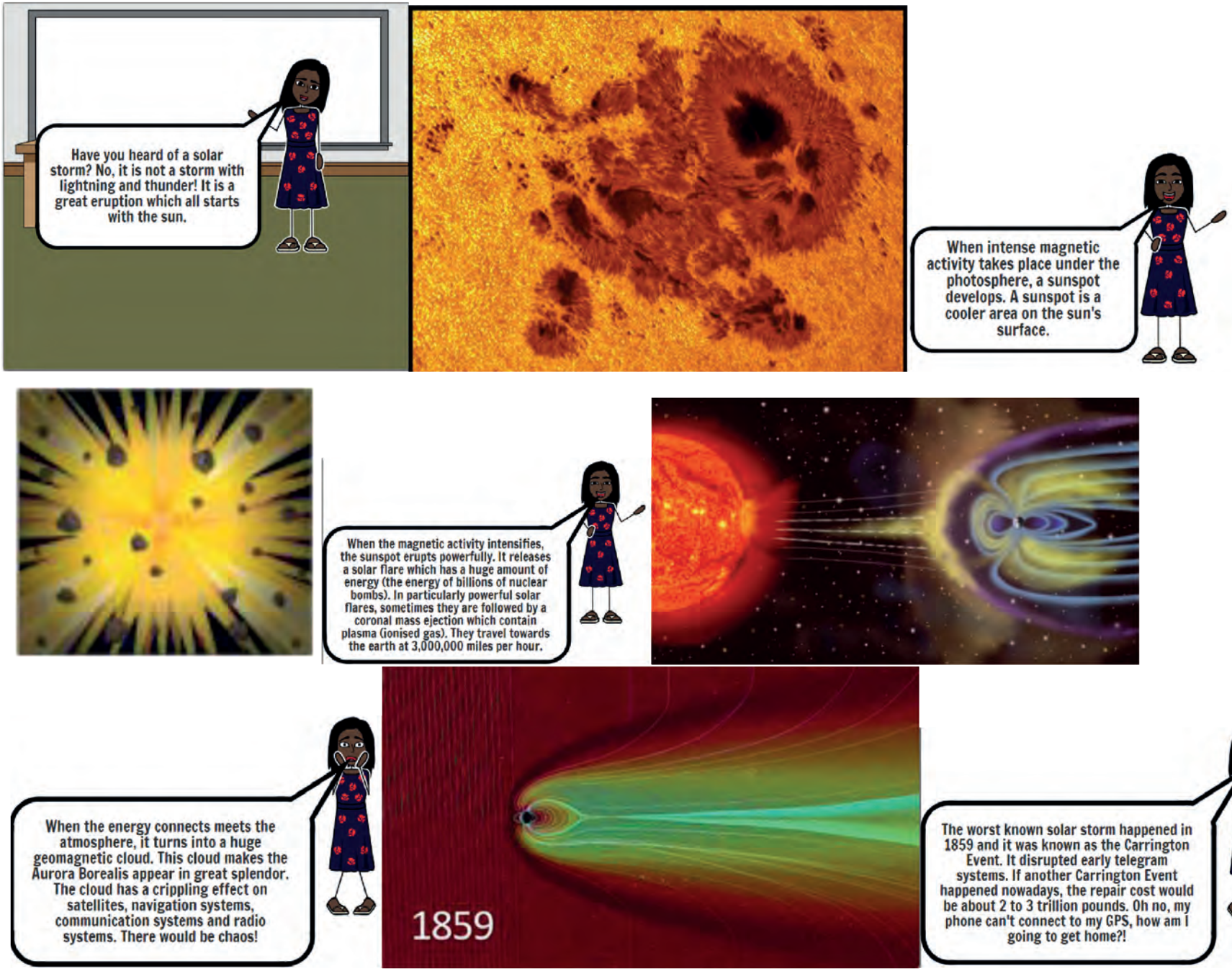
Winner: Vikram, ages 7-10 “Make”

‘A storm like no other’ a cartoon depicting a how a solar storm works and its consequences.



Winner: Jeet, ages 7-10 “Write”

A short story that made me realise what would happen when the Sun ejects material at our beloved planet Earth.

Beyond Earth

One late August afternoon in the Walker household, by the way I’m Jason Walker and my sister is Jilly Walker, but let’s just get on for now.

“*Have you packed your bags Jason and Jilly*” shouted mum from the kitchen. “*Yessss!*” we replied in chorus.

