



4-H Consumer Judging Guide

MP3 Players



MP3 players are definitely not one size fits all. They come in a range of shapes and sizes, use different types of memory, and support different formats. Based on these and other features, certain players are better suited to certain uses – you should choose the player (or *players*) that meets your needs. Along with type of memory and compatible formats, you should consider storage capacities, features, accessories and intended use when shopping for a player. It is also important to think about where you will get music and the software you will need.

The Two Basic Types of MP3 Players

Hard Drive-Based MP3 Players

The MP3 players with the largest capacities are hard drive-based MP3 players. They store the music and files on an internal hard drive, which means MP3 players of this type can have large capacities. Some feature up to 80GB of space, which would require an awful lot of music and videos to fill. The downside of hard-drive MP3 players is that hard drives have moving parts, that is, shakeable, breakable parts – not the best choice for people who want a portable MP3 player for working out. Hard drives also take up a little more space, so these MP3 players won't be quite as slim and light as others.

Flash-Based MP3 Players

Flash-based MP3 players feature flash memory, which has no moving parts. Flash MP3 players are lightweight and slim (perfect for the gym or a jog), but flash-drive MP3 players have smaller capacities. Their highest capacities max out at about 8GB, which is still plenty of space for most people. Generally, more memory in a

portable MP3 player means higher cost. There are plenty of affordable MP3 players between 1 and 80GB.

Battery Type and Life

Battery life is viewed as a critical factor in selecting an MP3 player. Most hard drive-based players come with non-removable lithium-ion batteries, which typically last two to four years. Many manufacturers have some sort of return/repair plan, so check the warranty policy before you buy. Flash MP3 players are split between those using AA or AAA batteries and those with an internal rechargeable cell. Since flash players need to be synced more often and it's easy to recharge as you sync, flash players with rechargeable batteries are usually preferable.

**You have to be really careful with power adapters for both car power ports and wall plugs. Use only those provided by the manufacturer; even if the plug physically fits, you still need to confirm the adapter's polarity, voltage, and amperage. While amperage can usually be 20 percent less or up to 100 percent more than what's needed by the player, polarity and voltage must be identical to the unit's requirements. If you're unsure about these factors, skip the bargains and buy the power adapter sold by the manufacturer – you'll avoid frying your player.*

Understanding Storage Capacities

Before you can really shop for a portable MP3 player, you need to know the difference between megabytes (MB) and gigabytes (GB). Memory storage capacities are measured in bytes. More bytes in an MP3 player equal more space to hold all of your songs. A megabyte is 1 million bytes. A gigabyte is 1 billion bytes (and therefore bigger

and better). You won't see too many digital MP3 players with capacities measured in megabytes, but there are still a few out there. The table below gives you an approximation of storage capacities in relation to music:

| Capacity | Number of Songs | Hours of Play |
|-------------------------------------|-----------------|---------------|
| 128 MB | 60 | 4 |
| 256 MB | 100 | 8 |
| 512 MB | 250 | 16 |
| 1 GB | Over 500 | 30+ |
| 20 GB (only on a hard-drive player) | 5,000 | 300+ |

Audio Formats

Songs and other audio files can be saved in a variety of file formats – some higher quality than others. MP3 is the most common (hence the term “MP3 player”). Different online music stores may use different formats. While most MP3 players are compatible with most formats, you should check before you buy. The most common formats you need to be aware of are MP3, AA, WAV/AIFF and WMA. **One special note on formats:** Songs in the AAC (Advanced Audio Coding) format are copyright protected.

With an MP3 player, you have to consider where your music is coming from to ensure your device will play your music. Here's what you need to know about music compatibility:

Existing music on your computer – If you've already ripped and/or downloaded lots of music, choose a player that supports the format(s) you're already storing. If it's MP3, you're OK with any player, but rarer formats are supported by only certain devices.

Compact discs – If all of your music is still on CDs, you can buy just about any MP3 player since you'll first need to convert your discs to MP3, WMA, OGG, or one of the other common formats.

Online music stores – If you plan on buying music downloads from an online music store, you need to make sure your player will work with the formats offered. In an ideal world, you'd be able to play any legally purchased music on any MP3 player, but due to format wars and DRM (Digital Rights Management), that's not possible. If you

know you're going to buy tunes online, you'll first have to select a store you like and then a player that supports the store. The files sold by these stores come with usage restrictions that commonly limit playback to three computers and stop you from mass-producing burned mixes. These restrictions can cause device compatibility problems, but the trade-off for consumers is that those safeguards make the labels comfortable enough to license their songs to online stores.

Subscription-based music services – You can legally fill up your MP3 player with endless gigabytes of tunes from an online music store and pay less than the price of a CD. How is this possible? Well, you're not actually buying the tracks; instead, you're renting them in an all-you-can-eat scenario for a monthly subscription fee.

