



## WATER ROCKET INSTRUCTIONS

1. **Fill 2-liter bottle with water. \***
2. **Slide bottle onto the stem of the provided PVC stand so that the nozzle is covering both rubber O rings.**
3. **Prepare your launching mechanism. \*\***
4. **Use an air pump (i.e. a bicycle pump or air compressor) to pressurize the bottle to the desired pressure. \*\*\***
5. **Release the launching mechanism.**
6. **Stand in awe of the glorious rocket you have sent towards outer space.**

\*How much water you fill your bottle with is for you to decide! You should experiment/research to establish the optimal amount of water to add.

\*\*We have provided brass wire as an optional launch mechanism. The wire could be tied to the bottle and stand to prevent it from launching until the wire is cut. You are not required to use this if you find an alternate mechanism that works best for you. Since the competition is based on time of flight, a launching mechanism will be required so that accurate time-of-flight measurements can be taken.

\*\*\*2-liter bottles can handle pressures up to roughly 120 psi before they explode. We have provided you with 3 bottles. Fill your bottles and test wisely. If for some reason all your bottles explode before the competition, you will have to provide your own and it must be the same style of bottle (i.e. not the weird *Coca-Cola* shape). When they explode, it is VERY loud. We have provided earplugs and eye protection just in case.

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## EXTRA STUFF

- **DO NOT** modify the rocket stand. You may place weight on it for stability or attach something for your launch mechanism, but nothing should be removed, holes should not be drilled, etc.
- **DO** modify the bottle. Add fins, glitter, nose cone, racing stripes, weight (we have provided hex nuts that can be used for this purpose). Anything that you think will make your bottle fly higher and fall slower.
- Modifications that could potentially weaken the structural integrity of the bottle will weaken the bottle under pressure. (i.e. drilling holes, warping with heat, cutting). Take this into account for your design.

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### MEET WITH A ROYAL ENGINEER

**Date:** Will be announced after registration deadline

**Time:** Will be announced after registration deadline

**Location:** Will be announced after registration deadline

Ask your rocket engineering questions and eat free pizza!

### 2024 WATER ROCKET COMPETITION

**Date:** Tuesday, May 7th (pending weather condition)

**Time:** Will be announced after registration deadline

**Location:** open field north of Discovery Hall

\*\*Thursday, May 9th (weather make-up day)

## ADDITIONAL GUIDELINES

- **Registration Deadline:** All Water Rocket Competition participants must fill out and return the 2024 Water Rocket Competition Registration Form to Jamila Bajelan in DSCH 335 or email to [bajelanj@unk.edu](mailto:bajelanj@unk.edu) by **Monday, April 1st at 4 pm.**
- **Deadline to Update Team Names/Mottos/Mascots:** All final updates to team names, mottos, and mascots must be provided to Jamila Bajelan ([bajelanj@unk.edu](mailto:bajelanj@unk.edu)) by **Friday, April 19th at 4 pm.** If updates are not made by then, this information will either be assigned, or provided as listed on the registration form.
- **Competition Date:** Rockets will need to be complete and flight-ready before **Monday, May 6th.** Rockets will be launched **Tuesday, May 7th** (or Thursday, May 9th pending bad weather conditions). Team members must be able to attend and compete to be eligible for “in-flight” competition prizes.
- **Competition “Winners”:** The winners will be awarded 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> places (as determined by the first, second, and third longest timed flights). *Repeat: airtime is more important than distance.* To be considered “in-flight” rockets must have been fully launched and be in motion, in the air, and not, for example, stuck in a tree. Winners will be determined by the judges. Flight time begins when the launching mechanism is tripped. Failed launches will not count toward flight time.
- Teamwork, inclusive behavior, and sportsmanship are considered a “must” to remain eligible for prizes.

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## WATER ROCKET COMPETITION PRIZES (Longest “in-flight” Water Rocket)

**First-Place:** First-place team will receive a \$350 Visa Gift Card!

**Second-Place:** Second-place team will receive a \$200 Visa Gift Card!

**Third-Place:** Third-place team will receive a \$100 Visa Gift Card!



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## THE SPIRIT ROCKET PRIZE!

**Prize:** \$50 Visa Gift Card!

Individuals or teams are encouraged to submit a “decorative” (not necessarily flight-ready) water rocket.

Teams/individuals competing in the “flight-ready” Rocket Competition are encouraged to submit a second rocket to participate in the Spirit Rocket Competition.

To eligible for the Spirit Rocket Prize, your Spirit Rocket must be submitted to Jamila Bajelan (DSCH 335) before **Wednesday, May 1st at 4pm.** Rockets will be displayed (space pending) and photographed for judging as well as for social media.

Spirit Rocket decoration themes and other embellishments are up to the competitor to decide **BUT** they cannot be offensive or discriminatory. We reserve the right to disqualify any such entries from the Spirit Rocket Competition.

**All Water Rocket Competition Prizes have been provided by Royal Engineered Composites.**

## **WATER ROCKET KITS**

**Check to be sure that the following items are in your Water Rocket Kit.**

**\*\*We will not be able to provide additional items (or remedy any missing items) after Water Rocket Kit pickup\*\***

### **Water Rocket Kit Contents:**

- Three 2-liter soda bottles
- A pair of earplugs for each team member
- A pair of safety glasses for each team member
- Two bags of ballast (hex nuts)
- 6 Ziploc bags (to hold ballast)
- 1 small roll of electrical tape
- 1 small roll of duct tape
- Fifteen 8.5x11-inch sheets of very heavy cardstock (white paper)
- Several sheets of colorful cardstock
- 16-gauge wire
- A water rocket t-shirt for each of your group members (names will be on t-shirts)
- Rocket stand (must be returned! If not returned, not eligible for prize)
- Four O-rings

**If any of the above items are missing from your Water Rocket Kit, notify us of this issue during at pickup.**

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### **DATES TO REMEMBER**

- **April 1st at 4 pm:** Deadline to register individual competitors or teams of up to three UNK students.
- **TBD:** Eat pizza, ask questions, and get feedback on your water rocket design from Royal Engineered Composites' engineers in Discovery Hall. Will be announced on or before April 1st.
- **April 19th at 4pm:** Deadline to update your team's name, motto, and/or mascot.
- **May 1st at 4pm:** Deadline to submit a "decorative" rocket for the Spirit Rocket Prize.
- **May 6th at 4pm:** Deadline to have your rocket ready to compete in the flight competition.
- **May 7th at TBD: Water Rocket Competition Day!**
- **May 9th:** Weather Make-up Day, only if needed.