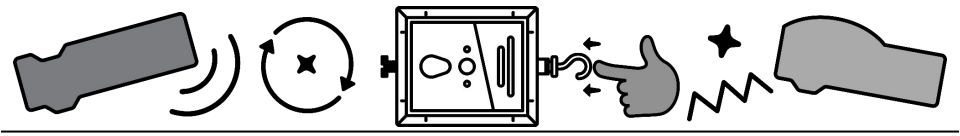
Vernier Go Direct Force & Acceleration Cards

Make projects that connect to the physical world



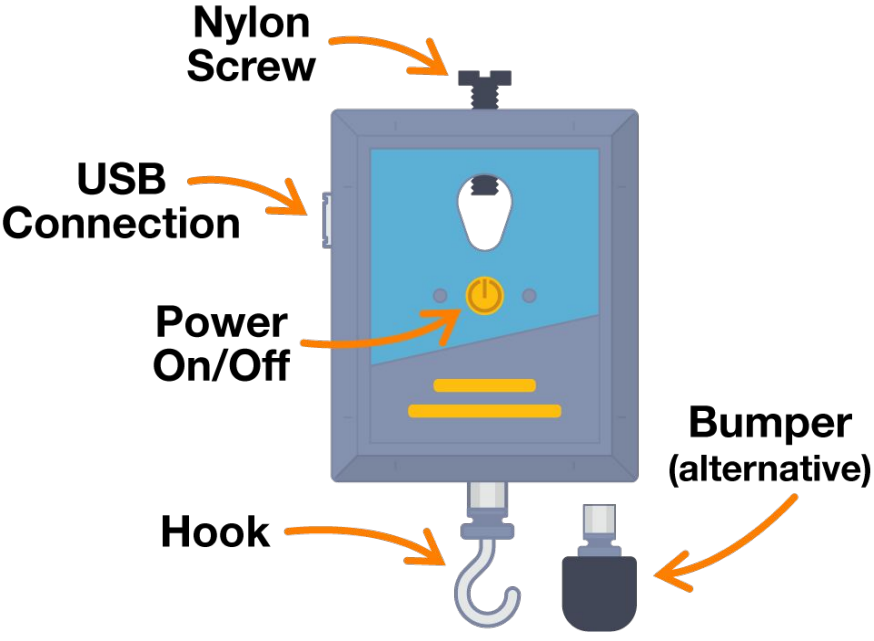
Cards in This Pack

- Go Direct Force & Acceleration Hardware and Blocks
- Set Up the Go Direct

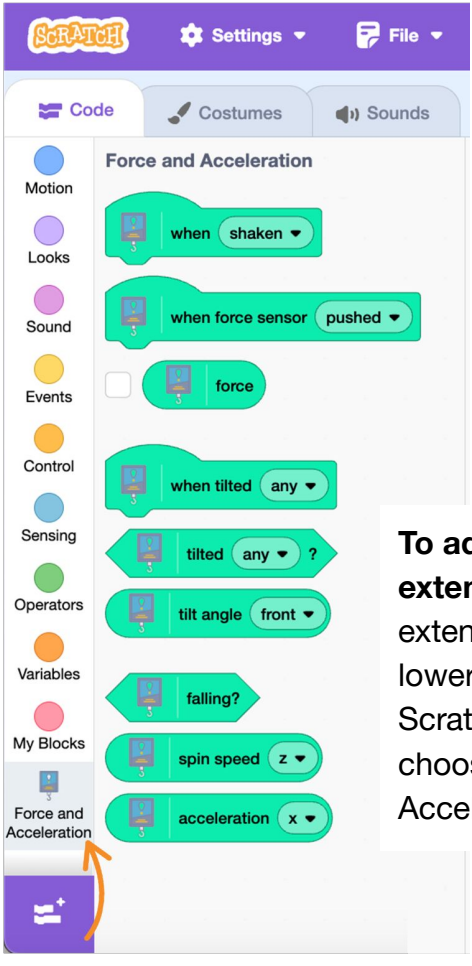
Try These Project Idea Cards in Any Order:

- Frog Band
- Day and Night
- Underwater Rocket
- Frisbee-Controlled Mandala
- Create Your Own/Remix

