

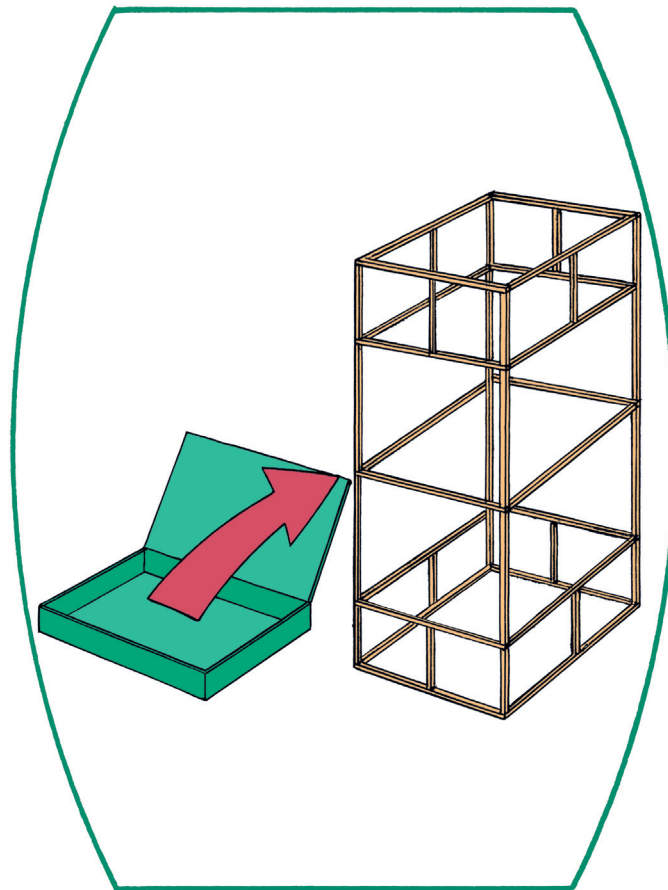


ODYSSEY OF THE MIND®

2006-2007

Problem No. 4:

OUT OF THE BOX Balsa



Out of the Box Balsa

Problem No. 4: Divisions I, II, III & IV

A. The Problem

The team's problem is to design, build and test a structure, made of balsa wood and glue that will balance and support as much weight as possible. The structure must be designed to fit completely inside a small box before it is completely assembled. The team is allowed to use materials other than balsa wood and glue to assemble the parts of the structure. During the performance, the team will remove everything from the box, then assemble and test the structure. There will also be a special effect at some time during the performance.

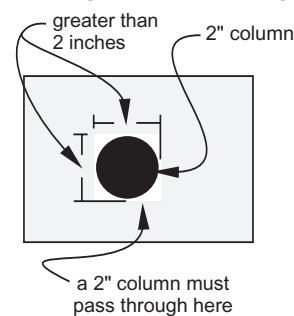
The **creative emphases** of this problem are on the way the structure is designed to be assembled and how a material other than balsa wood and glue is used in its assembly.

The **Spirit of the Problem** is to design, build and test a structure made primarily of balsa wood and glue that will fit inside a box that is smaller than the size the structure must be when completely assembled for weight-placement testing.

B. Limitations (Italicized words/terms are defined on Page 5 in the Problem Glossary or in the **updated 2006-2007 Odyssey of the Mind Program Guide**.)

1. **General Rules:** Read the *2006-2007 Odyssey of the Mind Program Guide*. This manual includes basic limitations for this problem and the forms required for competition. This problem cannot be solved without referring to the Program Rules section of the guide.
2. **Problem Clarifications:** The *Odyssey of the Mind Program Guide* explains the types of questions about the rules that will be clarified and the ways to submit those questions. General problem clarifications can be accessed at www.odysseyofthemind.com/clarifications/ and are published in the fall and winter issues of the *Odyssey of the Mind Newsletter*. Problem clarifications improperly submitted, postmarked, or emailed after February 15, 2007, will not be answered. CCI may find it necessary to issue clarifications after that date so continue to check for them after February 15 and before each competition.
3. The time limit for this problem is 8 minutes. This starts when the Timekeeper says, "Begin" and includes setup, Style, and presentation of the problem solution.
4. The cost limit for this problem is \$125 (U.S.). The combined value of the materials used during the demonstration of the team's solution, including Style, cannot exceed this amount. The *Odyssey of the Mind Program Guide* explains the cost limit and lists items that are exempt from cost.
5. The structure:
 - a. must be made of balsa wood and glue.
 - b. may include other assembly materials.
 - c. must fit into a box, along with all materials used for its assembly. The structure parts may be connected, separate, or a combination, as long as they all fit inside the box. The *entire contents of the box* must weigh no more than 18 grams.
 - d. must be a minimum of 8" tall when assembled for testing.
 - e. may be assembled at any time during the 8-minute performance time.
 - f. when assembled for testing, must have an open area running the entire height that will accept a circular column measuring 2" (5.1cm) in diameter. Therefore, the opening must be greater than 2". The open area will be measured by placing the structure over a 2" column so the structure passes completely over the column without assistance in its descent. The safety pipe of the tester must be in the opening during weight placement (see Figure A).
6. The balsa wood used in the structure:
 - a. must come from only *commercially produced* strips of balsa wood. No other type of wood or any variation of balsa wood may be used. Balsa wood may be purchased through www.odysseyofthemind.com/shop/.
 - b. must have a cross section no greater than 1/8" wide x 1/8" deep (0.32cm x 0.32cm). Some commercial cuts vary, so the maximum allowed of either dimension is actually .135" (0.33cm), which is slightly greater than 1/8".

