

# NATURAL SCIENCES

RESOURCE PACK  
GRADE 7 TERM 4



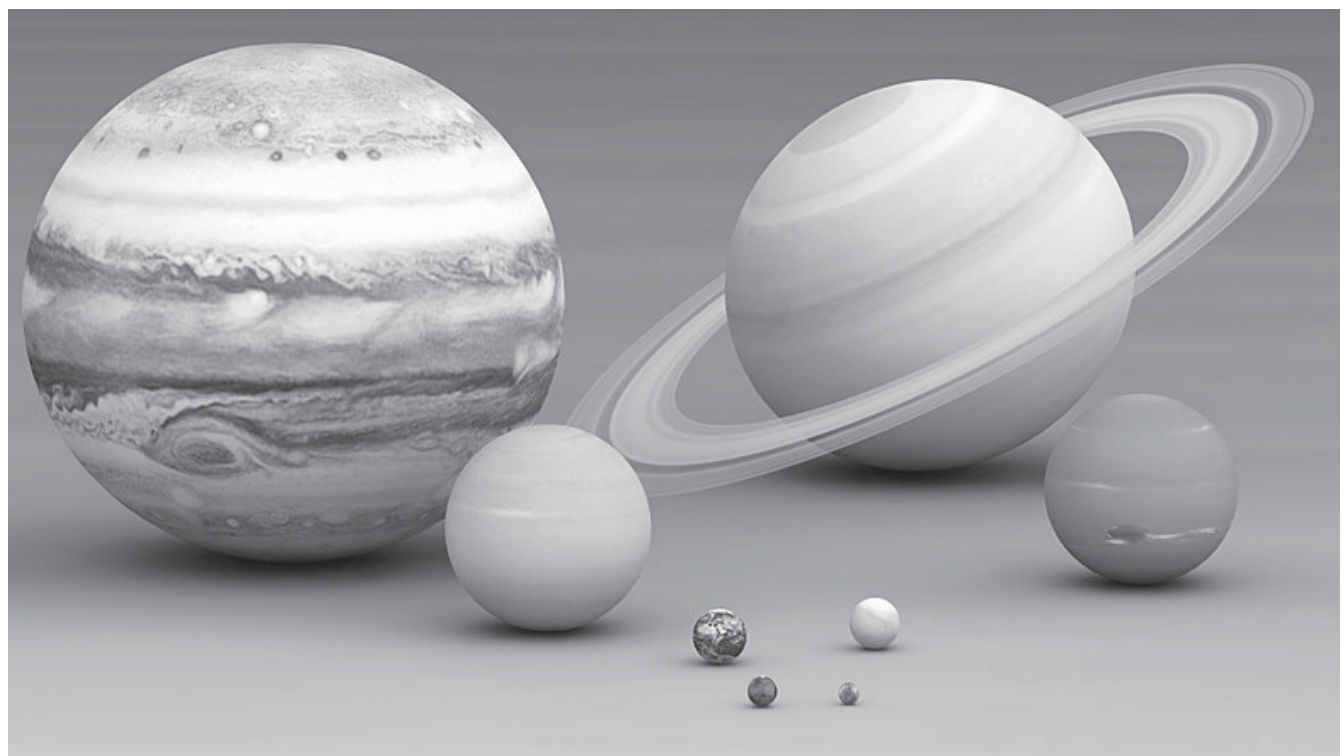
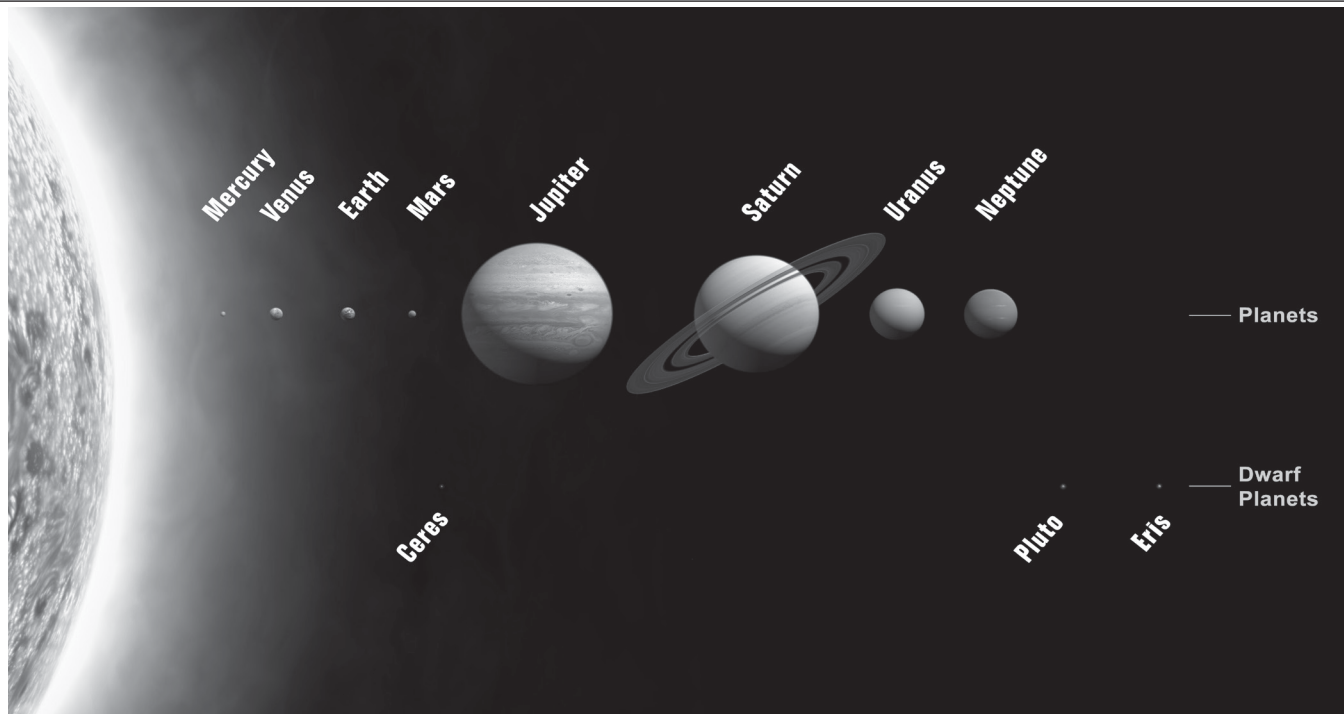
**GRADE: 7 TERM: 4 STRAND: PLANET EARTH AND BEYOND**

