



The Airgun Primer

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Airgun
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Why airguns?

What's not to love? Less noise, a wide range of power and accuracy capabilities, inexpensive ammunition, and the ability to shoot at home (depending on where you live) are all big benefits.

Why not?

With the right equipment, there's not much you can't do with an air gun. Whether you've got dreams of competing in the next Olympic games, ridding your property of pests, reducing the empty tin can population, or providing dinner for the family, there's an air gun that will do the job.

What's an airgun?

While most guns fling projectiles down range using “air” pressure, and we’re using the word “air” loosely, traditional firearms create that pressure using a fiery chemical reaction based on fast burning propellant powders. As a result, the “air” is not really pure air at all, but rather a hot and dirty gas cloud closer to smoke from a campfire than the stuff we breathe.

On the other hand, airguns use compressed air generated without an exothermic reaction. We’ll get into the specifics later, but for now, know that air can be compressed mechanically as needed by the air gun itself or carried in pre-charged tanks for later use.

Don’t be fooled by any air gun stereotypes. Modern, and even very old airguns are capable of launching everything from a tiny steel BB to large-caliber projectiles capable of taking big game.



Big Bore Air

Pressure is what makes every type of “gun” operate. Airguns just use compressed air, either generated on the fly, or stored as with this Airforce Texan .45 caliber air rifle.

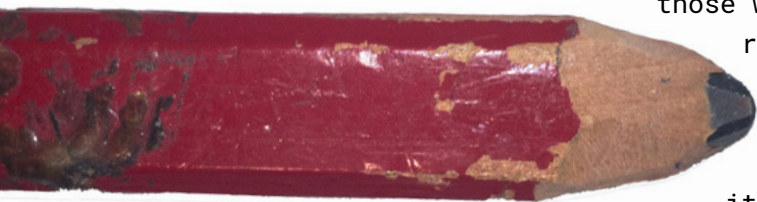
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HISTORY

A Bit of Historical Hot Air.

Like fashion trends, zombies, and congressmen, some things never really go away. Rather, they keep surging into the forefront of our attention, often emerging with even more vigor and enthusiasm. So it is with airguns. Yes, to steal a line from the classic movie *Zoolander*, “they’re so hot right now!” But here’s the interesting thing. Air guns aren’t new. In fact, they’re quite old. Really, really old.

While white-hot now, air gunning has been around about as long as the lead pencil and bottled beer. Just in case you’re wondering, those were invented back in 1564 and 1568 respectively. Preserved samples are sketchy, but air guns date back to that era or earlier, and we’re not even counting blow guns. We have it on good authority that those were invented by a Cretaceous period elementary school student using a wood straw and parchment spitball. The oldest preserved air gun, currently residing in the Royal Danish



Did poachers use airguns because they were quieter?

Probably not. Early airguns were very expensive.

Arsenal, dates to 1590, but the odds are good that wasn't the first one to hit the market.

Rich folks who wore elegant tights often preferred airguns for hunting instead of black powder muskets due to their quieter (at least in comparison) operation, faster rate of fire, and the fact that their wigs didn't smell all smoky after a long day in the field. Some historical accounts claim that resourceful poachers used them to take game, dodging wardens with the airgun's reduced noise and lack of telltale smoke clouds. Those stories are likely untrue, as early airguns were incredibly expensive and beyond the budget of the average poacher due to their painstaking hand construction.

The very earliest air rifles used bellows or spring-driven pistons to compress air for each shot and were the forerunners of modern spring-piston designs. Soon after, air gun makers shifted to pneumatic models





Even the 1780-era Girandoni used a detachable gas reservoir so users could change to a fresh one in the field. Photo: National Firearms Museum

that had onboard air reservoirs. Users, or more likely their servants, would pump the reservoirs full before use with hand-operated pumps.

In fact, those guys who created the very earliest Google Maps of much of the United States relied on a large caliber airgun for protection and food. Yes, Lewis and Clark carried a Girandoni air rifle on their famous 1804 to 1806 expedition. Here's why: shock and awe.

