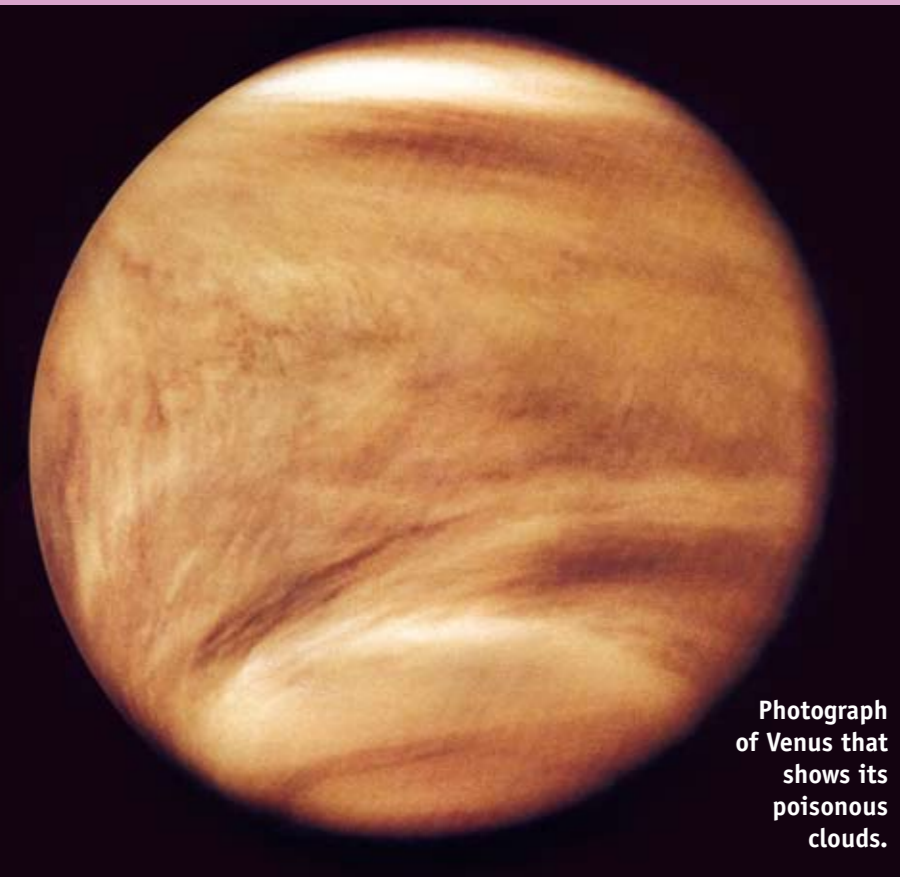




# MERCURY AND VENUS

Mercury and Venus are the two small rocky planets closest to the Sun.



Photograph of Venus that shows its poisonous clouds.

## 1. Mercury

Mercury is the closest planet to the Sun. It is difficult to see Mercury, because when we want to see it, we have to look towards the Sun. The best time to see Mercury is just before the Sun rises, or just after the Sun has set. Another reason why Mercury is hard to see is that it is so small.

## 2. Mercury – boiling days and freezing nights

Mercury is close to the Sun, so it is very hot during the day. Temperatures on Mercury reach 350°C. But at night the temperature on Mercury drops to a freezing -185°C. Mercury has no atmosphere to keep the temperature steady.

## 4. Venus

Venus is sometimes called the 'evening star'. Although it looks like a star, it is a planet and not a star. It is so bright that we see it first, before anything else in the evening sky. Venus starts very low in the evening sky, in the West. Each night Venus climbs higher in the sky. After that it starts to move lower again and eventually we begin to see Venus in the morning. We see it in the East, before sunrise. When we see it in the morning, we call it the 'morning star'!

## 5. Venus – the hottest planet in the Solar System

Venus is the hottest planet in the Solar System, although Mercury is closest to the Sun. Venus is hotter because it has an atmosphere. This atmosphere is mostly made up of carbon dioxide gas. Venus is covered by clouds of a poisonous chemical called sulphuric acid. When the Sun shines on these white clouds it makes Venus look like a very bright star.

