7¼ Inch Gauge Society Ltd
Proficiency Scheme

Bronze Award Booklet

7¼” Gauge Society Ltd

Proficiency Co-ordinator

The 7¼” Gauge Society Ltd is an international organisation based in the UK representing members with an interest in 7¼” and 7½” gauge miniature railways.

The Society looks after its members’ interests with Government and other official bodies including boiler inspection and insurance.

It publishes an interesting and colourful magazine four times a year which is full of excellent items about 7¼” gauge railways.

The Society has a website, with a members’ forum, picture gallery, sales and wants pages, as well as links to many other club, traders and private railway sites. There is also an Event page with dates of open days of many 7¼” railways which you may wish to visit.

For all the latest information and how to join the Society visit **www.sevenandaquarter.org**

The 7¼ ” Gauge Society Ltd Proficiency Award Scheme.

The scheme has been introduced nationally to encourage as many participants as possible to obtain a level of skill and knowledge whilst enjoying and becoming safely involved in our hobby.

Whilst it sets standards of awareness it is not a licence to drive a locomotive. It is a way of rewarding enthusiastic participation; by setting goals that encourage courteous, safe involvement in 7¼” gauge railways. The scheme dose not override the club rules but is there to help and support your learning and enjoyment of miniature railways.

This Booklet covers the Bronze Award and is intended for persons new to the hobby. The award is open to anyone whether they are a member of the 7 ¼” Gauge Society or not. Those who achieve this award will receive a badge and a certificate plus one year’s free e-membership of the 7¼” Gauge Society Ltd.

Please Note:- Persons under the age 18, will need Perant or Gradians permission to do the Bronze Award.

The 'railway world' has its own set of jargon, in common with most other worlds. To be able to be safe and enjoy the railway, you will need to learn the special meanings used by railway enthusiasts, and a lot of other things, so that you are able to use them correctly and understand what is meant when talking to others. This will also help keep you safe whilst at a railway. There is a downloadable "Glossary of Terms" on the society website for a more comprehensive explanation of some of the words used.

Miniature railways are all different in their length, their shape and also the way they are built. You may find a railway in a garden or in your local park.

Something we all are concerned with at the railway is keeping everybody safe - you, me, and our visitors. There will be rules which each railway makes, and you will have to follow these so that everyone can enjoy themselves safely.

Why do our trains go.

Put simply, if you put some kind of power onto a set of wheels and then put it all on a railway track then this becomes a locomotive (sometimes shortened to 'loco') or 'engine'.

There are three main ways of powering our locomotives. This is how we 'propel' our locomotive and so it is called propulsion.

Models of older locomotives are usually powered by steam. The steam is mostly made by coal fires (but oil, gas, coke, wood and peat are also used) heating water beyond boiling point.

More modern locomotives are made to look like the diesel or electric engines that we see today on full size railways and are usually powered by electricity from a battery inside the locomotive or they can have a petrol engine to make them move.

So either Steam, Electricity from batteries or Petrol (and very occasionally pedals) to make our engines go.

Steam locomotives have a boiler to heat the water in, and this has to be tested and certified safe. When in use, they burn hot coal and can let out sudden jets of steam and boiling water. So staying out of range is safest, until the engine driver allows you to come near.

You will learn a little more about the locomotives in the Silver Award but now is the time to learn about the ways to keep safe around them.

An engine driver has to keep the water level correct, the steam pressure up, as well as keeping the fire good and hot, and so they will be very busy with all this. Some drivers may be happy to show the fire to passengers and children who may not even realise there is a fire involved, but if not, you can help them by keeping passengers and children away from their engine by explaining how hot it can be. Even when the driver is a good one their steam engine can send smoke and steam out of the chimney and could cause discomfort to the driver, passengers or people around the track.

Petrol driven locomotives are generally powered by a small petrol engine, roughly around the size of lawn mower engine. Petrol engines can also get hot, and they let out dangerous gases. Petrol can also be very dangerous and catches fire very easily, so of course you must handle it with great care especially when putting more petrol in the tank. This should only be done by an experienced person and in a special area of the track away from everyone else.

Battery electric locomotives, as the name says, get their power from batteries and generally have several motors, one for each wheel set.

Batteries are sometimes filled with very dangerous acid, which can burn skin.
Electric locomotives can speed up very quickly and this can make it dangerous for the passengers if the driver is not careful with the way they use the controls.