P2P networks – Most tunes available on file-sharing networks (also called peer-to-peer or P2P networks) are already in the MP3 format, so there are no compatibility issues in this situation. Since someone else did the encoding, however, the audio quality of files on these services varies. Also, the legality of these sites is seriously questionable, so there's a risk of getting in trouble with the RIAA (Recording Industry Association of America), which could lead to hefty fines or even jail time.

Vinyl/cassettes – If you have lots of music on vinyl, cassettes, or even 8-tracks, you can record it on to your computer, turn the files into MP3s, then transfer those to any MP3 player. In order to simplify the process, consider buying a player that has line-in recording and allows you to encode MP3s directly from your stereo. If your stereo has a digital optical output and you want to record MP3s this way, make sure to find a player that has a digital optical input; this will preserve sound quality during the recording process. If there's no digital optical output on your stereo, any player with an analog input will do.

Key Features of MP3

File Management – MP3 files include ID3 tags that list the artist, track, album name, genre, and more. Working with this data, a player can organize the files for you. Most hard drive-based players sort files into artist, song title, and genre lists and can read playlists you create with software. You obtain song information easily via software enabled to work with an online track-listing

database, or you can enter the info manually. Look for an easy-to-read LCD screen that shows the information you frequently use.

Transfer Speed/Port Type – Most players today use the USB 1.1 interface, but downloading one 5GB batch of songs from your PC can take all night. Look for players that employ the much faster USB 2.0 standard. With FireWire, you can transfer an entire song in seconds, but few PCs have a FireWire port. (You can add a FireWire PCI card to your PC for a small fee.)

Software – All players come with software that allows you to download songs to them. Some of the more popular units have drivers you can use within online music stores and computer software; this permits you to rip from a CD-ROM and download the resulting MP3 file to your player from the same application. Other players come with their own specialized software. Some hard drive-based players appear as a drive within Windows Explorer, so you can drag and drop files into the device.

Additional Features

- **Data storage:** Some MP3 players also serve as data storage, so you can transfer other types of non-music files between computers.
- **Photo viewing:** If you are a photographer or if you just like to share your family pictures with everyone, you need an MP3 player with photo-viewing capabilities. If you have a lot of high-resolution photos, get something with a lot of memory, like a 20GB MP3 player.
- **Recording:** Some MP3 players feature digital voice recorders, which are great for recording lectures or personal reminders but not music. If you want to record music, get something that has an audio input jack, so you can record directly from other devices.
- **Video playback:** Most portable MP3 players with video playback are great for watching short clips and maybe a digitized TV show or two. They're probably not the best for watching feature films, however, because the screens are too small.



- **Wireless capability:** Many of the newer MP3 players are able to transfer songs and files wirelessly. Just make sure your other devices use the same wireless technology so they are compatible.
- **Hold switch:** If you're like most people, you'll be storing your digital MP3 player in your pocket or backpack. That means you may inadvertently bump a button now or then, which could potentially waste valuable battery life or skip to the next song before you're ready. A hold switch will make that less likely to happen, essentially making the MP3 player controls ineffective until you release them.
- **Expandability:** More and more MP3 players feature memory expansion slots, where you can insert flash memory cards. This can be handy for transferring files or for listening to a few songs once or twice that you don't want taking up space on your MP3 player.
- **Radio:** Many players offer FM radio reception, although they're more common on flash devices, which lack the spinning hard drives and the CD-playing features that can interfere with the signal. Other radio-related features include FM recording (usually to MP3), transmission (for playing back audio wirelessly through home and car stereos with FM tuners), and presets.
- **Personal information management:** Some MP3 players can accept phone books and schedules. The information is generally entered into Outlook or another PIM program, then synced to the device where you can view it but not change it on the go.
- **Sound-tweaking options:** Digital signal processing (DSP) changes a song's equalization or spatial characteristics. Since digital audio files come from multiple sources and people have individual sonic preferences, EQ and other DSP settings can be useful. Look for a customizable EQ setting (the more bands the better; five is the norm), as well as the standard presets (rock, jazz, bass boost, and so on).
- **Advanced playback features:** Just about every player offers shuffle, repeat, resume, and playlist functions. Still, there's room for improvement. Newer models offer the ability to create on-the-fly playlists without a com-

puter; smart playlists; song-rating methods in which preferred tunes appear more frequently in shuffle mode; automatic cross-fading that adds smooth transitions between songs; and automatic volume control, which makes all songs equally loud.