On Venus the rocky surface heats up during the day. The atmosphere works like a thick blanket to trap the heat on Venus. This makes Venus very, very hot. The temperature on Venus can reach 460°C! This is almost five times hotter than boiling water. There isn't a cool place anywhere on Venus. Even at night the side of Venus that faces away from the Sun is just as hot.

## 6. If you went to visit Venus ...

If you went to visit Venus you would also have to take your own oxygen supply because the atmosphere there would be poisonous for you.

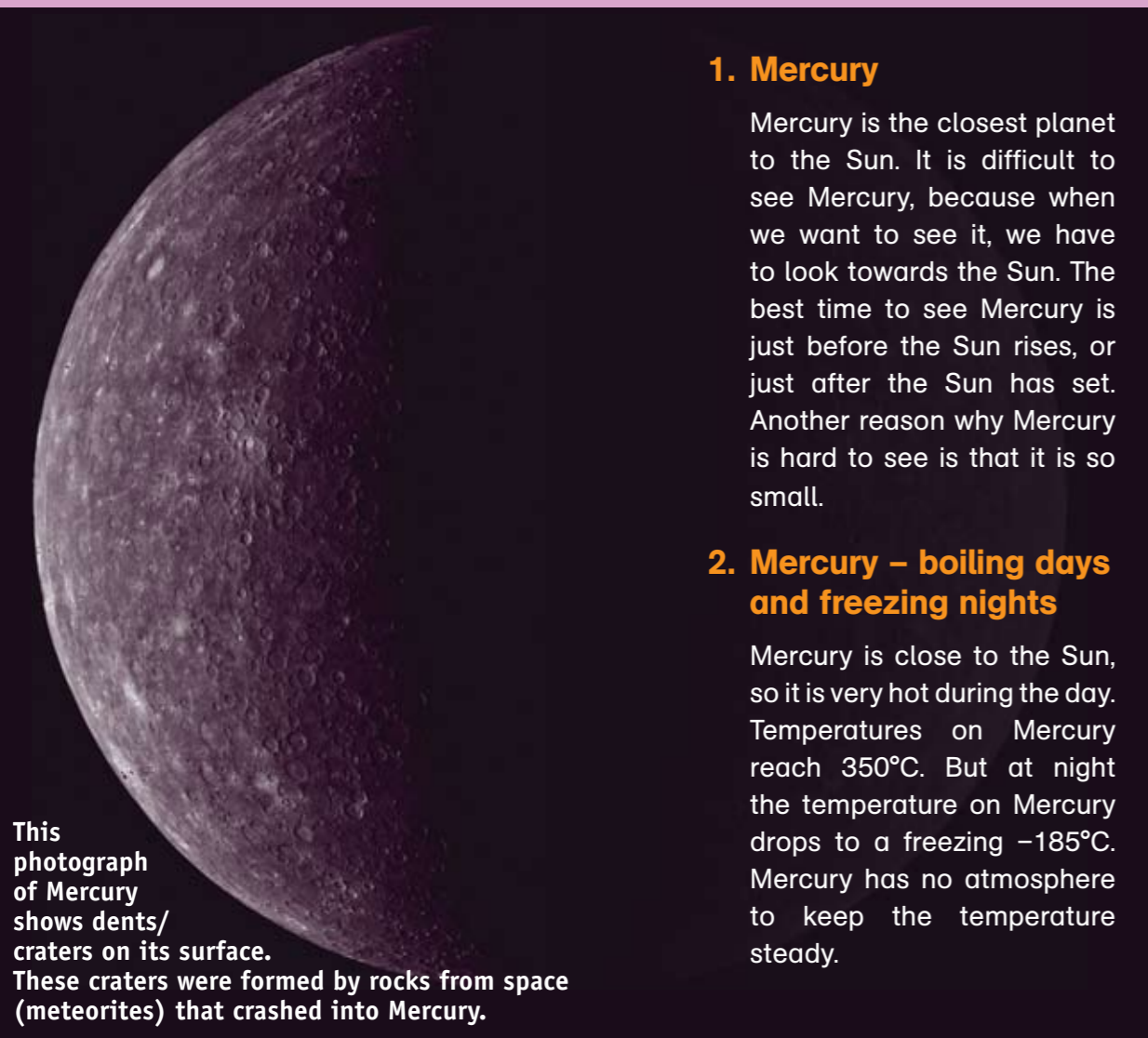
You would also see the Sun rise in the West and set in the East. This is because Venus spins in the opposite direction to Earth and most other planets.