You see, the airgun that Lewis brought along was really an "assault" air rifle capable of firing more than 20 shots per minute. As they traveled from Missouri to the Pacific coast through numerous Native American tribal territories, they always ended the meet and greet sessions with a casual demonstration of the rifle. Taking care to end the show and tell session before the rifle ran out of gas, and never making it clear that that had only one such rifle amongst their crew, the intrepid explorers left the impression that their wagons were chock full of "smokeless poles of thunder" that could shoot infinite quantities of lethal projectiles. As a result,

The Girandoni Air Rifle

The Girandoni rifle used a leather covered iron air tank as the stock, allowing it to fire 60+ .46 caliber lead balls. A tubular magazine alongside the receiver held 20+ projectiles which could be loaded into the chamber with a simple lever operation. Compare that to reloading a black powder rifle and the rate of fire advantage becomes apparent. Oh, and air guns aren't sensitive to wet and rainy conditions. That old phrase "keep your powder dry" didn't come about by accident.

The rifle was adopted by the Austrian military, who issued air soldiers with three tanks and a hand pump. The system operated at a pressure of 800 psi. That was high tech at the time considering that a car tire holds just over 30 psi of air. The rifles remained in service from 1780 until about 1815. Given their lethal range of over 100 yards and rapid fire capabilities, the Girandoni presented new military possibilities.



It never took off in a big way due to the challenges of manufacturing, relative fragility, and the fact that it took 1,500 strokes of a crude bicycle pump to charge just one air tank. Even though 18th century warfare was far more regimented, the enemy frowned upon being asked to wait while opposing forces pumped up their rifles.



An early Markham King Model D airgun. Photo: National Firearms Museum

tribes readily accepted gifts from the crew and encouraged peaceful travel through their territory. And that's how just 35 or so folks made it across the often unfriendly uncharted territory without major incident.

HISTORY

The 19th century marked the beginning of real airgun popularity.

Since we try to be historically accurate, we should note that no two historians can seem to agree on the proper spelling of the designer's last name. In different historical accounts, you'll see references to both Girandoni and Girardoni. We flipped a coin and went with the "n" spelling here.

The 19th century marked the beginning of real airgun popularity. Around 1820, Japanese inventor Kunitomo Ikkansai improved on earlier Western designs and used the Girandoni method of using the compressed air tank as the butt stock. These air guns were still very much handmade and quite expensive.

Interestingly, early air guns were almost always large caliber hunting and military tools, not the small BB plinkers we think of today. As these large rifles gradually lost favor with the advent

Let's make a deal.

**Buy a windmill
and we'll give you
a free Daisy BB
rifle.**

of smokeless powder and self-contained cartridges, development shifted towards small caliber models built for recreational and competitive use.

The W.F. Markham Company brought air guns to the mass market with the introduction of the Challenger model back in 1886. That spring-piston rifle was also responsible for the name we've assigned to the most common air gun projectile – the BB. We'll come back to that story later.

In 1888, the Plymouth Iron Windmill Company jumped on the bandwagon and began manufacturing spring-pistol rifles. Before long, more customers wanted those nifty "BB guns" rather than windmills, and the company was reborn in 1895 as Daisy Manufacturing.

Across the pond, air gun popularity was exploding during the 1890s, and local matches were common. An estimated 4,000 airgun clubs and associations were active at the time – and that was just in Great Britain.

In the United States during the first half of the 20th century, the big airgun market was comprised of kids using spring-pistol models like the Daisy. That was a glaring contrast to the very serious and precise nature of air guns made and used in Europe.



This air rifle, designed by Clarence Hamilton, was considered by the Plymouth Iron Windmill Company as a promotion to give away with the purchase of each windmill. When General Manager L.C. Hough tested it, he exclaimed, "Boy, that's a daisy!" And that was the beginning of the Daisy Manufacturing Company.



HISTORY

Innovation continued, however, and companies started to look at self-contained CO2 canisters to power air guns. At first, 8-gram bulbs used to carbonate soda were adapted and repurposed for air gun use. In 1954, Crosman introduced the Powerlet, a 12-gram cylinder designed specifically to power air guns. That concept stuck and you'll see similar cartridges on just about every sporting goods counter today.

After the passage of the 1968 Gun Control Act, many U.S. firearms companies imported large numbers of high-end airguns from Europe in an attempt to satisfy a perceived demand for less regulated guns, but the adult airgun market still didn't take off.