Fast forward to the night. “*This is our first vacation going in the all-electric Tesla 2000. Totally environment friendly!*” I declared. “*Ah finally we’re about to reach Exeter, dad just keep an eye on the GPS, there should be a turn coming to get to the charging station*” mum said in a rather calm voice, which we get to hear only on holidays.

“*Oh no, what is going wrong with the car’s GPS, it is flickering…and gone*” said dad in an alarmed voice. “*Jason can you look up in the map on mum’s phone?*” asked dad. I flicked mum’s phone on but, “*There’s no network dad*” I informed.

Luckily, dad remembered putting a paper map in the glove compartment as a joke when Tesla came home first time. “*This is handy! Take the first exit and there should be a charging station on the left*”said dad reading the map.

It was pitch black at the charging station, as if an early Halloween Jilly and I thought. For a split second did we see the northern lights in the sky? This can’t be, definitely not in Exeter. Mum and dad checked the charging station and said nothing is working here, no electricity whatsoever.

“*Wait, in the morning when I was asking Alexa about the weather in Exeter, Jilly overtook me and said space, space about a million times and Alexa said something about Coronal Mass something from the Sun and that the internet will stop working and something something.*” I said.

“*There’s a Met Office of Space Weather Operations Centre on the map, about 5 mins walk away from here, let’s take shelter there and may be we can find about your Sun* ***something*** *Jason.*” said dad.

To our relief, the Centre was open, the front door read ‘Open 24X7’. There we met one Mr. Chris Bernard.

“Hello Mr. Bernard, we got stuck near here when our car’s GPS, phone’s network and car’s battery stopped working. We came here to take shelter and find out if this has anything to do with the Sun?” dad asked.

“Indeed. A big Coronal Mass Ejection from the Sun happened in space tonight, as expected the solar cloud and plasma caused by the ejection interfered with our various satellites beyond earth. This is why the internet, phone network, electricity and a lot of things are not going to work until it passes away which would be in about 3 hours and 45mins”

“Oh so you knew all about this, like weather forecasters do about rain and snow?” I asked.

“Yes, incidentally we are called Space Weather Forecasters!” Chris smiled.

Chis is our new hero – glad witches and wizards weren’t casting naughty spells as in early Halloween after all.

Winner: DGS Science Club, ages 11-15 “Make”

We made pictures using filter paper and added water to separate the colours in the inks, giving an effect like Northern Lights in the night sky.

Winner: Shane, ages 11-15 “Write”

My article on space weather and the effects on Earth.

Space weather

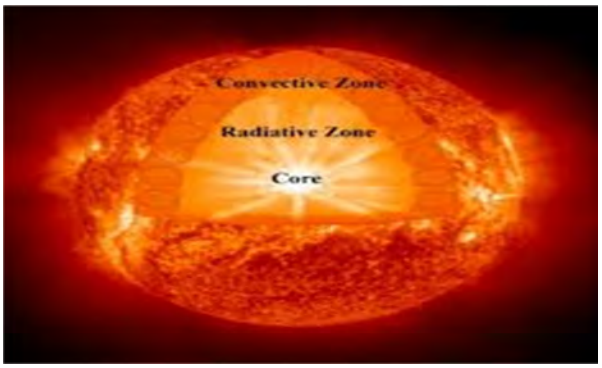
- What is space weather?

Some activities on the sun’s surface creates a type of weather called “**space weather”.** The sun is very far away, it's about 93 million miles (150 million kilometers) from the earth. However, space weather can affect earth and the rest of the solar system.

Space weather and Earth’s aurora.

An aurora, which is sometimes referred to as polar lights (aurora Polaris), northern light (aurora borealis), or southern light (aurora australis), is a natural light display in the Earth’s sky, predominantly seen in high-latitude regions (around the artic and Antarctic).

On artic nights the aurora often flames across the winter sky. The sun, which is a star at the center of the solar system, is where the tail of the aurora comes from. The sun acts as an enormous power plant and the energy is created deep inside the sun’s core.



In the sun’s core, the temperature is over 14 million degrees and the pressure are so enormous that hydrogen atoms are squeezed together into another element called helium.

