CFAES

College *of* Food, Agricultural, *and* Environmental Sciences

PROJECT IDEA STARTER

PhysBot—Your 4-H Fitness Tracker

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Welcome to PhysBot—Your 4-H Fitness Tracker. Have you ever wondered how fitness trackers work? What powers them? How they measure and collect data? Your PhysBot Data Tracker is fitness tracking demystified. Youth taking this project will understand what's under the hood of popular fitness trackers by learning how all the parts work and function together.

Physbot is an educational kit providing 6th–12th graders everything they need to learn about how tracking physical activity and fitness improves one's overall health. The PhysBot kit, which assembles in minutes, includes a data tracking device for youth, wristband, external heart rate monitor, 9V battery connector (battery not included), and instructions. Plus, a curriculum guide, free proprietary software, and web support. Learn more by viewing this short video: **vimeo.com/189263072**.

The PhysBot device is equipped with an Arduino microcontroller that connects heart rate, steps traveled, and body temperature to the tracker's circuitry. Users monitor sensor activity with the tracker's LED display, providing an enhanced data tracking experience. Data transmitted from the sensors, which include magnetometer, accelerometer, and thermometer, to the Arduino processor is stored, processed, and transmitted to a Mac or Windows computer via a detachable 2-meter USB cable. For information on purchasing your PhysBot go to **ohio4h. org/physbot**.

PLAN YOUR PROJECT

Use this idea starter along with your PhysBot data tracker kit and 4-H 365 Self-Determined Project Guide as the starting place for this 4-H self-determined project. The Self-Determined Project Guide is available from your county OSU Extension office or at **ohio4h.org/selfdetermined**. You may choose to do a little or a lot depending on your level of interest. Be sure to register your project with your county OSU Extension office.

AREAS OF INTEREST AND THINGS TO DO

Every self-determined 4-H project has various areas of interest. Each area offers specific things members can address during their project adventure. Using the 4-H 365 Self-Determined Project Guide, identify at least three areas of interest with at least three activities per area to explore. Take your ideas from the list below or make up your own.

Be sure to reference the instruction guide included with your PhysBot as you plan and conduct your activities.

Getting to Know Your PhysBot Biowearable—REQUIRED

☐ Assemble your PhysBot device.

☐ Configure and calibrate your device.

☐ Properly fit your device to assure accuracy.

☐ Download your free software at **ohio4h.org/physbot** to access and display your data.

Connecting with Your PhysBot

☐ Investigate how your heart rate and step count change during exercise. Keep your own log so you can easily see the changes.

☐ Measure how far you travel walking the halls of your school or home in a day. Keep a log of your daily travel for a week, and then share your weekly total with your project helper.

☐ Test your PhysBot's performance on a family pet. See how many steps your pet takes in an hour, day, or week.

☐ Hold your breath for a minute to see what happens to your heart rate. Can you explain what happens? Explain it to a friend.
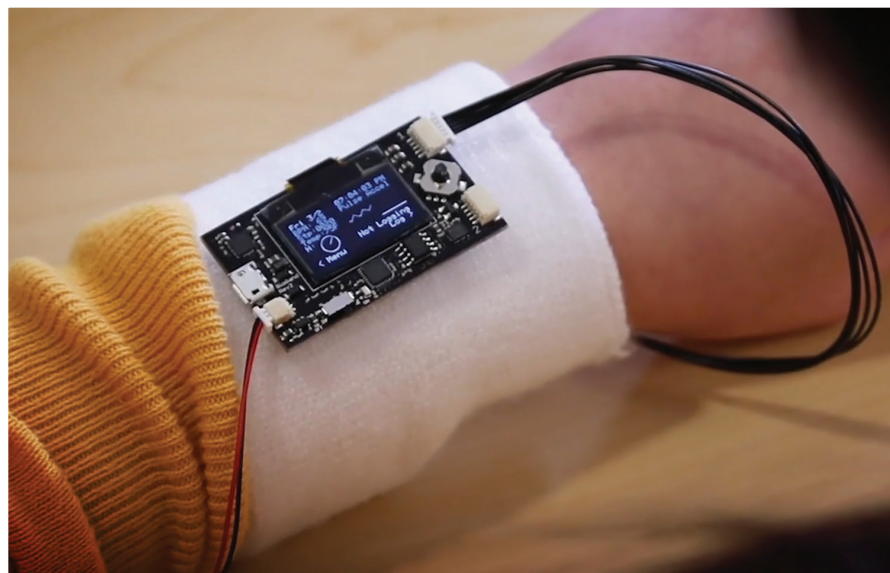
☐ Measure your stride (distance between the point of initial contact of one foot to the point of intial contact of the second foot). Compare your stride to an adult helper's stride.

Measuring Your Health with a Fitness Routine

☐ See what happens to your body when you exercise. With your PhysBot on and properly fitted, sit in a chair or on the floor for one minute. Log a resting heart rate (BPM). Now, do your own physical activity for three minutes to collect heart rate (BPM), steps, temperature, distance, etc. Then sit in a chair or on the floor for one minute to log your return to a resting heart rate. Find a knowledgeable adult to assist with interpretating the data you collected.

☐ Animals can be good for your health. Take your dog for a walk, ride a horse, or exercise your livestock project animal. What changes in data occur with this normal level of activity?

☐ Wear your PhysBot during a yoga class or during a 30-minute period of meditation to record and observe changes in your data.

☐ Try jogging or riding a bicycle with a friend for thirty minutes. What changes in data occur while keeping up with your friend? Is there a difference in data on the bicycle when your hands are not swinging?

Check Out the Data

☐ Collect and download one hour of PhysBot data. Then, by examining your heart rate data or step data only see if you can recall what you were doing as your data increased, decreased, or stayed the same.

☐ Test the idea that climbing stairs is great exercise. See what happens to your data when you climb two flights of stairs. How about five flights?

☐ Another exercise generally accepted to be very effective is jumping jacks. Are they really that effective, though? See what happens to your data when you do five jumping jacks. Rest, and then do ten jumping jacks. How about doing 20?

☐ Talk to someone who works out regularly and see what other exercises you can explore. Better yet, see what exercises a fitness professional—physical fitness instructor, coach for a school team, etc.—would recommend. After looking at the data, come up with your own top three exercises and share it with them.

☐ Are you a dancer? Put dancing to the test—line dancing, square dancing, or any kind of dancing you like to do—by wearing your PhysBot and looking at the data. Share what you learn with others who dance.

☐ Walk with someone else who has a fitness tracker. How does your data compare to the person you are walking with?

Learn More About Fitness Trackers

☐ Use a 3D printer to create a case for your PhysBot. Explain how you did it to a friend.

☐ Create a sunshade for your PhysBot screen. Demonstrate why it's helpful to your parent or guardian.

☐ Change out your wristband to something more fashionable. Does a friend agree it's better?

☐ Explore the science behind how the pulse rate sensor works on your wrist. Share what you learn with your project helper.

☐ Learn the best place on your body to manually record your pulse rate. Explain your findings to your project helper.

☐ How could you improve the design of the PhysBot?

RELATED RESOURCES

More information about PhysBot, including a leader's guide, is available at **ohio4h.org/physbot**.

After your PhysBot is built and operational, consider taking the 4-H project *Tracking Your Health and Fitness* (355).

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