

## Connections to School —


Children gain hands-on experience with important ideas contained in K-8 state and national science standards. In *Balancing Toys* children explore *equilibrium* — how weight and distance make a system turn or stay “balanced” around a fulcrum (balance point.)

All NPASS2 after school projects are relaxed, informal and fun. They stress five common process skills that are mentioned in state and national science standards: observing, investigating, questioning, explaining and problem-solving. We call these the *Master Scientist Skills*.

**NPASS<sub>2</sub>**  
National Partnerships for After School Science

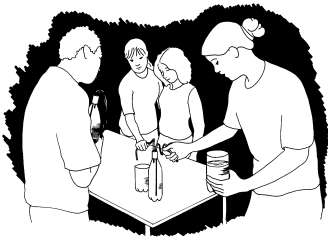
**MASTER PROBLEM SOLVER**

- Gets Started, Takes Risks
- Gets Help as Needed
- Pays Attention to Results



Take a risk and try *something!* If that doesn't work, try *something else*. Ask for help when you need it and pay attention to what works and what doesn't (for you and other people).

## Have you seen this other *Explore It!* project?



### Siphon Systems

Students explore how water moves in simple and complex siphon systems.



NPASS2 is a project of  
Education Development Center  
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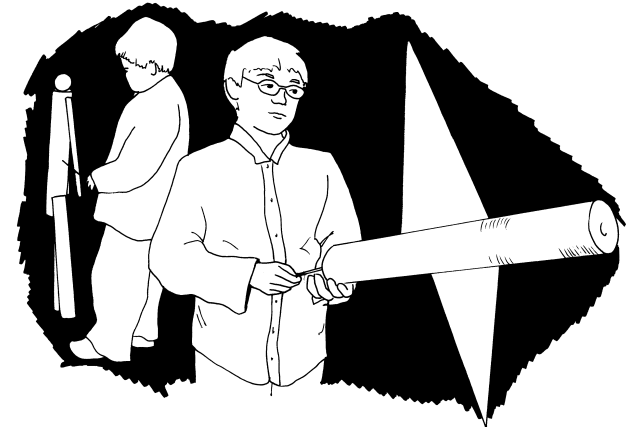
NPASS2 on the Web  
<http://npass2.edc.org>

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# MAKING SCIENCE FUN

**Balancing Toys:** an after school science and engineering project from the *Explore It!* curriculum series



▶ Students explore balance (equilibrium) by building models of a human body, an airplane, a sailboat and mobiles.



The National Partnerships for  
After School Science

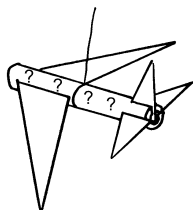
## FOR PARENTS\*

### Summary

Children design a model human body, a plane, a sailboat and mobiles to explore the principles of balance and equilibrium.

### *Explore It!* Balancing Toys Explorations

- Balancing a Model Body
- Balancing a Model Boat
- Balancing a Model Airplane
- Balancing an Acrobat
- Designing and Creating Mobiles



### Suggested Materials

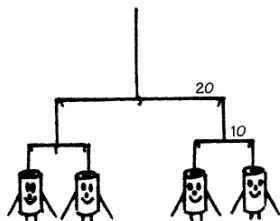
Pool Noodle                  Rubber bands  
Cable ties                  Ruler  
1/4" Dowel or stick (~3 feet)  
Small weights (nails or pennies)  
Small objects (CDs, cardboard, pencil)

String  
Scissors

### Troubleshooting Questioning

Ask these types of questions as your child explores the activities at home:

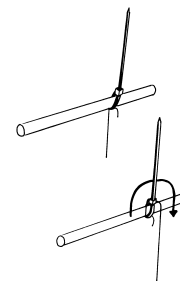
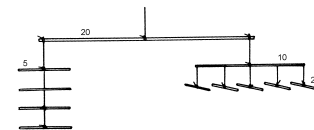
- What happens when a weight is moved along one of the dowels?
- How can you adjust the other objects so that the mobile stays in balance?
- Can you make a small weight on one side balance a much bigger weight on the other side? Find out how un-symmetrical a mobile can be.



\* For more information about this project go to:  
<http://npass2.edc.org/resources/curriculum-guides/balancing-toys>

## FOR KIDS

**Design your own mobiles.** Cut dowels (or sticks) into about 20, 10 and 5 inch sections for the crosspieces. Tie about 12 inches of string onto some small objects. Use the cable ties to secure the other end of each string to the dowels. The ties should be very snug but still able to slide along the dowel. Start with just one level and then see if you can add more. Move the position of the objects or levels on the dowels and notice how weight affects where objects and levels can be placed. See how *visually* "unbalanced" your mobiles can be. [Look up Alexander Calder's mobiles on the web, if you can.]



**Make your own Balancing Acrobat** using a 4 1/2" inch section of pool noodle. Push 2 short dowels into the bottom until about 1 inch protrudes for legs. Attach 2 long dowels for arms as shown. Make the acrobat balance on her two feet. Try different length arms. See what happens if you add weights (nails or pennies) to her arms or fingers.