This nuclear reaction releases energy and the light radiates toward the sun’s core in the outer layers then heat moves to the surface in huge eddies called “**convection cells”.** These electrical currents of charge gas create “**magnetic fields”** inside the sun. In some places, strong magnetic fields push their way up through the surface and it slows down the hot eddies. Then the surface cools and darker sunspot appear. The electrically charged gas is called “**plasma”** so plasma drags the magnetic fields further outwards. The magnetic field stretches and twist like a rubber band, then the rubber band breaks down and several billion tons of plasma is hurled out from the sun. This process is called a **solar storm.**

The solar storm can reach speeds over eight million kilometers an hour. And after six hours, it blows past the planet mercury and then after twelve hours, it blows past the planet Venus. The after eighteen hours, the solar storm reaches the earth. When it reaches the earth, something strange happens. An invisible shield or the Earth’s magnetic field deflects the storm and the magnetic fields coupled together and create a funnel for the gas streams. Down on the daylight side of the pole, this is the day light aurora.

The magnetic fields stretch further back and couple of magnetic rubber bands breaks and gas from the solar storm streams along the magnetic line towards the poles. On the night side, this is the night side aurora.

- **How can space weather travel to earth?**

The sun is always spewing gas and particles into space. This stream of particles is known as the **solar wind.** The gas and particles come from the sun’s hot outer atmosphere, called the “**corona”.** These particles from the corona are charged with electricity. The solar wind carries these particles towards the Earth at up to a million per hour.

- **Can space weather be harmful?**

Yes! Sometimes magnetic activity within the sun causes intense solar storms. The solar wind gets much stronger during these storms. Strong solar winds can be dangerous.

During a solar storm, explosions called solar flares break out. Solar flares send tons of energy whizzing through space at the speed of light. Sometimes flares come with huge solar eruptions. These eruptions are called coronal mass ejections.

All of that extra radiation can damage the satellites we use for communications and navigation. It can disrupt power grids that provide our electricity. The radiation from solar storms can also be dangerous for astronauts in space.

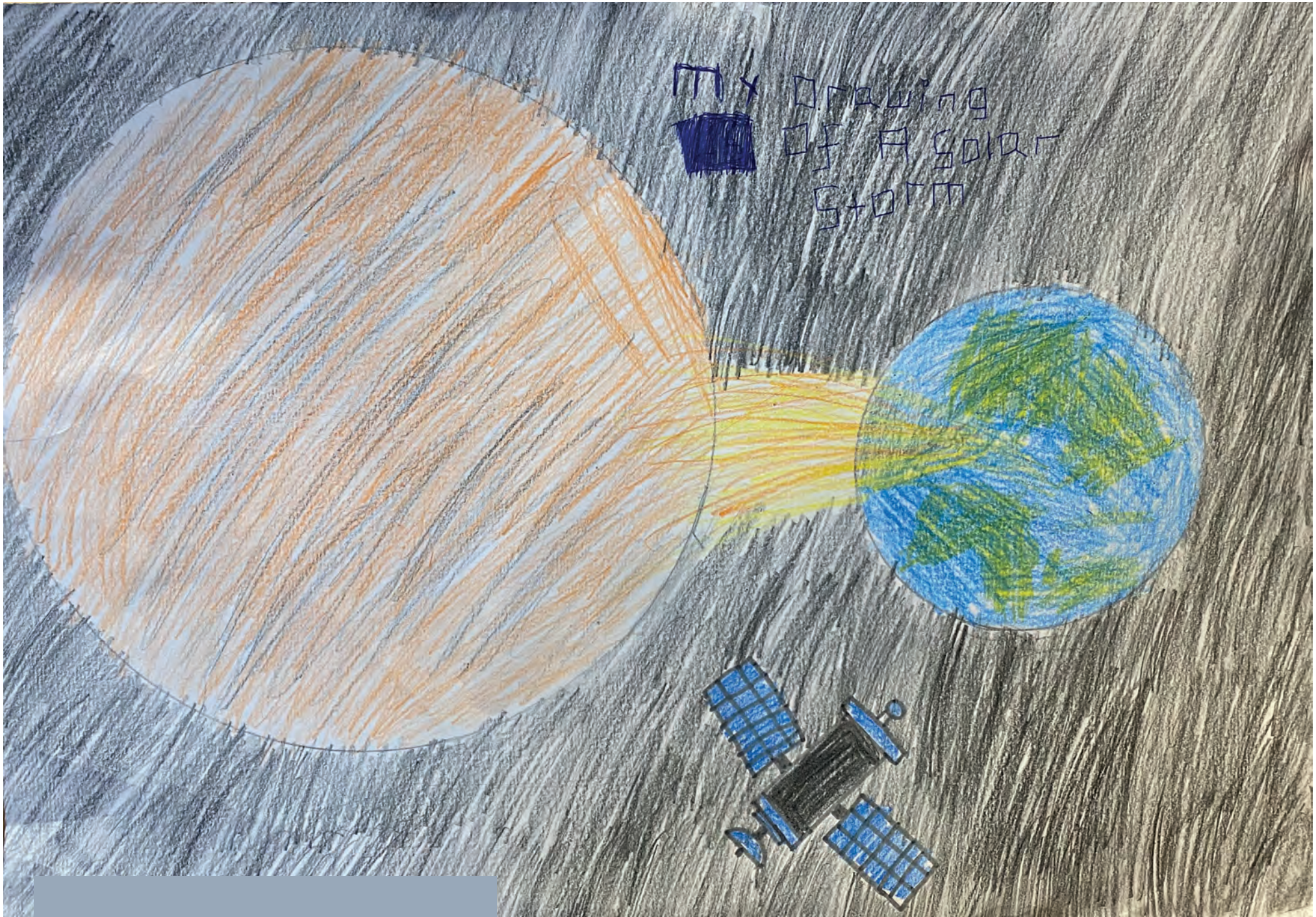
Solar storms can be very harmful.