Vernier Go Direct Force & Acceleration Hardware

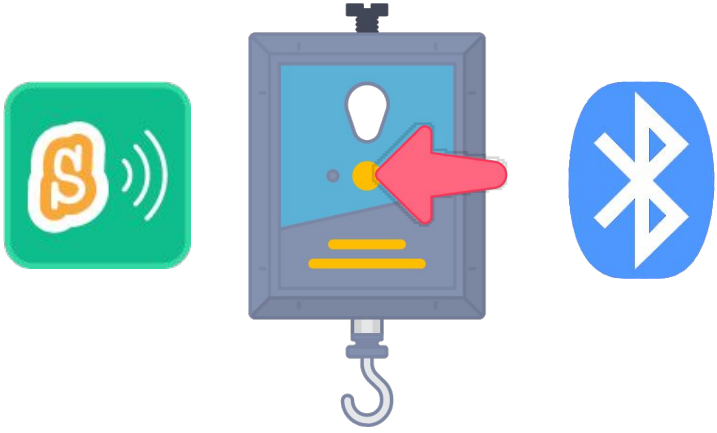


Vernier Go Direct Force & Acceleration Blocks



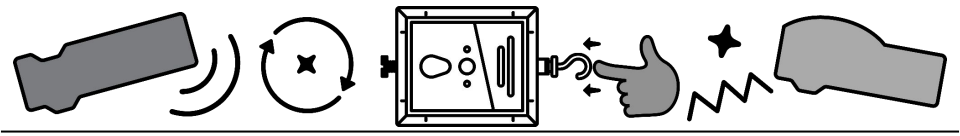
To add the Vernier sensor extension, click on the extension menu in the lower-left corner of the Scratch project editor and choose “Go Direct Force & Acceleration.”

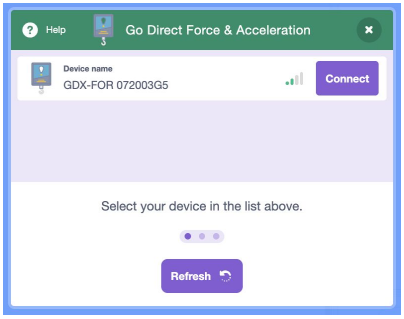
Set Up the Go Direct

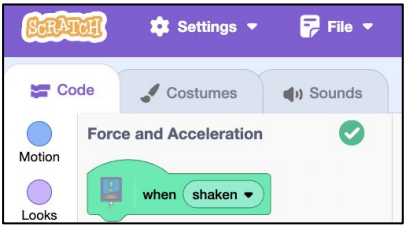


Instructions:

1. Each time you want to use the Go Direct sensor with Scratch, you'll need to start Scratch Link (downloadable on our extension page).
2. Turn on your sensor by pressing the power button.
3. Ensure that Bluetooth is switched on on your device.







4. Head to the Scratch project editor to finish connecting your sensor. In the blocks palette under the Force and Acceleration category, you should be prompted to connect to your sensor.

   An orange circle with an exclamation mark at the top of the category signals no connection. Click the orange circle to pull up the connection menu if it does not automatically appear and reconnect. A green check indicates connection.

5. The sensor contains a rechargeable battery so you can use it wirelessly.

Project Idea:

Frog Band

Shake, push, and drop/toss the sensor to make music! What can you add to customize your project?

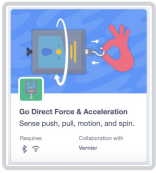
Vernier Go Direct: Frog Band

scratch.mit.edu

GET READY

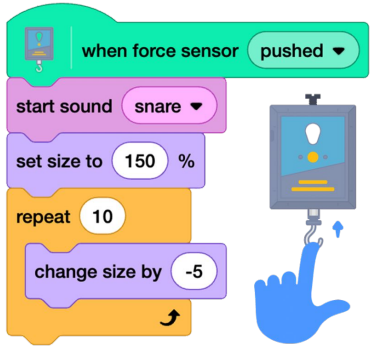
Choose 3 sprites.

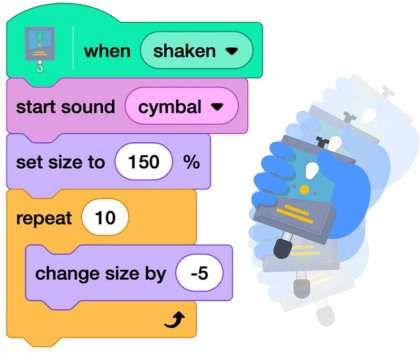
Add the Go Direct Extension.



ADD CODE

1. Select three Force and Acceleration hat blocks to trigger animation, like “when force sensor pushed,” “when started falling,” and “when shaken.”
2. Choose blocks from other categories (like Motion, Looks, and Sound) to create an animation that the actions will trigger.
3. Now, push, shake, or gently drop or toss the sensor between your hands to see the effects!





Project Idea:

Day and Night

Turn the sensor face down to change day into night. What can you add to customize your project? What if you wanted the backdrop to slowly brighten and darken? What if you wanted to add a sprite that would respond to the change in brightness?

