Ozobot as Patient Zero

Author: **Rene Perry**

Grades: 2—12
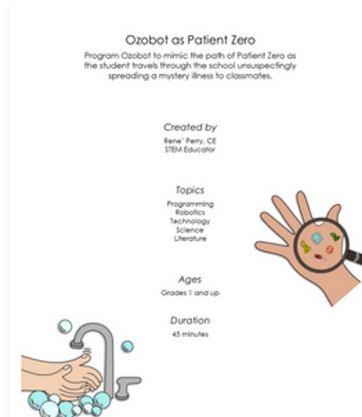
Coding Methods: Color Code

Subjects: Computer Science, Science

Robots: Bit

Brief Summary

Program Ozobot to mimic the path of Patient Zero as the student travels through the school unsuspectingly spreading a mystery illness to classmates.

Pre-Reader/ESL: **No**

Required Materials

- 1 Evo or Bit Ozobot per group
- 1 Printout: Patient Zero took a Virus to School per student
- 1 Printout: Patient Zero took a Bacteria to School per student
- 1 Printout: Germs, Mystery Illness Summary per student
- 1 Printout: Ozobot took a Germ to School (writing promp) per student
- 1 Printout: Patient Zero School Maps per student
- 1 Markers per group
- 1 Ozobot Color Reference Guide per student

Lesson Objectives

- Program Ozobot to mimic the path of Patient Zero as the student travels through the school unsuspectingly spreading a mystery illness to classmates.

Preparation

Background Knowledge

(None)

Lesson Tips

- The objective is to deconstruct a medical detective story then create a program that allows Ozobot to successfully mimic the route of the infected student from the story on the provided Patient Zero School Map. Or, use the microorganism information provided and write your own medical detective story! Exchange your program story with a classmate. Can they successfully program your medical story?

Direct Instruction (Teacher Facing Instructions):

1   Ready your Room: Make the necessary copies for each student. Place Ozobot, markers, and color code reference materials nearby.

2   Provide Materials.
Explain the Medical Detective coding task.
Provide de-bugging suggestions or supplies.
Encourage problem solving and sharing of data.

Lesson Closure (Optional)

(None)

Student Practice (Student Facing Instructions):

1   Choose either the Patient Zero takes a Virus or Bacteria to School story to read and program.
    Deconstruct the sequence of events within the medical story. As you read, the infected student travels through the school, passing by a series of classmates. Using the blank school map as a reference guide, follow the route of the infected student, or Patient Zero, using the markers, write a color program to match the story on a school map.
    For example, if the infected student "Gary" passes by "Audrey" in the story, then you must first find Audrey on the school map. Program Ozobot to travel from its current location to Audrey. Refer back to the medical story, where does the infected student, Gary, go after Audrey? Music class? Lunch with Eli? Continue your program until Gary has completed the school day, ending your medical program.
    Goals: Ozobot will successfully mimic the route of Patient Zero from the provided Patient Zero Bacteria or Virus story on the provided School Map.

Lesson Extension (Optional)

1   Once you have read and programed Ozobot to mimic patient zero in the provided stories, refer to the Germs Mystery Illness Summary sheet. Use the information found, such as modes of transportation for a germ or the symptoms of a virus, as reference while you write your own medical detective story!

Make a coding goal to sequence in at least three students that your little robot must pass by as it runs the program from your Patient Zero story on your School Map.

Use the blank school map to personalize and place your friends names and graphics to support your Patient Zero story program for Ozobot.   After you have written your medical detective story and tested your program on the school map, have another classmate test it! Exchange your Ozobot Patient Zero story with another student. Make sure to place your friends names on a map for them to follow along with your medical detective story. Was your Ozobot Patient Zero medical detective story program successful? Congratulations! If not, be a problem solver and de-bug the story program if necessary.

Goals: Ozobot will successfully mimic the route of Patient Zero from your personal Medical Detective story on the School Map you provide!