Ages 7-10 “Make”
Team EshAn

Solar system project.

Nabeel

Drawing of a solar storm.



Nadine

Drawing of a radiation storm in space.

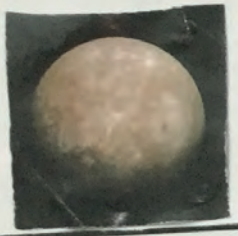
Team Space Storm

Pencil picture and poster of the Sun, Earth and solar flares. I created a splatter painting of deep space.

Team Weather

Poster that describes the atmosphere and weather of each planet in the solar system.

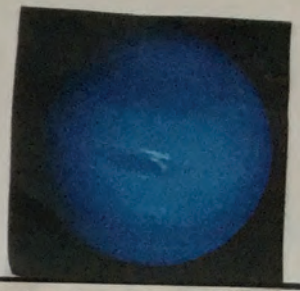
Space Weather



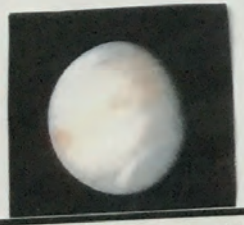
Since Mercury has hardly any atmosphere, it does not have weather like storms, clouds, winds or rain! But the surface of Mercury can reach 427 degrees during the day because it is so close to the Sun and can drop to -187 at night.

The weather on Mars is quite different from that on Earth, but its atmosphere and climate are also more similar to Earth's than any other planet. Martian weather is relatively colder than Earth's and often features vast dust storms

One of the four gas giants, Saturn's atmosphere is much like Jupiter's. Hydrogen makes up nearly all of the atmosphere, with smaller amounts of gases like helium, methane and ammonia.



Neptune has the wildest and strangest weather in the entire solar system it has huge storms with extremely high winds. Its atmosphere has dark spots which come and also bright circus like clouds which change rapidly.



The climate on Venus is widely known to be unpleasant at the surface. The planet roasts at more than 427 degrees centigrade under a suffocating blankets of sulphuric acid clouds and a crushing atmosphere more than 90 times the pressure of Earth's.

