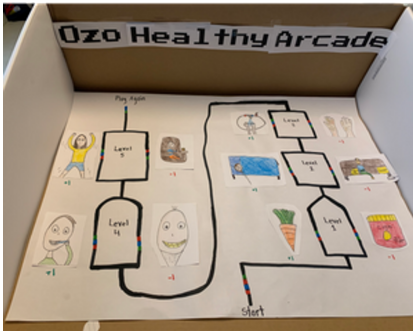


SDG #3 Good Health and Well Being: Arcade Game

Author: Jen Perry



Grades: 2–6

Coding Methods: Color Codes

Subjects: ELA, Art, Engineering/Tech,
Computer Science, SEL/Digital
Citizenship

Robots: Evo

Brief Summary

Students will create tasks that Ozobot has to complete to graduate Ozo School.

Pre-Reader/ESL: No

Required Materials

- 1 Evo or Bit per group
- 1 -Ozobot markers -OzoCodes Sheet per group
- 1 -poster paper or large cardboard box for arcade game per group
- 1 -Arcade Instructions (see attachment: SDG #3 Student Performance Task) <https://docs.google.com/document/d/113im2tb8eCXcqLIWqpc2O0GOBtNEQA9HZd-5-ARrRAM/edit?usp=sharing> per group
- 1 -books for literacy connection (optional) per group

Lesson Objectives

- describe the Sustainable Development Goals and identify ways they can support SDG #3: Good Health and Well Being
- understand that there are important skills and competencies that they need to be prepared to make the world a better place
- use design thinking skills and coding skills

Preparation

Background Knowledge

- Knowledge of -Project photo and video exemplars of projects -Teacher and students should have some experience color coding Ozobots. See OzoCode Sheet for a reference: Color Code Reference Sheet: <https://files.ozobot.com/stem->

education/ozobot-ozocodes-reference.pdf -Resources to learn more about the Sustainable Development Goals: UNESCO and Sustainable Development Goals <https://en.unesco.org/sustainabledevelopmentgoals> TEACH SDGs - Home: <http://www.teachsdgs.org/> Videos About the Sustainable Development Goals - United Nations Sustainable Development <https://www.un.org/sustainabledevelopment/sustainable-development-goals/> United Nations Sustainable Development Goals Student Resources <https://www.un.org/sustainabledevelopment/student-resources/> SDG Book Club - United Nations Sustainable Development <https://www.un.org/sustainabledevelopment/sdgbookclub/> The Worlds Largest Lesson <https://www.un.org/sustainabledevelopment/sdgbookclub/> Resources for SDG Goal #3: Goal 3: Good Health & Well-Being (World's Largest Lesson) <https://worldslargestlesson.globalgoals.org/global-goals/good-health/> Health - United Nations Sustainable Development <https://www.un.org/sustainabledevelopment/health/>

Lesson Tips

- Spend some time exploring the Sustainable Development Goals and specifically examining SDG #3 (see Background Knowledge resources).
- Make a literacy connection. Read a book about sustainability. Review Scholastic resource: 15 Books to Inspire Healthy Habits in Kids. TedEd (older students) has Health Lessons. Also, WE.org WE Give Health has detailed resources (including global resources)
- Make specific connections to your own health curriculum
- Have an understanding of how to use Ozobots color code

Direct Instruction (Teacher Facing Instructions):

1 Day 1 (45-60 minutes):

Begin the lesson with a suggested picture book or Ted Talk (see lesson tips)

As a class or in small groups, brainstorm ways to stay healthy

Ideas could include:

Eating healthy

Sleeping habits

Washing hands

Physical Activity

Mental health

As a class brainstorm some unhealthy behaviour.

Ideas could include:

Eating too many sweets

Not washing hands or maintaining proper hygiene

Not brushing hair or teeth

Staying up late

Not getting any exercise

Playing too many videogames or watching too much TV

Not dealing with stress or emotions properly

Tell students that they have been hired by Ozobot to create an arcade game on poster paper (see exemplar and handout Arcade Instructions)

Go over instructions with students

2 Day 2 (60+ minutes) - Coding Mini Lesson & Planning

1.Ozobot coding mini lesson: Tell the students, when the Ozobot meets an intersection, the bot will randomly choose which direction to go, unless you tell it which way to go with a "direction code ". In their Arcade game, Ozobot will randomly go in different directions to allow their player to either move to the left or right

Resource: BOT BASICS GET TO KNOW YOUR ROBOTS (see document pdf. pages 14-15) or review diagrams below.