## 7. Stories about Venus

The Zulu people called Venus *iCelankobe*. This name means 'asking for mealies'. The idea behind this name is that someone who arrives for supper by the light of the evening star (Venus) will only get the food that is left over from the meal.

In Malawi when people saw Venus in the morning, they called it *Chechichani*. They said Venus is a poor housekeeper who allows her husband, the Moon, to go hungry and starve. But when the Malawian people saw Venus in the evening sky they called Venus, *Puikani*. They said Venus is a fine wife who feeds the Moon and brings him back to life.

The Tswana people believed that if they saw Venus in the evening sky during the time of ploughing, there would be a good harvest.

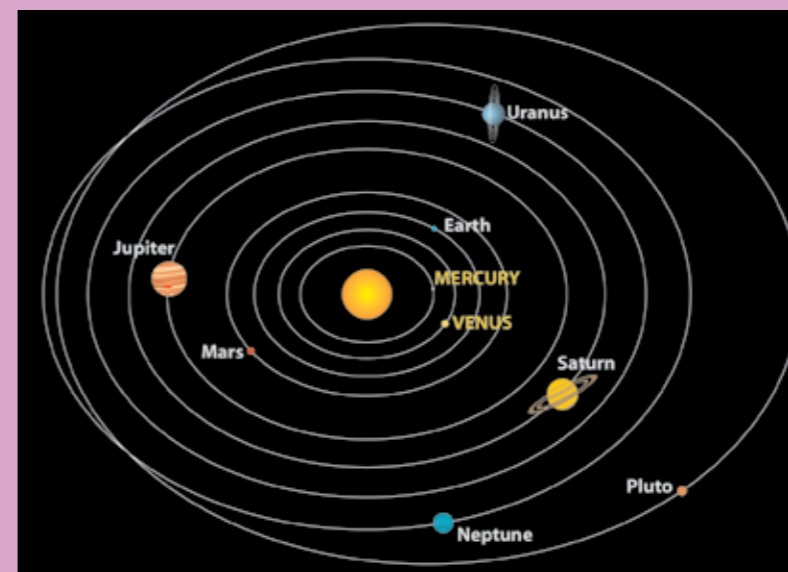


This photograph of Mercury shows dents/craters on its surface. These craters were formed by rocks from space (meteorites) that crashed into Mercury.

## 3. If you went to visit Mercury ...

There is no atmosphere on Mercury. So, if you visited Mercury, you would have to take your own oxygen supply. You would also need to wear a special space suit to protect you from the heat and dangerous sunlight. Mercury spins very slowly to make a day and night. The one side of the planet faces the Sun for a long time, while the other side of Mercury faces away from the Sun for a long time. A **day** on Mercury is about 59 Earth days long and a **year** is about 88 Earth days long.

Mercury also looks like the Moon because it has many craters on its surface. Mercury is very small and weighs much less than Earth. Therefore Mercury has a very weak gravity (pull towards the centre of the planet). So all the gases that it might have had, have floated away. This means that there is no wind or rain to erode (wear away) the craters on its surface.



Where are Mercury and Venus in our Solar System?

## COOL FACTS

	MERCURY	VENUS:
How far from the Sun?	58 million kilometres	108 million kilometres
Size (Diameter)?	4 880 kilometres	12 104 kilometres
How fast does it travel around the Sun?	48 kilometres per second	35 kilometres per second
How long is the day and night?	59 Earth days	243 Earth days
How long is the year?	88 Earth days	225 Earth days
Rotation?	Same direction as Earth	Spins in opposite direction to Earth



## ACTIVITY 1. Mercury and Venus

Learning area: Natural Sciences

### Compare Mercury and Venus

- Read the information on the other side of the card and then answer these questions.
  - Which is hotter – Venus or Mercury? Why?
  - What is wrong with the statement 'Venus is the Morning Star'?
  - Why is Venus sometimes mistaken for a star?
  - In which direction must we look to see Venus in the morning?
  - In which direction must we look to see Venus in the evening?
  - How long is one day and night on Mercury?
  - How long is a year on Mercury?
  - Why is it hard to see Mercury from Earth?
  - What is the surface of Mercury like?
- Make up two questions of your own about Venus and Mercury, based on the information on the card.
- Give them to other learners to answer.