Meeting Your Needs

Below is a listing of some of the most common uses of MP3 players with information on the best players to meet specific needs. If you truly need a player for more than one of the common uses, you might consider buying an additional player. For instance, you might want an ultra-compact flash player for jogging or skiing and a high-capacity hard drive-based device for traveling. Most people just want an MP3 player for general, day-to-day use – in that case, buy a quality product in your price range with the features you want.

Commuting – You listen to your stereo at home and to your computer at work, but filling your commute with tunes requires a portable player. If you commute by car, look for a hard drive-based model. Size doesn't matter much in this situation, so feel free to save money by buying a heftier unit. You'll also need a cassette style adapter and a cigarette-lighter charger. The former can be purchased anywhere, but for the charger, stick with manufacturer-approved accessories. That way, you'll avoid frying your player with the wrong voltage or polarity. If your car has no cassette player, you're going to need an FM transmitter device or a direct line-in jack on your car stereo. If you commute via subway or bus, look for a compact flash-based player and, to seal out as much of the din as possible, a pair of noise-canceling or sound-isolating headphones.

Traveling – If you spend a lot of time on the road, you need an MP3 player that will enhance your journeys with music yet doesn't add undue weight to your carry-on. If you travel with the same laptop that stores your music, a compact flash-based player is the way to go. If you'd rather leave the laptop at home, try a higher-capacity player that will hold all or most of your music – bonus points for one that has an easily removable and replaceable battery. Accessories worthy of consideration include noise-canceling or sound-isolating headphones for the plane as well as a portable speaker setup for your hotel room.

File Hoarding – If your appetite for digital music has your computer's hard drive(s) bursting at the seams, you fit the description of the file hoarder. While sound quality and features are important to you, what you need most is an enormous capacity – at least 40GB but maybe even more. It shouldn't be difficult for you to find a hard-drive player with enough storage to suit your needs, but it may be more expensive and larger than other options.

Working Out – If you want an MP3 player for working out, it should be compact and easy to operate with one hand. Rather than looking for one with massive storage, choose a flash-based model that can withstand tough workouts better than hard-drive based players. You may also want an armband, an option on many ultra-compact models, and a set of headphones that will stay in place rather than the cheap earbuds typically included. Also, look for sweat-resistant models and other fitness-friendly extras, such as a calorie counter or pedometer.

Listening to Audiobooks – MP3 players have quickly become the medium of choice for listening to audiobooks. Compared to CD and cassette players, an average MP3 player is small and has the capacity to hold many hours worth of audio. If you're looking to purchase an MP3 player that works well with audiobooks, there are a couple things to keep in mind. The first is whether it's compatible with popular audiobook sites. The second is if the player has bookmarking that will keep you from having to fast-forward through files.

Recording Audio – Some players on the market can record from line-level sources such as CD players or stereo outputs, so they're great for converting CDs, tapes, and vinyl records to digital formats such as MP3, WAV, or WMA. Those wishing to record live audio can do the same, although they'll need a powered microphone that can output a line-level signal. If voice recording is all you need, look for a model with a built-in mic.

Watching Video – Nowadays, many MP3 players and portable video players (PVPs) come all in one, as the majority of devices hitting the market include video playback as a feature. MP3 players with relatively large screens make the best substitute PVPs. Make sure you look for those that are at least two inches diagonal.

Accessories

There are many optional items you can purchase to enhance your player:

- FM transmitters
- MP3 car chargers
- In-line remote controls
- Jogging kits
- Deluxe carrying cases
- Flash memory adapters
- Flash memory
- Docking stations
- USB/FireWire kits
- Extra rechargeable batteries
- Cassette adapters



Just to name a few! You might also consider a higher quality set of headphones. Often, the headphones included with MP3 players are not the highest quality, and they are usually earbuds, which can be uncomfortable for some people. If your MP3 player has wireless capabilities, you can try some wireless headphones. You can also get some noise-isolating headphones or wrap-around buds that stay on while you bounce around working out.

Refurbished MP3 Players

New MP3 players don't always have to be new or expensive. If you want to save money on a quality digital music player, you should think

about getting a refurbished MP3 player. These are players that have been lightly used or demoed before being factory reconditioned to like-new condition. Nobody will know it was a discount MP3 player because it looks and performs like a brand new one.

The best buy on an MP3 player will be the one that meets your needs with the features you want at an affordable price.

Remember to consider:

- Storage capacity
- Battery type
- Compatible audio formats
- Key and added features
- Intended use
- Available accessories
- Price

References

- “Six Tips for Buying an MP3 Player With Flash Memory,” *Microsoft*, 2007, Microsoft.com.
- “MP3 Player Buying Guide,” *Overstock*, 2008, Overstock.com.
- “MP3 Key Features,” *PC World*, 2007, pcworld.com.
- “MP3 Player Buying Guide,” *CNET Editors*, 2008, cnet.com.

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