-When Ozobot is at an intersection, it will randomly choose which direction to go, unless it is programmed (given a specific line of code), to tell it which way to go.

-In groups or in as a class demo, test out Ozobots random feature

Emphasis the real-world coding connection: computers can be programmed to make a random decision. Creating randomness is used in many computer applications such as creating numbers for passwords.

Planning their game:

Students will follow the Arcade Instructions to plan a rough copy of their game. They will include 5 different “levels” and numerous lines of code including:

Enable Point Counter: A command that tells your Ozobot to count point codes down from five. Each time Ozobot reads a “Point -1” code it counts down. After the fifth “Point -1” code Ozobot will make a “done” maneuver, stop following lines, and blink red.

You can add more to the total count (not to exceed five) with “Point +1” codes. You can reset Ozobot by turning it off, then on.

Win/Exit (Play Again): A command to perform a “success” animation, then continue to follow the line. • Win/Exit

(Game Over): A command to perform a “success” animation, then stop following the line.

Note: Plan can be a quick sketch with a note of what color codes to include. Also, Ozobot may choose the line that leads to the previous level. This can be part of the fun - will Ozobot make it to the next level? However, If there is room on paper or coding capabilities allow it, students can include directional code that could prevent Ozobot from going back to the previous level (such as go straight). This could be a great debugging opportunity! Or more advanced coders could complete this task using Ozoblockly.

*For further examples of code see Google Drive Doc of lesson plan (attached in Ozobot Classroom)

3 Day 3 (60+ minutes)

- Using their plan from the previous lesson, students will create a good copy of their arcade game.
- Pictures of healthy and unhealthy activities should not be too big. Students may need support with the size and printing out paper frames or having paper cut out for students to draw on can be helpful.
- Encourage students to lightly use a pencil to mark lines before using Ozomarkers.
- Students should test out their code and debug if necessary.

Lesson Closure (Optional)

Class discussion: Can video arcade games teach people how to be healthier?

- Students should have an opportunity to share their arcade games with their peers.
- Students could plan a Health Fair and showcase their arcade games to the larger community.
- Summative assessment: (See Rubric and Student Self-Reflection in Student Performance Task *attached. Adapt for your own needs or involve your students in modifying it).

Student Practice (Student Facing Instructions):

- 1 Congratulations, you have been hired by Ozobot Gamers to create a prototype of an arcade game! In this game, players will have fun learning about ways to stay healthy. You will use OzoCodes Sheet to create Ozobot to travel to 5 different health levels. Will Ozobot be a healthy champion or will it be game over?

You will complete the SDG #3 Student Performance Task to help you make your arcade game

<https://docs.google.com/document/d/113im2tb8eCXcqLIWqpc2O0GOBtNEQA9HZd-5-ARrRAM/edit?usp=sharing>