**RESOURCE 1**

[https://commons.wikimedia.org/wiki/File:Size\\_planets\\_comparison.jpg](https://commons.wikimedia.org/wiki/File:Size_planets_comparison.jpg)

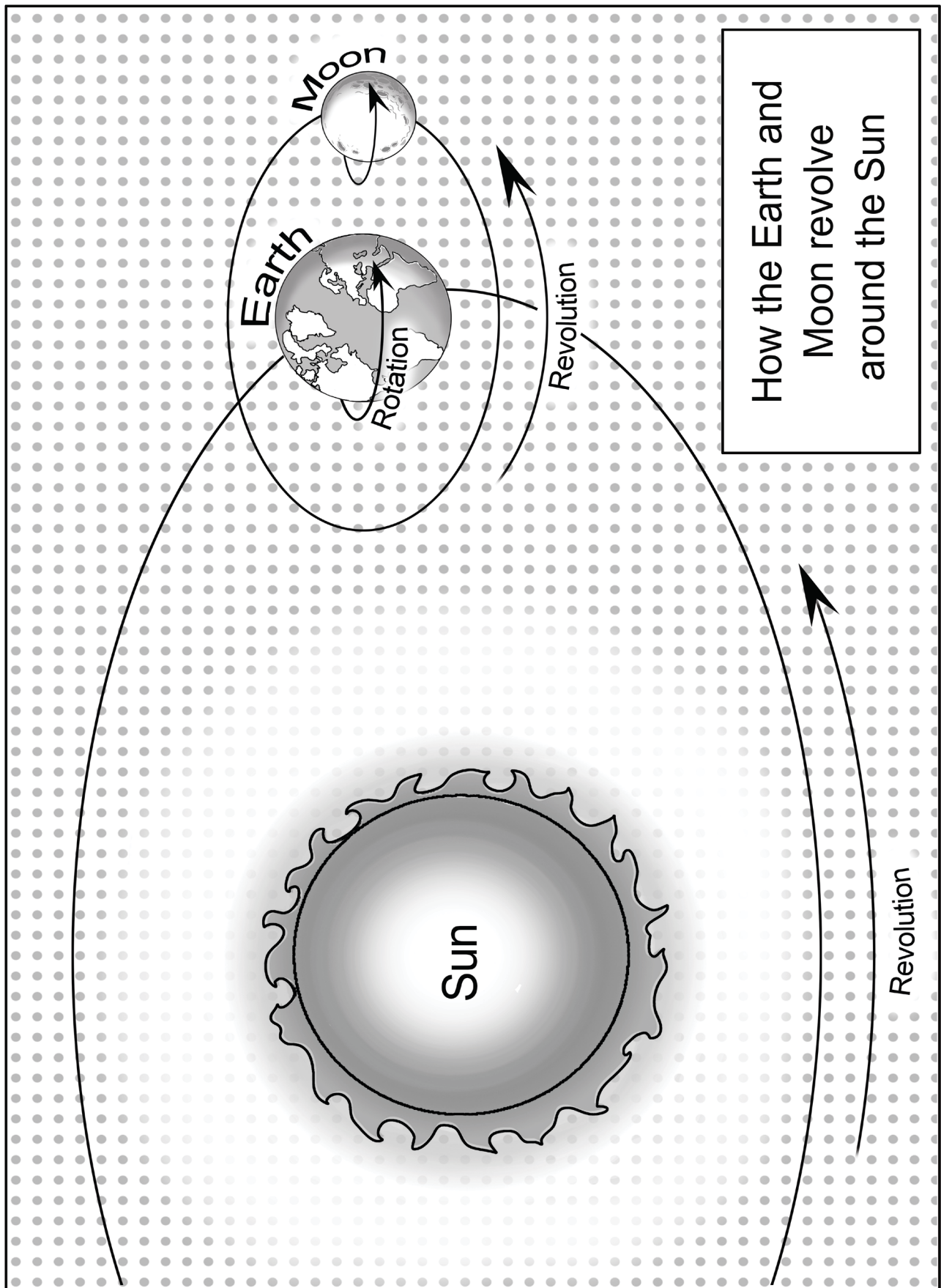
[https://solarsystem.nasa.gov/multimedia/gallery/solarsys\\_scale.jpg](https://solarsystem.nasa.gov/multimedia/gallery/solarsys_scale.jpg)

**THE SOLAR SYSTEM SHOWING THE 8 PLANETS**



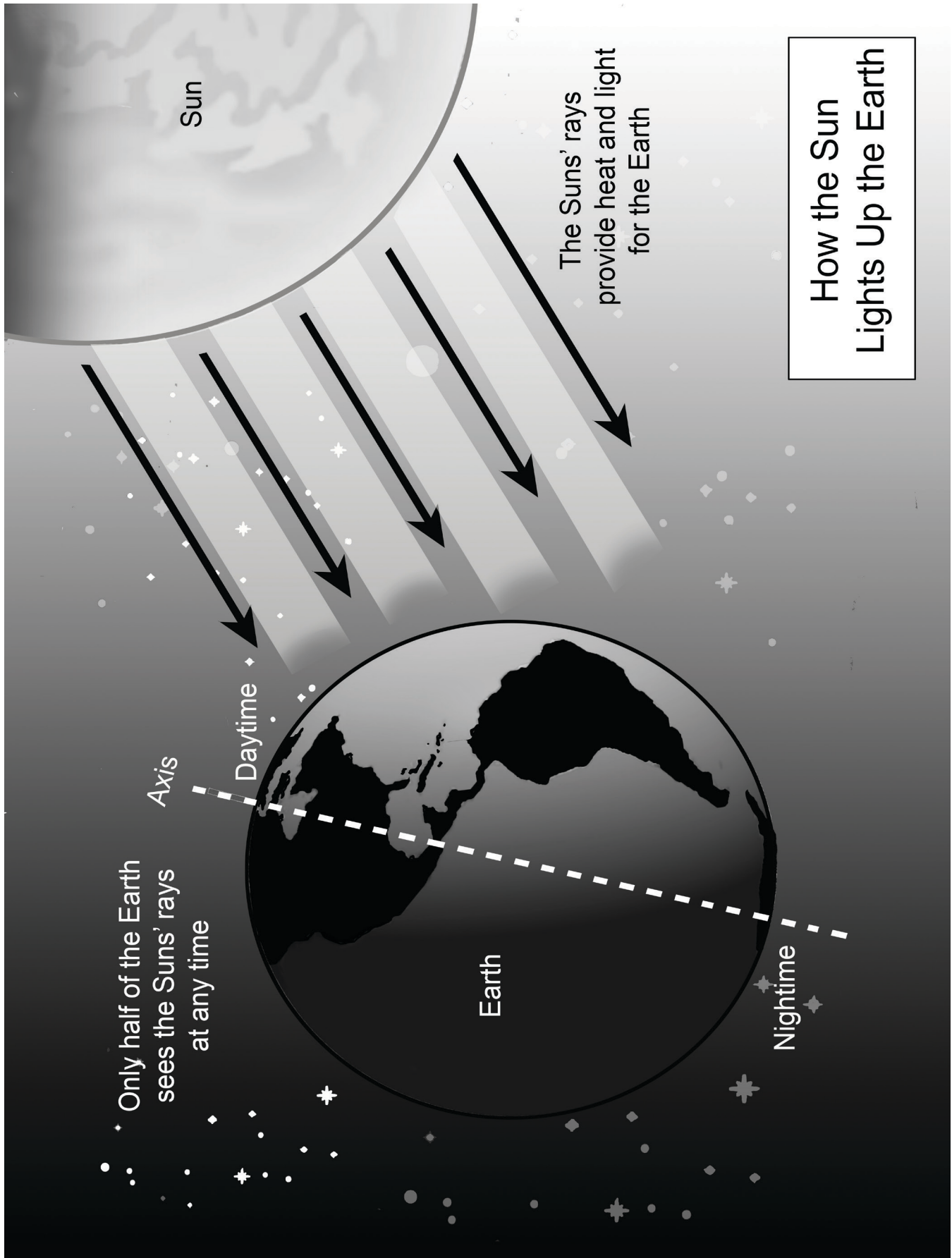
The relative size of the terrestrial planets and gas giants from left to right:  
Jupiter, Saturn, Uranus, Neptune, Earth, Mercury, Mars, Venus

