

## Intro Screen

In the Intro screen, students can guess which bin a ball will fall into, compare multiple trials, switch between a concrete and abstract representation, and begin to explore binary probability.

**VIEW** graphical representation

**ERASE** balls to start a new experiment

**DROP** 1, 10, or 100 balls

**LISTEN** to the ball as it bounces off the pegs

N = 100

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## Lab Screen

In the Lab screen, dive deeper into the exploration of binary probability in the context of a quincunx board.

**VIEW** the path a ball takes

**GRAPH** total count or fraction

**COMPARE** actual and theoretical distributions

**CUSTOMIZE** the number of rows and the probability of a ball falling to the right of a peg

**COMPARE** the actual mean and standard deviation to the theoretical

N = 63

$\bar{x} = 3.270$   $\mu = 3.200$   
 $s = 1.537$   $\sigma = 1.386$   
 $s_{\text{mean}} = 0.194$  ☒ Ideal

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## Design Notes

- In the Intro screen, the play button drops 1, 10, or 100 balls onto the board, up to a maximum of 100 balls. Once 100 have been dropped, it will appear inactive until the user clicks refresh or erases the bins.
- In the Lab screen, when the binary probability is adjusted, the pegs tilt as a visual cue that the likelihood of a ball falling to one side is affected. Teachers can help students make sense of the value for the probability by asking what a probability of 0 or 1 means in this context.
- The graphical views auto-scale so that the tallest bar always represents the largest value of any bin.

## Suggestions for Use

- Using the Intro screen, conduct multiple trials and compare the outcomes when 100 balls are successively dropped.
- On the Lab screen, showing the path of the ball can be useful for demonstrating a random walk. Students can count how many times the ball turned left or right and verify the final bin the ball lands in.

See all published activities for Plinko Probability [here](#).

For more tips on using PhET sims with your students, see [Tips for Using PhET](#).