

# CHALLENGES

- Once you have practiced your bottle-flipping method, try it 10 times in a row. Remember to keep your technique as consistent as possible. *How many times can you get the bottle to land upright?*
- Now try it 10 times with an **empty** bottle. *Can you still get the bottle to land upright?*
- Now try it 10 times with a **completely full** bottle. *Can you still get the bottle to land upright?*
- Try to see if you can find the optimal amount of water in the bottle. *What if the bottle is one half or three quarters? What amount of water gives you the best success rate?*
- **Extra:** Put some water bottles filled with different amounts of water in the freezer overnight (make sure they are sitting upright). Try flipping them the next day. *Is it easier or harder to successfully flip bottles with ice instead of liquid water inside them?*
- **Extra:** Try throwing the bottle different distances and heights—and vary how much you spin it. *Is it easier to get the bottle to land upright if you throw it across the room or so it lands just in front of you? What if you try to land it on a table instead of the floor? What if you try to get it to complete two flips instead of one?*
- **Extra:** Try landing the bottle on different surfaces, such as carpet, wood floors, tile, etcetera. *Is it easier to land the bottle upright on some surfaces than others?*

- **Extra:** Try the activity with different size or shape bottles. *Do some work better than others? Do you have a “favorite” type of bottle?*