During the 1970s and 1980s, Americans discovered what Europeans had known all along – air guns aren't just for kids. Companies introduced new models with enough power to hunt and accuracy appropriate for Olympic level competition. Since that time, dozens of companies have continued to contribute technological innovations that increase power and efficiency, thereby making air guns the fast growing market it is today.

IT'S TIME.

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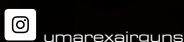
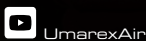
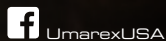
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AIRGUNS

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HOW

How Do Airguns Work?

All airguns work from the same basic principle. Pressure from compressed air pushes on a projectile until the force overcomes the friction of the barrel. The expanding air column drives the BB or pellet down the barrel and launches it on its way to the target. What differs between airguns is the way that compressed air is developed to start that process. Let's take a look at the five major types of modern air guns. And don't worry, we're not going to be whipping out any engineering drawings.

SPRING-PISTON

The first type and one of the earliest invented is the spring-piston. Although the word "spring" is in the name, that's not what propels the pellet or BB, at least not directly. It's easiest to think of this design as a spring-powered bicycle pump.

If you stuck a big coiled spring on the handle of a bicycle pump, then relied on that expanding spring to drive the pump and expel air, then you have the basic idea. In a spring-piston design, there's no stored compressed air – the compressed air is created on the fly just after the operator pulls the trigger. Cocking a spring-piston gun simply compresses the spring, usually a coil type. The compressed spring stores mechanical energy. When the user pulls the trigger, the spring is released and drives a piston that compresses air into and through the gun barrel. You might think of this system as "compressed air on demand" every time you make a shot.



The classic example of a spring-piston airgun is the Daisy Red Ryder.

HOW

Spring-powered airguns still use compressed air.

The air is compressed with spring pressure.

There's a lot going on inside of a spring-piston gun as the shot is fired. When the shooter presses the trigger, the spring releases to compress air in the piston. Our uncle, Isaac Newton, figured that when one thing moves forward, another moves in the opposite direction, so the spring movement creates a recoil sensation. When the spring reaches the end of its travel, it hits the wall, and you experience a second recoil motion. All of this starting and stopping happens before the pellet leaves the muzzle. As a result, good, stable shooting technique is a must. Also, partially as a result of all this motion, spring-piston airguns tend to be hard on scopes. That's why it's important to use scopes and mounts rated for spring guns.

The most common example of a spring-piston gun is the timeless Daisy Red Ryder. That lever-action cocking motion simply compresses the internal piston spring. When you shoot the Red Ryder, the spring creates a column of compressed air to launch the BB. Many break barrel air rifles use a spring-piston mechanism too. Spring-piston air guns are capable of surprising power and velocity, although that's somewhat directly related to the amount of effort required to cock the spring. One of the big advantages of spring-piston designs is that every shot delivers the same power. Velocity, and therefore point of impact should be identical from shot to shot with a quality spring-piston gun.

Gas pistons work like a spring.

But without the spring.

GAS PISTON

Gas piston guns operate much the same as spring-piston guns except that there is no spring. A self-contained gas ram or strut is used instead to capture and store energy from cocking. When the shooter cocks a gas-piston air gun, the motion compresses gas (usually some obscure inert type that you see on periodic element tables) in a sealed chamber. This gas pressure is used to drive the piston which compresses the air that moves the pellet. Think of this design as a double gas piston scenario. Cocking compresses gas in one ram that provides energy to compress air in a different piston when the shooter fires.

Advantages of gas piston guns are that there is no spring to wear out over time. Recoil is also lighter and smoother, and gas piston guns can be more accurate due to the reduction in overall internal motion. On top of that, it's not a big deal to store them cocked for reasonable periods of time.



This Gamo Swarm Maxxim uses an inert gas piston system. It's also a multi-shot repeater - the first of its kind.

HOW

PNEUMATIC

While spring-piston air guns create air on demand, pneumatic air guns store compressed air that's ready to go when the operator wants to fire a shot. There are a couple of basic designs of pneumatic air guns. The differences boil down to whether the gun has an onboard air compression mechanism or requires a "charge" from an external compressed air source.