Supplements

Additional Attachments

- Ozobot as Ptient Zero

Academic Standards

- ISTE.1.c
- ISTE.4.b
- ISTE.6.a
- CCSS.MATH. 1,2
- CCSS.ELA-Literacy W.K.3
- CCSS.ELA-Literacy W.1.2

Ozobot as Patient Zero

Program Ozobot to mimic the path of Patient Zero as the student travels through the school unsuspectingly spreading a mystery illness to classmates.

Created by

Rene' Perry, CE
STEM Educator

Topics

Programming
Robotics
Technology
Science
Literature

Ages

Grades 1 and up

Duration

45 minutes

# Ozobot as Patient Zero

SUMMARY
- Read the *Patient Zero Bacteria* or *Virus* story. **Program Ozobot to mimic patient zero** as the student weaves through a school day, coughing and touching classmates, unsuspectingly spreading germs. Refer to the Mystery Illness Summary as needed. Recognize various ways germs can pass from person to person. Identify healthy habits.
- Print and read *Germs, Mystery Illness Summary*. Use the information found, such as modes of transportation or the symptom list, as reference and **write your own medical detective story**. Exchange with a classmate and observe what happens!

GROUPINGS
Individuals or small groups

MATERIALS
- Ozobot Bit or Evo, one per group
- Printout: *Patient Zero took a Virus to School*
- Printout: *Patient Zero took a Bacteria to School*
- Printout: *Germs, Mystery Illness Summary*
- Printout: *Ozobot took a Germ to School* (writing prompt)
- Printout: *Patient Zero School Map (blank)*
- Printout: *Patient Zero School Map Color Program Solutions*
- Markers
- Code Reference Guide (http://files.ozobot.com/stem-education/ozobotozocodes-reference.pdf)
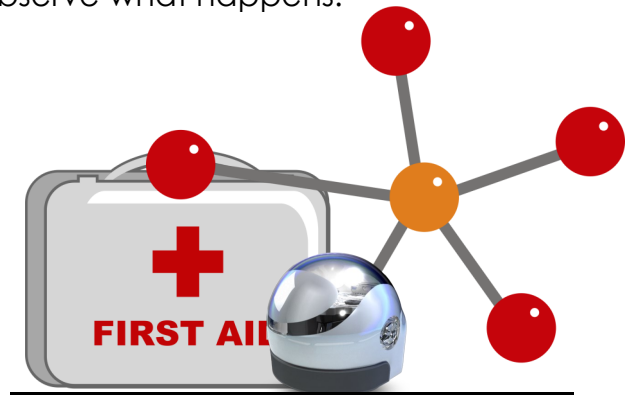
GRADE LEVEL
Grades 1 and up

DURATION
45 minutes

VOCABULARY
- **Ozobot Bit and Evo** - a little robot that can follow drawn lines or can be programmed using visual codes or through the OzoBlockly programming language
- **Biomimicry** - mimicking nature to perform a task or solve a problem using robotics
- **Chronological Order** - a sequence of events based on the time they occurred
- **Germ** - a microorganism, bacteria or virus, the source of the mystery illness
- **Disease** - an illness with well defined symptoms
- **Communicable** - the spread of a disease from person-to-person through direct or indirect contact with a contagious or infected person
- **Patient Zero** - the person identified as the first carrier of a communicable disease

Patient Zero took a Bacteria to School

Program Ozobot to mimic the path of *patient zero* as the student travels through the school unsuspectingly spreading a contagious *bacteria* to his classmates, causing an outbreak of *strep throat*!

- Read the *Patient Zero took a Bacteria to School*.
- Using the *Patient Zero School Map*, program Ozobot to mimic the path of the infected student.
- Refer to the *Germs, Mystery Illness Summary* as needed.

Richard woke up and hurriedly got ready for school. Downstairs, his mom had breakfast ready for him and his little sister, Clara. Richard noted that his sister was looking tired and she kept touching her throat.

The school bus was close to his house. Richard grabbed his backpack and, in his haste, he drank the rest of the juice from his sister's cup. Richard contracted the strep throat germ from his sister's cup.

