Lesson 4.3
Communication with Codes
In this lesson, students begin a two-lesson Code Challenge, using the Code Communicator Tool. In pairs, students make an image in the app and encode it into binary code. Each pair joins with another pair to form groups of four. The groups are tasked with designing a plan for communicating their codes to their group members across the classroom. Finally, the class reflects on how binary code is an example of a pattern that is used to transmit information. This lesson engages students in firsthand use of binary code to communicate messages and deepens students’ understanding of how technology is used to encode and decode information in order to send that information across distances.

**Anchor Phenomenon:** Human communication

**Students learn:**

- Binary code is a quick and efficient way to transmit information across a distance.
Introducing the Code Challenge

Students are introduced to the Code Challenge that they will work on in this lesson and complete in Lesson 4.4.

Instructional Guide

1. **Connect to the previous lesson.** Ask students to recall what they learned about codes in the previous lesson. [A code is a pattern of symbols. Binary code uses zeroes and ones. Binary code can be used to send messages.]

2. **Introduce the Code Challenge.** Introduce students to the activity they will work on in this lesson and complete in the next.

   As you read in the book *Patterns in Communication*, digital devices use binary code to send and receive information. In the Code Challenge, you will send and receive a message across the room, using binary code. First, you will make an image and use the Code Communicator Tool to encode that image into binary code.

3. **Project the Code Communicator Tool and demonstrate what students will do.** Go to the Code Communicator Tool.
   - Let students know that they will first work with a partner to make an image.
   - Press **Encode**.
   - Under Black and White Image Large, press **NEW**.
   - Make sure the black square at the bottom of the screen is selected and the Show Binary toggle is turned off.
   - Make a simple image as an example.
   - Explain that after students have made their images and recorded them in their notebooks, they can turn on the Show Binary toggle in the app to show the binary code on the image. Demonstrate doing this for your image.
   - Explain that students should record the binary code on the lines under the grid in order from left to right, starting with the top row of the grid. Emphasize that recording the codes accurately is important.
Part of this challenge is to be sure you record your code correctly. Any small error, such as skipping a number or recording the wrong number, can change the entire image.

This is important because in the next lesson, you will be sending your message to other students for them to decode. Therefore, you should be sure to double-check the code you record!

4. **Project notebook.** Have students turn to page 92, Code Challenge Part 1: Encoding an Image, in their notebooks.

   - Point to the "Your Image" grid and let students know that this is where they will record their images.
   - Point to the part of the page labeled “Binary Code for Your Image.” Let students know that this is where they will record the binary code for the image.
   - Emphasize that students should keep their images secret. Partners should not show their images to other classmates.

**Teacher Support**

**Instructional Suggestion**

**Providing More Experience: Today’s Daily Written Reflection**

*If you wanted to send a message to someone across the classroom, how could you do it? Describe three different ways you could send your message.* This prompt (on page 90 in the Investigation Notebook) asks students to think about what they already know about sending and receiving messages. Encouraging students to respond to this prompt can help prepare them for planning a strategy to communicate binary codes to classmates across the room.

**Instructional Suggestion**

**Going Further: Example of Erroneous Code**

Students might be interested to hear an example of what happens when a code is communicated inaccurately. If students exhibit interest, you might describe what happened to the Mariner 1 spacecraft. In 1962, the Mariner 1 spacecraft (without people on board) was destroyed because the programmer missed just one symbol in the code that was responsible for keeping the vehicle on course.
Students complete the first part of the Code Challenge with a partner.

### Instructional Guide

1. **Distribute digital devices.** Distribute one digital device to each pair of students. Let students know that one partner should “drive” the app at a time. Instruct pairs to switch drivers midway through making their images so they both have an opportunity to make part of the image in the app.

2. **Have partners work on the first part of the Code Challenge.** Instruct students to follow the directions on page 92, Code Challenge Part 1: Encoding an Image, in their notebooks. Remind students to keep their images secret from the rest of their classmates.

3. **Reflect on using binary code to send information.** When most pairs have finished recording their codes on page 92, prompt them to individually respond to the question on page 93, Code Challenge Part 1: Encoding an Image (continued), in their notebooks.

4. **On-the-Fly Assessment: Students complete Part 1 of the Code Challenge.** As students complete the first part of the Code Challenge, circulate to observe how they are understanding binary code.

5. **Have students share their responses to the question.**

   How do you think binary code will be helpful for sending a message across the room?
   