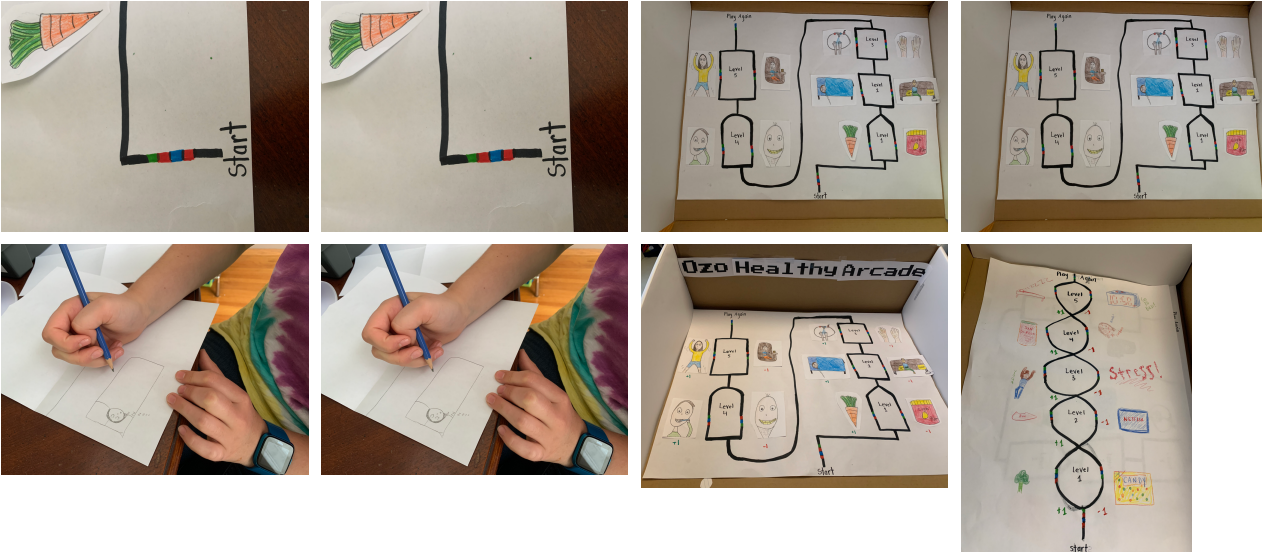
Goals: Students will design and code a healthy arcade video game using Ozobot Color Codes.

Students will use the Student Performance Task to guide them.

Supplements

Additional Attachments

- <https://docs.google.com/document/d/1YbFP8zDDzoDx5NHLczT0zrJHA4iwkdkfCoRglCAYcVc/edit?usp=sharing>
- <https://docs.google.com/document/d/113im2tb8eCXcqLIWqpc2O0GOBtNEQA9HZd-5-ARrRAM/edit?usp=sharing>
- <https://youtu.be/n0kMI4O4dBA>



Academic Standards

- CSTA.1B-AP-09
- CSTA.1B-CS-02
- CSTA.1B-CS-03
- CSTA.1B-AP-16
- ISTE.4.a
- ISTE.4.d
- ISTE.6.d
- ISTE.7.d
- CCSS.ELA-LITERACY.SL.4.1.b

Lesson Title: SDG #3 Good Health and Well Being: Arcade Game

Lesson Summary: Students will create their poster paper arcade game template on healthy behaviours and then code their Ozobot to play the game.

Lesson Objectives

Students will be able to describe the Sustainable Development Goals and identify ways they can support SDG #3: Good Health and Well Being

Students can identify healthy choices that create well-being

Students will be able to use design thinking skills and coding skills

Subjects:

Pre-Reader/ESL Friendly (no reading skills required):

Coding Style: Ozo Color Codes

Grades: 2-6

Tested with: (Evo/Bit)

Duration: 60+ Minutes/per class (3+ Classes)

Required Materials:

-Ozobots (number dependent on group sizes)

-Ozobot markers

-OzoCodes Sheet

-poster paper or large cardboard box for arcade game

-Arcade Instructions (see attachment: SDG #3 Student Performance Task)

<https://docs.google.com/document/d/113im2tb8eCXcqLIWqpc2O0GOBtNEQA9HZd-5-ARrRAM/edit?usp=sharing>

-books for literacy connection (optional)

Background Knowledge:

-Project photo and video exemplars of projects

-Teacher and students should have some experience color coding Ozobots. See OzoCode

Sheet for a reference: [Color Code Reference Sheet](#):

<https://files.ozobot.com/stem-education/ozobot-ozocodes-reference.pdf>

-Resources to learn more about the Sustainable Development Goals:

[UNESCO and Sustainable Development Goals](#)

<https://en.unesco.org/sustainabledevelopmentgoals>

TEACH SDGs - Home: <http://www.teachsdgs.org/>

[Videos](#)



[About the Sustainable Development Goals - United Nations Sustainable Development](https://www.un.org/sustainabledevelopment/sustainable-development-goals/)
<https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

[United Nations Sustainable Development Goals Student Resources](https://www.un.org/sustainabledevelopment/student-resources/)
<https://www.un.org/sustainabledevelopment/student-resources/>

[SDG Book Club - United Nations Sustainable Development](https://www.un.org/sustainabledevelopment/sdgbookclub/)
<https://www.un.org/sustainabledevelopment/sdgbookclub/>

