

# Project 23

## Top Brick

**Objective:** Child will understand how placement and weight affect the motion of an object.

**Essential Question(s):** How does the placement of design components affect the spinning speed of a top?

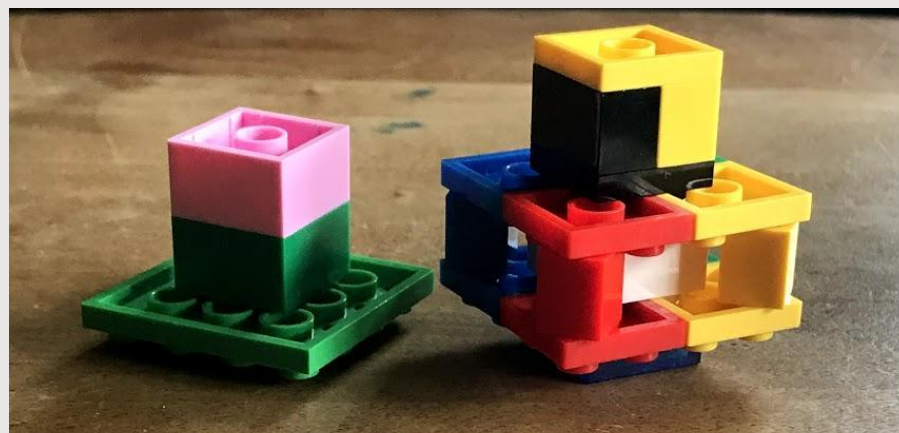
**Special Materials:** A regular top for opening demonstration, a shallow box for spinning (although desks work well, too, these don't spin that far)

**Bricks Required:** 2x2 tiles, 4x4 plates, various bricks and plates

### Project Structure:

#### Engage/Explain:

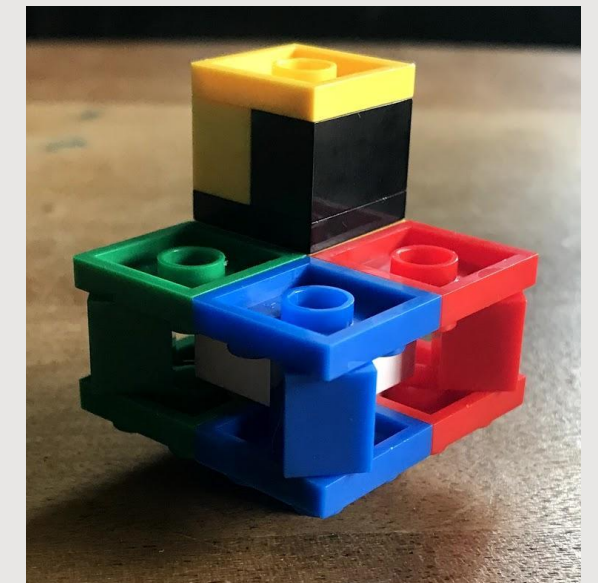
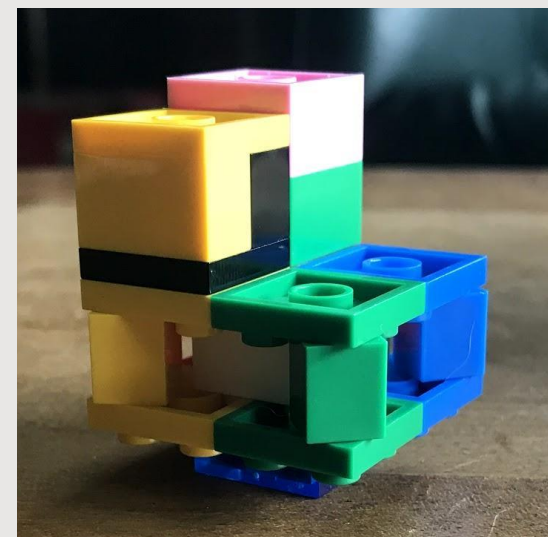
1. Spin a top and ask child about its motion.
  - a. Child should notice how vertical it is at the beginning, and how it begins to wobble when it slows down.
2. Ask child to notice the shape of the top: its handle, pointy bottom, and roundness. You may also want to point out its symmetry if child is familiar with the concept, and also mention what would happen if there were more weight in one place or another.



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### Explore:

1. Show child the rudiments of building a brick top:
  - a. Friction needs to be reduced on the bottom, so this will be built "upside down" or "studs on the bottom"
  - b. A 2x2 tile centered on a 4x4 plate will create the base of the top.
  - c. The top needs something to grip to give it a good spin.
2. Have child begin building their top, aiming to get one that spins well. Things to experiment with:
  - a. Weight: How many bricks should the handle have? Should it be wide or narrow? Tall or short?
  - b. Body: Should it be made of plates or bricks? Should it have gaps or be solid?
  - c. Bottom: Should the tile be right against the plate or should there be a plate or brick adding height?
3. Once child is satisfied with their design, ask them to experiment with moving parts around or adding weight in an unbalanced manner. Some ideas:
  - a. Move the handle to one corner or side;
  - b. Make the handle wider.
4. Child should prepare a data table, perform multiple trials, and record data on their varying prototypes.
5. Child can also have contests to see which top spins the longest, using their "best" top designs based on their recorded data.



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