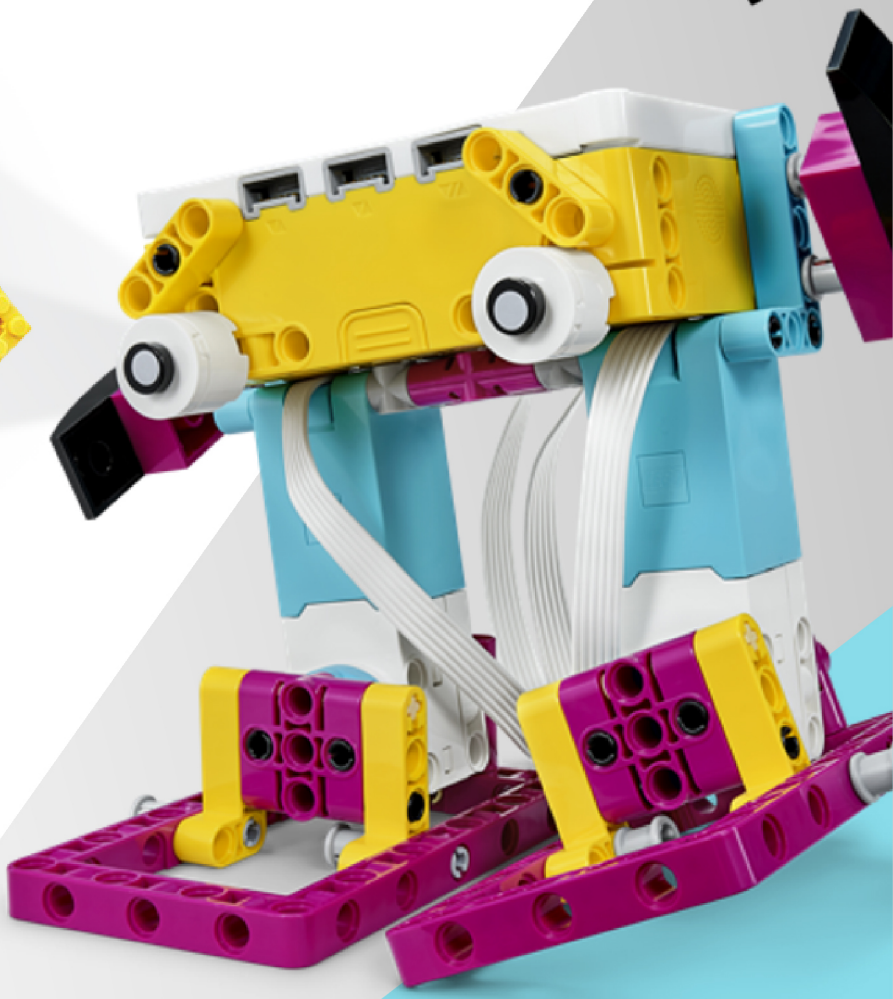
SPIKE™ Prime

Projects

8



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LESSON PLANS

Teacher Guide

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Treadmill

Teacher Book - SPIKE Prime Project

Do you have an exercise routine?

Exercise helps people lose weight and lower the risk of some diseases. A treadmill is an excellent source of exercise and can offer the option for careful heart rate monitoring.

Ignite a Discussion

Start a discussion by asking relevant questions, like:

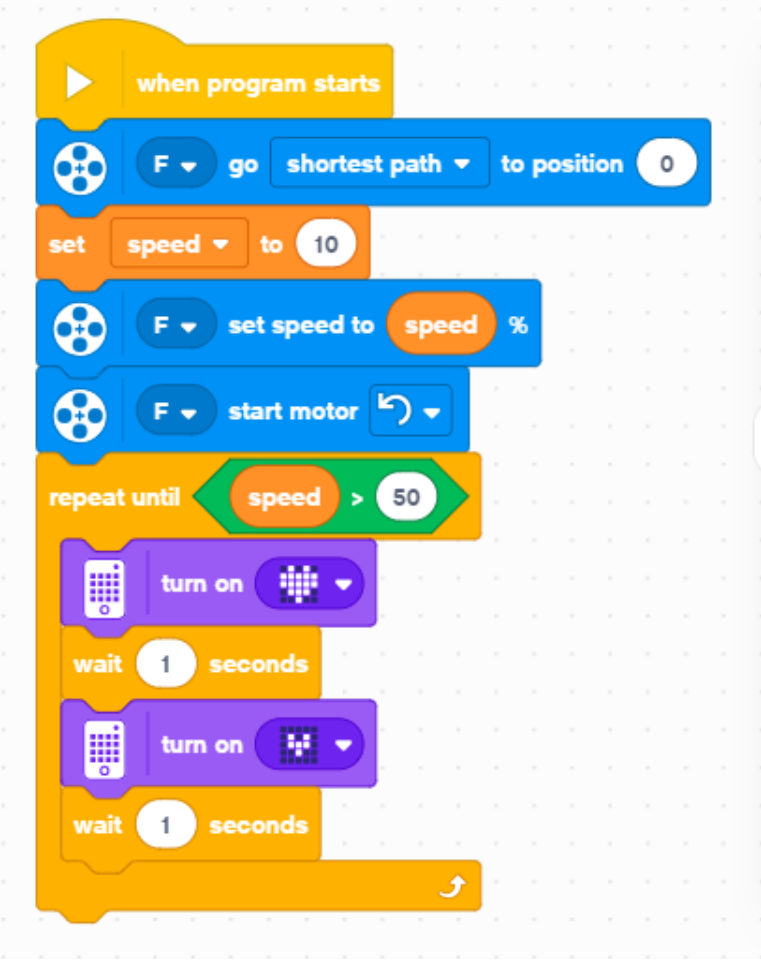
- What are the benefits of exercising?
- What are some ways to exercise indoors?
- Do you think it's better to exercise outside or inside?

