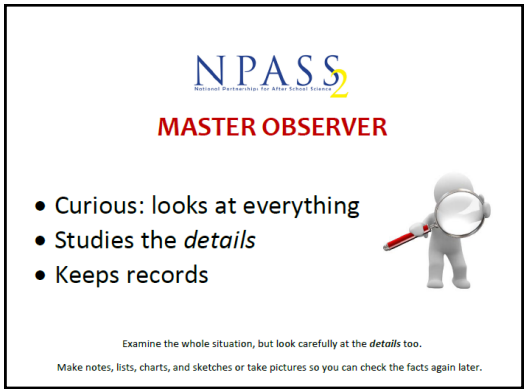
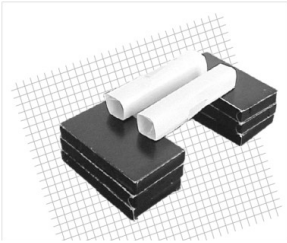
Connections to School —

Children gain hands-on experience with important ideas contained in K-8 state and national science standards. In Pinball they explore how force, gravity and angle (trajectory) influence their game.

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*.



Have you seen this other *Design It!* project?



Paper Bridges

Students engineer strong bridges and structural columns only from paper and a very small amount of tape.

EDC Learning transforms lives.

NPASS2 is a project of
Education Development Center
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Waltham, MA 02453

NPASS2 on the Web
http://npass2.edc.org

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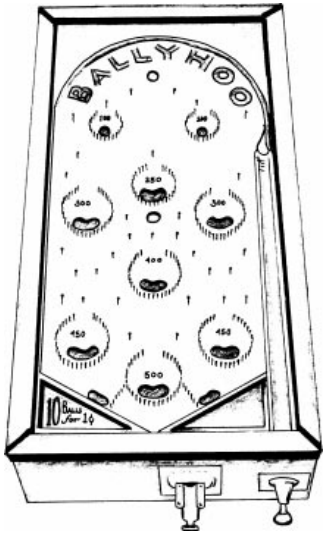
MAKING SCIENCE FUN

Pinball: Designing a Game

an after school science and engineering project from the *Design It!* curriculum series



Students design their own pinball games complete with flippers, plungers, bumpers and traps.

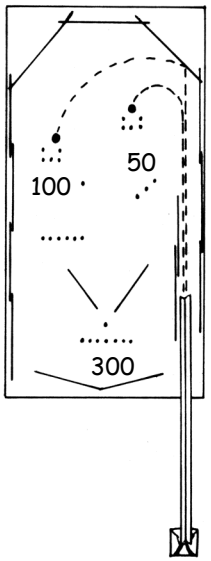
NPASS2 National Partnerships for After School Science

The National Partnerships for After School Science

FOR PARENTS*

Summary

Given pegboards, straws and marbles children design and build their own pinball games. They make up a point system for scoring and share their games with other teams.



Design It! Pinball Activities

- Setting Up a Pinball Game
- Making More Traps
- Giving Number Values to Your Traps
- Making Flippers
- Making Spring Plungers

Suggested Materials

Pegboard (about 2'x3' & 1/4" thick)
30 Flexible straws Rubber bands
2 Yardsticks Tape
Pencil
Half-gallon milk carton or other support for the ramp launcher
1-inch Marbles or wooden balls
2 Cups or other supports to lift the pegboard
Piece of cardboard (12"x12") for plunger
Small springs that fit on a pencil

Troubleshooting & Questioning

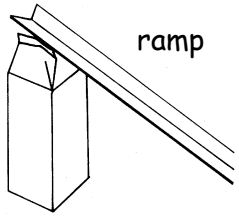
Ask these types of questions as your child designs his/her game:

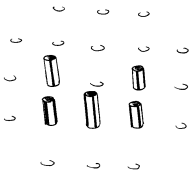
- How can you keep the marble from falling off the game board?
- What are the rules for playing your game?
- How do you make the marble go where you want it to go?
- How can you make your game more fun for someone else to play?

* For more information about this project go to: http://npass2.edc.org/resources/curriculum-guides/pinball-designing-game

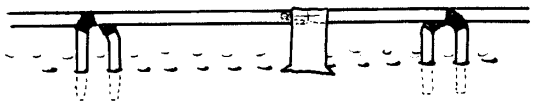
FOR KIDS

Make a Pinball Game at home using the materials suggested. Insert straws around the outside edges of the pegboard for guardrails. Make a launch ramp from two yardsticks taped together into a V-shape and supported by a half-gallon milk carton. Insert straws, wooden pegs or other materials into the pegboard to create traps, bumpers, flippers, obstacles and pinwheels. Assign points to these features according to difficulty. Make up some rules and share your game with a friend.

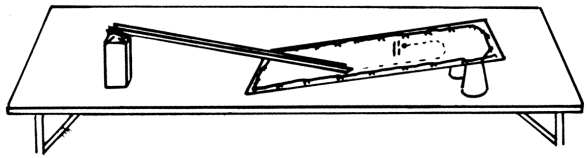




Straws form a trap

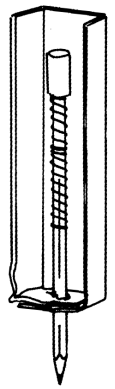


Guardrails made from straws and tape



supported board with launch ramp

Once your game is working, try a different launch method. Design a plunger launcher from cardboard, pencil and spring. Fasten this to your game board in place of the launch ramp. How does it work compared to the launch ramp? How can you control the launch speed using the plunger?



SAFETY

Never use elastic or rubber bands to launch the marble.