

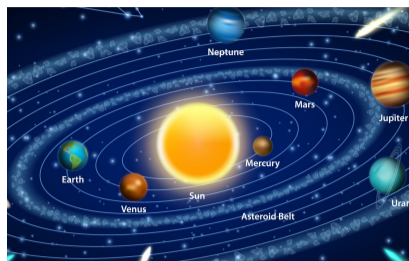


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IS THIS THE HOTTEST PLACE ON EARTH?



DEATH Valley, in the northern Mojave Desert, in California, is undoubtedly one of the hottest places on Earth.

The valley is a long, narrow basin, surrounded by four steep mountain ranges, which helps to trap warm air.

The air is also warmed by other desert regions to the south and east.

The mountain ranges also serve to deny Death Valley of moisture moving east from the Pacific Ocean.

This moisture falls as rain and snow on the mountains' western slopes.

At its lowest elevation, Badwater Basin, Death Valley dips 86 metres below sea level.

About 136 kilometres from Badwater Basin, Mount Whitney reaches an elevation of 4,421 metres.

The land is dark, with little vegetation, and therefore absorbs more solar radiation.

That just makes it hotter.

But a surprising amount of wildlife lives in the Death Valley National Park.

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The world's highest temperature record is hotly contested

DO you ever take an interest in international weather reports, and wonder where the hottest place on Earth is?

You may have heard about a significant weather event in the United States recently.

At 3.41pm, local time, on Sunday August 16, in the aptly named town of Furnace Creek, California, the temperature soared to 54.4° Celsius (130°F).

This is the hottest air temperature recorded on our planet for more than 100 years, and possibly ever.

Furnace Creek is located in Death Valley in the Mojave Desert.

Death Valley was also the hot spot where a 56.7°C (134°F) day was recorded on July 10, 1913, but some meteorologists now dispute the accuracy of that observation.

About nine years later, on September 13, 1922, a weather station in El Azizia, Lybia, recorded a temperature of 58°C (136°F).

But the World Meteorological Organisation (WMO) determined in 2012 that a mistake had been made with this observation.

So is Death Valley, California, the hottest place on earth? The answer is probably not.

In fact, no one can say with any

certainty where the hottest place on our planet is.

The WMO has more than 11,000 weather stations dotted around the globe to collect surface temperature observations.

But many locations, such as hot spots in the deserts of the Sahara, the Gobi and the Lut, are too remote to operate a weather station.

What we do know is very high air temperatures have also been recorded in Tunisia, Kuwait, Pakistan, Ethiopia, Libya, Sudan and Iran.

The highest temperature ever recorded in Australia was 50.7°C (123.3°F) in Oodnadatta, South

Australia, on January 2, 1960.

In Tasmania, the record belongs to the town of Scamander, which hit a high of 42.2°C (108°F) on January 30, 2009.

The WMO requires air temperature readings to be made by a thermometer 1.2 to 2 metres off the ground and shielded from direct sunlight.

NASA and other partners have collected satellite measurements, using the Moderate Resolution Imaging Spectroradiometer (MODIS): earthobservatory.nasa.gov

MODIS measures something called "Land Skin Temperature (LST)", which is often a lot hotter

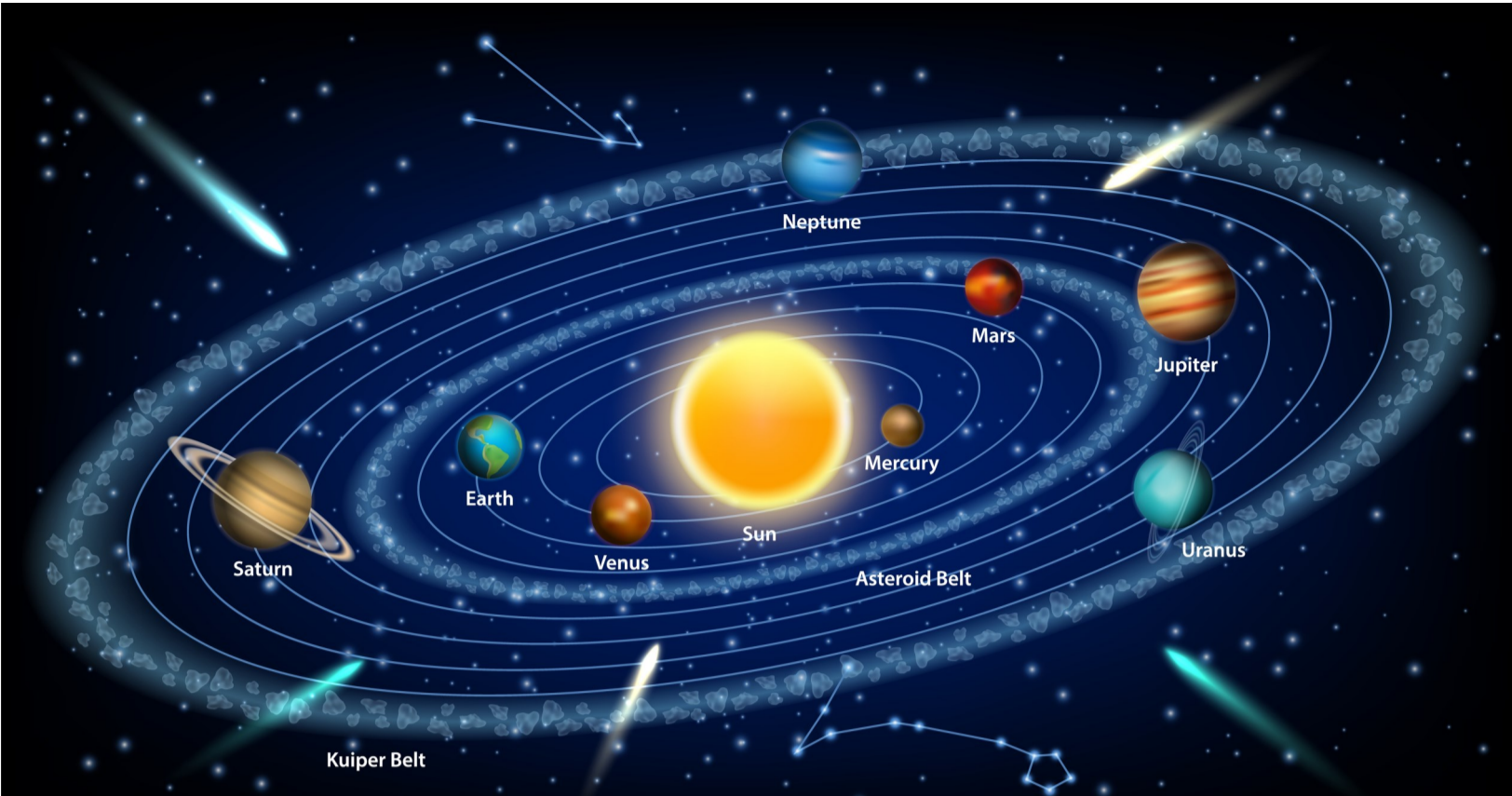
than air temperature. For example, on a hot, sunny day you might have noticed that the sand on a beach beneath your feet is hotter than the air temperature.