   [It might be faster to say “one” and “zero” instead of describing the image. It will be easy to show a symbol, such as holding up a finger for “one,” instead of needing to talk.]

6. **Collect all digital devices.** Ask students to make sure that their digital devices are turned off.
Embedded Formative Assessment

On-the-Fly Assessment 14: Using Binary Code

Look for: As students complete the notebook pages for Part 1 of the Code Challenge, circulate and note how students are understanding the connection between their image and the code they have recorded. Do students recognize the one-to-one correspondence between the zeroes and ones in the code and the black and white squares in the grid? What ideas do students have about how binary code will be helpful for sending messages across the classroom?

Now what? If students do not seem to understand the correspondence of zeroes and ones to the black and white squares, have them make another image in the Code Communicator Tool, but this time, have them turn on the Show Binary toggle. As students make an image, ask them questions such as What happened to the code when you changed the square from white to black? and What do the numbers in the binary code tell you about the pattern of black and white squares in the image?

If students are still struggling to understand how binary code can be used to communicate, and if you haven’t already assigned the optional activity in Lesson 4.2, have students complete the optional activity. For details regarding this optional activity, see the note called Providing More Experience: Using Binary Code to Encode and Decode Images in the Teacher Support tab in Lesson 4.2, Activity 3.

Teacher Support

Instructional Suggestion

Going Further: Encoding More Complex Messages

We suggest that you use the Black and White Image Large for the Code Challenge, but you may decide to make the activity simpler or more complex by having students send a different kind of message. The list below outlines the number of bits needed to encode each kind of message in the Code Communicator Tool:

- Black and White Image Small: 25 bits
- Black and White Image Large: 49 bits
- Color Image Small: 75 bits
- Color Image Large: 147 bits
- Text: up to 65 bits
- Sound: up to 30 bits
Possible Responses

Code Communicator Tool: Encode mode

What students should do and notice:
Each pair of students creates a black and white image in the Code Communicator Tool and records the binary code for that image in their notebooks. Students should notice that an image can be represented as a series of zeroes and ones. An example is shown below.

Investigation Notebook
Code Challenge, Part 1: Encoding an Image (page 92)
Name: ___________________________ Date: __________

Code Challenge
Part 1: Encoding an Image

1. Make an image in the Code Communicator Tool with your partner.
2. In the grid below, fill in squares to make a record of your image. Be sure to keep your image secret from the rest of your classmates!
3. In the Code Communicator Tool, turn on the Show Binary toggle to encode your image.
4. Record the code on the lines below the grid.
5. When you have finished making your image and recording the binary code, answer the question on the next page.

Your Image

Binary Code for Your Image
0000000 0010100 000000
0001000 1000001 0100010
0011100

© The Regents of the University of California
How do you think binary code will be helpful for sending a message across the room?
It might be faster to say "one" and "zero" instead of describing the image.
Designing a Communication Plan

In groups of four, students collaborate to make plans for sending codes across the room.

Instructional Guide

1. Refer back to *Patterns in Communication*. Hold up a copy of the reference book, and then turn to page 42, “Digital Devices,” and read the last paragraph aloud.

2. Ask students to explain what this paragraph means. Accept all responses, but reinforce those that mention the idea that signals become harder to communicate across long distances except when they are being communicated through digital devices.

3. Explain that students will now plan for the next part of the Code Challenge.

   In the next lesson, you will send the binary code for your image across the classroom.

   What might be challenging about this?

   Accept all responses, but you may want to point out that it might be difficult to see and hear across the classroom.

   You will now think of a way to send your code across the classroom without having it degrade, or break down—just like digital devices do. The goal is to send your message quickly and accurately.

   What ideas do you have about how you could do that?

   Have students turn to their partners to discuss this briefly.

4. Have students use sheets of paper or binders to cover the images in their notebooks. Each student should cover the image on page 92 for the next activity.
5. **Assign groups of four.** Have each pair of students join another pair to form a group of four. Pairs should not show their images to the other pairs in their groups.

6. **Have groups plan how pairs will send their messages across the room to the other pairs.** Encourage students to be creative, but remind them that the purpose of the Code Challenge is for each pair to send a message efficiently and to have the other pair in the same group receive and record the code accurately.

7. **Have students record their plans in their notebooks.** Have students turn to page 94, Communication Plan, in their notebooks. Specify that groups should agree on one strategy that all group members think is likely to work.

8. **Discuss patterns in binary code.** Regain the class's attention and then ask the following questions to help students reflect on the crosscutting concept of Patterns.