Figure A: Top View of the Opening



- c. must be at least 36" (0.91m) long when the team receives it.
 - d. cannot be hand picked by anyone other than the team members. Team members may request wood to be from a commonly known grade, but no one else may sort and pick specific pieces. If the wood is handpicked by anyone other than the team members, the judges will assess an Outside Assistance penalty.
 - e. must be cut by the team. The only exceptions are the perpendicular end cuts of the original strip. If a cut is made by anyone other than the team members, the judges will assess an Outside Assistance penalty.
 - f. may be marked or colored. However, it must not be artificially strengthened in any way, such as, soaked in glue, using tape for purposes other than assembly, etc.
7. Every type of glue used on the structure must be used as purchased; that is, nothing may be added to it, nor may it be mixed with anything unless the manufacturer specifies that two ingredients combine to form the glue. Any brand or type of glue is permissible as long as the manufacturer has printed the word "glue", "epoxy", "cement" or "adhesive" on the tube, container, box, or accompanying printed material.
8. Assembly material(s):
- a. may be anything the team wishes, but they must be used only to assemble or connect the structure's parts.
 - b. must not be within 1" of the crusher board and not within 1" of the surface of the tester base when weight placement begins.
 - c. must be in the box to be eligible to be part of the assembled structure tested in weight placement.
 - d. will count toward the structure's total weight whether or not they are used in the assembled structure.
9. The box:
- a. may be commercially produced or made of anything the team wishes.
 - b. must completely enclose all parts of the structure and all assembly materials.
 - c. will be measured at Weigh-In and must fit completely within a measuring device with the following internal dimensions:

Division I: 1½" x 6" x 9"

Division II: 1" x 6" x 8"

Divisions III & IV: 1" x 6" x 6"

10. Tools may be used to assemble the structure. Assembly tools:
- a. must not be in the box.
 - b. must not be part of the assembled structure during weight placement.
 - c. are exempt from cost if they are used only to assemble the structure. If their visual appearance or the way they are used enhances the performance, they must be counted toward cost on the Materials Value Form.
11. The special effect:
- a. may be anything the team wishes.
 - b. must be able to be seen and/or heard by the judges and audience.
 - c. may be presented at any time during its 8-minute competition time.

12. The team must use only the weights and tester supplied by the Tournament Director (see Figure B). These must be used only in the normal process of placing weights; for example, the weights cannot be used for Style, the tester cannot be decorated, etc.

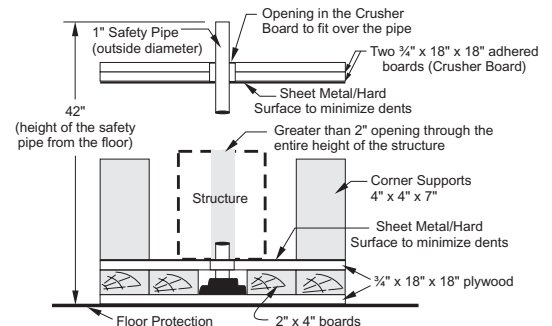


Figure B: Tester Design

13. Team members must place weights one at a time onto the structure. The first weight must be the crusher board supplied by the Tournament Director. This will count toward the total weight held.
14. **Division I** teams may have an adult (18 years of age or older) assist* at least one team member in placing weights heavier than 20 pounds. **Division II** teams may have an adult assist* at least one team member in placing weights heavier than 40 pounds. In **Divisions III and IV**, team members must place the weights themselves. For all divisions, the team must decide the order in which it will place the weights.
- *The adult can only help to place these weights. A team member must select the weight to place and do more than simply touch the weight while an adult places it on the stack.
15. Team members must wear safety goggles, eyeglasses with plastic lenses, or other protective eyewear (approved by the judges) if they are within the Safety Area while the structure is supporting weight and their heads are below the crusher board (see E11).

