CHALLENGE 2

DANCE PAD MANIA

YOUR CHALLENGE

Build a dance pad that lets you use your feet to sound a buzzer or flash a light.

MATERIALS*

- 1.5-volt AA battery
- AA battery holder (optional)
- Aluminum foil
- Bulb holders for light bulbs (enough for half the group)
- Buzzers (enough for half the group)
- 2 11 x 17-inch sheets of corrugated cardboard (per team)
- Duct tape
- Electrical wire (22-gauge works well)
- Light bulbs that can run on a 1.5-volt AA battery
- Plastic wrap
- Scissors
- Wire strippers

* For information on where to get these materials, see page 6 or visit pbskidsgo.org/designsquad/engineers.

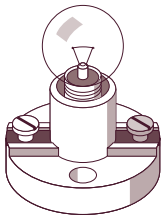
BRAINSTORM AND DESIGN

Divide your group into teams of two. Half the teams will make floor pads that flash a light, and the other half will make floor pads that sound a buzzer. When you work as a team, you can often solve design challenges more quickly. For example, you can share knowledge, get new ideas, and brainstorm solutions to problems. You can also learn a lot by looking at how other teams made their pads and seeing how they solved problems.

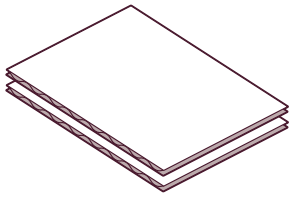
Your dance pad is basically a super-sized version of the alarm you built in Challenge 1. Like Hidden Alarm, the dance pad has a power source (the battery), materials for conducting electricity (the wires and foil), and something that uses the electricity (the buzzer or light). Yup, that's right, it's an electrical circuit. Before you begin designing, brainstorm answers to the following questions and record your ideas in your design notebook.

- Will my pad turn on a buzzer or a light?
- How will I build a switch into my pad to turn the buzzer or light on and off?
- How big will my pad be?
- How can I make it sturdy enough to withstand constant stomping?
- Where will I put the battery? Inside the pad? Outside the pad?

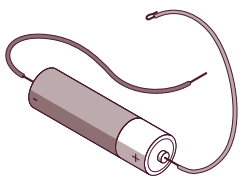
Buzzer



Light bulb and bulb holder



Corrugated cardboard



1.5-volt AA battery

BUILD, TEST, AND REDESIGN

As you build, make sure the circuit works and that it will be able to stand up to some rugged treatment! Once you've built your pad, test it. Step on it several times in a row to turn the buzzer or light on and off. How well did it work? When we made ours, we had to debug some problems. For example, our wires sometimes got loose and our pad stopped working. Also, our switch didn't always work. If things like this happen to you, figure out a way to fix the problem so that your pad works every time.

TAKE IT TO THE NEXT LEVEL

- Make a pad that has both a light and a buzzer.
- Make a pad that uses two batteries, two lights, or two buzzers.

INSIDE THE ENGINEERING

TECHNO GYM

Bust a move! Break it on down and get a good workout at Overtime Fitness™, a revolutionary fitness arcade for teens. Forget what you know about gyms, this is the gym of the future. Get your heart pumping with *In the Groove 2*®, a dance game that works like *Cyber Groove*™, *Dance Dance Revolution*®, *Feet of Fury*™, and *"Pump it Up"*®. Just try keeping up with those moving arrows! How about putting your one-two punch to the test with *MoCap Boxing*®, a virtual game complete with boxing gloves, a 3D virtual opponent, and infrared sensors that track your movements? Or try a game that has you jump, duck, and lunge to avoid virtual dodge balls. You can even hook yourself up to a video game box and become a human joystick to move an on-screen player. Note: The sensors, computers, sound systems, and software that make these games work were all brought to you by engineers. What will those ingenious engineers come up with next!?

Overtime Fitness is a trademark of Overtime Fitness, Inc. *In the Groove* is a registered trademark of Konami Digital Entertainment Co., Ltd. *Cyber Groove* is a trademark of Front Fareast Industrial Corp. *Dance Dance Revolution* is a registered trademark of Konami Digital Entertainment Co., Ltd. *Feet of Fury* is a trademark of Cryptic Allusion Games. *"Pump it Up"* is a registered trademark of Andamiro U.S.A. Corp. *MoCap Boxing* is a registered trademark of Konami Corporation

Watch *Design Squad* on PBS (check local listings). Download more challenges at **pbskidsgo.org/designsquad.**

PBS

TAKE IT ONLINE

Want something electrifying? Build a switch and wire up some different kinds of circuits! Download *Turn It On and Off* from Intel's *Design and Discovery* hands-on engineering program.

intel.com/education/designanddiscovery

The *Design Squad* cast moves and grooves. They built a floor sensor that used thin foam and metal to make switches that turned sound clips on as they danced.

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