Let's talk about self-contained pneumatic air guns first. Commonly referred to as "pump guns" these models have a lever, fore-end, or another device that allows the user to charge the primary cylinder with compressed air. After cocking, the gun is ready to fire using the compressed air charge. When the operator presses the trigger, a bash valve between the chamber and air cylinder is opened, allowing the compressed air into the chamber and barrel to launch the pellet. Once the air cylinder is charged with compressed air, there are few moving parts, so there is little recoil or movement during the shot. Where piston guns use springs or gas rams to compress air in the firing piston, pump guns fill the firing cylinder directly.

The simplest pneumatic air guns have single pump operation, so one cycle of the pumping mechanism charges the cylinder. This design is relatively simple and offers good shot to shot power and velocity consistency.

Some pneumatic air guns offer a multi-pump feature. The more you pump, the more air in the cylinder is compressed, and the higher the resulting velocity. If target shooting, pump less and fire at lower velocity. If you're hunting, then fill it up for maximum performance. Most multi-pump designs have a safety stop feature that prevents further air compression once the gun's maximum internal pressure is reached.

You also might run across multi-shot self-contained pneumatic air guns. These allow the user to charge the internal tank by pumping just like a single shot. However, the gas release is metered so that some compressed air remains in the cylinder for subsequent shots.

This Crosman Classic 2100 is an example of a multi-pump pneumatic airgun. The more times you pump the action, the more power you get - up to a point.





This Benjamin Marauder is a classic example of a pre-charged pneumatic (PCP) air rifle. The tube underneath the barrel holds compressed air. It's pressurized to 3,000 pounds per square inch.

HOW

Compressed air to go.

PRE-CHARGED PNEUMATIC

While pre-charged pneumatic air guns are still part of the pneumatic family, we're listing them separately for clarity.

The difference between a pre-charged pneumatic (PCP) and self-contained pneumatic air gun is that the PCP is charged with compressed air from an external source. These guns have no onboard mechanism to pressurize the air reservoir on the go. Using an air compressor, external hand pump, or high-pressure air reservoir like a diving tank, users charge the on-board compressed air storage cylinder before a shooting session. Most, if not all, PCP rifles and pistols are multi-shot designs, so depending on the caliber, pellet weight, and desired velocity, the shooter might get somewhere between 10 and 100 shots before a recharge is required.

Like self-contained pneumatic air guns, PCP guns have little recoil due to the lack of moving parts. Once the trigger is pressed, the only thing really moving around in the system is air. PCP guns are also suited well for large-caliber use due to the high air pressure and volume required to launch big and heavy pellets.

Oh, remember that early 1780-era air rifle later used by Lewis and Clark? Yes, the Girandoni was one of the earlier examples of a pre-charged pneumatic. Who says high-tech has to be new?

HOW

Like SCUBA tanks...

Only smaller.

COMPRESSED CARBON DIOXIDE (CO₂)

Last but not least is the CO₂ family. Compressed CO₂ air guns are characterized by their use of a self-contained and disposable compressed air supply. If you've been to a big box or sporting good store, you may have seen air pistols that use CO₂ cartridges that look like miniature scuba tanks. They're filled and sealed at the factory. The gun itself features a mechanism that punctures the seal and allows the compressed CO₂ into the airgun.

As compressed gas comes ready to go, these types of air guns don't have sophisticated pumping mechanisms. Simply install the cartridge and shoot. Depending on the size of the cartridge and type of gun, one might expect 20 to 100 shots before needing to toss a used cylinder and install a new one.

The most common CO₂ cylinder is the 12-gram model. These are about 3 1/4-inches long and 3/4 of an inch in diameter. You'll also find larger 88 or 90-gram pre-filled cartridges that are used in rifles and carbines.

This Sig Sauer P226 air pistol is powered by 12-gram CO₂ cartridges.



HOW

Are airguns quiet?

