

# Trophy Triathlon

**Ages 6 –10** Design, build, and test a trophy that can hold a sports ball.

**Prep Time:** 10 minutes ▪ **Activity Time:** 20 minutes or longer

**Materials:**

**Base options (8 – 11" tall recommended):**

- Paper towel tubes, 1-liter bottles (with top cut off), large plastic cup, tennis ball tube

**Other building materials:**

- Newspaper, magazines, tape (up to 12"), rubber bands, clothespins, binder clips, straws, craft or popsicle sticks, chopsticks

**Testing materials:**

- Measuring tape
- Sports balls (Basketball, soccer ball, tennis ball, baseball, bowling ball, golf ball, etc.)



**1 Ask/Imagine/Plan**

Explain the challenge to your child (or children), detailing the tape restrictions and the goal to build the tallest tower.

Ask your child to choose which ball they will try to hold up. Have them explore the materials you have gathered. Ask them to brainstorm features they think are most important (e.g. a wide base, strong connections/joints, etc.).

**2 Create**

Challenge your child to construct a prototype with the materials they have selected.

**3 Test**

Pick a sports ball to test with and place it on top of the tower. Your design must be able to stand freely with no extra supports to be measured. Using the tape measure, measure in inches from the bottom of the base to where the bottom of the ball rests (this may not necessarily be the top of the tower!).

**4 Improve**

Ask your child to try to improve their trophy by changing one variable. Test the new prototype. Can it support a heavier ball now? What did they learn from their tests? How could they make an even better trophy? Can they make their design taller? Have them plan a new design as they did before, and then test it again. How did their new design work compared to the old?



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## FACILITATION TIPS

Measure out the tape ahead of time so that your child does not overdo it. For a challenge, you can tell them that once they have their tape, they may not have more, even if they need to redesign. This requirement encourages planning ahead.

Ask your child to consider the shapes of materials (e.g. rolled up newspaper vs. flat), combining materials, and center of gravity. Is tape necessary or will gravity hold their structure together?

Emphasize the necessity of sketching a plan for a model. Drafts and drawings are essential in the engineering field, and act as “blueprints” to make sure that teams of engineers are all on the same page.



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### Additional Questions and Resources:

- Feel the different materials you have available to build with. Which materials might work best to hold a lighter, smaller ball? How about a heavier, larger ball? Why?
- What are some of the variables in your design that you can change?
- Does your tower work well with most balls or only a few? Why?
- What could you change to make your design stable enough to hold all the balls?
- What change did you make from your previous trophy and what influence did that change have on how well it held the balls?

