

3rd July

Memory verse

One generation shall praise thy works to another, and shall declare thy mighty acts. Psalm 145:4
Have a Memory Verse Grand Finale Day! This week's verse was quite an easy one. Don't forget this week to go over some of the other verses you have learned.

A railway story¹

On 3rd July 1938 the weather was cold for July. It was windy with strong gusts whipping across the tracks at London's Wood Green Engine Depot on the East Coast main line. A team of engineers from the Westinghouse company arrived for some special tests of the brakes that their company manufactured. They should have been met by Nigel Gresley the London North Eastern Railway's chief engineer but he was at home in bed ill. His deputy Douglas Edge had everything waiting for them, however. Steamed up and ready to go was one of Gresley's newest and fastest engines, *Mallard*. *Mallard* was new, but not brand new. At four months old she had had just enough time to be well run-in and going nicely but not enough time for any of her motion to become worn. She would be perfect for a brake test – and perhaps for something else.

Nigel Gresley, was concerned that his engines, now reaching faster and faster speeds, needed brakes that performed better. The trials would establish just how well the new Westinghouse fast acting “Quick Service Application” brakes could perform. There were no fare-paying passengers on this run, of course, but there were six empty luxury coaches and in front of them a dynamometer car containing measuring equipment supervised by the LNER's test inspector. Although on that chilly morning at Wood Green none of the Westinghouse engineers realised it, the LNER were planning to do more than just test the brakes. At that time the speed record for a steam engine was 124.5 mph and it was held by Germany. Could the LNER's new streamlined engine set a record that would surpass Hitler's railways' achievement?

The brake tests were carried out as planned between London and Barkston South Junction near Grantham, Lincolnshire. Lunch was served in the restaurant car – and then Mr Edge made his sensational announcement. Would the members of the Westinghouse team prefer to go back to Peterborough by taxi at the LNER's expense or would they prefer to stay – on what would be an attempt at the speed record? There was no question; they were all keen to stay onboard!

Mallard was a streamlined locomotive, which meant she and her “A4” sisters looked very different to other engines. In fact, though, it was not the streamlining that made the greatest difference to her speed. *Mallard* was one of three A4 locomotives to have a new type of exhaust system, which included a double blast-pipe chimney. You can see the streamlined shape in the picture and also the special chimney.



There was work going on on the track near Grantham so *Mallard* passed through the station at a stately 24mph. On the footplate fireman Thomas Bray used the time at slow speed to build up a good big fire ready for the bank ahead. After that her speed rose to 60mph – up Stoke Bank which had a gradient (slope) of 1 in 200.² The speed crept up to 75mph as the gradient eased. Now came the moment.

¹ Put together from a variety of sources including The National Railway Museum website and Jones, Robin, *History of the East Coast Main Line* (Marlborough, 2017)

² This means that for every 200 metres of distance there is a rise of one metre in height.

Mallard's driver was Joe Duddington from Doncaster. He had been in the secret all along and so had his fireman. They had climbed onto the footplate that day ordinary men: they were to climb down heroes, looked up to with adulation by every schoolboy in the country. Sixty-one year old Driver Duddington was experienced, with a reputation for running engines hard when needed. Would he drive poor *Mallard* on until her big-end bearing over-heated and damaged her? A special preventative measure was adopted; a glass capsule full of aniseed oil fitted to the big end that would burst if it got too hot. The strong smell of aniseed in the cab would warn the crew to ease off.

The top of the bank was reached and the record attempt began. They passed the signal box at Stoke summit at 85mph and plunged into Stoke Tunnel treating the Westinghouse engineers in the deluxe coaches to a brilliant display of red shooting stars, as burning hot cinders cascading out of *Mallard's* unique chimney poured along the length of the train's windows. The official limit on the downward side of Stoke Bank was 90 mph. But *Mallard* was out of the tunnel now and nothing could stop her.

In the dynamometer car the needle crept remorselessly upwards: 120 mph – faster than the record set by the rival London Midland Scottish railway – then mile post 90¼ winked past and *Mallard* flew through Little Bytham Station at 126mph. The station was sprayed with hot ash, a waiting room window shattered and, inside the luxurious coaches, crockery was smashed along with the Nazi speed record and every other record for steam power for all time.

But something else had broken too. In the dynamometer car Mr Edge had already rejected the idea of trying for 130mph and through his special intercom he had told the crew to slow down. They still rushed through Essendine Station at 109 mph and then the crew on the footplate suddenly noticed a tell tale smell – aniseed!

The crew slowed down but *Mallard* needed repairs. At Peterborough another engine coupled up to the coaches to take them back to London and *Mallard* went off to the works to be put to rights. But the records in the dynamometer car were unimpaired: *Mallard* was the fastest steam engine in the world.

Why did steam engines never go any faster? In 1939 came the war and after it post-war austerity. Then railways were to suffer from Dr Beeching's drastic cuts. Driver Bill Hoole made the official post war steam speed record in *Mallard's* sister engine *Sir Nigel Gresley* at 112mph in 1959 and rumour still has it that he would have beaten *Mallard's* record too had he not been ordered to slow down by British Railways officials. They were not keen that a steam engine should put the newer diesels in the shade. But that is another tale for another day!³

Some things to do

Today is definitely a day for getting out any toy or model trains you have. You might like to experiment with gradients; how steep a grade can your engine climb and how many waggons can it pull up a slope? You can use layers of cardboard to build and adjust gradients for model trains. Even Brio battery driven engines can be used to do this experiment.

In many parts of the world railways have to cope regularly with heavy falls of snow. A snow-plough can be attached to the front of an engine to push the snow off the line. If you have model trains especially the battery operated brio or Lego type you could experiment with fitting a piece of cardboard on the front of the engine. Crumbled polystyrene would make good snow. Can you make a plough that will push it off the track?

3 .If you want to hear Driver Duddington describe his epic run, the sound track to this video <https://www.youtube.com/watch?v=uFIPFEGLIW8> of a model railway *Mallard* is his actual voice.

Very small children love a sit-on-and ride train even if it does not actually move. With all the cardboard boxes that arrive with home deliveries these days it should be possible to put together an engine (paper plate wheels just stuck on the outside, cardboard tube funnel) a coal tender and some waggons for toys to ride in. Older children might be able to whip up something big enough like this for younger ones to sit in. Please don't make the mistake of giving the driver a steering wheel though!

Today's optional resource file comes from the *Trains* project on the Mothers' Companion flashdrive and shows the inside of *Mallard's* Cab in outline for colouring.⁴

A steam experiment to do

You will need a paper windmill for this experiment.⁵ Taking care not to scald yourself, hold the windmill over the spout of a steaming kettle. If your kettle is the sort that cuts out when it boils you may have to hold the on switch down for a few seconds. If you have made sure that the sails of your windmill turn freely on the pin that secures them to the stick, you should be able to get them to turn, powered by the steam.⁶

4 Available from: <https://motherscompanion.weebly.com>.

5 You can make one yourself if you do not have one: <https://www.wikihow.com/Make-a-Pinwheel>.

6 But how is steam used to power a whole locomotive? <https://www.youtube.com/watch?v=nd2Ii4OGQ4k> shows you exactly how it works.