## ACTIVITY 3. How old would you be on Mercury?

Learning area: Mathematics

### Calculate your age if you lived on other planets

A year is the time it takes for any planet to orbit around the Sun. The time it takes to do this depends on the speed the planet is moving, and how far away it is from the Sun. On Earth a year is 365,25 days. If you are 10 years old it means you have been around the Sun ten times in your lifetime! Mercury only takes 88 days to complete one orbit around the Sun. How old would you be on Mercury?

- Work it out for yourself:
  - Calculate how many days you have been alive (multiply your age in years by 365).
  - Then divide this number by 88 (the number of days in a Mercury year).
- Then use the same method to work out how old you would be on Mars. A Mars year is 687 days.
- Can you explain why you are 'younger' on Mars than on Earth, and 'older' on Mercury than on Earth?

## ACTIVITY 4. Movements of the planets

Learning area: Natural Sciences

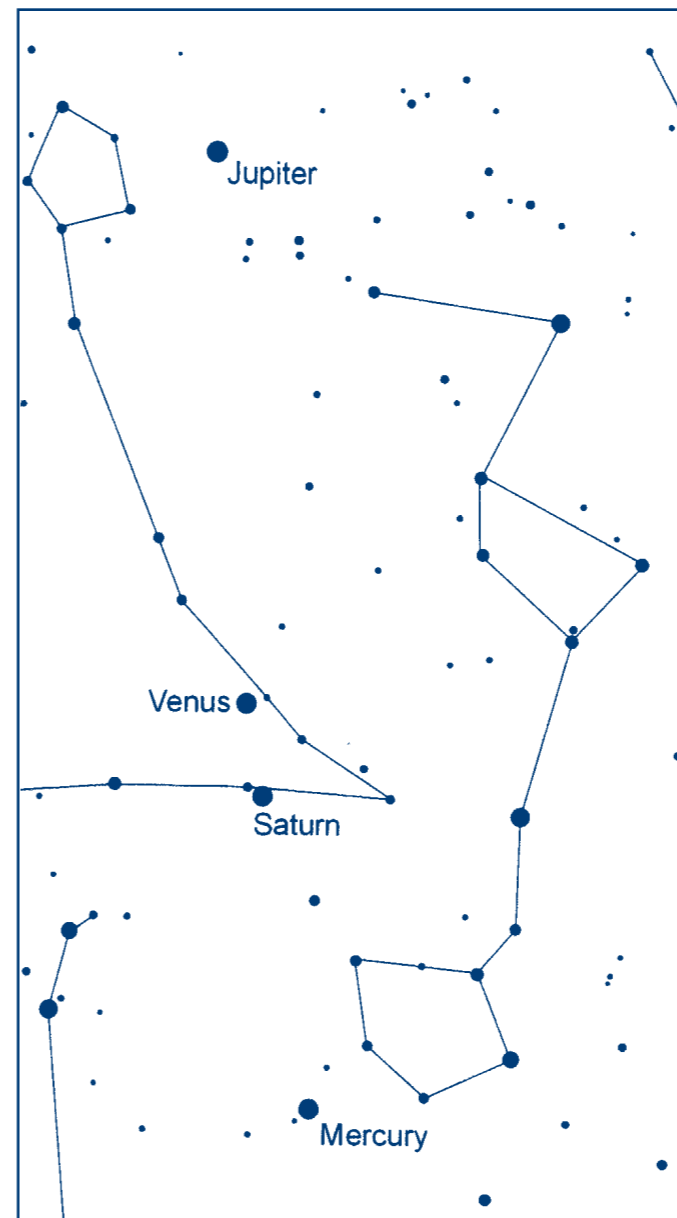
### Trace the movement of some of the planets

At night the patterns (or constellations) of stars stay the same. But planets move amongst the stars. They do change their position. This is because they orbit around the Sun at different speeds.