Vernier Go Direct: Day & Night

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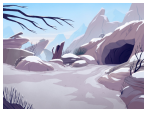
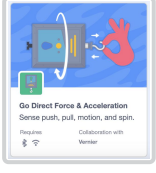
GET READY

Choose any backdrop.



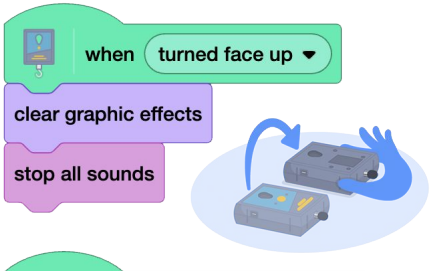
Mountain

Add the Go Direct Extension.



ADD CODE

1. While on the Backdrop, select two Force and Acceleration hat blocks “when turned face up” and “when turned face down.”

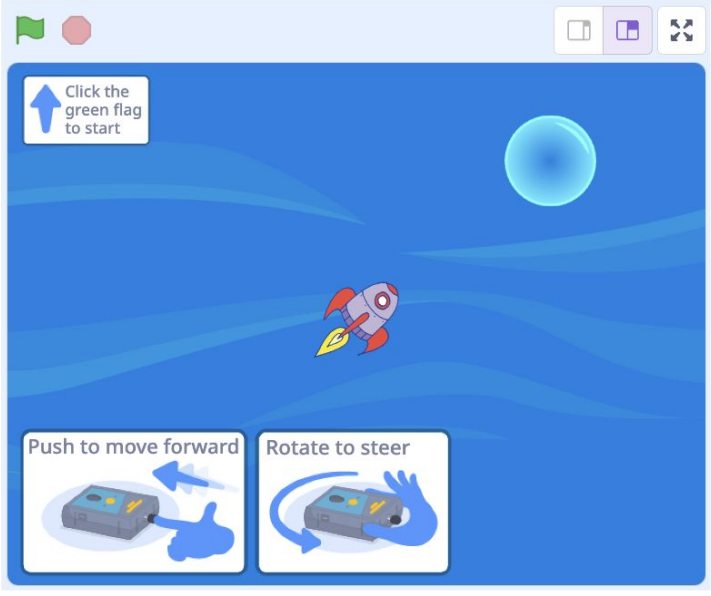


2. Under Looks, select a “clear graphic effects” and “set brightness effect” block and add them under the hat blocks. Use a negative number when setting the brightness effect to darken the backdrop. Clear the effect or use a block to set the brightness to a positive number to reset or brighten the backdrop.

3. Now, flip the sensor over a few times to see the effects!

Project Idea:

Underwater Rocket



Spin and push the sensor to steer a ship. What can you add to customize your project? Can you add an element of difficulty by making the second sprite move after a certain number of seconds? Or maybe add a scoring element or obstacles to avoid.

Vernier: Underwater Rocket

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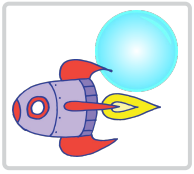
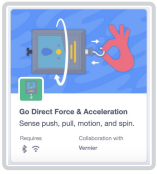
GET READY

Choose 2 sprites.

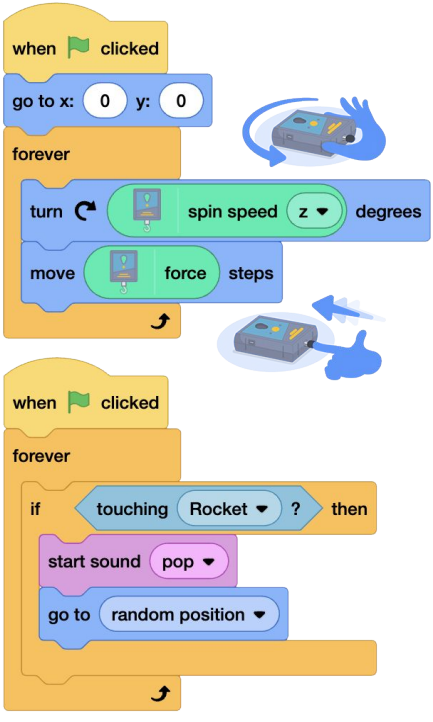


Add the Go Direct Extension.



