



Cost Efficiency

Cost efficiency measures your ability to save money while building your model. **Bring Receipts** for all items purchased for your model. Point will be assigned as follows (**the lower the score the better**):

\$0.00	0 points
\$1.00- \$5.00	.1 point
\$6.00 - \$10.00	.2 points
\$11.00 - \$15.00	.3 Points
\$16.00 - \$20.00	.4 Points
More than \$20.00	.5 Points

List all items used in your model and their costs on the **Material List Form**. This form is required on the day of the event. Where recycled items are used, put the letter "R" in the cost column. You may use as many recycled materials as you wish. A penalty of 1 point will be given for each missing receipt for items purchased new specifically for tower construction. A 3 point penalty will be added to the student's score if the materials list form is missing. No receipt is necessary for recycled items; however the items must be accounted for on the materials list form. The cost of glue, nails screws, general adhesives and items used to decorate the tower should be counted towards the tower's total cost. The cost of the tower should **not** include tax.

Design Ingenuity

Ingenuity is how much **imagination and skill** were used in your model. Water Professional must often use ingenuity; they use skill and imagination to solve difficult problems.

The Judges will look at several items:

- Craftsmanship (is the model sturdy, do the parts fit together nicely)
- Imagination (are the design and material unique)
- Artistic merit (does the model have creative ideas, colors and themes)
- A score of .1-.5 will be awarded

Structural Efficiency

Structural Efficiency is calculated by dividing the weight of the model when it is empty by the average height of the tank times the amount of water it holds. The lower this number is the more structurally efficient the tower design is. This is shown with the following formula:

$$\text{Structural Efficiency} = \frac{\text{Weight of the tower when empty (pounds)}}{\text{Ave tank height (Ft)} \times \text{Weight of the tower when full (pounds)}}$$

This criteria is similar to what engineer's use in the real world! Remember, the tank should be between 1.5 ft and 2.5 ft high (see drawing provided) and hold at 1 gallon of water but no more than 2.5 gallons!

Hydraulic Efficiency

Hydraulic Efficiency is the amount of time it takes the judges to fill the model with 1 gallon of water and drain it back out again. The judges will fill the tank through the $\frac{3}{8}$ " connector. The less time it takes to fill and drain the tank through the connector the better. ***The tank must have a vent or a cover so the judges can see into the tower during filling. Coverless towers will not be considered vented.***

Interview Presentation

Each Student will have no more than 5 minutes to present their water tower to the judges and answer any questions that the judge may pose. Students should be able to verbalize engineering concepts related to their tower and speak on their competition experience. Example questions: What did you enjoy the most about the competition? How did your model water tower perform? Are you thinking about a career in the water industry?

Required Design Standards and Penalties

Keep to the following standards when designing and constructing your model:

- The tank must be **between 1.5-2.5 feet high (see drawing)**
- The tank have a **vent or removable lid** so judges can tell when it is full. Uncovered towers or non-vented towers will result in a penalty of 3 points.
- When full the tank must hold **between 1 and 2.5 gallons of water and it should not leak!**
- The model must use **the $\frac{3}{8}$ " inch connector as supplied.**
- **Bring receipts** for all material purchased for your model. A one point penalty will be given for each item not having a receipt (max of 5 points).
- **Bring Material List** (.15 points will be added to the score if a list is not provided).
- **Structural instability** (tower has to be supported by a person during filling or during any of the evaluation) - .10 point penalty will be added to the score.

Penalties will be assessed for not following the above standards. These standards are demonstrated in the diagram attached at the end of this packet.

Additional Information

Please Contact:

Michael Ramsey

**Chair - MWTC: ISAWWA (630) 981-6289(W) or (630) 878-4507 (C)
545 S. Randall Rd. St. Charles IL 60174**

***“From Today’s Youth Come Tomorrow’s Leaders
Let’s Lead some to the Water Profession”***