EARTH REVOLVING AROUND SUN, AND MOON REVOLVING AROUND EARTH.



How the Earth and  
Moon revolve  
around the Sun





RESOURCE 5

EARTH SHOWING THE EQUATOR



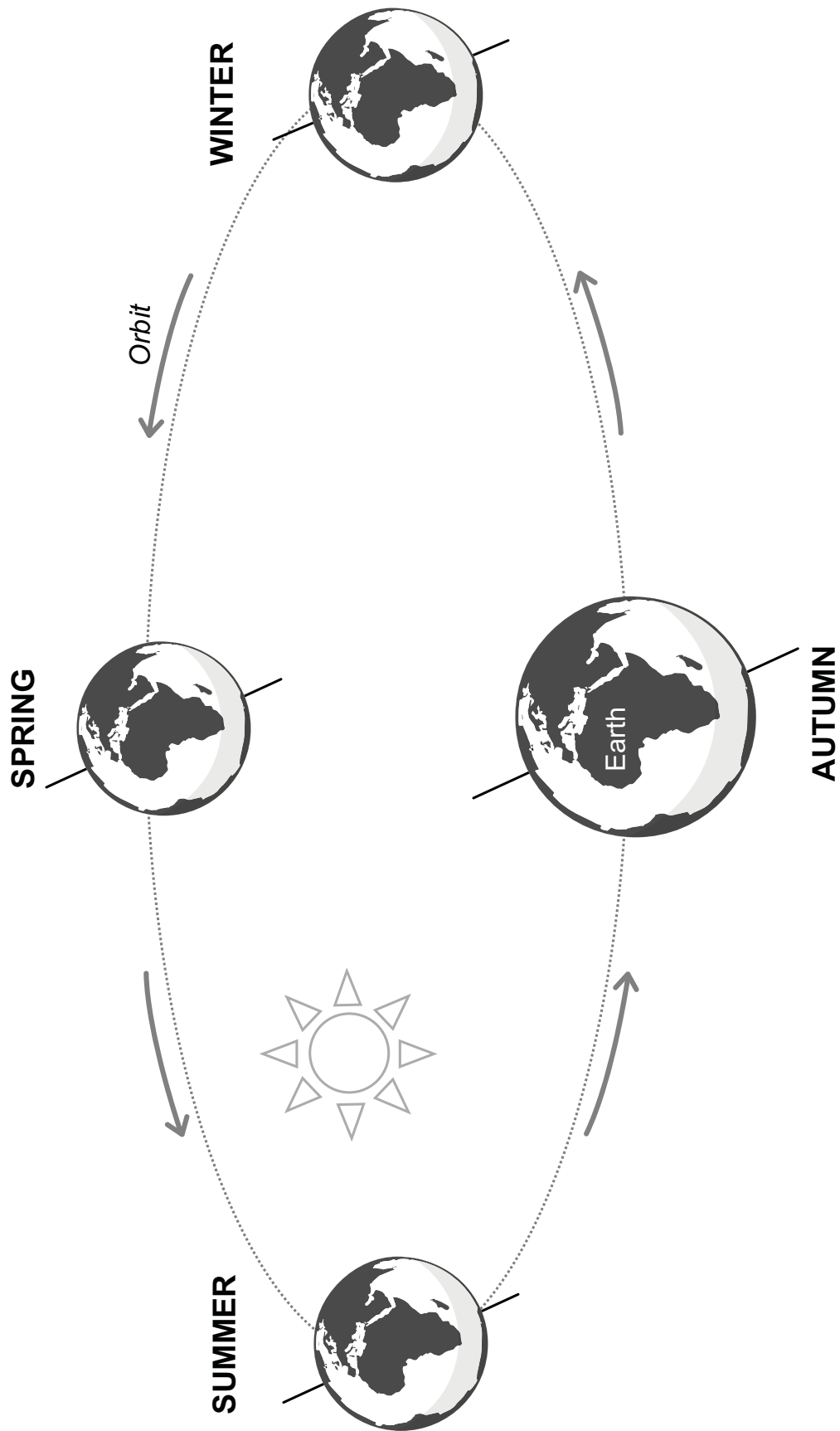
RESOURCE 6

EARTH SHOWING THE HEMISPHERES

Northern Hemisphere



Southern Hemisphere

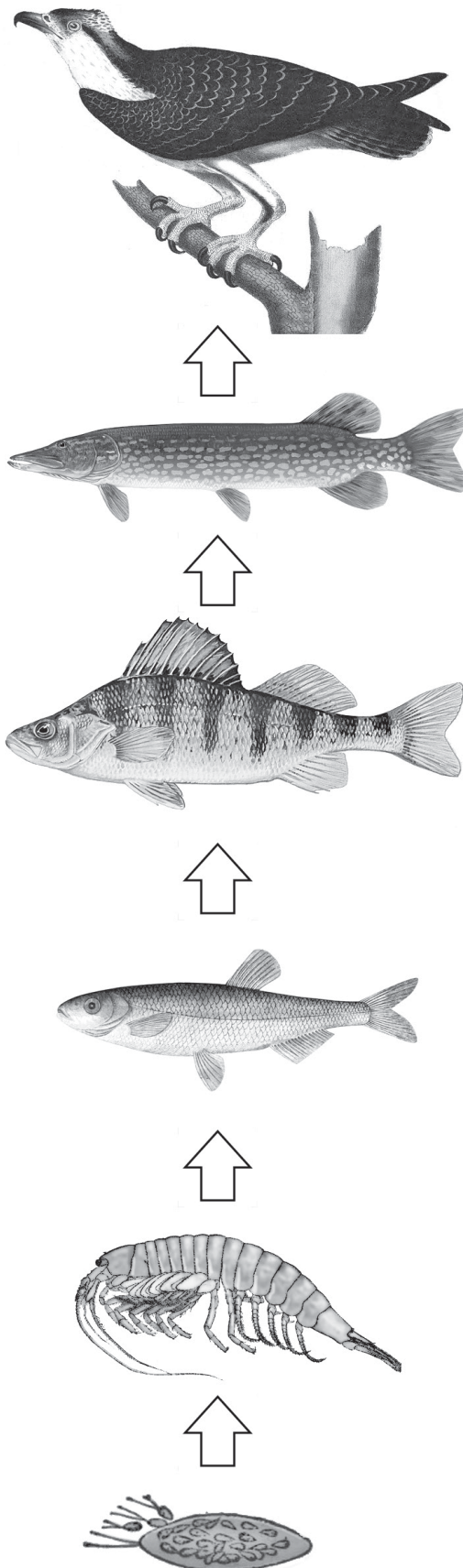




## RESOURCE 8

By Composition by Amada44 [Public domain], via Wikimedia Commons

## FOOD CHAIN



## RESOURCE 9

<https://commons.wikimedia.org/w/index.php?curid=26057883>

### PEAT PLANT WHERE COAL IS MADE



## RESOURCE 10

[https://commons.wikimedia.org/wiki/Solar\\_eclipse\\_of\\_2015\\_March\\_20\\_in\\_Couthenans](https://commons.wikimedia.org/wiki/Solar_eclipse_of_2015_March_20_in_Couthenans)