On the bus, Richard sat next to Isabella and shared stories about the upcoming soccer game after school. He transferred the germ to his friend through the air while they sat close to each other.

Between classes, Richard noticed he was feeling a bit warm. He walked with his friend Cloe where he unknowingly spread germs to Cloe when they traded homework packets and books before math class.

After math, Richard started sneezing in the hallway. Richard paused by his friend George to get a tissue and blow his nose. As Richard continued through the school hallways, he accidently coughed on classmate Emily as he passed her in the hallway on his way to music class. Both George and Emily breathed in the contagious germ as it traveled through the air.

In music class, Richard practiced his duet with Charlotte passing the germ to her. Richard's throat was a little tender after singing. Harrison probably got the strep throat bacteria from Richard when he borrowed his drumsticks to use in band practice.

When the bell rang, Richard slowed down and joined his friends, Nathan and Mia, in the lunchroom. Forgetting to wash their hands, Richard spread the germs when he shared a chocolate bar with his two classmates.

When school ended, Richard joined his friend Liam outside for the soccer game. Richard possibly spread the strep throat bacteria through direct contact as the two boys exchanged high-five's, while cheering their team to victory!

Patient Zero took a Virus to School

Program Ozobot to mimic the path of **patient zero** as the student travels through the school unsuspectingly spreading a contagious **virus** to his classmates, causing an outbreak of **chicken pox**!

- Read the *Patient Zero took a Virus to School*.
- Using the *Patient Zero School Map*, program Ozobot to mimic the path of the infected student.
- Refer to the *Germs, Mystery Illness Summary* as needed.

Richard woke up and hurriedly got ready for school. Downstairs, his mom had breakfast ready for him and his little sister, Clara. Pancakes were the family favorite! Clara wasn't eating though, she kept hugging her blanket. Richard moved the blankie from the kitchen table and noticed a small rash on his sisters arm.

The school bus was close to his house, Richard grabbed his backpack and hugged his mom and sister goodbye. Richard contracted the chicken pox virus from touching his sister and her blanket.

On the bus, Richard sat next to Marcus and shared his excitement about the upcoming theater performance after school. Richard transferred the germ to his friend through the air while they sat close to each other.

At school, Richard noticed he was feeling a bit warm, and he had a slight headache. Richard walked with his friend Oliver to class where he unknowingly spread germs to Oliver as they looked through their science journals and iPads together.

After science, Richard accidently coughed on classmates George and Emily as he paused by his friends in the hallway on his way to drama class. They breathed in the germ as it traveled through the air.

In drama class, Richard slowed down to practice his leading role with Elijah passing the germ to him. Richard started scratching his arm. He didn't think anything of it, maybe a bug bite?

When the bell rang, Richard joined his friends, Charlie and Noah, in the lunchroom. Forgetting to wash their hands, Richard spread the germs when he shared a brownie with his two classmates.

Richard walked down the hallway, passing Mia and Olivia, on his way to his locker. There, Richard accidently sneezed the virus on Tamara as she collected her school books from the locker next to his.

When the final bell rang and school ended, Richard joined his classmate Sachi for the school's theater performance. Richard possibly spread the chicken pox virus when he held Sachi's hand as they located their seats inside the auditorium.

Mystery Illness Summary

Strep Throat
Symptoms

- An infection in the throat and tonsils caused by a bacteria. Symptoms may include red swollen tonsils, sore throat, difficulty swallowing, swollen and tender lymph nodes in the neck, mild body aches, fever, and a general feeling of tiredness and weakness.

Chicken pox
Symptoms

- An illness caused by a virus that is transmitted by direct contact with the rash or droplets dispersed by coughing or sneezing. Symptoms may include fever, loss of appetite, headache, fatigue (tiredness), raised pink or red bumps that are itchy. These bumps turn into blisters then crust or scab.

