Member of a club/group
- No charms = None of the above

**Ears:**
- ( Sister(s)
- ) Brother(s)

Use dots (*) inside the ear indicates number of siblings. Dots in upper ear indicates older sibling(s). Dots in the lower ear refer to younger sibling(s).

**Mouth:**
-  o Loves science
- —— Thinks science is ok
- ♀ ♀ Thinks science is scary
-  o Does not like science

**Cheeks:**
-  o  o Likes vanilla ice cream
-  ◯  ◯ Likes chocolate ice cream
- □ □ Other

**Freckles:**
The # of freckles indicates the day of birthdate.

**Eyelashes:**
The # of eyelashes indicates the # of pets.
Bioglyph Challenge

Use your investigative powers to match each classmate with their bioglyph. You are allowed to ask questions that require a yes or no answer. (“Is this your bioglyph?” is not an acceptable question!)

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Bio = Life + Glyph = Symbols

What do we know about this person from their bioglyph?

Face Shape:
- Male
- Female

Hair Color:
- Black
- Brunette
- Red

The # of strands indicates the month of birthday.

Long strands indicate long hair, while short strands represent short hair.

Eye Color:
- Green
- Blue
- Brown
- Hazel

An oval eye shape indicates glasses or contact lenses.

A circle shape indicates perfect vision.

Eyebrows:
- Favorite color
- Red
- Blue
- Green
- Purple

- Other

Now:
- Rides bus to school
- Rides in car
- Rides bicycle
- Walks

Necklace:
- On a sports team
- Member of band or chorus
- Member of a club group
- None

- None of the above

Ears:
- Sisiter(s)
- Brother(s)

The dot (•) inside the ear indicates number of siblings. Dot in upper or indicates elder sibling. Dot in lower ear indicates younger sibling.

Mouth:
- Loves science
- Thinks science is ok
- Thinks science is scary
- Does not like science

Chores:
- Likes vanilla ice cream
- Likes chocolate ice cream

- Other

Freckles:
The # of freckles indicates the day of birthday.

Eyelashes:
The # of eyelashes indicates the day of birth.
1st – Choose the right face shape.

2nd – Add the hair to show your hair color and length as well as the month you were born.
   
   # of strands = Month - Jan = 1, Feb = 2, etc.
   Style = Color of your hair
   Length = Short (Less than 1")
            Medium (Between 2 - 4")
            Long (More than 4")

3rd – Add the eyes to show the color of your eyes and whether or not you wear glasses or contacts.
   
   Oval = Glasses or contacts
   Circle = Perfect vision
   Position of the eyeball = Color of your eyes

4th – Add eyebrows to show your favorite color.

5th – Add a nose to show how you get to school MOST days.

6th – Add charms to show the sports you play or the clubs and groups you are in this year.

Add one shape for each one you are in or plan to be in this year. For example, someone who played football, is playing basketball, and is in Science Club, would have two circles and one star.
7th – Add ears to show if you have brothers and sisters as well as if they are older or younger than you.

Sisters = ear on the left side and brothers = ear on the right side

Add dots to show the number of older or younger sisters or brothers.

8th – Add a mouth to show if you like science.

9th – Add cheeks to show your favorite kind of ice cream.

10th – Add freckles to show the day of your birthday.

For example, someone born on January 26th would have a total of 26 freckles. Put them all on one cheek or split them between the two cheeks.

11th – Add eyelashes to show the number of different kinds of pets you have.

For example, someone who has three dogs, two cats, a bird, and some fish, would have four eyelashes total since they have four different kinds of pets. Put all your eyelashes on one eye or split them between the two eyes.

12th – Write your name lightly on the back of the page so that it does not show through. Turn it in to your teacher.
Bioglyph Challenge
Can you identify your classmates?

