Name:.....

Comprehension: What do the constellations mean?

Over the course of human history, many different civilisations have looked at the night sky and given names and stories to the stars. Today, different cultures tell stories of different patterns they see in the night sky above us, and some of those you might recognise are the patterns we have inherited from the ancient Greek and Roman worlds.

The Romans put stars into groups called **constellations**, and in fact many of these constellations, along with their names, were borrowed from Greek astronomers who had identified them before the Romans, which in turn had often been borrowed from ancient Babylonian **astronomy**.

Each constellation had a name and an associated story or myth which explained why that pattern had come to rest in the sky each night. Because the Romans didn't really know that stars are actually gigantic glowing objects millions of miles away from the Earth, they saw the constellations as patterns which were fixed in the sky forever, like a sort of **celestial** covering over the Earth.

Many of the Greek and Roman constellations are ones still used today by astronomers, and you might recognise their names and shapes. A large proportion of constellations are named after mythological animals: **Lupus** was seen as a giant wolf being chased by **Centaurus**, the centaur (a mythological creature who is half-human and half-horse); **Taurus** was a magnificent bull who swam in the sea, which is why only his front half is visible in the sky; and **Draco** was known as an enormous snake thrown into the sky by the goddess Minerva, twisting over itself and freezing in the cold North Pole so that its shaped was fixed forever.

The two constellations **Canis Major** (Bigger Dog) and **Canis Minor** (Smaller Dog) stand together in the night sky because, as the story goes, Canis Major was a dog famous for always catching whatever he chased. One day he was challenged to chase the Teumessian fox, a fox who could never be caught, so the two ended up running around forever and ever until Jupiter decided to save them from their fates and turn the both into stars so they could continue their chase in the sky.

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One interesting thing to notice is that many of these constellation's names come from the Latin word for the thing they describe! **Ursa Major** and **Ursa Minor** were both humans who were turned into bears (**ursae**) by the gods, whereas **Aquila** was understood to depict Jupiter's pet eagle (**aquila**) who travelled to earth to do his bidding, and in one story **Scorpius** was a giant scorpion who fought the hunter **Orion**, who later joined the creature in the sky.

Other constellations are named after mythological figures or characters, such as **Andromeda**, a princess from Ethiopia who escaped from the terrifying sea monster **Cetus** (also a constellation), situated near her mother **Cassiopeia** and father **Cepheus** in the night sky. The constellation **Hercules** represents the famous hero who is known for completing twelve near-impossible tasks at the request of the gods. The Romans, just like different ancient cultures across the world, believed that there was a strong link between the history of human life on earth and the patterns they could see in the skies.

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2) The Romans gave their constellations names which we still use today, but where did most of the stories behind the constellations come from?

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3) The following English words have Latin origins. Can you figure out what they might mean? Look back at the text above to help you, and use a dictionary or the internet if you need to!

identity **proportion** **celestial** **fate** **inherit**

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4) Using the passage, can you write down the Latin words for 'bigger' and 'smaller'? Which English words are descended from these Latin words?

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5) The word **constellation** comes from the Latin word *constellatio*. **con-** means 'together', whereas the Latin word for 'star' is **stella**. Can you figure out what the original meaning of *constellatio* is?

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6) In the text we learned that **aquila** means eagle in Latin. This word looks a bit like some of the words you may have learned at school, like **regina**, **aqua**, and **nauta.** How are these words similar to **aquila?**

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7) In the text we see that the word for 'bears' is **ursae**? Can you explain why the Latin word ends in **-ae**? What is the Latin word for 'bear"

.....

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Name:.....

History: Astronomy in the ancient world

An ancient Sumerian map of the stars, written on clay.

The science of astronomy has been around for thousands of years, and ancient civilisations understood the movement of stars and planets a long time before the Romans. In ancient Babylonia (parts of modern day Iraq and Syria) astronomers had clever ways of measuring how the length of the day changed over the year, and when certain planets might be seen in the sky. In ancient Egypt, thousands of years before Rome was founded, astronomers used the stars to predict when the River Nile would flood each year, and pyramids were built so that their tops pointed towards stars in the sky.