How does a germ travel from person to person?
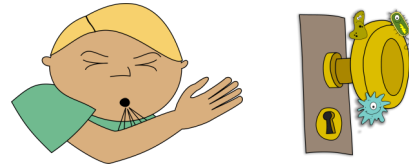
MODES OF TRANSPORTATION

- Direct Contact - *A common way for infectious disease to spread is through direct transfer of bacteria from person to person (touch, cough, sneeze, kissing).*
- Indirect Contact - *Most germs can linger on a tabletop, counter, or doorknob touched by someone ill, you can pick up the germs left behind. If you then touch your mouth, eyes, or nose before washing your hands, you may become infected.*
- Airborne - *This type of disease transmission occurs when germs travel through the air and are inhaled by another.*
- Insect - *Some germs rely on a carrier, such as a mosquito (malaria), tick, or a flea to move from person to person. These carriers are known as vectors.*
- Contaminated food or water - *Another way germs can infect you is through contaminated food (E.coli) or water (cholera).*
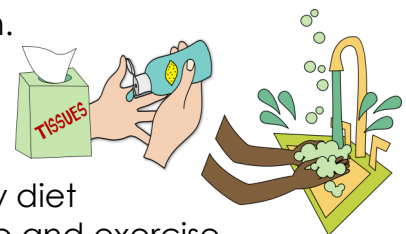
How does a germ enter your body?

- Microorganisms are capable of causing disease, and usually enter our bodies through the eyes, mouth, nose, or a wound that breaches the skin barrier.

What are some ways our body protects us?

The human body is designed to protect itself from illness. The network of cells, tissues, and organs that all work together is called the immune system.

What are some healthy habits that keep a person safe?

- Wash your hands
- Use hand sanitizer
- Maintain doctor well checks
- Drink lots of water
- Maintain a healthy diet
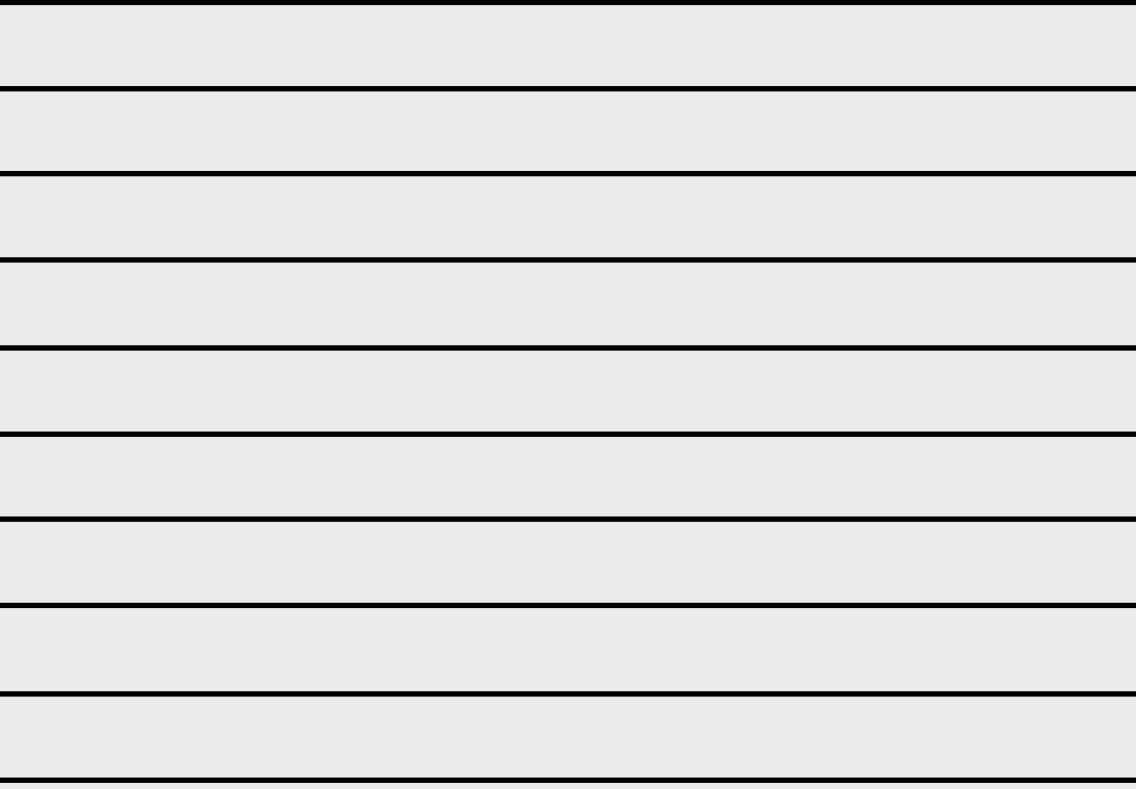- Get plenty of sleep and exercise