Have your students watch the video to see what they are about to do.

Build your Treadmill.

This treadmill has a speed control paddle and displays the heart rate.

Let's try this code first.



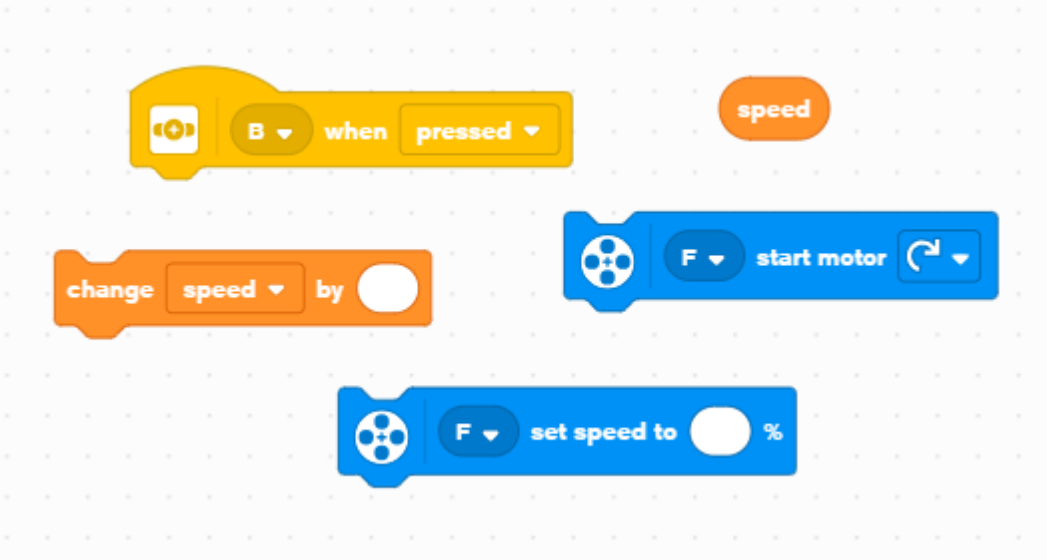
This program will start the treadmill at a set speed.

Now pedal faster.

Every time the pedal is pressed, change the speed of the motor by 10.

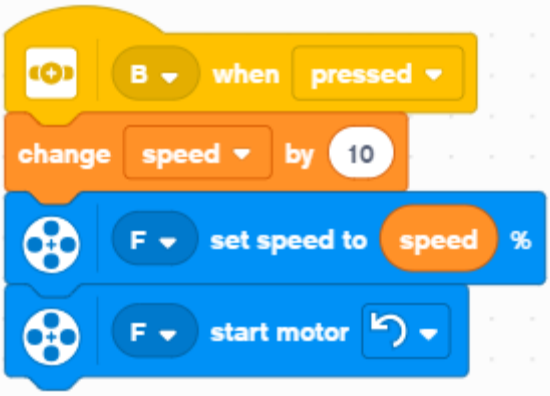
When the speed is greater than 50, make the heart rate appear faster on the light matrix.

(HINTS)

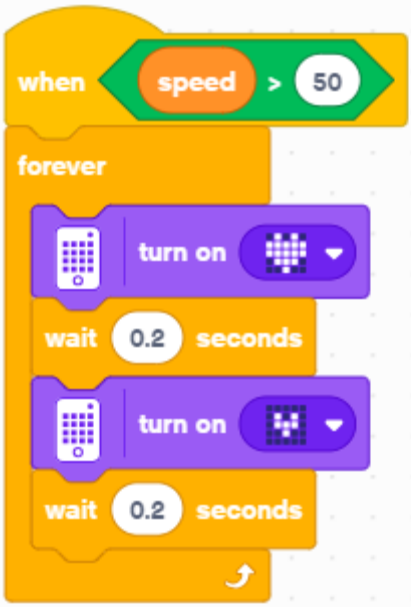


Think about using these code blocks.