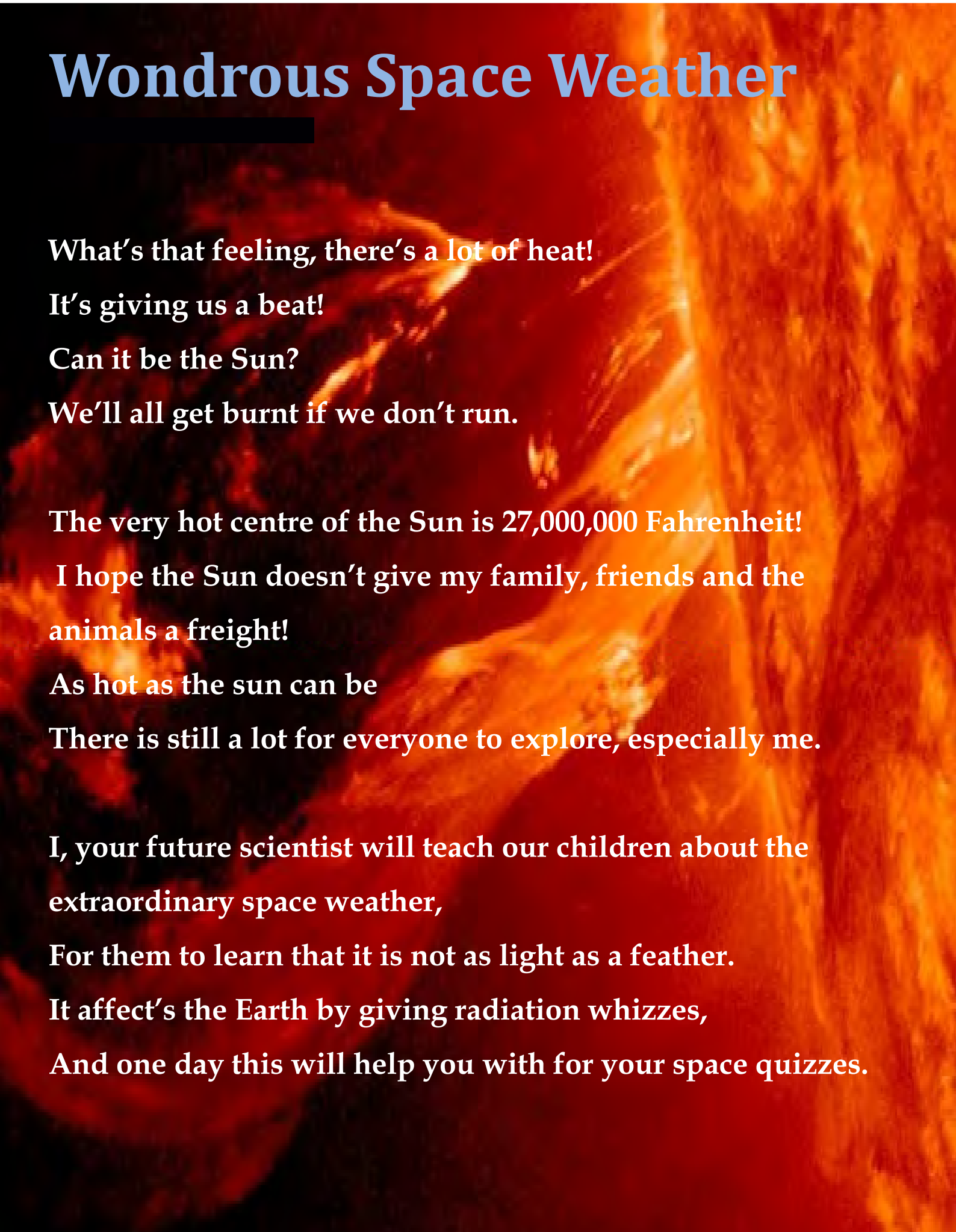
The temperature in the clouds of Jupiter is about minus 145 degrees. The temperature near the planet's centre is much, much hotter. The core temperature may be about 24,000 degrees Celsius. There is also a raging storm called the red spot on Jupiter.

Uranus is cold like freezing cold. The surface of the planet is -184 degrees! There are strong winds and sometimes circus clouds made up of methane ice crystals are seen in the atmosphere.

The Earth has the right mixture of air for things to live. A layer of gases around the earth gives things the air the things the air to breathe. Dust from erupting volcanos rises high into the atmosphere where it forms a dust belt.

Ages 7-10 “Write”
Highly Commended: Space Scientist

Wondrous Space Weather



What’s that feeling, there’s a lot of heat!
It’s giving us a beat!
Can it be the Sun?
We’ll all get burnt if we don’t run.

The very hot centre of the Sun is 27,000,000 Fahrenheit!
I hope the Sun doesn’t give my family, friends and the animals a freight!
As hot as the sun can be
There is still a lot for everyone to explore, especially me.

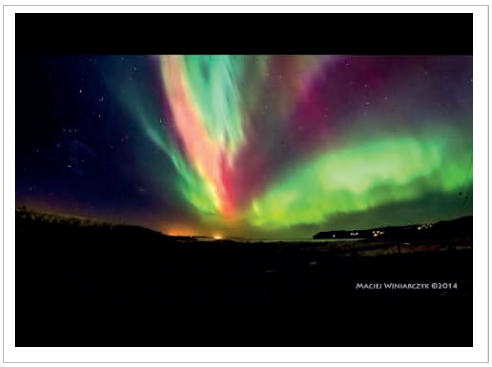
I, your future scientist will teach our children about the extraordinary space weather,
For them to learn that it is not as light as a feather.
It affect’s the Earth by giving radiation whizzes,
And one day this will help you with for your space quizzes.