   - **What do we know about patterns?**  
     [They repeat. They are something we observe to be similar over and over again.]

   - **In what way is binary code a pattern?**  
     [Binary code is a pattern of ones and zeroes. The pattern that we are using is: one is always black, and zero is always white.]

9. **Conclude the lesson.** Let students know that in the next lesson they will be sending their codes to their group members, using the Communication Plans they decided on today.

### Teacher Support

#### Instructional Suggestion

**Student Thinking: Communication Plans**

Students may have varied ideas about how they could communicate their messages across a distance. One reason for having students work in groups to make a Communication Plan is so they can brainstorm ideas and build on one another's suggestions. Students might suggest the following strategies for communicating the binary codes across the room: holding up one finger to represent 1 and holding up the hand in the shape of a circle to represent 0; writing “0” and “1” on different sheets of paper and holding them up; making movements that indicate 0 and 1 (for example, standing represents 0, and sitting represents 1). Encourage students to be creative when they craft their Communication Plans.

#### Instructional Suggestion

**Providing More Experience: Test and Revise Communication Plans**

If you have extra time, you can have groups test their Communication Plans to see if they will work. They can do this by sending the first few numbers of one image’s binary code, and checking to see that the receivers were able to successfully receive those numbers. Then, group members can discuss what worked and what did not work, and revise their Communication Plans to use in the next lesson.
Possible Responses

Investigation Notebook
Communication Plan (page 94)

Answers will vary.

Example:
We will hold up our fingers to show 0s and 1s. One finger held up equals 1, and an O shape held up equals 0. We will hold up the hand signals for 10 seconds each, so people have time to record the code.
Code Challenge
Part 1: Encoding an Image

1. Make an image in the Code Communicator Tool with your partner.
2. In the grid below, fill in squares to make a record of your image. Be sure to keep your image secret from the rest of your classmates!
3. In the Code Communicator Tool, turn on the Show Binary toggle to encode your image.
4. Record the code on the lines below the grid.
5. When you have finished making your image and recording the binary code, answer the question on the next page.

Your Image

<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Binary Code for Your Image

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

Name: _______________________________________ Date: ________________
Code Challenge
Part 1: Encoding an Image (continued)

How do you think binary code will be helpful for sending a message across the room?

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
Communication Plan

With your group, discuss how you will send the code for your image across the room. When you have decided on a plan, write a description of what you are going to do.

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

Make a drawing if it helps you explain your thinking. Label your drawing.
Introducing the Code Challenge

Students are introduced to the Code Challenge that they will work on in this lesson and complete in Lesson 4.4.

Instructional Guide

1. **Connect to the previous lesson.** Ask students to recall what they learned about codes in the previous lesson. [A code is a pattern of symbols. Binary code uses zeroes and ones. Binary code can be used to send messages.]

2. **Introduce the Code Challenge.** Introduce students to the activity they will work on in this lesson and complete in the next.

   - Como leyeron en el libro *Patrones en la comunicación*, los aparatos digitales usan código binario para enviar y recibir información. En el Reto de códigos, enviarán y recibirán un mensaje a través del salón, usando código binario. Primero, harán una imagen y usarán la Herramienta comunicadora de códigos para codificar esa imagen en código binario.

3. **Project the Code Communicator Tool and demonstrate what students will do.** Go to the Code Communicator Tool.
   
   - Let students know that they will first work with a partner to make an image.
   - Press ENCODE.
   - Under Black and White Image Large, press NEW.
   - Make sure the black square at the bottom of the screen is selected and the Show Binary toggle is turned off.
   - Make a simple image as an example.
   - Explain that after students have made their images and recorded them in their notebooks, they can turn on the Show Binary toggle in the app to show the binary code on the image. Demonstrate doing this for your image.
   - Explain that students should record the binary code on the lines under the grid in order from left to right, starting with the top row of the grid. Emphasize that recording the codes accurately is important.
4. **Project notebook.** Have students turn to page 92, Code Challenge Part 1: Encoding an Image, in their notebooks.

- Point to the “Your Image” grid and let students know that this is where they will record their images.
- Point to the part of the page labeled “Binary Code for Your Image.” Let students know that this is where they will record the binary code for the image.
- Emphasize that students should keep their images secret. Partners should not show their images to other classmates.

**Teacher Support**

**Instructional Suggestion**

**Providing More Experience: Today’s Daily Written Reflection**

*If you wanted to send a message to someone across the classroom, how could you do it? Describe three different ways you could send your message.* This prompt (on page 90 in the Investigation Notebook) asks students to think about what they already know about sending and receiving messages. Encouraging students to respond to this prompt can help prepare them for planning a strategy to communicate binary codes to classmates across the room.

