

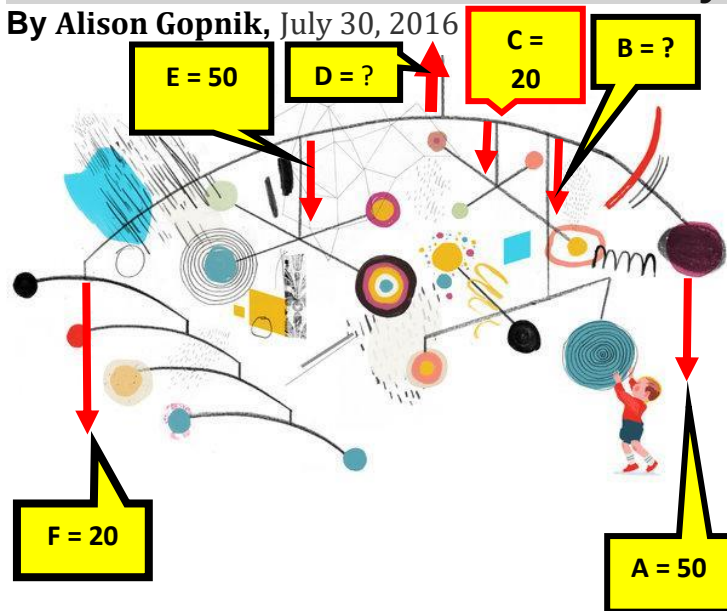
# ROTATIONAL EQUILIBRIUM

Unit 15 Dr. John P. Cise,

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## What Babies Know About Physics and Foreign Languages

By Alison Gopnik, July 30, 2016



**INTRODUCTION:** Goal of this application is to find force  $D$  &  $B$  which keep this mobile in rotational equilibrium. All forces are in gram units and distances are in cm. Take axis of rotation to be at  $D$ . Lever arms from axis of rotation of forces are as follows:  $A: 30$  cm.,  $B: 20$  cm.,  $C: 10$  cm.,  $E: 20$  cm.,  $F: 50$  cm.

**QUESTION:** Find forces  $B$  &  $D$ ?

**HINTS:** To solve for two unknowns it is needed to set up two equations.  $\Sigma F_y = 0$  ,  $\Sigma T = 0$

**ANSWERS:**  $B = 15$  grams ,  $A = 155$  grams

Parents and policy makers have become obsessed with getting young children to learn more, faster. But the picture of early learning that drives them is exactly the opposite of the one that emerges from developmental science. In the last 30 years, the United States has completed its transformation to an information economy. **Knowledge is as important in the 21st century as capital was in the 19th, or land in the 18th. In the same 30 years, scientists have discovered that even very young children learn more than we once thought possible.** Put those together and our preoccupation with making children learn is no surprise. The trouble is that most people think learning is the sort of thing we do in school, and that parents should act like teachers — they should direct special lessons at children to produce particular kinds of knowledge or skill, with the help of how-to books and “parenting” apps. Studies prove that high-quality preschool helps children thrive. But policy makers and educators are still under pressure to justify their investments in early childhood education. They’ve reacted by replacing pretend corners and playground time with “school readiness” tests. But in fact, schools are a very recent invention. **Young children were learning thousands of years before we had ever even thought of schools. Children in foraging cultures learned by watching what the people around them did every day, and by playing with the tools they used.** New studies show that even the youngest children’s brains are designed to learn from this simple observation and play in a remarkably sensitive way. **The children analyzed the pattern of events, figured out which actions actually made the toy go, and immediately produced just those actions.** They would just pull the tab and turn over the toy. **They used their observations to create an intelligent new solution to the problem. We take it for granted that young children “get into everything.” But new studies of “active learning” show that when children play with toys they are acting a lot like scientists doing experiments. Preschoolers prefer to play with the toys that will teach them the most, and they play with those toys in just the way that will give them the most information about how the world works.**

**We don’t have to make children learn, we just have to let them learn.**