[The Worlds Largest Lesson](https://www.un.org/sustainabledevelopment/sdgbookclub/) <https://www.un.org/sustainabledevelopment/sdgbookclub/>

Resources for SDG Goal #3:

[Goal 3: Good Health & Well-Being \(World's Largest Lesson\)](https://worldslargestlesson.globalgoals.org/global-goals/good-health/)
<https://worldslargestlesson.globalgoals.org/global-goals/good-health/>

[Health - United Nations Sustainable Development](https://www.un.org/sustainabledevelopment/health/)
<https://www.un.org/sustainabledevelopment/health/>

Lesson Tips:

1. Spend some time exploring the Sustainable Development Goals and specifically examining SDG #3 (see Background Knowledge resources).
2. Make a literacy connection. Read a book about sustainability. Review Scholastic resource: [15 Books to Inspire Healthy Habits in Kids](#). TedEd (older students) has [Health Lessons](#). Also, WE.org [WE Give Health](#) has detailed resources (including global resources)
3. Make specific connections to your own health curriculum
4. Have an understanding of how to use Ozobots color codes

Direct Instruction (Teacher Facing Instructions):

Day 1 (45-60 minutes):

1. Begin the lesson with a suggested picture book or Ted Talk (see lesson tips)
2. As a class or in small groups, brainstorm ways to stay healthy
Ideas could include:
 - Eating healthy
 - Sleeping habits
 - Washing hands
 - Physical Activity
 - Mental health



3. As a class brainstorm some unhealthy behaviour.
 - Ideas could include:
 - Eating too many sweets
 - Not washing hands or maintaining proper hygiene
 - Not brushing hair or teeth
 - Staying up late
 - Not getting any exercise
 - Playing too many video games or watching too much TV
 - Not dealing with stress or emotions properly
4. Tell students that they have been hired by Ozobot to create an arcade game on poster paper (see exemplar and handout Arcade Instructions)
5. Go over instructions with students

Day 2 (60+ minutes) - Coding Mini Lesson & Planning

1. Ozobot coding mini lesson: Tell the students, when the Ozobot meets an intersection, the bot will randomly choose which direction to go, unless you tell it which way to go with a "direction code ". In their Arcade game, Ozobot will randomly go in different directions to allow their player to either move to the left or right

Resource: [BOT BASICS GET TO KNOW YOUR ROBOTS](#) (see document pdf. pages 14-15) or review diagrams below.

- When Ozobot is at an intersection, it will randomly choose which direction to go, unless it is programmed (given a specific line of code), to tell it which way to go.
- In groups or in as a class demo, test out Ozobots random feature



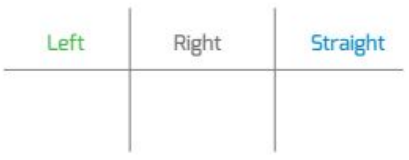
DIRECTION CODES

When Evo or Bit meet an intersection, they bot will randomly choose which direction to go, unless you tell it which way to go with a "direction code".



Student Prompt Question

Which way does Ozobot go? Test it out on the map below and keep track of where it went.



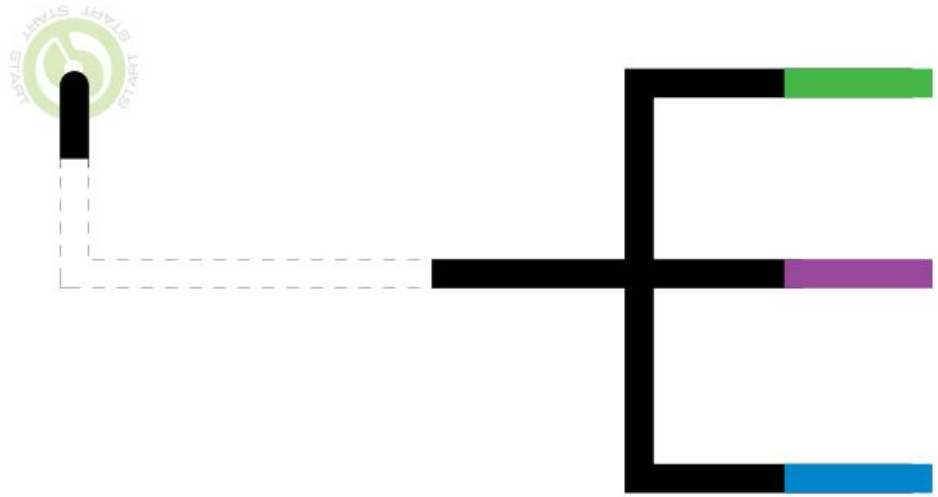
Ozobot Tip

You and your students can use this random choice generator to help make decisions, like choose which activity to do.