Locomotive or Train - which is it?

A locomotive is the engine, whether it is steam, battery or petrol driven with its tender or driving truck attached.

A train is the locomotive with carriages or trucks of any kind coupled to it.

Brakes

How trains are stopped

Battery electric and Petrol locos can use their motors for braking. They can also be fitted with vacuum or air brakes. These are usually fitted to the carriages as well to help give better braking.

Steam engines can also use steam to operate a brake and sometimes have a device called an *ejector* to produce a vacuum to help apply the brakes. Most engines also have a handbrake which can be applied when the locomotive is left standing for any length of time.

One day you may want to have your own engine and there are many kits available to help you get started. Some clubs have help available to assist you in building your own engine. Engine drivers may be any age, but due to insurance rules drivers must be over 16 years of age to carry members of the public.

Railway open days

Whilst 7¼" gauge locomotives, trains and railways are absolutely wonderful for you to enjoy, it must be remembered at all times that they can be very dangerous and could cause injury to you or other people if you are not careful.
Railways must consider how to make sure everybody who visits them is kept healthy and safe. This is the law and so all of us have to do it.

Of course, this means doing everything in a thoughtful way so that it is done safely and within the rules. Then everything will run properly.

Even if your railway is not open to the public it is very important that it operates safely and just taking care can make sure this happens.
Most tracks have a person who is in charge or responsible for running the whole railway. They may even have a special name such as 'Responsible Officer' or 'Station Master' and you should know who this is so that if you see anything dangerous or something they should know, you can tell them what you have seen. Also if they ask you to do some work for the railway or they ask you to stay out of the way, do it straight away! If it was work to do, let them know when you have finished the job.

If your railway is open to the public and carrying passengers, station staff must be appointed to ensure no members of the public walk onto the track and that they stand well back from the edge of the platform. They should also have an "Operating Procedure" or other description which describes the jobs of all staff for public running days. This will be specific to a track and probably in great detail. They should look after people getting on and off the train and tell them important things:

- to keep feet on the foot boards
- not lean out, and sit up straight.
- How to deal with dropped items

Each railway has its own list of things to say, and you will soon learn what they are.

When everybody is safely on the train the station staff will tell the Guard, who is in charge of the train, that it is ready to leave. Some people think it is the engine driver, but they are in charge of the engine and have enough to do just driving the train correctly and in a safe way. The engine driver also has to watch out for signals and speed limit signs on the railway.

The Guard is in charge of the train and so that they can see everything that is going on, they normally ride at the rear of the train. The Guard must make sure the passengers are seated safely and properly before and during the journey, that they do not lean out too far, drag their feet or stick their arms out, as they might get hurt.

The Guard can give instructions to the driver if needed to. This is usually done with a whistle. The usual whistle signals are:

- One whistle blast to stop.
- Two whistle blasts to go forward.
- Three whistle blasts to go backwards.

Repeated (sometimes Six) whistle blasts when they want the driver to stop now, for an emergency.

If the train has to stop for an emergency on the railway line for a while, the Guard will walk back along the track and make sure the next train has plenty of warning that there is danger ahead. They may even wave a red flag, or leave it across the track, to do this.

Usually the Guard will make sure that the couplings are all properly fitted before starting the day and may help the driver conduct a brake test.

Connecting or coupling up a train

The carriages, trucks or wagons are connected or coupled together in a number of ways. These are the more commonly seen ones:

1. A metal bar with metal pins
2. A Screw Link Coupling
3. Three Link Chain, can be more
4. Bolt and Bar

1. Pin and Bar, note the clip that stops the pin from coming out accidentally.

2. Screw Link Coupling . This photo shows the tensioner to pull the two items together, so the buffers press against each other. You can see this kind of coupling on full sized, preserved railways.

3. Three link chain.
The sharp eyed amongst you will see that this coupling in fact has four links. The vacuum brakes for the train, including the engine would be activated if this link became uncoupled.

4.Bolt and bar, usually used for fixed couplings, like Engine to tender. Note the bent bar to accommodate height of coupling brackets.

You may see other methods of coupling in use.

Wait for the other members of the railway to show you how to couple up carriages, but do be careful as it is too easy to catch your fingers—that hurts! You may also need to understand how the brakes are connected, if vacuum or air brakes are used.