The Ancient Greeks were very good astronomers, so many of our astronomical words in English come from Ancient Greek: planet comes from the Greek word meaning 'wanderer', comet comes from the word meaning 'long-haired star', and the word astronomy comes from the Greek astronomia meaning 'the study of stars'!

These discoveries were inherited by the Romans, who watched the skies throughout the year for many different reasons. The movement of the planets and stars played an important role in Roman religion, and they believed that things happening in the skies like an eclipse or the appearance of a comet could have an influence on what happened on earth. Roman farmers also used the position of the stars in the sky to know when to grow certain crops, and to tell what time of year was arriving. In fact, our modern calendar is based directly on the Roman calendar, which takes about one solar year (from the Latin word sol ('sun') to complete. The twelve months and their names also come from the Roman calendar: for example, the month October comes from the Latin word octo meaning 'eight', since October was originally the eighth month of the year!

The Romans didn't have telescopes, so they could only look at the planets with their eyes. As a result, they didn't know exactly what the planets were (they probably thought they were stars like the sun, and not different worlds like Earth) but they still gave them the names which we still use for them today. Each planet is named after a Roman god: Mercury was the god of messengers and travel, Venus was the goddess of love, Mars the god of war, Jupiter the king of the gods and Saturn was Jupiter's father. Uranus, Neptune and Pluto hadn't been discovered then, but when they were found many years later their discoverers used Latin names to name them too.

Jupiter, Mars, Saturn and Venus were all named after Roman deities.

Name:.....

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Name:.....

Creating a Roman Sundial

Even though the Romans didn't have watches, they did have clocks, and they did manage to tell the time! Instead of looking at a machine to help them figure out what time of day it was, the Romans used the sun. The contraption they used is called a sundial, and you have probably seen one before in gardens or parks. While they are not as accurate as modern clocks and watches, they can still be used to see what the hour of the day is, and even roughly what minute it is if your sundial is good enough. Today we're going to be going back in time to see what time-keeping was like 2000 years ago...

Below are two shapes for you to cut out: a sundial base, and a short pointy shape called gnomon. We are going to put these together and place our sundial so that we can read the time off of it when the sun shines over the gnomon – just ike in Ancient Rome!

You will need:

- **A pair of scissors**
- **Some tape or a glue stick**
- **A compass or a smartphone**
- **Printed copies of the sundial cutouts OR if you don't have a printer you could draw these out by hand using the templates below**

1. Carefully cut out the sundial base and the gnomon, making sure to only cut around the edges. Don't cut through the line at the bottom of the gnomon – we need that later.

2. Place the sundial base on a hard surface. Ask an adult to use the scissors cut down the line which says 'cut here'. This is where we are going to attach the gnomon.

3. Fold the bottom of the gnomon down along the line near the bottom of the shape. We want this to be at a 90° angle to the main body of the gnomon.

4. Now slide the bottom fold of the gnomon into the part of the sundial base you have cut through. Holding the main body of the gnomon, fold it upwards so that it is pointing towards the sky. The gnomon should be at a 90° angle to the sundial base.

