CHALLENGE 2
GET-MOVING GAME

The invention challenge
Invent an indoor game for one or two people that gets you moving.

In this challenge, kids: (1) play an "imagine new uses for old things" game; (2) brainstorm activities that get people up and moving; (3) follow the design process to invent a game, including the equipment and rules for playing it.

1 Prepare ahead of time

- Read the leader notes and the challenge sheet.
- Gather the materials (per ten kids, organized into five teams):
  - 20 rubber bands
  - 10 Ping-Pong balls
  - 10 plastic spoons
  - 5 paint stirrers
  - 5 tennis balls
  - 20 sheets of cardboard (approx. 8.5x11 in.)
  - 10 small aluminum baking tins
  - 5 small plastic bags
  - duct tape
  - scissors
  - copier paper
  - string

2 Warm up: Play an "Imagine New Uses For Things" game (10 minutes)
Ask kids this seemingly simple question: What's an invention? Kids are likely to say it's a new machine or product. But sometimes, inventing means coming up with a new use for an existing product. To encourage flexibility in kids' thinking, ask them to think of non-electric things used in a kitchen (e.g., spatula, strainer, pot, pan, ladle, cup, wooden spoon, pitcher, refrigerator magnet, mixing bowl, paper towel, etc.). *(NOTE: Don't let kids choose a knife or other sharp, pointy object as their implement.)* Then, have each kid think up a game or sport that could use these. Since this is a thought exercise rather then an actual game, encourage kids to be imagnative. Once they finish brainstorming, have each kid briefly describe the game or sport he or she invented. Point out that looking at things in new ways takes imagination, and imagination and invention go hand in hand, whether you're an artist, a toolmaker, a housekeeper, an inventor, or an engineer.

3 Introduce the challenge (5 minutes)
To underscore the need for inventions that promote physical activity, introduce kids to the idea of a "couch potato."

Do you know a couch potato—someone who watches a lot of TV? A group of Girl Scouts in Fremont, California wanted to help couch potatoes have a lot of fun living healthier, more active lives. So they created the Couch Potato Interest Project. To earn a badge, you need to do several activities. One is to check out a few health studies. Many studies show that people who are inactive risk being overweight, becoming depressed, and having poor fitness and out-of-control blood-sugar levels (diabetes). Another activity is to keep a log of how much TV you watch and see if you watch more or less than your friends. Then, you quit watching TV for a week. At the end of the week, you evaluate how you feel. Do you feel better? Healthier? Happier? Were you more active? These girls invented a badge to help couch potatoes. What are other inventions that could help improve a couch potato's life?

DESIGN SQUAD

SHOW KIDS THE RELATED TV EPISODE

To help basketball fans see all the angles of a fast-moving game, the Design Squad *teams compete to design a system of courtside remote-controlled cameras. Watch the "Got Game" episode online at* **pbs.org/designsquad**.

COUCH POTATO?

The term *couch potato* was coined (i.e., invented) in 1976 and entered into the Oxford English Dictionary in 1993. Research studies consistently show that being sedentary can lead to health problems—obesity, poor nutrition, diabetes, depression, and poor fitness.

LEMELSON-MIT InvenTeams

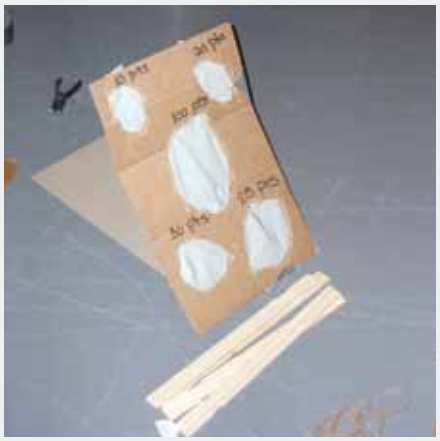
SHOW KIDS A RELATED INVENTEAM PROJECT

The Divine Child High School InvenTeam invented a way for people to recharge up to three electronic devices, such as cell phones and MP3 players, while riding a bike. Check out this project and others at **web.mit.edu/inventeams**.

Looking at things in new ways takes imagination, and imagination and invention go hand in hand.

4 Brainstorm design ideas (10 minutes)

- This challenge is about action. List a few action verbs on the board (e.g., toss, roll, throw, catch, shoot, spin, and paddle). Challenge kids to add to the list (e.g., hit, run, block, flip, dribble, knock over, sink, pitch, steer, and score). Finally, ask kids to match each verb to a game (e.g., *hit* and *baseball*).
- To get kids thinking about games that are fun and easy, ask, What games might you play at recess, camp, or a carnival? *(four square, tag, tug-of-war, ring toss, hit-a-target, jump rope, beanbag toss, mini golf, knock down a milk-jug tower, balloon pop, basketball, etc.)*
- Discuss what it means to invent a game. Does it require a new piece of equipment? New rules? Changing a familiar game? *(It could be any or all of these things.)*



During testing, we ended up with a variety of designs. These pictures show several possible solutions. But don't show them to kids—they're likely to copy the ideas they see in the pictures.

5 Build, test, and redesign (25 minutes)

In our testing, the kids loved playing their games—a true measure of success. During our sessions, we encountered some issues that your kids might also face:

- **Kids can't think of a game.** Revisit the list of verbs and games. In our testing, kids' games usually involved catching, throwing, bouncing, dropping, knocking down, or rolling. Also, kids can choose an existing game from the brainstormed list and change it: a new part, a new element from another game, or new rules, for example.
- **Your space is small for active games.** You may need to tell kids that their games need to be playable in a certain amount of space. Tell kids how much room each pair can have.
- **The game is very complicated.** Have kids focus on one part of their game instead of trying to do everything they have in mind. As a guideline, ask them to choose a part that kids could play at recess or at a carnival booth.

6 Discuss what happened (10 minutes)

- Is a game that increases people's activity level a good invention? Explain. *(An active game provides exercise, which benefits people in ways such as improving health and mood.)*
- How does your game get people moving?
- What features of your game would make someone want to play? *(The game is fun, not too easy or hard, and has simple rules and different levels of play.)*
- Testing and redesigning are important steps in the design process. How did these steps help you invent your game? *(Kids start with a particular rule or piece of equipment. Sometimes, they realize that the rules don't really work, and they modify them. Other times, the equipment doesn't work as expected, and kids modify it or change the rules to play the game with the equipment as is. This sort of testing and redesigning often happens on the fly, but it's still the design process that leads to an improved invention.)*

TINKER SOME MORE

Tell kids they work for a company that's been asked to invent a game that helps one of the following users be more active. What kind of game ideas can they suggest for people who are:

- on crutches or in a wheelchair?
- who are bedridden?
- on a long road trip?
- living on the International Space Station?

CHALLENGE THE STEREOTYPE

Tell kids that inventors and engineers do interesting things that improve people's lives. For example, point out that engineers and inventors have developed many ways to increase people's activity level and improve their health and level of fitness. Also show kids videos in which young engineers describe how engineering lets them lead interesting, exciting lives and do cool things. See them online at:

- **pbs.org/designsquad/profiles**
- **web.mit.edu/inventeams/videos.html**