

How to Prepare for a Rimfire Known Distance Event



This is a general guide to prepare for a Project Appleseed Rimfire KD event. Each range can be a little different. If something is significantly different from the advice in this guide, the event leader (Shoot Boss) will reach out in advance and let you know.

Table of Contents

What to Bring	3
<i>Personal Items</i>	3
<i>Rifle-specific Items</i>	3
<i>Ready your Equipment</i>	4
<i>Special Equipment Considerations</i>	4
Safety	5
<i>Project Appleseed’s Four Safety Rules</i>	5
<i>“Safe Rifle”</i>	Error! Bookmark not defined.
What to Expect	6
<i>Arriving</i>	6
<i>Check-in</i>	6
<i>At the Firing Line</i>	6
<i>Lunch</i>	6
<i>Instruction</i>	6
Known Distance Read-Ahead	7
<i>Range Estimation</i>	7
<i>Come-ups for 200- and 100-yard classes</i>	7
<i>Reading and Adjusting for Wind</i>	7

Finding & Signing Up for an Event

Finding an Event

A Rimfire KD event is an intermediate clinic for rimfire rifle shooters. We require attendance at a 25m Appleseed event prior to coming to a RKD clinic. If you need to find a 25m event near you, check out our schedule here: <https://appleseedinfo.org/schedulemap/>

Direct links for other event types:

Rimfire Known Distance: <https://appleseedinfo.org/schedule/?eventtype=rkd>
Known Distance Rifle: <https://appleseedinfo.org/schedule/?eventtype=kd>
Appleseed Pistol Clinics: <https://appleseedinfo.org/schedule/?eventtype=pistol>
Ladies Only events: <https://appleseedinfo.org/schedule/?eventtype=ladies>

Pricing

Our current pricing can be found here: <https://appleseedinfo.org/pricing-information/>.

What to Bring

This list is very similar to the 25m event What to Bring list. Keep in mind that not all items are essential.

Personal Items

- *A Teachable Attitude (A desire to learn and improve and a mind open to new things are the most important things you can bring to the event.)
- *Ear protection (earmuffs and/or earplugs. Electronic ear muffs are helpful, but not essential.)
- *Eye protection (clear shooting glasses are recommended. Impact resistant prescription glasses may be okay.)
- Shooting mat (a thick blanket or rug remnant can be used as a substitute)
- Tarp (for under the shooting mat to catch spent casings – this makes cleanup much easier)
- Elbow pads or elbow-padded shooting jacket (if you don't have elbow pads, take an old pair of socks and cut out the toes)
- Dress for the weather. We always shoot unless the weather is hazardous. (It rarely is.) Long sleeves and long pants are recommended. Low-cut shirts can collect hot brass; we recommend a crew-neck shirt.
- Closed-toe shoes are a necessity. Boots are recommended (no open-toe footwear)
- Weather-appropriate hat (360° brim for sun or with ear coverage for cold)
- Sufficient water - you must stay hydrated (1 gallon per person recommended)
- Trail mix or high-protein snacks (Protein is fuel. Sugary carbohydrates may make you sleepy.)
- Light, high-protein lunch (lunches at Project Appleseed are working lunches)
- Folding chair
- Wet wipes
- Sunscreen and bug spray
- Small notebook & pencil. A Sharpie is helpful as well to mark your targets.

Rifle-specific Items

- *Rimfire rifle (This course is structured for rifles chambered in .22 Long Rifle, but other rimfire calibers are welcome if range rules permit them. We recommend rifles with detachable magazines. Zero the rifle at 25m or 50y if possible. Plan on sticking with one rifle for the weekend, but bring a backup rifle if you have one.)
- *Scopes are generally recommended for the Rimfire KD, but shooters can be successful with iron sights.
- *Ammunition: 450 (2-day) or 250 (1-day) rounds of the same type & brand of ammo (better to have too much than not enough) unless the Shoot Boss contacts you and recommends you bring more.
- *2 magazines that hold at least 10 rounds, but bringing spares is recommended. (20-round mags OK if state law allows.)
- *USGI style cotton web sling, 1 ¼"-wide
- Sight adjustment tool
- Rifle cleaning supplies (Boresnake and oil are encouraged)
- Trash bag and light-colored towel (to protect your rifle from sand, snow, rain, or intense sun)
- Large pushpins (preferred) or a staple gun & staples
- Rifle operator's manual & sight/scope manual, if you have them
- Rifle case

* Critical item.