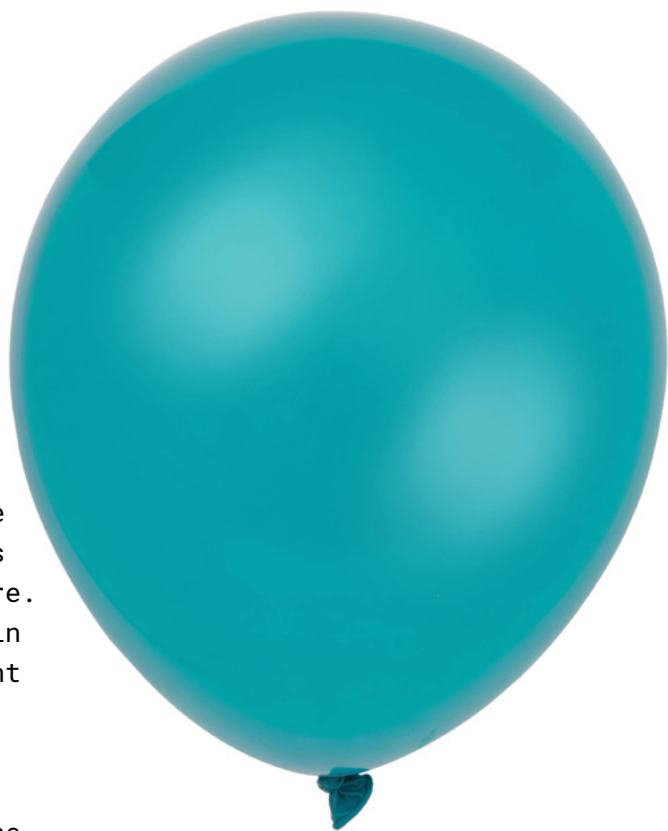
While there's some truth to the fact that air guns are generally quieter than their combustion-based counterpart firearms, they still make noise – sometimes a lot of noise.

This simple experiment that you can do at home explains exactly why. Blow up a balloon. Tie it off. Now pop it. If you filled it to any significant degree, it made a loud noise, likely scaring the dog. That's because of the sudden release of air pressure. All of that higher pressure compressed air in the balloon was released at once in a violent manner into the lower pressure surrounding air, so it made noise.

If you repeat the experiment, but release the air gradually, there's virtually no noise, and your dog will not need therapy. That's because the high-pressure air adjusted to the lower pressure environment gradually and in a controlled fashion.

It's the same principle with air guns. To launch a projectile with any appreciable velocity, the airgun needs to release a sizable quantity of compressed air in a small fraction of a second. Like a balloon popping, that makes noise.

Just as with cartridge firearms, various moderator (silencer) devices can be used to help tame that sudden release of high-pressure air to the much lower pressure air in the surrounding environment. The underlying science is similar between airgun and firearm moderator or suppressor technology. Escaping air (or gas in the case of firearms) is redirected, swirled around, cooled, and slowed down before it escapes the moderator device. That means it exits more gradually, and at lower pressure, so it makes less noise.



Smoothbore or rifled barrels?

With projectile choices ranging from round copper-plated steel BBs to softer lead pellets, buyers will find airguns optimized accordingly, with smoothbore and rifled barrels.

Generally speaking, guns designed to fire hard steel BBs are smoothbores and don't impart spin to stabilize the BBs over longer distances. More accurate guns designed to fire soft lead pellets are often rifled and impart a spin to stabilize the pellet as it travels down the barrel.



Whether you decide to take up small (or even large) game hunting, enter the competition world, or simply shoot recreationally, airguns are a great way to experience the outdoors with young and old alike.

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3

AMMO

Airgun Ammunition

The “ammunition” used by air guns isn’t ammunition at all, at least not in the classic sense. Air guns supply their own power, so the only ammunition component used is the projectile itself. Depending on the nature and type of airgun, you might hear its projectiles called BBs, pellets, or large-caliber bullets.

Technically speaking, caliber refers to the diameter of a projectile. In the air gunning world, you’ve got options ranging from the ubiquitous .177 caliber BB or pellet all the way up to .87 caliber (that’s almost an inch!) for some custom airguns. Here are the most common.



AMMO

Calibers

.177 (4.5MM)

The classic BB is almost always a .177 caliber projectile, although you might still find some examples of .20 caliber (5mm) floating around. This caliber is also the standard for international target shooting competitions, at least those sanctioned by the ISSF. If you watch air pistol and air rifle competitions during the summer Olympic games, this is the caliber used. Most .177 caliber pellets weigh between seven and ten grains. In case you're not familiar, a single grain is 1/7,000th of a pound.