Where a locomotive has a tender or “driving truck” (this is usually a separate small wagon pulled behind the loco to carry the driver in order for him/her to drive it properly) this will probably be connected to the engine by a bar as in photo 5 and perhaps a safety chain as well.

Track

Before you build a railway, everybody has to give it a lot of thought.

The first thing to work out is which way the railway will go. For miniature railways you will want to find the flattest way so there are as few slopes, up or down, on the journey as possible. To do this, we build embankments (where we put the earth in to fill a hole), or we can make a cutting (where we dig down into the ground). This way we can help to make the journey as level as possible. Sometimes we may even have to build a bridge or a tunnel to make our journey level.

When we have made the ground nice and flat we can start to build our track.
Ballast is laid on our level ground. This is a bed of hard stone such as granite, sleepers are put onto this and have more ballast put around them to keep them in place.

Sleepers are long pieces of wood (or steel, concrete or even plastic) which lay across the ballast.

Rail is then put on top of the sleepers. Rail comes in various shapes and sizes and is made of steel or aluminium. The rail is put on top of the sleepers, and held to the correct gauge by fixing screws, or special clips called chairs.

Gauge is the distance we fix the two rails apart on our sleepers and for our railways this is seven and one quarter inches or 7¼" and that is of course where we get the name for our Society (this is an old measurement but is about the same as 184mm).

When finished the whole thing is called the **"Permanent way"**

Track Maintenance

Because the permanent way is so important, it needs to be looked after and have regular attention to keep it working properly. If the rails settle down into the ballast too much, (called subsidence) we add some more ballast and make the track level again. We need to make sure everything is safe each time we are going to operate our railway and that the track is ready for us to use.

A complete check of the track should be made by a 'responsible person' who would usually walk along the track looking for anything that is wrong such as, points not working correctly, rail damage, branches, or twigs on the track, in fact anything that might cause a problem.

When all this is completed, it is a good thing to run a train to test that the line is working as it should do. An experienced driver will take the train round before any passenger-running takes place. When signals are to be used, they can use this test run to check, with the Signalman, that everything is working correctly.

Signalling

Railway signalling is the way we keep our trains and passengers safe by stopping trains from running into one another.

Without proper signalling it would be very easy for trains to catch up with one another and then they could collide (crash into one another). Also trains cannot stop quickly and signals will give a warning long before the driver can see another train.

Signals also let the driver know it is safe to continue with the journey as the Signalman knows what is going on and keeps all the trains in the right and safe place.

Some single track railways operate what is called a **token** system instead of signals. This only allows the driver holding the token for the train, into one section of track at a time. A token can be almost anything, but there must only be one of them available.

Signals

A signal is a mechanical or electrical device, placed beside the railway line, so that a Signalman can let an engine driver know whether they must stop or continue along the line. Signals can tell us many things:

1. The line ahead is clear (free of any obstruction), or blocked.
2. The driver may go.
3. Which way points are going to make the train go.
4. The speed the train may travel at.
5. What the next signal along the line is showing.

Signals can be Semaphore or colour light signals.

Semaphore signals were first invented a long time ago but are still seen at many miniature railways. They have a moveable arm.

The colour of the signal and the position of the coloured arm tells the driver what to do. A red horizontal arm means stop. Raised of lowered to about 45 degrees means go.

Colour Light Signals work something like traffic lights with Red, Yellow (not amber) and Green lights. They tell the driver different things according to which light is lit. **Red** is for Stop, **Yellow** Proceed with Care and **Green** for All Clear to go. Some signals have only 2 lights. These can be Red-Yellow or Red Green. They have the same meaning as a 3 light signal

A Colour Light Signal can also have lights attached to the side or top of the signal, these are known as feathers or direction indicators. They are usually white, this is to show the driver which way a point will be taking the train. In the photo an unlit feather means straight on and a lit feather the point will take you to the left.

Some railways do not use signalling systems, relying on the driver being able to see what is ahead. This is called “line of sight”.

Now that you have read through this booklet and have started to practise the information you can ask your club assessor for the test. This is a question and answer style test, so no writing is involved.

Having achieved the Bronze award, you can continue your enjoyment of railways and go for the Silver award.

This award is much the same as Bronze but is to a higher standard and gives you a more in-depth working knowledge of miniature railways. The booklet is available from your club assessor or downloadable from the society website or email the proficiency scheme co-ordinator at proficiency@sevenandaquarter.org