Equipment Preparation

Ready your Equipment

- Depending on the range facility, you may shoot on a concrete firing line. If we do, it's good to remember that concrete is HARD. Bring your shooting mat/blanket and some extra padding. An old towel will help save your elbows.
- Be prepared for seasonal and range conditions. Blowing sand and dust, rain, snow, and intense sun are all conditions you may encounter. In event of blowing sand and dust, you'll need to totally degrease your rifle in favor of a dry lubricant like graphite. Be ready to protect your rifle with a plastic bag or a simple waterproof wrap for the action.
- Protect ammo and mags from the same conditions. Ziplock bags are great for this.
- Have your rifle oiled appropriately (light oil) and ensure all fasteners are appropriately snug.
- Function-test your rifle. If possible, have it zeroed for 25m or 100y so that you will be properly prepared for the class.
- Review the owner's manual for your rifle on how to operate your rifle. Do the same for your sights/scope if they have a separate manual.

Special Equipment Considerations

1. Due to a firearms safety bulletin, .17HMR semi-automatic rifles are not recommended.
2. Owners of the Smith & Wesson M&P 15-22 rifles must comply with the Smith & Wesson Safety Alert. We will make every effort to have a S&W Bolt Inspection Gauge on-hand for owners to check their bolts for compliance. You are encouraged to review the following links to the Smith & Wesson websites for information about the issues and how to check the M&P 15-22 bolt to determine that it is within specification:
 - <https://www.smith-wesson.com/mp15-22-consumer-safety-alert>
 - https://www.smith-wesson.com/sites/default/files/MP1522_Alert_030619.pdf
 - See this video on how to check your S&W rifle. https://www.youtube.com/watch?v=UJO0gJRmc_c
3. An additional Liability Waiver will also need to be signed by any student at a Project Appleseed clinic who chooses to use a semi-automatic .17HMR rifle or a Smith & Wesson M&P 15-22 firearm.
4. Legal short-barreled rifles are permitted at our events. Select-fire rifles must stay on the "semi" setting. Pistol caliber carbines up to .45 caliber are permitted, but not recommended for this class.
5. Legal suppressors are welcome at our events.
6. AR-type pistols (with or without stabilizing brace) are not permitted at Project Appleseed rifle events.

Safety

Safety is paramount at Project Appleseed. You learned this safety information at your 25m rifle event, but it's provided for you as a refresher.

Project Appleseed's Four Safety Rules

Project Appleseed has four event-specific safety rules. They are:

1. **Always Keep the Muzzle in a Safe Direction.** The muzzle is the pointy end of the rifle. It must always be kept in a safe direction, which is usually up or downrange. Host range rules may be more restrictive.
2. **Do Not Load Until Given the "Load" Command.** A student may insert a prepared magazine into the rifle only after he receives the "Load" command.
3. **Keep Your Finger Off the Trigger Until the Sights are On the Target.** A student should keep his finger straight alongside the stock until his sights are on the target (or target backer). At that point, he may place his finger on the trigger.
4. **Make Sure Those Around You Follow the Safety Rules.** We all share the responsibility that we all go home without any extra holes. If you see anything you remotely think might be a safety issue, immediately take corrective action!

Every Appleseed instructor and attendee is expected to abide by these rules.

"Safe Rifle"

Throughout the day, you will be asked to make your rifle safe. We do this to ensure it is safe for us to go downrange and check targets.

