SASTA OLIPHANT SCIENCE AWARDS

SOUTH AUSTRALIAN SCIENCE TEACHERS ASSOCIATION

Prize Winner

Models & Inventions

Year 3-4

Mukhlis Hasibuan
Haneef Hasibuan

Linden Park Primary School

OSA RISK ASSESSMENT FORM

for all entries in (✓) ☑ Models & Inventions and ☐ Scientific Inquiry

This must be included with your report, log book or entry. One form per entry.

NAME: Haneef Hasibuan and Mukhlis Hasibuan ID: 0319-031

SCHOOL: Linden Park Primary School

Activity: Give a brief outline of what you are planning to do.

We are making a model train without wheels by making magnetic force push against the train's weight. This is also known as megnetic levitation, or maglev for short.

Are there possible risks? Consider the following:

- Chemical risks: Are you using chemicals? If so, check with your teacher that any chemicals to be used are on the approved list for schools. Check the safety requirements for their use, such as eye protection and eyewash facilities, availability of running water, use of gloves, a well-ventilated area or fume cupboard.
- Thermal risks: Are you heating things? Could you be burnt?
- Biological risks: Are you working with micro-organisms such as mould and bacteria?
- Sharps risks: Are you cutting things, and is there a risk of injury from sharp objects?
- Electrical risks: Are you using mains (240 volt) electricity? How will you make sure that this is safe? Could you use a battery instead?
- Radiation risks: Does your entry use potentially harmful radiation such as UV or lasers?
- Other hazards.

Also, if you are using other people as subjects in an investigation you must get them to sign a note consenting to be part of your experiment.

Risks	How I will control/manage the risk
Fragile because it is made of Lego	1. we stick some pieces together with Super glue 2. We store and transport the model in a box.

(Attach another sheet if needed.)

Risk Assessment indicates that this activity can be safely carried out

RISK ASSESSMENT COMPLETED BY (student name(s)): Haneef Hasibuan (Rm 1, Yr 2)
Mukhlis Hasibuan (Rm 29, Yr 4)

SIGNATURE(S):

☐ By ticking this box, I/we state that my/our project adheres to the listed criteria for this Category.

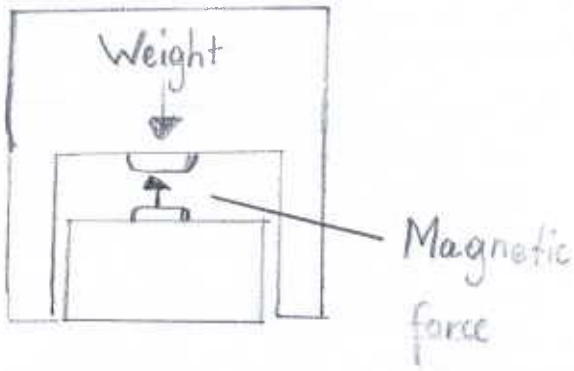
TEACHER'S NAME: Jane Fuller

SIGNATURE: Jane Fuller DATE: 17.8.21

Lego Maglev Train Model

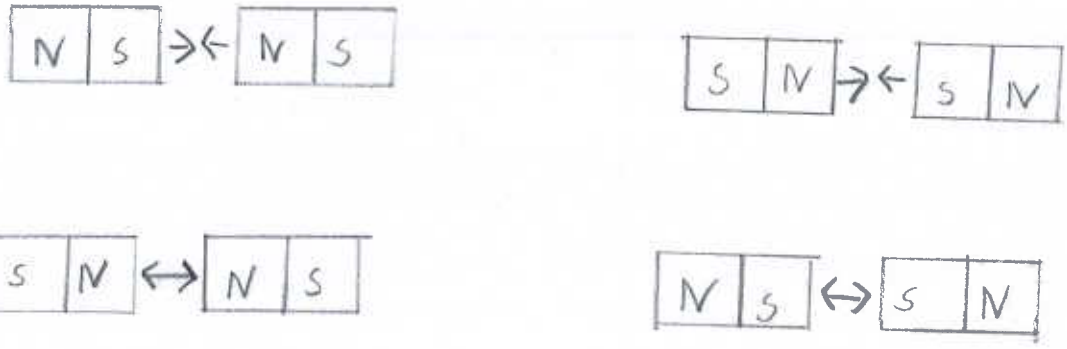
by Mukhlis Hasibuan (Yr 4),
and Haneef Hasibuan (Yr 2).

The scientific principles behind our model are magnetic and gravitational forces. Our model train uses magnetic force to lift and move the train over the track, against the weight of the train, just like magnetic levitation, or maglev, trains in real life.



We used Lego, sticky tape, rare-earth magnets, superglue, and metal weights to build the train and track. Our parents helped us stick the magnets to the Lego, as it was really tricky.

Our model Lego Maglev Train floats because the poles of the magnets at the bottom of the train, and on the track repel each other.



In the beginning, we used a copper coil, some magnets, and a AAA battery to create a model maglev train powered by electromagnetic force, but we couldn't get it to work consistently. So, we re-used the magnets to make our current train instead.

We used sticky tape to attach all the magnets at first, but our train could not move smoothly because the layers of tape created uneven thickness along the track, and on the underside of the train. Swapping some of the tape for superglue worked better.

A real-life Maglev train moves because the electricity powering the system continuously changes the polarity of the magnets on the track to propel the train. To make our train move, we can gently guide it forwards or backwards along the track. Sometimes, the front or back of our train "sticks" to the track because of the gaps between the magnets on the track. If we build this model again, we will look for a magnetic strip instead of using many small magnets.