Which Way?

Use black marker to complete your path, then place bots on the START. bots will randomly select a color. Repeat several times.



Emphasis the real-world coding connection: computers can be programmed to make a random decision. Creating randomness is used in many computer applications such as creating numbers for passwords.



Setup | Drawing Lines | Exploring Color | Color Codes | **Direction Codes** | Going Further

DIRECTION CODES

? Student Prompt Question
How much warning do the bots need?
Test out different distances between directional codes and intersections to find out. (The answer is about 1 inch.)

</> Real-world Connection
Computers can be programmed to make a random decision. Creating randomness is used in many computer applications like the security systems you use online everyday. Watch how your bot makes random decisions at intersections.

Planning their game:

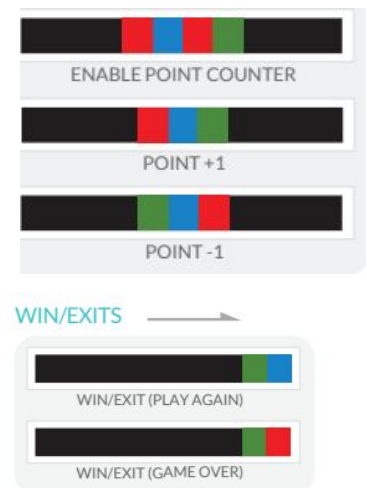
Students will follow the Arcade Instructions to plan a rough copy of their game. They will include 5 different “levels” and numerous lines of code including:

Enable Point Counter: A command that tells your Ozobot to count point codes down from five. Each time Ozobot reads a “Point -1” code it counts down. After the fifth “Point -1” code Ozobot will make a “done” maneuver, stop following lines, and blink red.

You can add more to the total count (not to exceed five) with “Point +1” codes. You can reset Ozobot by turning it off, then on.

Win/Exit (Play Again): A command to perform a “success” animation, then continue to follow the line. • **Win/Exit (Game Over):** A command to perform a “success” animation, then stop following the line.

Note: Plan can be a quick sketch with a note of what color codes to include. Also, Ozobot may choose the line that leads to the previous level. This can be part of the fun - will Ozobot make it to the next level? However, If there is room on paper or coding capabilities allow it, students can include directional code that could prevent Ozobot from going back to the previous level (such as go straight). This could be a great debugging opportunity! Or more advanced coders could complete this task using Ozoblockly.



Day 3 (60+ minutes)

- Using their plan from the previous lesson, students will create a good copy of their arcade game.
- Pictures of healthy and unhealthy activities should not be too big. Students may need support with the size and printing out paper frames or having paper cut out for students to draw on can be helpful.
- Encourage students to lightly use a pencil to mark lines before using Ozomarkers.
- Students should test out their code and debug if necessary.

Student Practice (Student Facing Instructions):

Congratulations, you have been hired by Ozobot Gamers to create a prototype of an arcade game! In this game, players will have fun learning about ways to stay healthy. You will use [OzoCodes Sheet](#) to create Ozobot to travel to 5 different health levels. Will Ozobot be a healthy champion or will it be game over?

You will complete the SDG #3 Student Performance Task to help you make your arcade game <https://docs.google.com/document/d/113im2tb8eCXcqLIWqpc2O0GOBtNEQA9HZd-5-ARrRAM/edit?usp=sharing>

Extensions:

- Challenge: What other games can you design with Ozobots?
- Pacman Ozo in [Ozobot Classroom](#) is a great lesson
- This lesson could be adapted to use Ozoblockly (see <https://ozobot.com/blog/2-ozobot-activities-get-excited-new-pokemon-games> for an idea how this could be done by programming the Ozobot to go to different areas).