**Instructional Suggestion**

**Going Further: Example of Erroneous Code**

Students might be interested to hear an example of what happens when a code is communicated inaccurately. If students exhibit interest, you might describe what happened to the Mariner 1 spacecraft. In 1962, the Mariner 1 spacecraft (without people on board) was destroyed because the programmer missed just one symbol in the code that was responsible for keeping the vehicle on course.
Students complete the first part of the Code Challenge with a partner.

**Instructional Guide**

1. **Distribute digital devices.** Distribute one digital device to each pair of students. Let students know that one partner should “drive” the app at a time. Instruct pairs to switch drivers midway through making their images so they both have an opportunity to make part of the image in the app.

2. **Have partners work on the first part of the Code Challenge.** Instruct students to follow the directions on page 92, Code Challenge Part 1: Encoding an Image, in their notebooks. Remind students to keep their images secret from the rest of their classmates.

3. **Reflect on using binary code to send information.** When most pairs have finished recording their codes on page 92, prompt them to individually respond to the question on page 93, Code Challenge Part 1: Encoding an Image (continued), in their notebooks.

4. **On-the-Fly Assessment: Students complete Part 1 of the Code Challenge.** As students complete the first part of the Code Challenge, circulate to observe how they are understanding binary code.

5. **Have students share their responses to the question.**

6. **Collect all digital devices.** Ask students to make sure that their digital devices are turned off.
Embedded Formative Assessment

On-the-Fly Assessment 14: Using Binary Code

Look for: As students complete the notebook pages for Part 1 of the Code Challenge, circulate and note how students are understanding the connection between their image and the code they have recorded. Do students recognize the one-to-one correspondence between the zeroes and ones in the code and the black and white squares in the grid? What ideas do students have about how binary code will be helpful for sending messages across the classroom?

Now what? If students do not seem to understand the correspondence of zeroes and ones to the black and white squares, have them make another image in the Code Communicator Tool, but this time, have them turn on the Show Binary toggle. As students make an image, ask them questions such as *What happened to the code when you changed the square from white to black?* and *What do the numbers in the binary code tell you about the pattern of black and white squares in the image?*

If students are still struggling to understand how binary code can be used to communicate, and if you haven’t already assigned the optional activity in Lesson 4.2, have students complete the optional activity. For details regarding this optional activity, see the note called Providing More Experience: Using Binary Code to Encode and Decode Images in the Teacher Support tab in Lesson 4.2, Activity 3.

Teacher Support

Instructional Suggestion

Going Further: Encoding More Complex Messages
We suggest that you use the Black and White Image Large for the Code Challenge, but you may decide to make the activity simpler or more complex by having students send a different kind of message. The list below outlines the number of bits needed to encode each kind of message in the Code Communicator Tool:

- Black and White Image Small: 25 bits
- Black and White Image Large: 49 bits
- Color Image Small: 75 bits
- Color Image Large: 147 bits
- Text: up to 65 bits
- Sound: up to 30 bits
Possible Responses

Code Communicator Tool: Encode mode

What students should do and notice:
Each pair of students creates a black and white image in the Code Communicator Tool and records the binary code for that image in their notebooks. Students should notice that an image can be represented as a series of zeroes and ones. An example is shown below.

Investigation Notebook
Code Challenge, Part 1: Encoding an Image (page 92)
Code Challenge
Part 1: Encoding an Image

1. Make an image in the Code Communicator Tool with your partner.
2. In the grid below, fill in squares to make a record of your image. Be sure to keep your image secret from the rest of your classmates!
3. In the Code Communicator Tool, turn on the Show Binary toggle to encode your image.
4. Record the code on the lines below the grid.
5. When you have finished making your image and recording the binary code, answer the question on the next page.

Your Image

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Binary Code for Your Image
0000000 0010100 000000
0001000 1000001 0100010
0011100

Code Challenge Part 1: Encoding an Image (continued) (page 93)
How do you think binary code will be helpful for sending a message across the room? It might be faster to say "one" and "zero" instead of describing the image.
Designing a Communication Plan

In groups of four, students collaborate to make plans for sending codes across the room.

Instructional Guide

1. Refer back to Patterns in Communication. Hold up a copy of the reference book, and then turn to page 42, “Digital Devices,” and read the last paragraph aloud.