.22 (5.5MM AND 5.6MM)

The .22 caliber pellet is starting to make its way into the competition world too, at least for events not restricted by Olympic rules. It's also great for hunting small game due to its larger diameter and heavier weight. Most .22 caliber pellets weigh between 14 and 18 grains.

.25 (6.35MM)

More diameter allows more weight. Whether for hunting or stable target shooting, .25 is another popular airgun caliber. Most .25 caliber pellets weigh between 20 and 30 grains.

.357, .45, .50, AND .58

Now we're into the territory of big bore airguns suitable for hunting larger game. Most resemble the projectiles that are used in black powder rifles. Given the large diameter and heavy weight, you'll find that most air guns capable of shooting these heavies are PCP designs. In these big bore calibers, you'll find bullet weights between 80 and 300 grains.

Pellet Types

Airgun pellets are available in different shapes and sizes for different purposes.



Round BBs are usually made of steel and coated with copper.



Pointed pellets maintain velocity and offer improved penetration.



Round nose pellets offer good aerodynamics suitable for plinking and hunting.



Hollow-point pellets are designed to expand and are primarily used for hunting.



Wadcutter pellets cut clean holes in paper and are used for competition and target shooting.



Some pellets use combinations of different styles, like a pointed tip within a hollow-point.



Big bore airguns use full size bullets, usually with hollow bases.

TO LEAD OR NOT TO LEAD...

Classic airgun pellets are made out of lead. Relatively inexpensive, the material is also soft, which helps develop a good air seal in the barrel, and that increases velocity. You'll also find that most pellet manufacturers offer pellets made from various metal alloys. These are often lighter and harder than lead pellets of the same size. That lighter weight generates increased velocity, and harder material construction increases penetration while limiting the risk of projectiles breaking up on impact. Alloy pellets also reduce the risk of lead exposure.

AMMO

The story of the BB...

Ever wonder where the term BB came from? It's been around so long that it's become one of those things that just is, like Coke and Xerox, but there's an interesting story about the origin of the name.

Back in the late 1800s, air guns were designed to use spherical lead pellets. These lead balls were slightly oversized relative to the airgun barrel. Since the lead pellet was softer than the steel barrel, the ball squished into the bore, thereby providing a good gas seal that allowed the compressed air to do its work and drive the pellet out of the muzzle.

Guess what kind of lead balls were already quite common? Shot pellets from shotgun shells. Since the size and weight were already about perfect for the power generated by early air guns, shot shell size "BB" pellets were adopted for airgun use. That's where the nickname "BB" originated. Those early BBs were 0.180 inches in diameter and barrels were often just a hair smaller, around 0.175 inches.

As air guns gained popularity, industrious kids soon discovered that steel ball bearings of the same approximate size were lighter and therefore faster. After a few years of dealing with ruined barrels caused by folks firing non-standard steel BBs, the industry standardized the BB and barrel size so steel could be used safely without damaging airguns. And that's how we ended up with the current standard of .177-caliber BBs.

4

POWER

How Powerful Are Airguns?

Talking about power and guns is sure to lead to lots of confusion. Without getting immersed in high school physics, and at risk of offending nearby professors with this oversimplified explanation, think in terms of two “power” measurements. The scientific words are momentum and kinetic energy.

Momentum is an easy concept to understand; it measures the ability to move an object. If I throw one of those big heavy medicine balls you might find in a Crossfit gym at you, you’re going to know it. That’s because big heavy objects tend to move other objects when they strike. On the other hand, kinetic energy refers to destructive power, not necessarily the ability to move something. I like to visualize a power drill when considering kinetic energy. It has lots of destructive power, but drilling a hole in a board isn’t going to knock that 2x4 across the room.

Projectile	Pellet Weight	Velocity	Energy (ft-lbs)	Momentum (lbs-ft/sec)
.177 BB	5.23	350	1.4	0.3
.177 BB	5.23	1,000	11.6	0.7
.177 Pellet	7.9	1,000	17.5	1.1
.22 Pellet	14.3	1,000	31.8	2.0
.25 Pellet	27.9	900	50.2	3.6
.357 Pellet	145	750	181.1	15.5
.45 Ball	143	910	263	18.6
.45 Hollow point	200	830	306	23.7
.45 Round nose	405	750	505.9	43.4

Airguns cover a broad range of bullet weight, velocity, kinetic energy, and momentum. Calibers at the higher end of the scale make excellent hunting solutions, even for larger game.