Closing (Or Formative/Summative Assessment):

Class discussion: Can video arcade games teach people how to be healthier?

- Students should have an opportunity to share their arcade games with their peers.
- Students could plan a Health Fair and showcase their arcade games to the larger community.
- Summative assessment: (See Rubric and Student Self-Reflection in Student Performance Task *attached. Adapt for your own needs or involve your students in modifying it).

Academic Standards:



CSTA 1B-CS-02 Model how computer hardware and software work together as a system to accomplish tasks. (P4.4)

CSTA 1B-CS-03 Determine potential solutions to solve simple hardware and software problems using common troubleshooting strategies. (P6.2)

CSTA 1B-AP-16 Take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development. (P2.2)

ISTE 4a Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

ISTE 4d Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.

ISTE 6d Students publish or present content that customizes the message and medium for their intended audiences

ISTE 7d Students explore local and global issues and use collaborative technologies to work with others to investigate solutions.

CCSS.ELA-LITERACY.SL.4.1.B Follow agreed-upon rules for discussions and carry out assigned roles.

Additional Attachments:

SDG #3 Student Performance Task

<https://docs.google.com/document/d/113im2tb8eCXcqLIWqpc2O0GOBtNEQA9HZd-5-ARrRAM/edit?usp=sharing>

Exemplar Photos and Youtube video (See Ozobot Classroom)

<https://youtu.be/n0kMI4O4dBA>



Healthy Arcade Challenge: Performance Task

Group Member Names:

Congratulations, you have been hired by Ozobot Gamers to create a prototype of an arcade game! In this game, players will have fun learning about ways to stay healthy. You will use [Color Codes Reference Sheet](#) to create Ozobot to travel to 5 different health levels. Will Ozobot be a healthy champion or will it be game over?

Follow these steps:

1. IDEATE!! This is a fancy word for brainstorming.
Use the table to record your ideas about healthy behaviour and the opposite unhealthy behaviours. There is an example below. Put a ★ next to 5 behaviours that you would like to include in your arcade game.

Healthy Behaviours	Unhealthy Behaviours
Getting 8-10 hours of sleep	Staying up late playing video games and not getting 8-10 hours of sleep

2. Sketch a rough copy of your arcade (see the example for some ideas).
You must include:
 - A start
 - 5 images of healthy behavior (drawings or digital images)



- ❑ 5 images of the opposite unhealthy behavior (drawings or digital images) *Each drawing/image will be a level
- ❑ At each level, there will be an intersection where Ozobot will randomly select which way to go.



- ❑ At the start of your code include
- ❑ On the one side of each intersection, include a drawing/image of a healthy behaviour
- ❑ On the other of each intersections, include a drawing/image of a healthy behaviour
- ❑ If Ozobot goes to the healthy behaviour, Ozobot will gain a point



(include this code)

- ❑ If Ozobot goes to the unhealthy behaviour, Ozobot will lose a point



(include this code)

- ❑ Using the Ozocodes to connect the images together (in the rough copy you can just write down which ones you will use without actually color coding it).
- ❑ At the final intersection, include



3. CODE & DESIGN your good copy by following your plan . Using a big poster paper or a cardboard box with white paper on the bottom,
4. TEST out your code. Does your arcade game work? You can add to your code or debug (fix a problem in coding) if you need to.
5. SHARE. Get ready for others to play your game. You should think of an awesome name and logo for your game.
6. (Optional): Create a video game box for your game
7. Complete reflection (individually).



Assessment of Healthy Arcade Game

Name: _____

	Outcomes Not Met (needed support)	Met Outcomes (acceptable)	Exceeded Outcomes	Comments:
Able to ideate: plan indicates time and effort were put into arcade design				
Demonstrated coding skills				
The reflection was insightful				
Had a growth-mindset (able to problem solve and persevere)				
Able to work cooperatively with a group				
(optional) The Arcade video game cover was captivating				



Healthy Arcade: Reflection Sheet

Name:

The best part of my healthy arcade game is

Something I found challenging was

Next time I would

How can creating a video game about healthy choices make the world a better place?

Name a few things you can do daily to live a healthier life?

- 1.
- 2.
- 3.