RULES:

• You can only ask questions that require a YES or NO answer.
• You cannot ask, “Is this your bioglyph?” or similar questions.
• Use your quiet voices and keep your papers covered to prevent people from getting easy answers.
• Write the person’s name on the line on your worksheet that has the same number that is on their bioglyph page.
• Questions?
Fancy Folding Codes

If you know how to make a paper fan then you can crack these secret messages

Instructions

1. Click on one of the designs below and print out
2. Start by cutting along the dotted line
3. The design now needs to be folded like a fan. Your first fold is to the first set of lines either side of the design
4. Flip over and fold exactly back on itself
5. Carry on in this fashion as neatly as you can until you reach the end of the pattern
6. Now gently stretch out the fan and hold up to eye level.
7. If you have folded it correctly you should see a secret message!

Fold like a fan

[Image of a folded paper fan with the word "COOL"]
INVISIBLE INK FORMULAS

FORMULA #1
- 1 Tablet of Laxative
- 1 Tablespoon Rubbing Alcohol
- Cotton balls
- Household Ammonia

Mash the laxative tablet into the tablespoon of alcohol. Be sure the tablet is entirely dissolved. Write a message on the paper with paintbrush dipped into the solution. As the solution dries, the writing will disappear. To develop the message: dampen the cotton ball with liquid ammonia and dab it on the page. The writing will reappear.

FORMULA #2
- Lemon Juice
- Heat Source

Write your message in lemon juice and wait for it to dry. Use a hair dryer, iron or light bulb (carefully) to expose the message.

FORMULA #3
- Vinegar
- Heat Source

Write your message in vinegar and wait for it to dry (or use hair dryer). Use a hair dryer, iron or light bulb (carefully) to expose the message.

FORMULA #4
- Whole Milk
- Heat Source

Write your message in milk and wait for it to dry. Use a hair dryer, iron or light bulb (carefully) to expose the message.

FORMULA #5
- Vinegar or Lemon Juice
- Red Cabbage Water
(Chop one large red cabbage into small pieces. Note: blackberries, red onions, or even hibiscus flowers can be used as well - simmer the cabbage pieces until the water turns a deep shade of purple. Allow the water to cool. Refrigerate when not in use.)

Write your message in lemon juice or vinegar and wait for it to dry (or use hair dryer). Using a spray bottle, mist red cabbage water over it to expose the message.

FORMULA #6
- 3 Tablespoons Baking Soda
- 3 Tablespoons Water
- Grape Juice

Mix about 3 tablespoons of baking soda and 3 tablespoons water. Write with this mixture on paper and let it dry. Paint or rub the grape juice across the paper to expose the message.

FORMULA #7
- 1 Teaspoon Corn Starch
- 1/4th Cup Water
- Lodine
- Water

Mix the corn starch with the water. Heat it a little, about 30 seconds in a microwave. Stir it and let it cool. Write your message on paper and let it dry. To expose the message wipe the surface of the paper with a sponge this has been wetted in iodine and water.

FORMULA #8
- Whole milk
- Sandpaper
- Pencil

Write a secret message with whole milk. Let it dry. Scrape the pencil point with the sandpaper, letting the pencil dust fall on the message area.
SECRET MESSAGE EGG CHALLENGE

WHAT YOU NEED

» Small bowl
» Measuring cup
» Alum (can find in the spice aisle at your local supermarket)
» White vinegar
» Q-tips
» Hard-boiled egg

WHAT TO DO

In the bowl, dissolve one part alum in one part vinegar. Mix well. Use the Q-tips cotton swab to write or draw something on the eggshell using the alum and vinegar solution as ink. Let dry. Remove the eggshell from the egg.

WHAT HAPPENS

The alum-and-vinegar solution dries invisible, but when the eggshell is removed the writing is visible on the egg's surface (the egg is still edible).

WHY IT HAPPENS

The vinegar (acetic acid) dissolved the calcium carbonate in the eggshell, allowing the alum to permeate the shell and discolor the egg white.

*Ok, we have to admit, we've never gotten this to work. If you're successful, e-mail us a photo at educators@spymuseum.org and we'll send you a prize!