

Fall Festival at the Verde Valley Fair
2019 Pumpkin Chuckin' Contest
Saturday October 26, 2019 – **12:00pm (check in at 11:00am)**
Official Rules and Divisions

Five divisions for trebuchets.

- 1.* Lightweight Division: Age 14 and below (with adult supervision)
Max. total weight counterweight is 15 lbs.
Max height = 41"
Projectile weight = Minimum 3 ounce tomato

- 2.* Middleweight Junior Division: Age 17 and below (with adult supervision)
Max. total weight of counterweight is 75 lbs.
Max height = 70"
Projectile weight = Minimum 1 pound pumpkin

3. Middleweight Open Division: Open to all ages
Max. total weight of counterweight is 75 lbs.
Max. height = 70"
Projectile = Minimum 1 pound pumpkin

4. Heavyweight Division: Open to all ages
Max. total weight of counterweight is 400 lbs.
Max. height is 10 feet
Projectile = Minimum 5 pound pumpkin

5. Unlimited Division (Throw for Show)
Age: Open to all ages
Max Trebuchet Weight: No limit
Max Trebuchet height: No limit
Min pumpkin weight: No limit, whatever the captain wants to throw

***In the lightweight and middleweight junior divisions the participants must take part in the construction of their trebuchet; an adult mentor is permitted to assist in the construction of the trebuchet only when and if necessary.**

Who can participate in the Pumpkin Chuckin' Contest?

ANYONE! Kids of all ages! 9months to 90years! Cub Scouts, Boy Scouts, Girl Scouts, High Schools, Businesses, Service Clubs, Neighborhoods!

General Rules for Trebuchets

Total weight of the counterweight including any container and support for the counterweight may not exceed the weight limit. See table above for weight limits for the 4 competitive divisions. There are no limits for the Unlimited (Throw for Show, still eligible for awards) Division, all hurlers are welcome. The weight limit is meant to ensure that all contestants have the same potential energy. Teams must get their trebuchets weighed and measured before they are staked down, to get a fair weight.

Height of trebuchet including throwing arm fully extended (the un-cocked height, straight up in the air) may not exceed limit. The sling is not included in the height limit, so the sling may exceed the limit. The cocking mechanism can also exceed the height limit. A loading or firing structure CAN go over the height limit with no penalty. This is to ensure safety in loading and firing the trebuchets. The height limit refers to the top of the throwing arm (at its highest point during the throwing motion) and the top of the counterweight at its highest point. Neither the top of the throwing arm or the counterweight can go below ground. This is to ensure that all the contestant have the same amount of potential energy to use.

The trebuchet may be mounted or assembled on a trailer, for convenience. The height of the trebuchet will be measured from the floor of the trailer. This does give a slight advantage so to compensate, the height of the trailer will be subtracted from the distance of the throw. For example, if someone uses a 3 foot trailer and throw 100 feet, they get credit for only 97 feet.

No digging into the ground is allowed (like a pit for the counterweight to fall further). You may use the ground to stake the trebuchet to prevent rocking. Ropes, wires or straps are also allowed. This is encouraged again for safety reasons. Staking the trebuchet to the ground is also permitted, as well as adding sand bags to the frame, etc.

Winches or other electrical motors are allowed to cock a trebuchet. This is for safety reasons. If these devices are electrical they must be battery operated since there will be no access to AC power in the field.

All trebuchets must be only gravity powered. No springs or pneumatics or other power sources.

A prop or firing device may fall over the firing line, as long as the arm or main structure of the trebuchet stays behind the firing line.

- 1) All Pumpkins fires must remain intact until they impact the ground to obtain an official measurement
- 2) No part of the machine shall cross the firing line
- 3) No explosives are allowed
- 4) Pumpkins are not be altered in any way
- 5) All youth must be under adult supervision at all times
- 6) No pets are allowed at event

BYOP

Bring your own pumpkin (or tomato, or whatever you want to hurl). We are NOT doing a pumpkin patch this year, so you will need to provide your own pumpkins. We suggest you have 3 prime pumpkins at exactly the right weight for the contest, and several other for practice and free-for-all at the end. Water balloons are an easy projectile. Be sure the projectile is AT LEAST the required weight.

1. Projectile must weigh at least the limit or more:
2. Lightweight = 3 ounces
3. Middleweight = 1 pound
4. Heavyweight = 5 pounds.

Judges will weigh counterweight and projectile and measure height before firing. Total weight of the trebuchet (including counterweight) must be UNDER the limit, or subject to a small penalty. Weight of projectile must be OVER the limit. Height must be UNDER the limit, or subject to small penalty. No part of the trebuchet may go over the line during firing, except the sling.