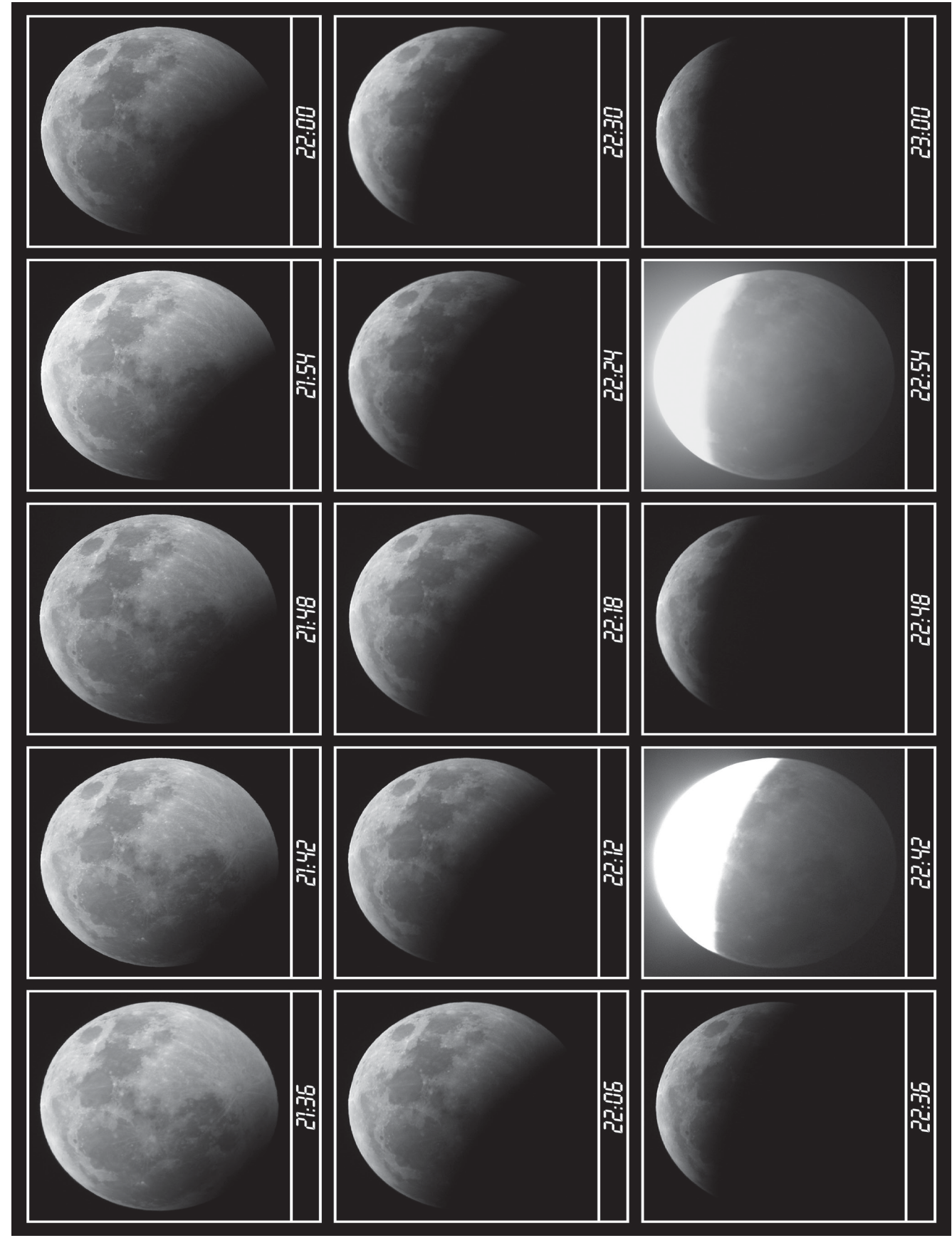
## SOLAR ECLIPSE



# RESOURCE 11

[https://commons.wikimedia.org/wiki/Lunar\\_eclipse\\_of\\_2008\\_August\\_16](https://commons.wikimedia.org/wiki/Lunar_eclipse_of_2008_August_16) lunar eclipse