Patient Zero took a Germ to School One Day

Written by: _____

Write an Ozobot Medical Detective Story!

- Print and read *Germs, Mystery Illness Summary*. Use the information found, such as modes of transportation or the symptom list, as reference and write your own medical detective story. How will patient zero travel through your school? Use the blank school map and write your friends into the story!

Setting	Characters	Extras	Problem	Solution
	List the main characters in	List the extra characters to		
Name of your school:	sequential order, places Ozobot will pass by during your Patient Zero program.	support your story/program	• Place the names on your school map.	• Ozobot can success-fully mimic the characters path of Patient Zero from your story on a school map.
	1. 2. 3. 4. 5. 6.	1. 2. 3. 4. 5. 6.	• Write your medical detective story! (Use the Germ Illness Summary as reference.) • Write your color program for Ozobot. • Run and de-bug any challenges.	• Have another student read your story and program Ozobot. Compare and discuss your results.

_____

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☐ If box is checked, my Medical Detective story continues on the back...
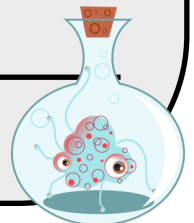
Ozobot as Patient Zero

LEARNING OBJECTIVES and UNDERSTANDINGS
- Identify behaviors to maintain health and prevent the spread of infection.
- Recognize that germs can make a person sick.
- Recognize that viruses and bacteria are microscopic in size and both are germs.
- Utilize critical thinking skills to solve a problem.
- Scientists ask and identify questions to gain knowledge or solve problems.
- Scientists make predictions based on prior experiences.
- Scientists make observations and/or collect data to construct evidence-based conclusions.
- Share findings and conclusions with others.
- Infectious agents, such as bacteria and viruses, can cause illness and can spread from person to person.
- The body can protect and defend itself from infection.
- Understanding how infectious disease spreads in a population helps with prevention measures.

CURRICULUM STANDARDS
- ISTE   1.c Use models and simulation to explore complex systems and issues.
                4.b Plan and manage activities to develop a solution or complete a project.
                6.a Understand and use technology systems.
- NGSS 3-5-ETS1-3   Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.
- NGSS 3-PS2-2   Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
- MS-ETS1-2   Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- CCSS MATH 1, 2   Make sense of problems and persevere in solving them. Reason abstractly and quantitatively.
- MATH.PRACTICE.MP5 Use appropriate tools strategically.
- MATH.PRACTICE.MP7 Look for and make use of structure.

GRAPHIC ARTS
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flycatcher CLIPART