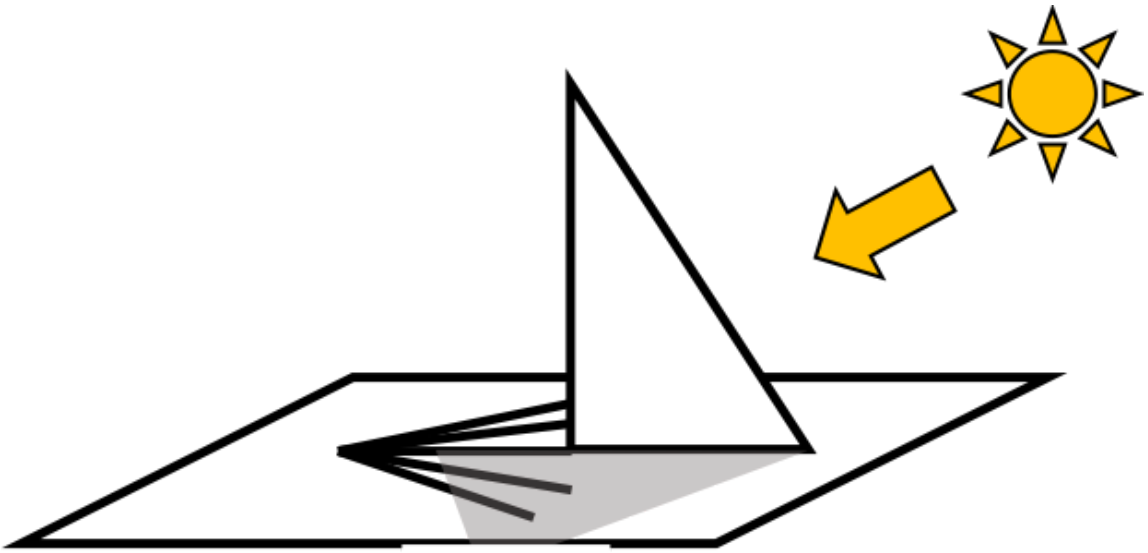
5. Now use some glue or a small piece of tape to stick the bottom fold of the gnomon to the underside of the sundial base, so that the gnomon can stand by itself and does not fall over.

Name:.....

6. You have successfully created your sundial! Now we need to place it in the right position relative to the sun. First, we need to find north. If you have a compass at home, this is straightforward. If you don't have a compass you can use a smartphone: find where you are on a maps app, and notice where the small compass on the screen is pointing. Look for the red part of the compass – this is pointing north. The compass may even have a small 'N' next to it to make it clearer. If you don't have either of these things, just look for where the sun is shining at exactly 12 noon (1pm from April to October due to Daylight Saving Time). At this time the point directly below the sun is exactly south. Face the sun and turn yourself around until the sun is now directly behind you. You are now facing north.

7. Place your sundial so that the arrow at the top of the base which says 'North' is pointing directly north. If you are inside or don't have a north-facing window, you can stand in a very sunny room and turn your sundial towards the north as described.

8. You will now be able to tell the time! The shadow of the gnomon will fall on the line which corresponds to the current time. Between April and October the time shown on the sundial will be one hour behind the time you will read on your other clocks. You can watch as the shadow moves along the sundial throughout the day, just like the hands of a clock!