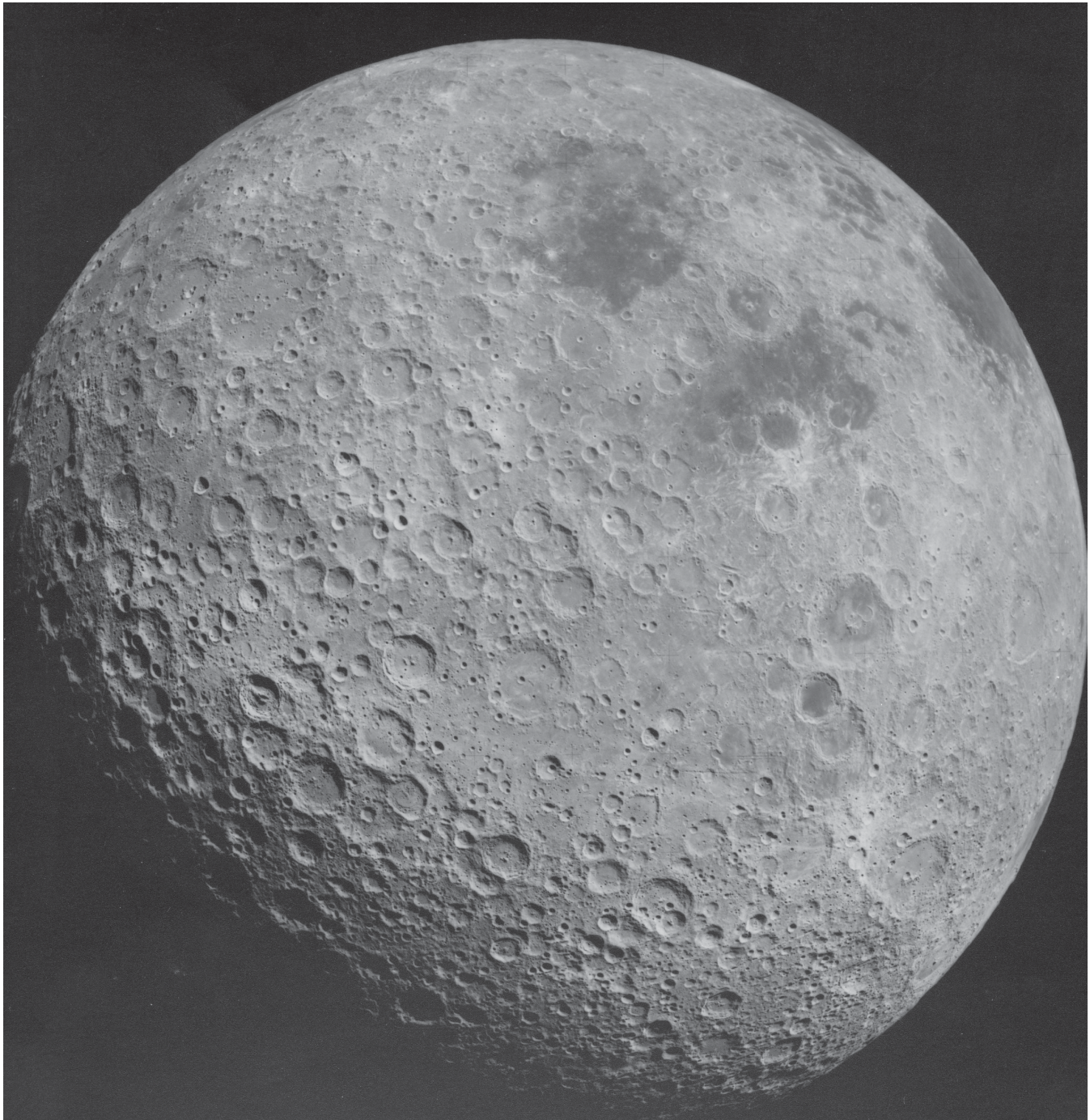
## LUNAR ECLIPSE



## RESOURCE 12

[https://commons.wikimedia.org/wiki/File:Back\\_side\\_of\\_the\\_Moon\\_AS16-3021.jpg](https://commons.wikimedia.org/wiki/File:Back_side_of_the_Moon_AS16-3021.jpg)

### FAR SIDE OF THE MOON



## RESOURCE 13

[https://commons.wikimedia.org/wiki/File:Moon\\_front-view\\_\(Clementine\\_dataset\).png](https://commons.wikimedia.org/wiki/File:Moon_front-view_(Clementine_dataset).png)