2. Ask students to explain what this paragraph means. Accept all responses, but reinforce those that mention the idea that signals become harder to communicate across long distances except when they are being communicated through digital devices.

3. Explain that students will now plan for the next part of the Code Challenge.

   En la lección siguiente, enviarán el código binario para su imagen a través del salón.

   ¿Qué podría ser desafiante sobre esto?

Accept all responses, but you may want to point out that it might be difficult to see and hear across the classroom.

   Ahora pensarán en una manera de enviar su código a través del salón de clases sin hacer que se degrade, o descomponga, tal como lo hacen los aparatos digitales. El objetivo es enviar su mensaje con rapidez y precisión.

   ¿Qué podría ser desafiante sobre esto?

Have students turn to their partners to discuss this briefly.

4. Have students use sheets of paper or binders to cover the images in their notebooks. Each student should cover the image on page 92 for the next activity.
5. **Assign groups of four.** Have each pair of students join another pair to form a group of four. Pairs should not show their images to the other pairs in their groups.

6. **Have groups plan how pairs will send their messages across the room to the other pairs.** Encourage students to be creative, but remind them that the purpose of the Code Challenge is for each pair to send a message efficiently and to have the other pair in the same group receive and record the code accurately.

7. **Have students record their plans in their notebooks.** Have students turn to page 94, Communication Plan, in their notebooks. Specify that groups should agree on one strategy that all group members think is likely to work.

8. **Discuss patterns in binary code.** Regain the class’s attention and then ask the following questions to help students reflect on the crosscutting concept of Patterns.

   - ¿Qué sabemos sobre los patrones?
     - [Se repiten. Son algo que observamos que sea similar una y otra vez].

   - ¿De qué manera el código binario es un patrón?
     - [El código binario es un patrón de unos y ceros. El patrón que estamos usando es: uno es siempre negro, y cero es siempre blanco].

9. **Conclude the lesson.** Let students know that in the next lesson they will be sending their codes to their group members, using the Communication Plans they decided on today.

**Teacher Support**

**Instructional Suggestion**

**Student Thinking: Communication Plans**

Students may have varied ideas about how they could communicate their messages across a distance. One reason for having students work in groups to make a Communication Plan is so they can brainstorm ideas and build on one another’s suggestions. Students might suggest the following strategies for communicating the binary codes across the room: holding up one finger to represent 1 and holding up the hand in the shape of a circle to represent 0; writing “0” and “1” on different sheets of paper and holding them up; making movements that indicate 0 and 1 (for example, standing represents 0, and sitting represents 1). Encourage students to be creative when they craft their Communication Plans.

**Instructional Suggestion**

**Providing More Experience: Test and Revise Communication Plans**

If you have extra time, you can have groups test their Communication Plans to see if they will work. They can do this by sending the first few numbers of one image’s binary code, and checking to see that the receivers were able to successfully receive those numbers. Then, group members can discuss what worked and what did not work, and revise their Communication Plans to use in the next lesson.
Possible Responses

Investigation Notebook
Communication Plan (page 94)

Answers will vary.

Example:
We will hold up our fingers to show 0s and 1s. One finger held up equals 1, and an O shape held up equals 0. We will hold up the hand signals for 10 seconds each, so people have time to record the code.
Desafío de los códigos
parte 1: codificar una imagen

1. Haz una imagen en la herramienta “Code Communicator”
   (comunicadora de códigos) con tu compañero/a.
2. En la cuadrícula siguiente, llena cuadros para crear un registro de tu
   imagen. ¡Asegúrate de mantener tu imagen en secreto del resto de tus
   compañeros/as!
3. En la herramienta “Code Communicator” (comunicadora de códigos),
   enciende el interruptor de palanca “Show Binary” (mostrar binario) para
   codificar tu imagen.
4. Apunta el código en las líneas debajo de la cuadrícula.
5. Cuando hayas terminado de hacer tu imagen y de apuntar el código
   binario, responde la pregunta en la próxima página.

Tu imagen

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Código binario para tu imagen

_________________________________________________________________
_________________________________________________________________
Desafío de los códigos
parte 1: codificar una imagen (continuación)

¿En qué manera crees que el código binario será útil para enviar un mensaje a través del salón?

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
Plan de comunicación

Con tu grupo, discute cómo enviarás el código para tu imagen a través del salón. Cuando te hayas decidido por un plan, escribe una descripción de lo que vas a hacer.

Haz un dibujo si ayuda a explicar tu razonamiento. Identifica las partes de tu dibujo.