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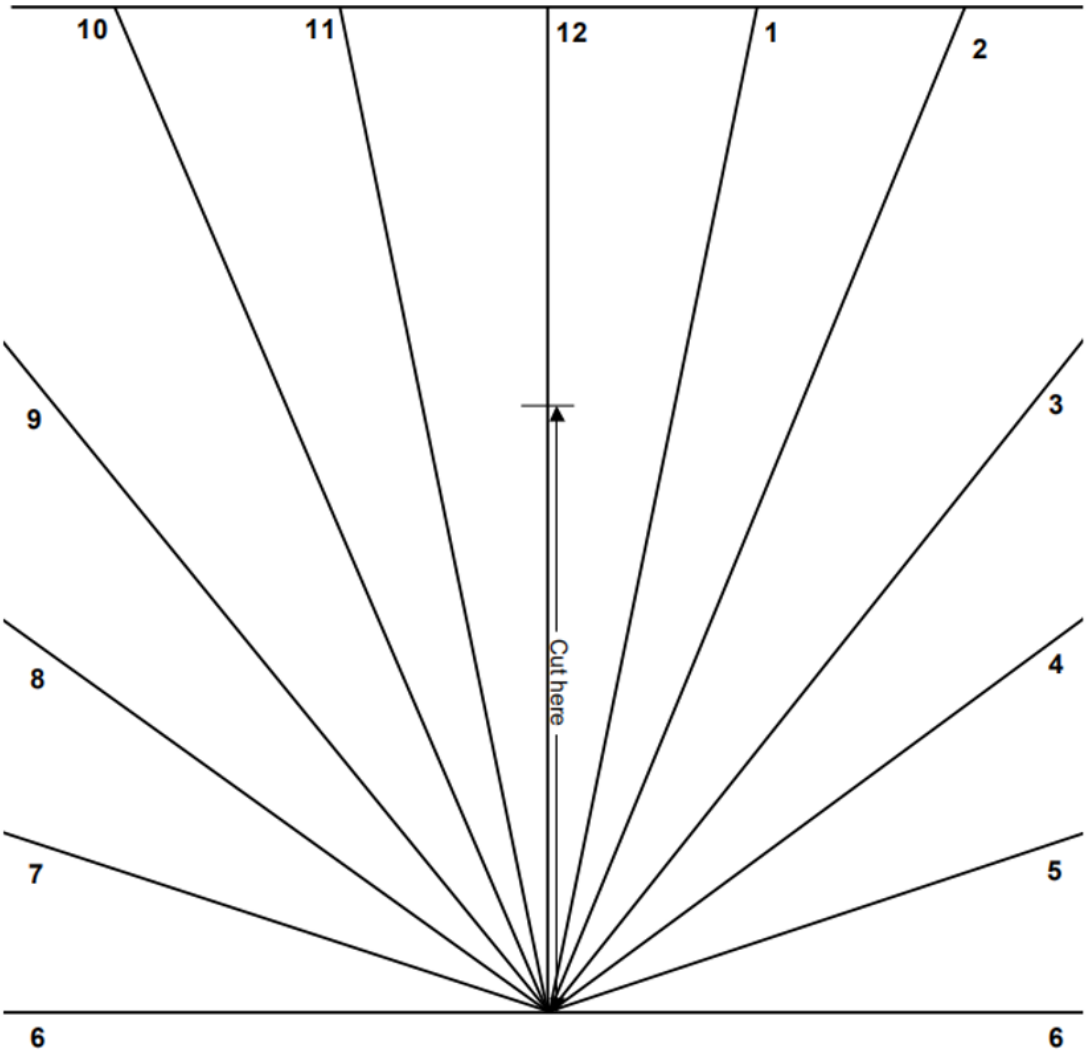
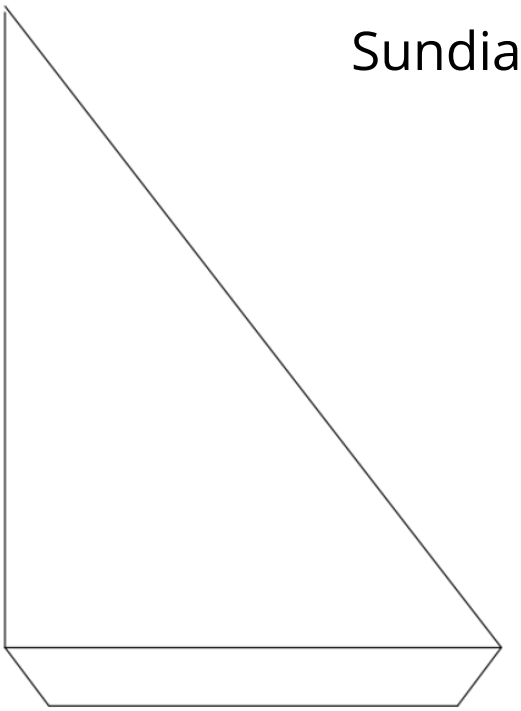
Name:.....

NORTH



Sundial Base



Gnomon

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Name:.....

Language: Naming the Roman Universe

In Latin, nouns ending in **–a** are called **first declension nouns**. These are the nouns we have learned before in class, such as **regina, nauta, poeta, puella** and so on.

These nouns are **singular** – that is, there is only **one** of them. When we want to make these words **plural** (more than one), we have to change their **endings**:

regina ‘queen’ → reginae ‘queens’

poeta 'poet' → poetae 'poest'

1. (a) The following Latin words are all related to astronomy or to the universe. Write down the English translation for each word. Remember that each one is the origin of an English word.