POWER

How much energy does a BB gun have compared to a Nolan Ryan fastball?

Now that we've covered workout trends and lumber let's get back to the topic at hand. For power comparisons, we'll use the two most common measurements in the shooting world: kinetic energy measured as foot-pounds and momentum measured as pounds-feet per second. To put these numbers in perspective, we'll look at more familiar things like handguns, bowling balls, and major league baseball pitchers.

The classic Daisy Red Ryder shoots a 5.23 grain (a grain is 1/7,000th of a pound) BB at a maximum velocity of about 350 feet per second. If we do a bunch of math, that means that it delivers 1.4 foot-pounds of energy and 0.3 pounds-feet per second of momentum. Let's compare those numbers to the average 9mm pistol. If you shoot a 124-grain bullet at 1,150 feet per second, that generates 364.2 foot-pounds of energy and 20.4 pounds-feet per second of momentum.

While more relatable, those are still pretty abstract numbers, so let's talk about baseball for a minute to give those numbers some meaning. The fastest major league pitch

POWER

ever measured was hurled in 1974 by Nolan Ryan. His “Nolan’s Express” clocked in at a whopping 108.1 miles per hour. Since everyone knows that a baseball weighs 5.25 ounces, we can calculate Nolan’s kinetic energy and momentum at 128.2 foot-pounds and 52.0 pounds-feet per second. The momentum of that fastball is over 150 times as much as that delivered by the Daisy Red Ryder.

OK, so we started this looking at the numbers for a Daisy Red Ryder. While it can put an eye out according to moms everywhere, it’s not anywhere near the high power end of the airgun spectrum. Here’s a list of different air calibers and their respective energy and momentum figures.

As you can see, when we start getting into big bore air guns, we’re in traditional firearm territory. As an example, the AirForce Texan .45 caliber rifle delivers significantly more energy than a 1911 .45 ACP pistol. The average 230-grain pistol bullet fired from a 1911 moves at 850 feet per second yields 369 foot-pounds and 27.9 pounds-feet per second of momentum. The Texan? How about 505.9 foot-pounds and 43.4 pounds-feet per second when shooting 405-grain lead round nose bullets. That’s nothing to sneeze at.

Since we’re in the big bore math now, let’s move up from baseball to bowling. Pro bowlers that wear those nifty wrist braces sling a bowling ball down the lane with enough velocity so that hits the pins at about 18 miles per hour. If they’re tossing a 16-pound ball, that means they unleashed 173.4 foot-pounds of energy and a whopping 422.4 pounds-feet per second of momentum!

What’s all this mean? Besides illustrating the fact that shooting projectiles, driven by air or powder, won’t move someone as much as a bowling ball, it shows that air guns are in the same league as some big caliber firearms.



This Anschutz competition rifle is a pre-charged pneumatic rifle. Note the gas reservoir beneath the barrel.

5

ACCESSORIES

Airgun Accessories

Depending on the type of airgun you purchase, you'll need some extra accessories. The very first (and most important) airgun accessory to put on your shopping list is a proper pair of impact-resistant safety glasses. Pellets and especially hard steel BBs can bounce straight back from targets or backstops with surprising velocity. Yes, your mom was right - even smaller and lower power BB guns can put an eye out. If you plan to use your existing prescription specs or sunglasses, check with the manufacturer to be sure that they're impact resistant.

Most airguns will require regular maintenance with specific types of oil. Air guns rely on air pressure for peak performance and lubrication helps the seals maintain a proper air seal. Don't just grab the 3 in 1 out of the garage, it's important to use the right stuff in the right quantities. In fact, using the wrong oil or even the right oil in the wrong places can be dangerous with high-pressure airguns. Always check and carefully follow manufacturer recommendations for your specific airgun.

ACCESSORIES

CO2 airguns are convenient as the air supply is disposable and self-contained. Most CO2 air pistols use 12-gram cartridges that are available online and at most sporting goods and big box retail stores. Some airguns use larger canisters like 88/90-gram canisters shown with this Sig Sauer MPX air carbine. Those can be a little harder to find, so check online if your local dealer doesn't stock them.