If any of the trebuchet weights or heights are above of the specified range, a small penalty will added by the judging committee. For example, if a heavyweight trebuchet weighs 425 pounds and throws 100 feet, they will be penalized by a percentage. For example, they would get credit for $100 \cdot 400 / 425 = 94$ feet.

There is no advantage given to trebuchets that are under weight or under height.

"Best Design" Prize

All trebuchet divisions/classes are competing for the overall "Best Design" prize.

The overall "Best Design" winner is determined by computing the scaled distance for each division/class winner and the one with the greatest value wins.

Scaling: Trebuchets "scale" very well. All things being equal, a trebuchet that is twice as tall will throw twice as far. However, it will weight 8 times more and throw a projectile that weighs eight times more. The reason is that something twice as big, is twice as wide and twice as deep so the volume and weight increase by a factor of eight.

With this in mind, each division is 5 times heavier than the division below it. Doing the math, this scales to 1.71 taller (cube root of 5). So each division is 1.71 times taller than the division below it so they can be compared against each other to award an overall "Best Design" prize. The lightweight division distance will be multiplied by 2.924 and the middleweight divisions will be multiplied by 1.71 to accurately compare against the heavyweight division. For example, if a lightweight trebuchet throws 50 feet and a heavyweight trebuchet throws 145 feet, the lightweight trebuchet is scaled up to 146 ($50 \cdot 2.924$) feet which beats the heavyweight trebuchet. The table at the end of this document shows this scaling. This scaling will be used to award the overall "Best Design" prize. Each division will also have a best distance prize.

This gives the younger divisions a real chance to walk off with the most prestigious prize, no fancy metal working or wood working shop required, just brains and persistence.

Safety

All trebuchets must have a safety device (like a C-clamp) to stop the throwing arm from firing prematurely during loading of the projectile. Another excellent safety device is a support which can be placed directly under the counterweight, preventing it from falling. The safety committee will determine if the trebuchet is safe. If the trebuchet is deemed not safe, the safety committee will make every effort to help the team make it safe, time permitting.

Once the counterweight is lifted, the trebuchet is dangerous (even the small ones). Be careful not to put hands, feet or any body part in the potential path of the throwing arm or counterweight. Put the safety on immediately after the counterweight is lifted (before loading the sling, etc)!

All trebuchets will be inspected before firing and must pass the inspection to fire.

Two Flags are encouraged: We are encouraging teams to bring two flags to add to the visual spectacle. One flag will be placed by the team's trebuchet. The other flag will be placed at the team's best throw. This will allow spectators to see who is winning during the three rounds.

All hurlers welcome

Other catapults, trebuchets, and hurling machines may "throw for show." Other trebuchets, or catapults, not in the above categories are encouraged to come and "throw for show" along with the other contestants. However, if they do not meet the division specs., they will not be part of the official competition.

How to Enter

To sign up for the trebuchet contest: Contact Verde Valley Fairgrounds via email or phone (below). We will have prizes!!!!!!

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PO Box 1974
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This chart shows the scaling between the various divisions. For example, a 34 foot throw in the Lightweight Division is equivalent to a 100 foot throw in the Heavyweight Division.

Lightweight Division	Middleweight Division	Heavyweight Division	Lightweight Division	Middleweight Division	Heavyweight Division	Lightweight Division	Middleweight Division	Heavyweight Division
3	6	10	103	175	300	202	345	590
7	12	20	106	181	310	205	351	600
10	18	30	109	187	320	209	357	610
14	23	40	113	193	330	212	363	620
17	29	50	116	199	340	215	368	630
21	35	60	120	205	350	219	374	640
24	41	70	123	211	360	222	380	650
27	47	80	127	216	370	226	386	660
31	53	90	130	222	380	229	392	670
34	58	100	133	228	390	233	398	680
38	64	110	137	234	400	236	404	690
41	70	120	140	240	410	239	409	700
44	76	130	144	246	420	243	415	710
48	82	140	147	251	430	246	421	720
51	88	150	150	257	440	250	427	730
55	94	160	154	263	450	253	433	740
58	99	170	157	269	460	256	439	750
62	105	180	161	275	470	260	444	760
65	111	190	164	281	480	263	450	770
68	117	200	168	287	490	267	456	780
72	123	210	171	292	500	270	462	790
75	129	220	174	298	510	274	468	800
79	135	230	178	304	520	277	474	810
82	140	240	181	310	530	280	480	820
85	146	250	185	316	540	284	485	830
89	152	260	188	322	550	287	491	840
92	158	270	192	327	560	291	497	850
96	164	280	195	333	570	294	503	860
99	170	290	198	339	580	298	509	870
103	175	300	202	345	590	301	515	880