In order, the steps to making a rifle safe are:

1. **Magazine Out.** Remove the magazine from the rifle.
2. **Bolt Back.** Lock the bolt to the rear.
3. **Safety On.** Engage the mechanical safety.
4. **Chamber Flag In.** Take the (provided) chamber flag and insert the stem through the ejection port and all the way into the chamber.
5. **Rifle Grounded.** Place the rifle on the ground with the ejection port up and the muzzle forward of the firing line.
6. **No One Touching the Rifle.** Neither the shooter nor any instructor will touch a rifle once the line is clear. Students will be clearly advised when it's time to handle rifles again.

A gentle reminder:

1. *We do not transition with loaded rifles.*
2. *"Hot reloads" (shoot one & change the mag) are not permitted in any Project Appleseed rifle class.*

What to Expect

Class Times

Rimfire Known Distance Clinics are normally scheduled to begin at 8:00 AM and will end no later than 5:30 PM. However, if times for the clinic you sign up for are different, the event leader (Shoot Boss) will contact you in advance. We'll try to get you out earlier if we can, but there is a lot of content and activities in this class. Please arrive at least 30 minutes early to fill out the paperwork and get set up.

Arriving

When you arrive at your Project Appleseed event, we will attempt to meet you in the parking lot. We'll let you know where to park. Also, we'll ask you to leave all firearms (including concealed carry) in your car and give you directions to the check-in table.

Check-in

Once you get to the check-in table, we'll have you take care of some boring paperwork. (It'll be short.) If range fees are required, they will be collected (cash only please) and remitted to the host range. We'll give you a chamber flag and a t-shirt. Then, we'll share directions to get to the firing line.

At the Firing Line

You'll likely return to your car and retrieve your gear, EXCEPT for firearms. Someone will be at the firing line to help you pick out a spot. You'll place your shooting mat on the firing line and all your other gear behind the equipment line. After the safety briefing, you will be directed on when to retrieve your rifle.

Lunch

Lunch at Project Appleseed is a "working lunch." There will not be time for you to leave the range to buy food. The host may provide lunch at a reasonable cost, but this is the exception rather than the norm.

Instruction

At a Project Appleseed Rimfire KD event, you will receive instruction and practice at employing your rimfire rifle out to distances of up to 200 yards. Most Rimfire KD events are shot at 50, 100, 150, and 200 yards. If 200 yards is not available, a reduced course may be fired out to 100 yards. Expect there will be a fair amount of walking to check targets. During lunches and breaks, we'll tell stories of heroes of the Revolutionary War.

You will the opportunity to earn your Rifleman Patch, if you have not already done so. Also, you have the opportunity to earn your Rimfire KD bar. To qualify for a Rimfire KD bar, you must use a rifle chambered in .22 Long Rifle. Other rimfire calibers are welcome, but are ineligible for the RKD patch.

Expect to gather data about your rifle and ammo. You'll learn about negotiating wind and, conditions permitting, get practical experience shooting in the wind. At a 2-day Rimfire KD event, you should expect to receive instruction in Target Detection and Range Estimation, with a practical exercise in the latter.

Known Distance Read-Ahead

Range Estimation

To effectively estimate range to an object, a Rifleman must know two things:

First, he must know the size of the front sight in minute of angle. (Width or height)

Second, he must know the size of the object in inches. (Width or height)

A simple equation to determine range is: $\text{Range (100s yards)} = \text{Target size (inches)} / \text{Target size (MOA)}$

Example 1: Front sight is 8 minutes wide. Object is 24 inches across. Object is 1.5 times wider than front sight, (12 minutes). 24 divided by 12 is 2. Range is 200 yards

Example 2: Same sights, same sized object. Target measures 1/2 the width of the front sight, (4 minutes). 24 divided by 4 is 6. Range is 600 yards