Another reason to use safety glasses is that most wrap around your eyes, offering better protection from top, bottom, and side impacts.

If you invest in a pre-charged pneumatic air gun, you'll need a way to charge its onboard air reservoir with very high-pressure air. PCP guns often require 3,000 to 4,500 pounds per square inch of air pressure, so your hand bicycle pump isn't going to do that job. Local dive shops, paintball dealers, and even fire departments often have high-pressure air compression equipment capable of doing the job, so ask around locally.

Once you find a "filling station" you'll need a way to store that compressed air until you're ready to charge your airgun. You can use SCUBA tanks with the right hoses and adapters, but those can be heavy and unwieldy. Be sure to check out new carbon fiber air tanks. Not only are they much, much lighter than SCUBA tanks, they're stronger and can often handle higher internal pressure, up to 4,500 psi.

If you need to conserve cash or want a field-expedient way to charge your PCP airgun, you might consider a hand pump. While they might look like a simple bicycle pump, they're far more - and priced accordingly. The valves and seals are designed to provide the high-pressure air required but at the expense of some serious physical exertion. Charging your PCP gun might require hundreds (or more) pumps using a hand-operated device.



When you get serious and tire of making trips to the local dive shop to refill your tanks, you can always get your own air compressor. Again, the shop versions at the local hardware store won't do the job. You'll need a compressor built to provide not only high pressure but clean and very dry air. A compressor like the Air Venturi

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model shown here might cost you \$1,200 or so. It's not inexpensive, but if you're a regular shooter, it'll save you money in the long haul. This model is compact and only takes up about a foot and a half of floorspace.

Don't forget targets! Sure, you can use paper with a proper backstop, but with lower-powered airguns, you can also use more reactive targets. There's nothing wrong with using tin cans, but you also might want to consider reusable targets like the "Texas star" shown here. One you hit one of the targets, it flips back, starting the while windmill rocking and spinning. It's great training and can be used in the backyard or garage with a proper backstop. You also may want to consider a trap-style shooting gallery. The exterior box stops and captures pellets. Interior targets are often resettable by hitting one of the plates, so you don't have to walk downrange quite so often.



This Air Venturi compressor delivers 4,500 pounds per square inch of pressure and will keep you shooting forever.



⑥

COMPETITION

Airgun Competition

Got a competitive itch? Spent enough time honing your skills and now you're ready to see how you rank compared to other airgun shooters?

The most popular airgun competition format is Three-Position Air Rifle. Depending on how serious you want to get regarding equipment, you can star with Sporter Air Rifle competitions which encourage the use of off-the-shelf airguns, so no big initial investment is required. When you get serious, check out Precision Air Rifle competition; that's the one modeled after Olympic-style shooting.

Regardless of equipment, Three-Position Air Rifle competition calls for competitors to engage targets 10 meters down range from standing, kneeling, and prone positions. You can find more information on these competitions at the [Civilian Marksmanship Program website](#).

If you want to take the fast track to competitive success, look into [CMP training camps](#) for junior competitors and their adult leaders. When you're ready, you can also compete against peers across the country by [entering postal matches](#). It's an honor system approach where competitors from different areas shoot standardized targets. Results are transmitted to the CMP for tabulation. It's easy, and no travel is required to get started.

If you prefer a little less structure, you might check out Silhouette Competitions. These satisfying matches call for competitors to knock down metal chicken, pig, turkey, and ram targets. No fancy shooting jackets or competition gear is required, and you can most likely use the rifle you have. You can find more information on Silhouette at the [National Rifle Association](#).

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RESOURCES

Resources



You can take your airgun hobby to whatever level of sophistication you like, right up to the Olympic Games. Photo: USA Shooting.

Are you ready to embark on a journey of airgun shooting? Want to learn more? Got a competitive itch that needs scratching? There are lots of resources available to help you get started, and airgunners are always willing to help you along the way. Here are a few helpful links to get you going.

[NRA Air Gun Programs](#)

[Junior ROTC Air Rifle Competition](#)

[NRA Precision Air Rifle Rules](#)

[The Olympic Path for Junior Athletes](#)

[Air Rifle Marksmanship for Youth](#)

[Getting Started in Shooting](#)

[National 4-H Shooting Sports](#)

[American Legion Air Rifle Tournaments](#)