(i) planeta

(ii) astronomia

(iii) luna

(iv) nocturnus

(v) constellatio

(vi) cometes

(b) Now write down the Latin words in (i), (ii) and (iii) in the **plural**.

(c) Using a dictionary, the internet, or your own knowledge, write down a **definition** for each of the English words you have written down for part **(a)**. A definition looks like this:

Jupiter: a large red-orange planet in our solar system between Mars and Saturn.

You might remember from class that in Latin, **verbs** also change their endings. Their endings change depending on **who is doing the action**:

spect**o** = I watch spect**at** = he/she/it watches specta**mus** = we watch

Latin Verb Endings			
I...	**-o**	We...	**-mus**
You (singular)	**-s**	Y'all...	**-tis**
He/she/it...	**-t**	They...	**-nt**

If a Latin noun is the **subject** of the sentence (that means it is **doing** the action) it ends in **–a**:

regina amat poetam. The queen loves the poet.

When a noun is the subject of the sentence, we say it is in the nominative case. **regina** is in the nominative case.

If a Latin noun is the **direct object** of the sentence (that means the action is **done to it**) it ends in **–am**:

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Name:.....

regina amat poetam. The queen loves the poet.

When a noun in the **direct object** of a sentence, we say it is in the **accusative** case. **poetam** is in the accusative case.

When a noun is in the **nominative case** and it is **plural**, it ends in **–ae**: reginae gustant.

reginae gustant. The queens taste.

2. Translate the following sentences into English, using the vocabulary to help you. Remember to look at the endings on the verbs and nouns!

(i) specto planetam

(ii) spectamus lunam

(iii) astronomiam amant

(iv) ubi est luna? iuxta stellam.

(v) stellae micant.

(vi) planeta non ambulat, orbitat.

planeta = planet
luna = moon
astronomia = astronomy
non = not

ubi = where
est = is
iuxta = next to
stella = star

spectare = to look at/watch
ambulare = to walk
orbitare = to orbit
micare = to shine
amare = to love

3. (a) Translate the following sentences into English (if they are in Latin) or into Latin (if they are in English.)

(i) Mars est planeta, sol est stella.

(ii) The planet orbits the star.

(iii) amatis terram et lunam.

(iv) Astronomy is a science.

(v) nauta navigat ad stellam.

(vi) Terra, luna et sol micant cotidie

sol = Sun
Terram = Earth
scientia = science
ad = to

nauta = sailor
navigare = to sail
cotidie = every day

(**b)** Some common English words actually have an astronomical origin: using the clues given below, can you figure out the **literal** meaning of each of the English words below?

(i) **disaster** (comes from *dis-* = 'bad' + *aster* = 'star')

(ii) **astronaut** (comes from *astrum* = 'star' + *nauta* = 'sailor')

(iii) **interstellar** (comes from *inter-* = 'between, among' + *stella* = 'star')

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Name:.....

Answer Key: Naming the Roman Universe

1a.
(i) planet
(ii) astronomy
(iii) moon
(iv) nocturnal
(v) constellation
(vi) comet

1b.
(i) planetae
(ii) astronomiae
(iii) lunae

1c. Anything similar to the following:
(i) planet: an object in space which orbits a star
(ii) astronomy: the study of space and the universe
(iii) moon: a small object which orbits a planet
(iv) nocturnal: happening or living by night
(v) constellation: a group of stars, often in the shape of a person or thing
(vi) comet: a large ball, mostly made of ice and usually with a long tail, which move around in outer space

2a.
(a) I look at the planet.
(b) We look at the moon.
(c) They love astronomy.
(d) Where is the moon? Next to the star.
(e) The stars shine.
(f) The planet does not walk, it orbits.

3a.
(i) Mars is a planet, the Sun is a star.
(ii) planeta orbitat stellam.
(iii) Y'all love the Earth and the moon.
(iv) astronomia est scientia.
(v) The sailor sails to the star.
(vi) The Earth, moon and Sun shine every day.

3b.
(i) 'bad star'
(ii) 'star sailor'
(iii) 'between/among the stars'

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Nocturnal Skies

Name:.....