16. A weight must be held on the stack for at least 3 seconds to count in the total weight held. There is no restriction on how rapidly team members place the weights.
17. Team members may remove weights from the weight stack during testing. However, only the weights on the stack when weight placement ends are eligible for score.
18. It is the team's responsibility to add the extension pipe to the safety pipe, if needed.
19. The team may test the structure and perform its Style presentation any time during its 8-minute competition time. If the team plans to perform Style after its structure breaks, the team should inform the Staging Area Judge. If the team does not inform the judge it will not be penalized.
20. **A reminder about outside assistance:** Team members are not allowed to discuss with others how they solved this problem until after World Finals. Sharing ideas with other participants or in a public forum is considered outside assistance. Anyone doing this puts their team and the team of anyone who receives the information in position for a penalty. Failure to report such an occurrence could bring a significant penalty, or lead to disqualification or suspension (see *Odyssey of the Mind Program Guide* pages 44-45).

C. Site, Setup and Competition

1. If possible, the tester will be on a solid, uncarpeted floor and will be level (see Figure B). It will be positioned in the center of the Safety Area, a 60" x 60" taped square, which will serve as a guideline to keep team members aware of their proximity to the tester and as a reminder of where they must wear safety glasses. The team is not allowed to move the tester.
2. At least 30 minutes before its scheduled competition time, the team must report to the Weigh-In Site with its structure and all assembly materials enclosed in the structure's box. While in Weigh-In, the team will assemble its structure so it is in the same shape as it will be when weight-placement testing begins. The Weigh-In Judges will measure the box and check the assembled structure for rule infractions.
3. If the structure does not meet specifications, Weigh-In Judges will try to give the team an opportunity to bring it into specifications or submit another structure before its competition time. In most cases, corrections should be completed no less than 20 minutes before competition time. There is no penalty if the structure is brought into specifications before completing the Weigh-In process.
4. Once the structure has completed the weigh-in process the team must disassemble it and place it back in the box. The structure may not be changed, altered or substituted.
5. Once the structure is back in its box, a judge will place the box into a bag and keep it at the Weigh-In site until the team picks it up for competition. The bag will be supplied by the judges at Weigh-In. The team must return to pick up the structure no earlier than 25 minutes before its scheduled competition time.
6. The judge will attach a Weigh-In Checklist to the bag containing the box and structure. The team cannot remove the Weigh-In Checklist until directed to do so by the Staging Area Judge. If the Weigh-In Checklist has been removed, the bag tampered with or the box removed, the team may have to repeat the weigh-in process. Depending on the situation, the team could receive a Spirit of the Problem penalty. The team may not open its box until the 8-minute competition time begins.
7. The team members must report to the competition site with everything they will use in their solution at least 15 minutes before they are scheduled to compete.
8. After the Timekeeper says, "Begin" the team can remove its structure from the box, assemble the parts into the complete structure, then place the structure onto the testing device. The team can adjust the structure's position while placing the crusher board, but no one can touch the structure once the crusher board has been placed onto it. If team members wish to adjust the structure, they must remove all weights, including the crusher board, then proceed.
9. The weight-placement portion of the problem solution will end when:
 - a. the crusher board or structure touches any corner post.
 - b. a weight rests against the safety pipe and the judges determine that the pipe is helping to support the weight stack. If time remains, the team can adjust the weight and continue weight placement.
 - c. a weight extends beyond the height of the full length of the safety pipe, including the extension pipe.
 - d. any part of the assembled structure, including its assembly materials, touches the tester pipe in a manner the judges deem supporting the weight stack.
 - e. the 8-minute time limit ends. The team must stop all activity when the judge calls "time" or the team gives a signal that it has finished.

- Teams should bring cleaning utensils to clean up any mess. Should a team take an unreasonable amount of time to clean the site, or leave a mess, the judges will assess an Unsportsmanlike Conduct penalty. Others not on the team's roster may help the team clear the site and remove the team's props. The competition area must be left clean and dry for the next competing team.

P R E C A U T I O N S

- Use eye protection, e.g., a face shield, safety glasses, goggles, etc., when looking closely at a structure holding weight. Collapsing structures may project pieces of wood several feet.
- Keep your fingers on the sides of the weights when placing them onto the crusher board or onto other weights.
- Remain aware of the structure, the testing device, and weight stack at all times to avoid injury in case of collapse.
- Do not stand too close to the structure, tester, and weight stack unless necessary, and avoid bumping them accidentally.
- Use a safety pipe through the center hole of the weights to help prevent them from falling.
- Place a piece of plywood/hardboard or a tumbling mat under weights waiting to be placed onto the weight stack to help prevent damage to the floor.
- Super glues are extremely dangerous to use and some glues have dangerous fumes. Read and follow all precautions and directions on the manufacturer's labels. Non-toxic model airplane wood glues are recommended. If toxic glue is used, proper precautions, such as ventilation and parental supervision, are advised.

D. Scoring

- In each division, the structure holding the most weight will receive 150 points. All other structures will receive a corresponding score based on the percentage of weight held1 to 150 points
- Creative use of an assembly material1 to 25 points
- Creativity of the way the balsa wood and other materials are designed to be assembled into the structure1 to 25 points

Maximum possible: 200 points

E. Penalties (Deduct penalty points from the percentaged score, **not** from total weight held.)

- "Spirit of the Problem" violation (each offense).....-1 to -100 points
- Unsportsmanlike conduct (each offense).....-1 to -100 points
- Incorrect or missing membership sign-1 to -15 points
- Outside assistance (each offense).....-1 to -100 points
- Having someone cut pieces of wood, or glue joints....."weight held" score of zero
- Over cost limit-1 to -100 points
- Artificially strengthened structure..... -5 points to "weight-held" score of zero
- *A structure that is overweight, oversized or undersized, and not corrected prior to completion of Weigh-In:
Overweight Structure (Weight will be determined by the official gram scale for each competition. The team will place all structure pieces on the scale at the same time.) Overweight penalties will be assessed as follows:
 .01-.25 gram overweight = -20 points; .26-.50 gram overweight = -40 points; .51-.75 gram overweight = -60 points; .76-1.00 gram overweight = -80 points; 1.01-1.49 grams overweight = -100 points; 1.50 grams overweight or more = "weight-held" score of zero.
Oversized Wood: any piece exceeds 1/8" x 1/8" (.135" x .135") "weight-held" score of zero
Undersized Structure (as it will appear when completely assembled and while resting on the surface of the tester base to begin weight-placement testing.) *Less than 8" but more than 7-7/8" high -100 points
 7-7/8" or less "weight-held" score of zero
- *Assembled structure does not accept the 2" diameter column through its entire height"-100 points
- Assembled structure "Open area" does not accept the safety pipedisqualified from weight-placement testing
- If any team member is not wearing safety glasses while inside the Safety Area and his/her head is below the crusher board, the team must stop weight placement until that team member puts on safety glasses. Time will continue.

* These penalties will be substituted with a weight-held score of zero if, in the aggregate, that is less of a penalty.

F. Style (Elaboration of the problem solution; use three copies of the Style Form from the *Odyssey of the Mind Program Guide*.)

- 1. Special effect during the performance.....1 to 10 points
- 2. Creative use of materials of one team member's costume.....1 to 10 points
- 3. (Free choice of team)1 to 10 points
- 4. (Free choice of team)1 to 10 points
- 5. Overall effect of the four Style elements in the performance.....1 to 10 points

Maximum possible: 50 points

G. Tournament Director Will Provide*

- 1. *At the weigh-in site:*
 - a. a gram scale accurate to 1/10th of a gram.
 - b. a micrometer or other precision method of checking wood thickness.
 - c. a 2-inch column-measuring device.
 - d. an accurate ruler or device to measure the structure's size requirements.
 - e. a measuring device for the box.
 - f. a bag to place the team's structure.
 - g. tape to attach the Weigh-In Checklist to the bag.
- 2. *At each competition site:*
 - a. a three-prong electrical outlet.
 - b. a tester and a 60" x 60" taped Safety Area.
 - c. a 12-inch extension to the safety pipe.
 - d. two pairs of safety glasses.
 - e. a judging team and all materials necessary to judge this problem.
 - f. a minimum of 400 lbs. of weights in assorted sizes generally from 5 lbs. to 45 lbs., each with a hole 2" in diameter. When registering for a tournament, teams needing more weight should notify the Tournament Director.

***NOTE:** Contact your Tournament Director for information regarding specific competition sites such as actual dimensions, amount and size of weights, weight of the crusher board, registration procedures, floor surface, etc. Do not submit a clarification request for this information.

H. The Team Must Provide

- 1. Three copies of its Style Form, one Material Values Form, one Outside Assistance Form, and all team-specific clarifications.
- 2. Safety glasses or other eye protection.
- 3. Any necessary extension cords or adapters.
- 4. Cleanup materials as needed.

I. Metric Equivalency Chart

Lengths:

1 inch = 2.54 cm 1 foot = 30.48 cm
1 cm = .39 inches 1 meter = 3.28 feet

Weights:

1 ounce = 28.35 grams 1 gram = .035 ounces
1 lb = .454 kilograms 1 kilogram = 2.205 pounds

J. Glossary

Entire contents of the box — all structure parts and assembly materials that are allowed to be a part of the assembled structure. This does not include the box, which must not be part of the assembled structure.

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Problem by Dr. C. Samuel Micklus and Samuel W. Micklus

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