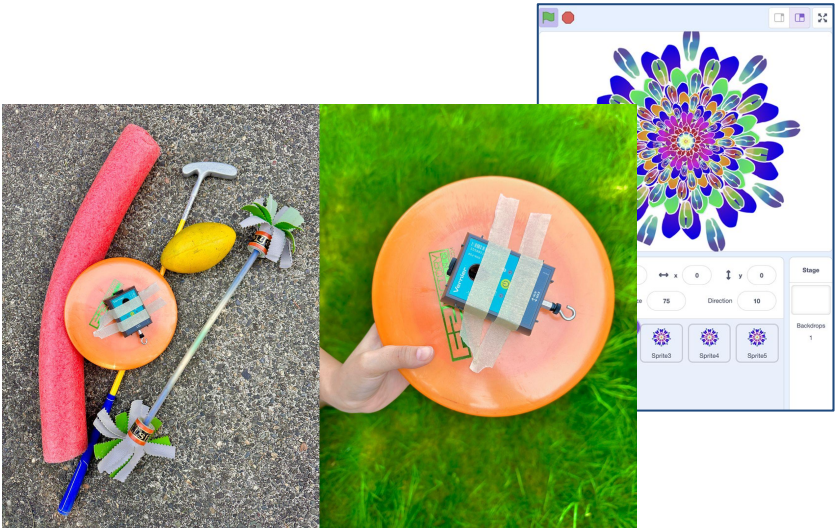
ADD CODE

1. Have one sprite forever turn and move around the stage, but use the “spin speed” reporter block under the Force and Acceleration category as the amount to turn by, and the “force” reporter block as the amount to move by.
2. For the second sprite, code something to happen when sprites touch.
3. Now, spin the sensor and push on it to steer your first sprite into your second.



Project Idea:

Frisbee-Controlled Mandala



Use a rubber band, pipe cleaners, hair bands, zip ties, adhesive tape, etc., to attach a Vernier sensor to various objects like a golf club, juggling stick, pool noodle, or a frisbee (ensure the area where you'll attach is clean and dry). Code animation when the object is thrown, swung, or moved.

Vernier: Frisbee-Controlled Mandala

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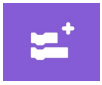
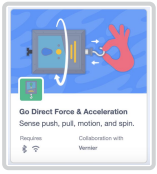
GET READY

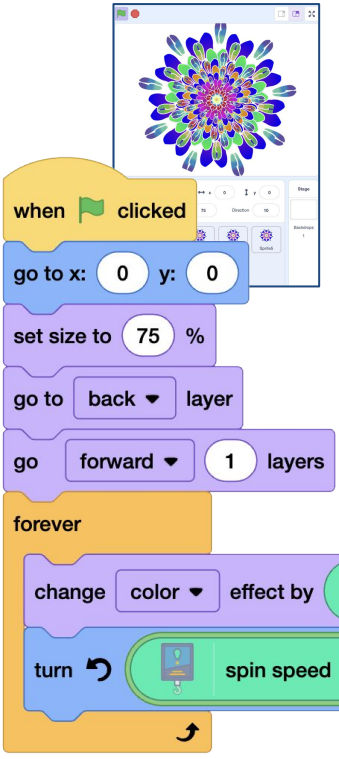
Create a sprite and duplicate it 3-6 times.



Add the Go Direct Extension.



ADD CODE

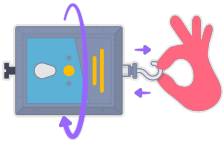


1. For a mandala effect, code each duplicate sprite to align atop each other but at a different size and layer order, using the “set size” and “go forward _ layers” blocks.

2. Use sensor readings, like acceleration and spin speed, to control the turn and color of each layer. Use Operator blocks, like multiply and divide, to make the color and speed of each layer different.

Project Idea:

Create Your Own/Remix

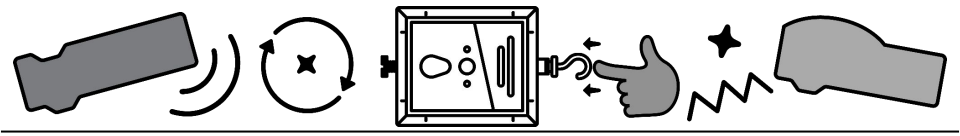


Try creating your own unique project or remix projects to use the Vernier sensor (versus keyboard keys or the mouse, etc.) to control sprites.

See our Starter Projects page for projects you might remix. Such as:

- Make It Fly
- Maze Starter
- Pong Starter
- Spin Art
- Soundflower
- Sound Graph

How could you use tilt, acceleration, spin speed, shaking, etc., to control a sprite's direction, movement, or variable values?



Interested in capturing the data the sensor is collecting? Try remixing a project like Sound Graph to capture readings such as force. Draw the results on the stage and capture them in a list (that could also be exported into a spreadsheet).

As Vernier's website suggests, you could see the results if you hold it while on a swing or slide, "attach a string to the hook and whirl it in a horizontal or vertical circle…[or use the sensor to] pull an object across a surface to measure frictional forces."