

Railroading Merit Badge

Requirement 1a Study Guide

- 1) Name three types of modern freight trains.
- 2) Explain why unit trains are more efficient than mixed freight trains.



The three basic types of trains are **Mixed Freight**, **Unit Trains**, and **Intermodal Trains**.

Mixed

Freight

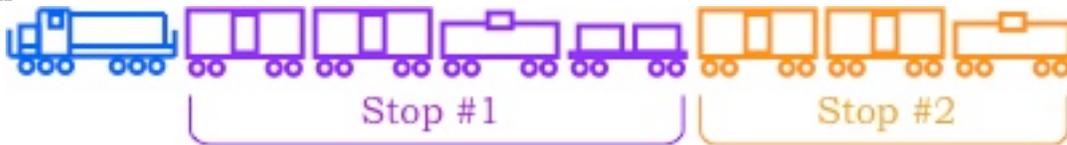


The Mixed Freight train is probably the most common freight train that you will see. You may think they are called Mixed Freight, because *all the cars are mixed up*. Have you ever wondered why they don't put all the boxcars together, and all of the tank cars together, and etc.? There is a very good reason!

The railroads use large consolidation yards across the country, where they sort train cars onto new trains that get them closer to their destination. More importantly, they are sorted into the **order they will be delivered** to their destinations. In the image below, you can see that the first cars behind the locomotive are for the first yard this train will pass on the trip, and the next batch of cars are for the second yard along the trip.

Drop-off

order!



This *pre-sorting* of the cars helps the trains, because it will be easier and faster to drop off cars along the trip. This can allow a crew to drop off to more stations on a single trip.

Mixed Freight trains need to make many stops along their trip, to drop off loaded cars, and maybe pick up some empty cars to move along. They may also have to wait for passenger trains, or maybe even wait for other freight trains to go through before the Mixed Freight can take their turn on the track. (This is because there are not many places where a long freight train can park without blocking the track, so the Mixed Freight may need to wait miles away, until they can make their deliveries.) As a result, we can drive a car from Sacramento to San Jose in about 2.5 hours, but a Mixed Freight train making deliveries along the trip can take 8-12 hours to cover the same distance due to the delays, and the time to drop off and pick up cars.

Unit

Trains



The name **Unit Train** refers to a train that carries one type of commodity, usually in the same type of freight cars, and usually starting with all the cars in one place, and dropping them all off at another place. Some examples of unit trains are:

- **Coal Train**, from the coal mine to a power plant.
- **Auto Trains**, from a car making plant to a Shipping Port

- **Grain Train**, bringing grain from the farmers to the mill

Because the Unit Train doesn't need to make many stops along the way, it can be routed along the best route to reach the destination. This can save time and fuel, and it allows the Unit Train to go farther in a day than a Mixed Freight.

Intermodal



Trains

While the **Intermodal Train** may look like a *Unit Train of Intermodal cars*, there are a few differences that don't meet the eye. It helps to know some of the history of how freight has been moved.

Initially, if you wanted to ship your goods to market by train, you needed to bring your goods to the local train depot. You usually loaded it onto a truck and trailer, and it was then unloaded and put into boxcars, which were then rolled to a depot near your final destination, where it was moved again to another truck and trailer, and finally unloaded where you wanted the goods to go. Every time the freight was loaded and unloaded, there was a chance for something to be broken, or maybe stolen, along the way.

Later, those trailers were loaded onto a flatcar, rather than transferring the freight to a boxcar. This was called *Piggy-back Service* by Southern Pacific, but it is generally called *Trailer on Flat Car* (or *T.O.F.C.* for short). This required special loading facilities, which meant sometimes your freight went a bit further by road, but it was more secure, because it wasn't being unloaded so many times.

In order to move freight from ships to trains, easily, the **International Transfer Unit** (ITU) was developed. It was a specific sized shipping container that could be locked shut, could be easily stacked, and could be lifted easily from train or ship or truck. A single ITU container is 20 feet long. Double units were 40 feet long, but there are now also 48- and 53-foot long containers.

Today, a truck with a special ITU trailer can bring a shipping container to your business, and you can load it and lock it. The trailer then goes to a special loading facility where the container is lifted from the trailer and placed special *Intermodal Freight Car* (usually a *Well Car*).

The train then takes containers to a special transfer facility at a shipping port, where special cranes lift it from the train and put it back on a trailer. Next, the trailer and container is driven a short distance to the dock beside the ship, where larger cranes lift the containers from trailers, and put them onto special Container Ships for their sea journey. At their destination port, containers will move from ship, to a train, to a trailer, and finally to their destination.

*The thing that makes an **Intermodal Train** different from a **Unit Train** is that some of the *not all of the freight is going to the same destination*. For example, when the train arrives at the port transfer facility, most of the containers may go onto the ship, but some of the containers will go on trucks bound for other customers.*