PrawnyArt

graphics from: PoppyDreamz digital art

Ozobot
Code Reference Guide

Fast

Cruise

Slow

Turbo

Straight

Go Left

Go Right

Pause

U-turn

U-turn Line End

Win-PlayAgain

Win-GameOver

George

Emily

Cloe

Oliver

Harrison

Charlotte

Nathan
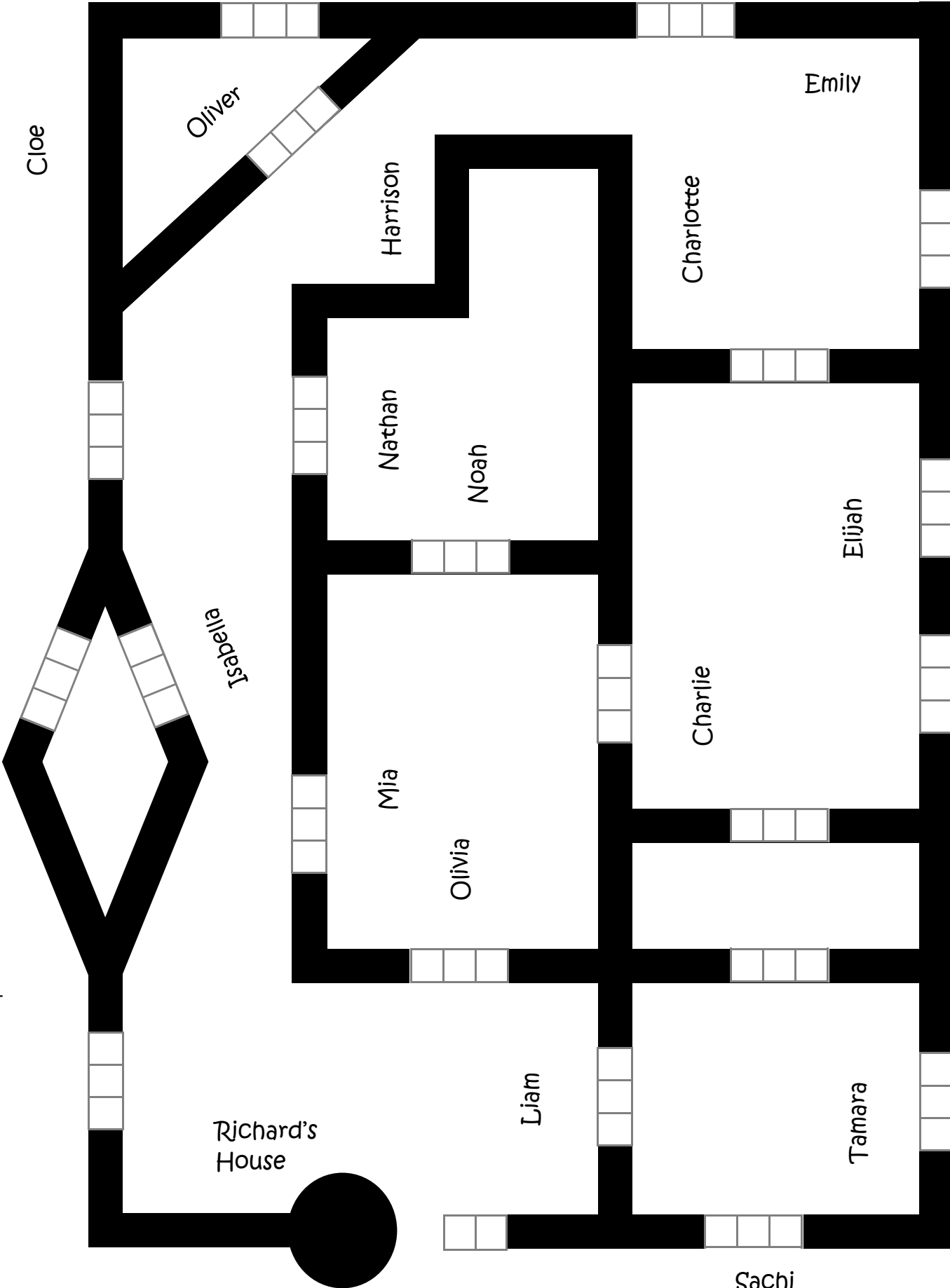
Noah

Charlie

