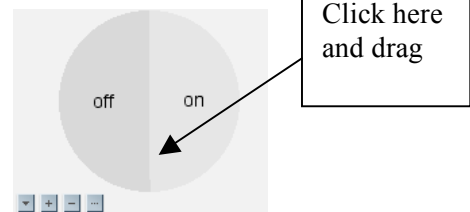


## Random Lights

Name(s): \_\_\_\_\_

1. Open the TinkerPlots document **Random Lights.tp**. The sampler in this document makes tall “buildings” with individual “offices” that have their lights on or off.
2. Click the **RUN** button to run the sampler several times to make different buildings.
3. Do the lights in your buildings look randomly placed? Explain.
4. What is the probability of the lights in an office in this office building being on? How did you determine this probability?

5. You can change the probability of the lights being on by dragging the section divider. Click the divider and drag it so the probability of the lights being on is about  $\frac{1}{3}$ .



6. Click **RUN** several more times to see what the building looks like now. About what percentage of the offices now has lights on?
7. Move the divider in the spinner to different locations to see how this affects the building lights in the offices.

8. Suppose that the lights are on in ten randomly arranged offices in this building. Mark the “offices” so they are randomly placed.



9. Change the spinner so there is about a 10% chance that the lights in an office are on. You can show the percents by clicking the **Device Options** menu (the arrow in the lower left of the device) and choosing **Show Percent**.
10. Click the **RUN** button several times to produce a new arrangement of which lights are on in the office building. Each time, inspect the building to see how the lights are arranged. Are the arrangements basically the same as the building you made above? Explain.
11. Some of the results from Step 10 may surprise you. When you get a pattern that looks particularly interesting, make a copy of the building by selecting the plot, going to the **Edit** menu and choosing **Copy as Picture**. Then paste it into a new TinkerPlots document.
12. Why do we call these *random* lights?