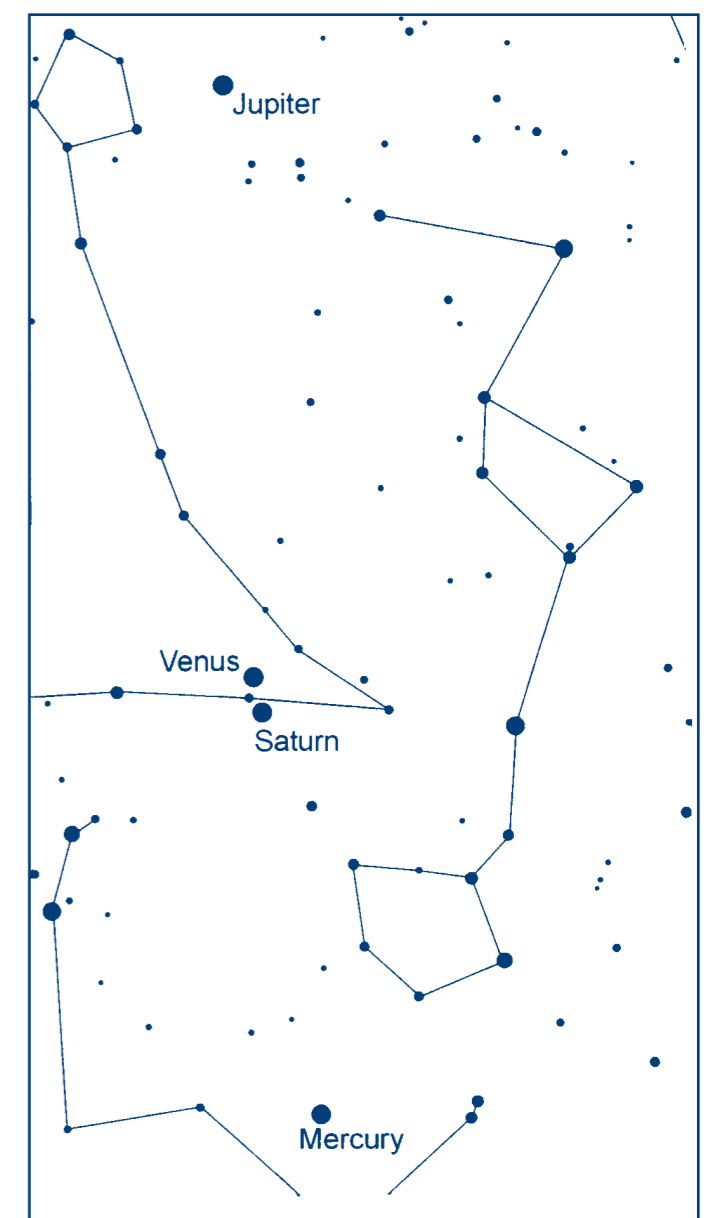
- Look at these two charts. They both show the night sky at 4.30 am on two different nights in the same week. The chart shows what you would see if you looked towards the East.
  - What planets can you see?
  - Which two planets have moved the most on the

chart?

- Which two planets have moved the least on the chart?
  - Which of these planets has the fastest speed?
  - Which of these four planets has the slowest speed?
  - Can we describe Venus as a 'morning star' or 'evening star' during this week? (*Clue: Venus is in the East.*)
- What is the only star we can see throughout the day provided there are no clouds?
  - Why don't we see the other stars and the planets during the day?



24 May 6.30 am 1998



27 May 6.30 am 1998

Iziko Planetarium, Cape Town

## ACTIVITY 2. Travelling to the Sun

Learning area: Mathematics

### Calculate how long it would take to travel to other planets

The Sun is very far away. This means it would take a very long time for people to travel through space to the Sun. Scientists have to calculate accurately how long voyages by spacecraft will take. The table below shows how long it would take to get from Earth to the Sun and from Mercury to the Sun at different speeds.

- Calculate how old you would be if you went from Earth to the Sun at car speed. (An average car travels at 120 kilometres/hour).
- Then calculate on which date you would reach the Sun if you left today and travelled at space shuttle speed.
- Then do the same for travelling from Mercury to the Sun.

From	Distance	By car	By space shuttle	At the speed of light
Earth to the Sun	150 000 000 km	170 years	175 days	8 minutes
Mercury to the Sun	60 000 000 km	68 years	70 days	3 minutes