Come-ups for 200- and 100-yard classes

200y Rimfire KD Ammunition Come-Ups (in MOA), Sight Height 1.9"						
Distance	Eley Target 40g	Blazer 40g HV	Federal Automatch	CCI Standard Velocity	Average	My Come Ups
50	0	0	0	0	0	
50->100	7	5	5.5	7	6	
100->150	10.25	7	7.5	9	8.3	
150->200	10.25	8	8.5	10	9	
Total	26.7	19.6	21.4	26.1	23.4	

100y Rimfire KD Ammunition Come-Ups (in MOA), Sight Height 1.9"						
Distance	Eley Target 40g	Blazer 40g HV	Federal Automatch	CCI Standard Velocity	Average	My Come Ups
25	0	0	0	0	0	
25->50	0.4	0.6	0.3	0.4	0.4	
50->75	3.1	1.0	1.6	3.1	2.2	
75->100	3.9	2.8	3.1	4.3	3.5	
Total	7.4	4.4	5.1	7.4	6.1	

* Data source: Strelak Pro

Reading and Adjusting for Wind

A Rimfire KD event can be a great opportunity to learn about shooting in the wind.

How to correct for wind with a .22 rimfire rifle:

1. Estimate wind speed (in MPH)
2. Estimate the angle of the wind in reference to the shooter.
3. Determine the winds "value" (1/2, Full, or Zero)

4. Determine the wind correction
5. Apply the correction to the rear sight, or “hold-off”.

Step 1. Estimate Wind Speed

- Estimate wind speed using handy objects: Drop a light object and estimate the angle at which it falls, then, divide by 4.

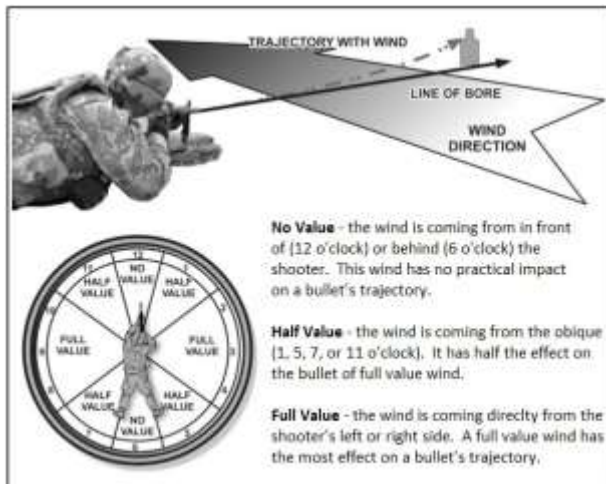
Example: Object drops at 40-degree angle, divided by 4 is 10, so wind velocity is approximately 10 mph.

- Alternatively, estimate wind speed using natural effects:

No movement, smoke rises straight up	Under 1 mph
Direction of wind shown by smoke, Tree leaves barely move	1 to 3 mph
Wind felt on face, Leaves rustle slightly	4 to 7 mph
Leaves and twigs are moving. Loose bits of paper are lifted and ruffled	8 to 12 mph
Small branches are moved, loose dust and paper are blown along	13 to 18 mph
Large branches and small trees sway, dust clouds	19 to 24 mph
Large branches in constant motion, wind begins to whistle	25 to 31 mph
Whole trees are in motion, Walking is affected	32 to 38 mph

Steps 2/3. Estimate Wind Direction and Determine Value

The direction of the wind in relation to the path of the bullet determines how much effect (Wind Value) it has on the bullet’s path.



Graphic credit: U.S. Army Training Circular 3-22.9, C2. 31 August 2017.

Step 4. Determine the wind correction using the following formula:

- Correction in MOA = Wind Value x 50s of yards x 5s of mph of wind x Wind Value

Step 5. Apply the correction and take the shot

- For constant/steady winds, adjust the sight the number of MOA into the wind.
- For variable winds, hold off by estimating the number of MOA using your front sight post or reticle