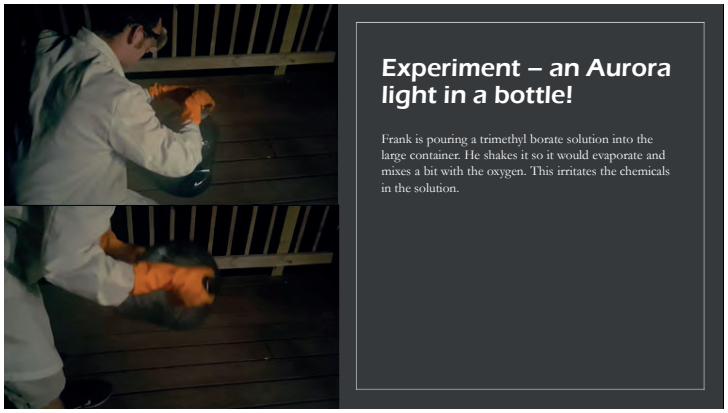
Ages 11-15 “Make”
OFS Duo

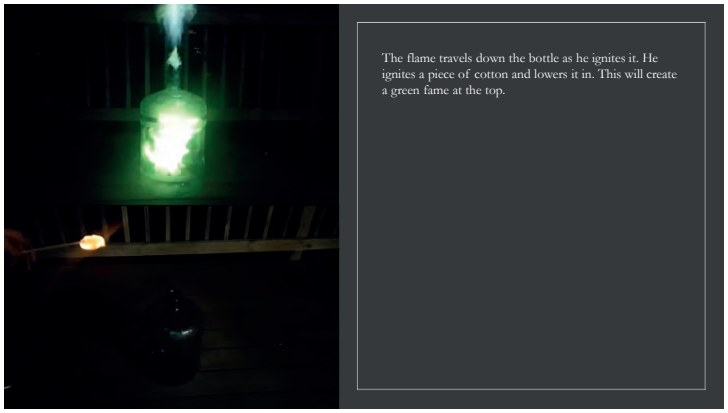
A comic strip about a solar storm which destroys every planet in the solar system except Earth.

Highly Commended: Malaika

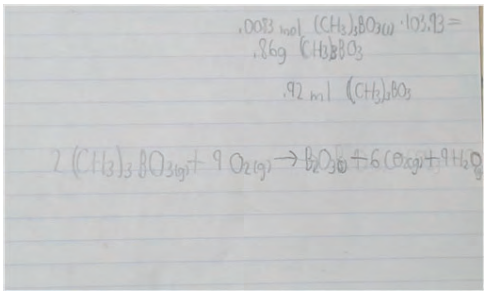
The Aurora Lights presentation with quizzes to help teach other pupils in my schools about the aurora.







This is the equation he used to carry out the experiment:



Try some of these activities to learn more about the Aurora Lights!

Something for Students:

◦ https://thewordsearch.com/puzzle/1559724/aurora-lights/

Something for Teachers. Try out my Kahoot!

◦ https://play.kahoot.it/v2/?quizId=eb744374-d5c3-49e2-8809-e6b749a

Highly Commended: Team Endeavour

My acrylic painting shows the Earth and magnetic fields seen by us as a beautiful dance of light.

Ages 11-15 "Write"
Team Dinz

A poem about the destruction we face due to the solar storms.

With fire breath and spitting blaze, the world will fall one day
A mother star that blaze alight does have her mighty rage
So do not wait for fire hot to burn all that we know
The solar storm of darkest days will destroy that once we love

Shock our homes without a notice rip us, man, apart
Watch as those who dare its blaze wither undercast
The soler mother wax and wain in times of desperate filter
Like flitting beast in cold of Jacks', her title is the ender

The kind of man was once not here and will not remain forever
Return to dust within her grasp our memories to squander
Ticking clock and raging storms a war we do not see
Those trying to hide behind our words and lies of destiny

Hold the breath and see the beauty of that which can destroy you
Lights of north that glow in night warn of her true duty.