Possible Solution



1. **When the sensor is pressed**
2. **Change the speed by 10**
3. **Set the motor speed to the speed variable**
4. **Run motor**



5. **When speed is greater than 50**
6. **Keep displaying the heart rate faster (with less wait time)**

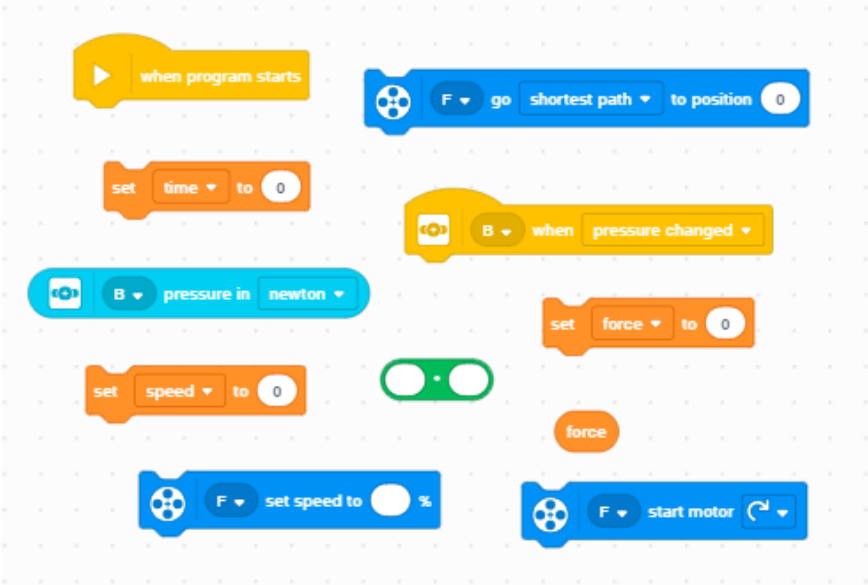
EXTRA CHALLENGE

Control speed

Change speed of the motor according to the force detected by the force sensor. The greater the force the faster the speed.

(Speed = Force x 10)

(HINTS)



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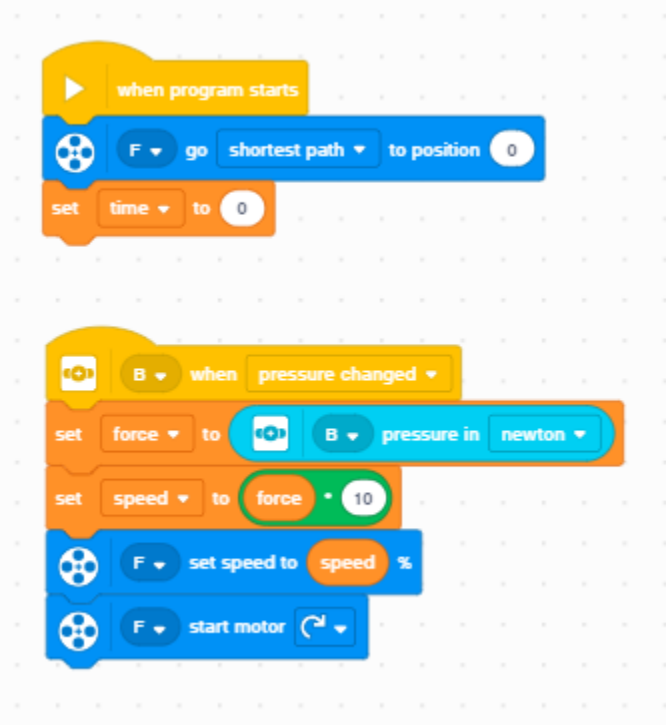

Differentiation

Simplify this lesson by:
- Play a beep sound every time the force sensor is pressed.
Take this lesson to the next level by:
- Change the wait time of the heart rate display at different speed intervals.

Assessment Opportunities

Teacher Observation Checklist

Create a scale that matches your needs, for example:

1. Partially accomplished
2. Fully accomplished
3. Overachieved

Use the following success criteria to evaluate your students' progress:
- Students can describe the function of an object.
- Students can describe the benefit of an object's features against needs.
- Students can construct effective arguments.

Self-Assessment

Have each student choose the brick that they feel best represents their performance.

- Blue: I can describe how things work
- Yellow: I can describe in detail how things work and I can highlight what it's good at.
- Violet: I can convince someone that I've invented the coolest thing in the world.

Peer-Assessment

Encourage your students to provide feedback to others by:

- Having one student score the performance of another using the colored brick scale above.
- Asking them to present constructive feedback to each other so that they can improve their group's performance during the next lesson.

Just do it!