The highest LST recorded by MODIS was 70.7°C (159.3°F) in the Lut Desert in 2005.

The second highest was in the shrublands of Queensland - 69.3°C (156.7°F) in 2003.

So why are some land areas on Earth hotter than others? There are many reasons, but the most important one is the Sun and its relationship with the Earth.

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The Sun's starring role in hot topic

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The Sun shines more directly near the equator, but closer to the poles this solar radiation spreads out over larger areas.

This is because the Earth is round, well roughly at least, and because it tilts on its axis.

During winter the poles are tilted away from the Sun, and receive very little or no sunlight.

Closer to the equator the sunlight is consistent all year round.

But the difference in temperatures between the poles and the equator would be much greater without the Earth's atmosphere.

The atmosphere drives weather patterns and ocean currents, moving warm and cold air around the globe.

Temperatures are also influenced by elevation - if you are closer to sea level the air is more dense, and can hold more heat.

And being closer to large bodies of water, like oceans, reduces the temperature of a location, but that will have to be a topic for another time.

Earth bearable in Goldilocks zone

EARTH is the third closest planet in our solar system to the Sun, a distance astronomers call the "Goldilocks zone".

Our planet is not too hot and not too cold, just right for sustaining liquid water and therefore life.

The surface of the Sun is about 5800°C, and this energy radiates into space as visible light and other forms of energy, but reduces in intensity as it travels almost 150 million kilometres to Earth.

On Venus, the next closest planet to the Sun, temperatures reach more than 400°C.

While on Mars the average temperature is -60°C.

But distance from the Sun is not the only factor impacting the Earth's average temperature.

About 30 per cent of the solar radiation the Earth receives is reflected off light-coloured surfaces like snow, ice and clouds.

The amount of energy received from the sun is called insolation, and the amount reflected is called albedo.

But based on how much sunlight hits Earth versus how much is reflected, Earth's average temperature would be well below freezing - about -18°C.

But the average temperature on Earth is about 15°C.

This is mainly because the atmosphere, the thin blanket of gases around the Earth, also helps our planet from getting too hot or too cold.

It keeps out most ultraviolet radiation, which is harmful to living things and is what causes sunburns, while letting in the sun's warming rays.

The Earth converts this solar radiation, visible light, into infrared radiation.

Certain gases in the atmosphere then absorb this infrared radiation which has been reflected back from the ground.

This process, called the "greenhouse effect", stops heat from escaping back into space.

More information can be found here: www.visionlearning.com

Your challenge is to keep track of the maximum temperatures in your town or city for a week.

You can find this out by reading the newspaper (the following day), watching the TV News each night, or by looking it up on the Bureau of Meteorology website. www.bom.gov.au

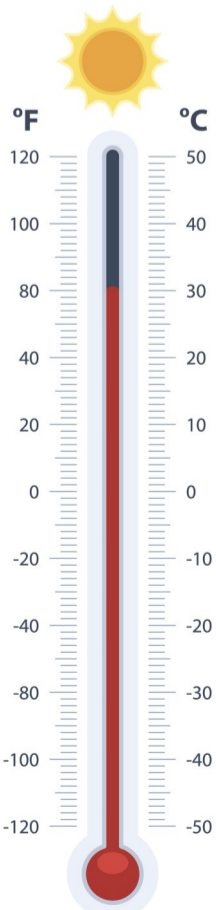
If there is no observation for your town, use the closest town to where you live.

Present your findings in a creative way.

You could draw a thermometer.

It does not need to be as detailed as the one pictured right.

Children's University Tasmania members can earn stamps in their passports for this challenge at the discretion of their school coordinators.



JUST RIGHT: The Earth's distance from the Sun is the most significant, but not the only important factor, controlling temperatures.

SPOT THE DIFFERENCE

There are eight small differences between the first giant panda picture and the second one. See if you can spot them. The solution is below.



SOLUTION: 1. Stone missing from on top of rock, 2. Big rock in background changed, 3. Left ear changed, 4. Leaves missing behind head, 5. Eye changed, 6. Bamboo longer, 7. Leaves at bottom left changed, 8. Shape of paw changed.

Artwork: www.ihnpollyfarmer.com.au/