Elijah

Marcus

Isabella

Mia

Olivia

Patient Zero School Map
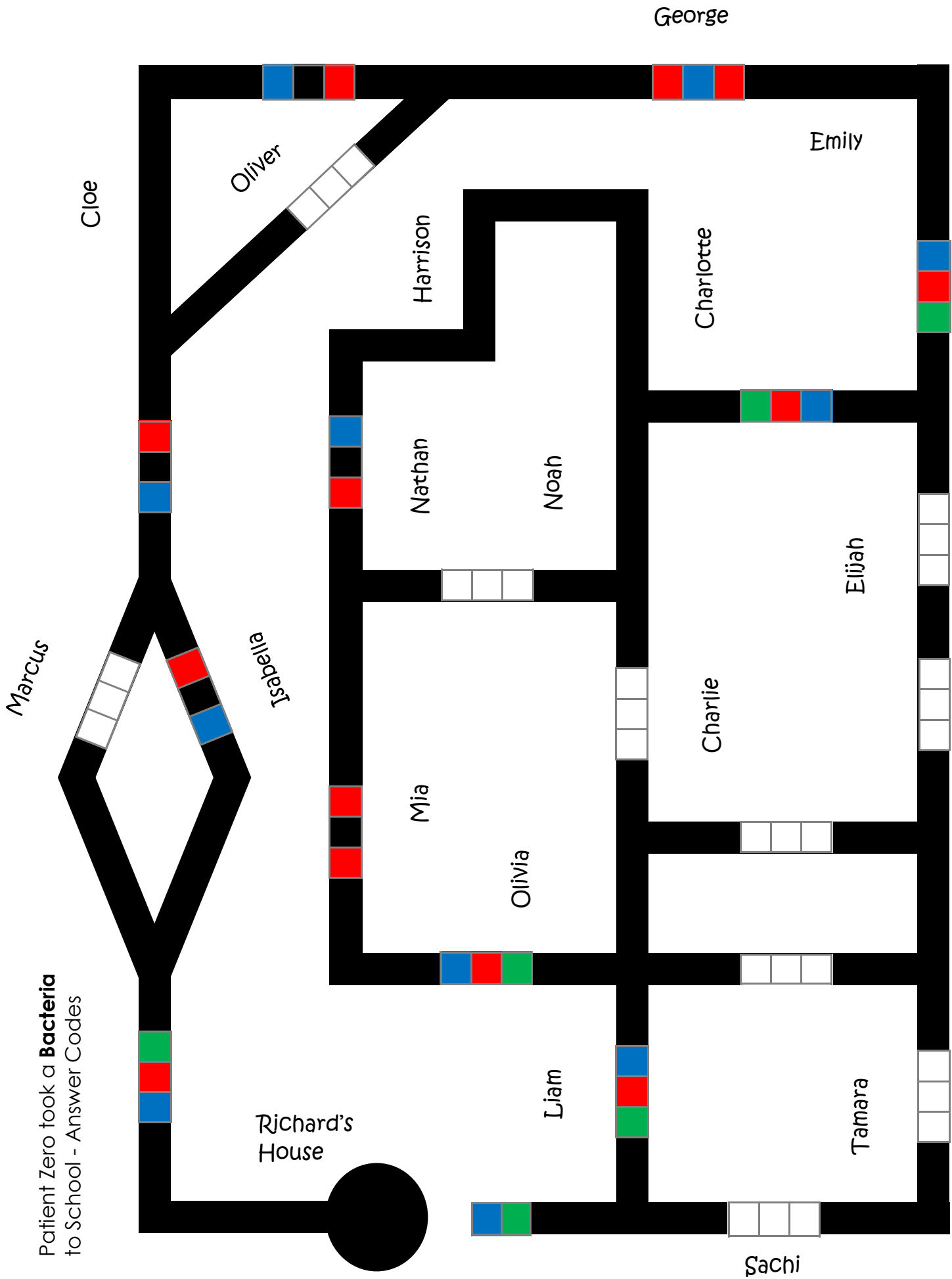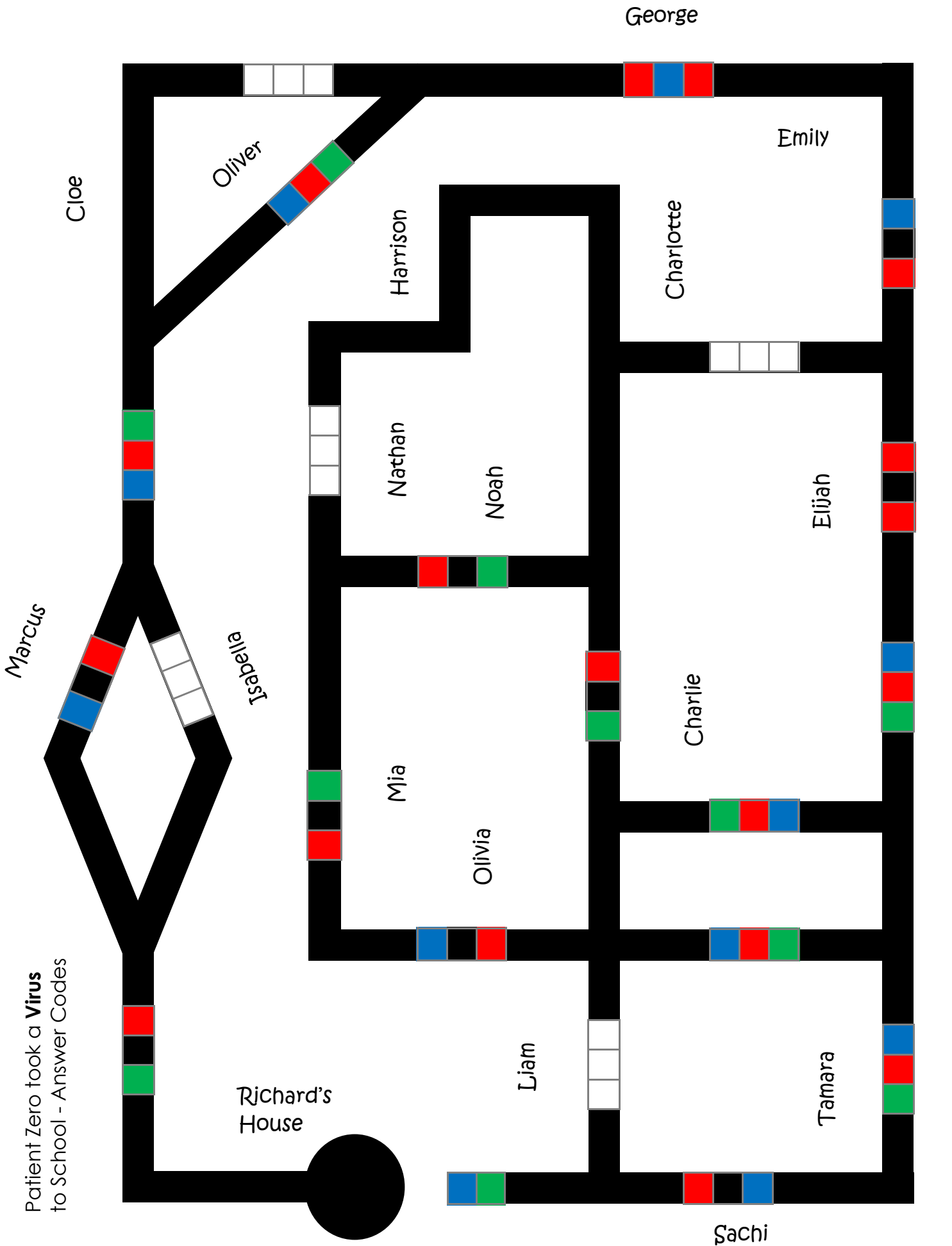
Richard's House

Liam

Tamara

Sachi

Patient Zero took a **Bacteria** to School - Answer Codes

Names visible: George, Emily, Cloe, Oliver, Charlotte, Harrison, Emily, Nathan, Noah, Charlotte, Marcus, Isabella, Elijah, Mia, Charlie, Olivia, Liam, Tamara, Richard's House, Sachi

Patient Zero took a **Virus** to School - Answer Codes

George

Emily

Cloe

Oliver

Harrison

Charlotte

Nathan

Noah

Elijah

Marcus

Isabella

Charlie

Mia

Olivia

Liam

Tamara

Richard's House

Sachi