### NEAR SIDE OF THE MOON



## RESOURCE 14

By Ronnie Robertson (High Tides IMG\_9078) [CC BY-SA 2.0 (<http://creativecommons.org/licenses/by-sa/2.0>)], via Wikimedia Commons

### HIGH TIDE



## RESOURCE 15

By Dylan Kereluk from White Rock, Canada (Flickr) [CC BY 2.0 (<http://creativecommons.org/licenses/by/2.0>)], via Wikimedia Commons

### LOW TIDE





## RESOURCE 16

[https://www.google.co.za/search?q=shoreline+ecosystems&rlz=1C1CHBD\\_enZA757ZA757&source=Inms&tbn=isch&sa=X&ved=0ahUKEwiHvYeOkf\\_VAhUqAsAKHdV\\_AVcQ\\_AUICigB&biw=1366&bih=662#imgsrc=6XdNUKO57troRM:](https://www.google.co.za/search?q=shoreline+ecosystems&rlz=1C1CHBD_enZA757ZA757&source=Inms&tbn=isch&sa=X&ved=0ahUKEwiHvYeOkf_VAhUqAsAKHdV_AVcQ_AUICigB&biw=1366&bih=662#imgsrc=6XdNUKO57troRM:)

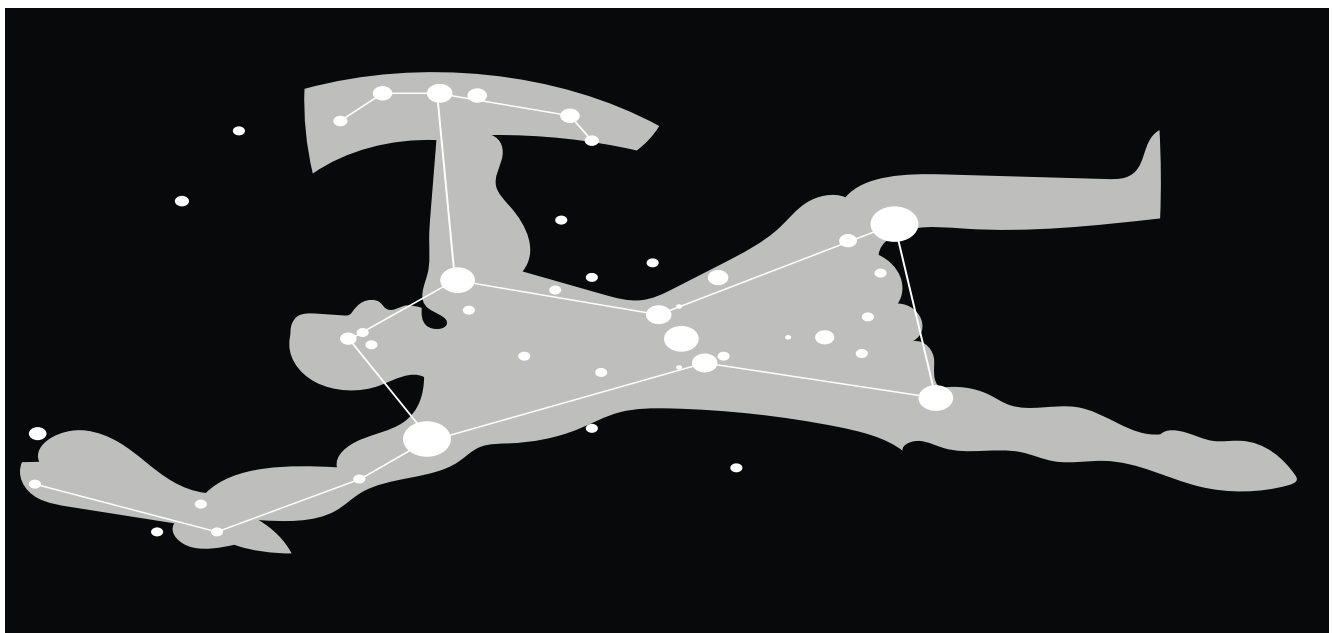
## SHORELINE ECOSYSTEMS



## RESOURCE 17

[https://commons.wikimedia.org/wiki/File:Spectacular\\_visible\\_light\\_wide\\_field\\_view\\_of\\_region\\_of\\_Orion%27s\\_Belt\\_and\\_the\\_Flame\\_Nebula.jpg](https://commons.wikimedia.org/wiki/File:Spectacular_visible_light_wide_field_view_of_region_of_Orion%27s_Belt_and_the_Flame_Nebula.jpg)

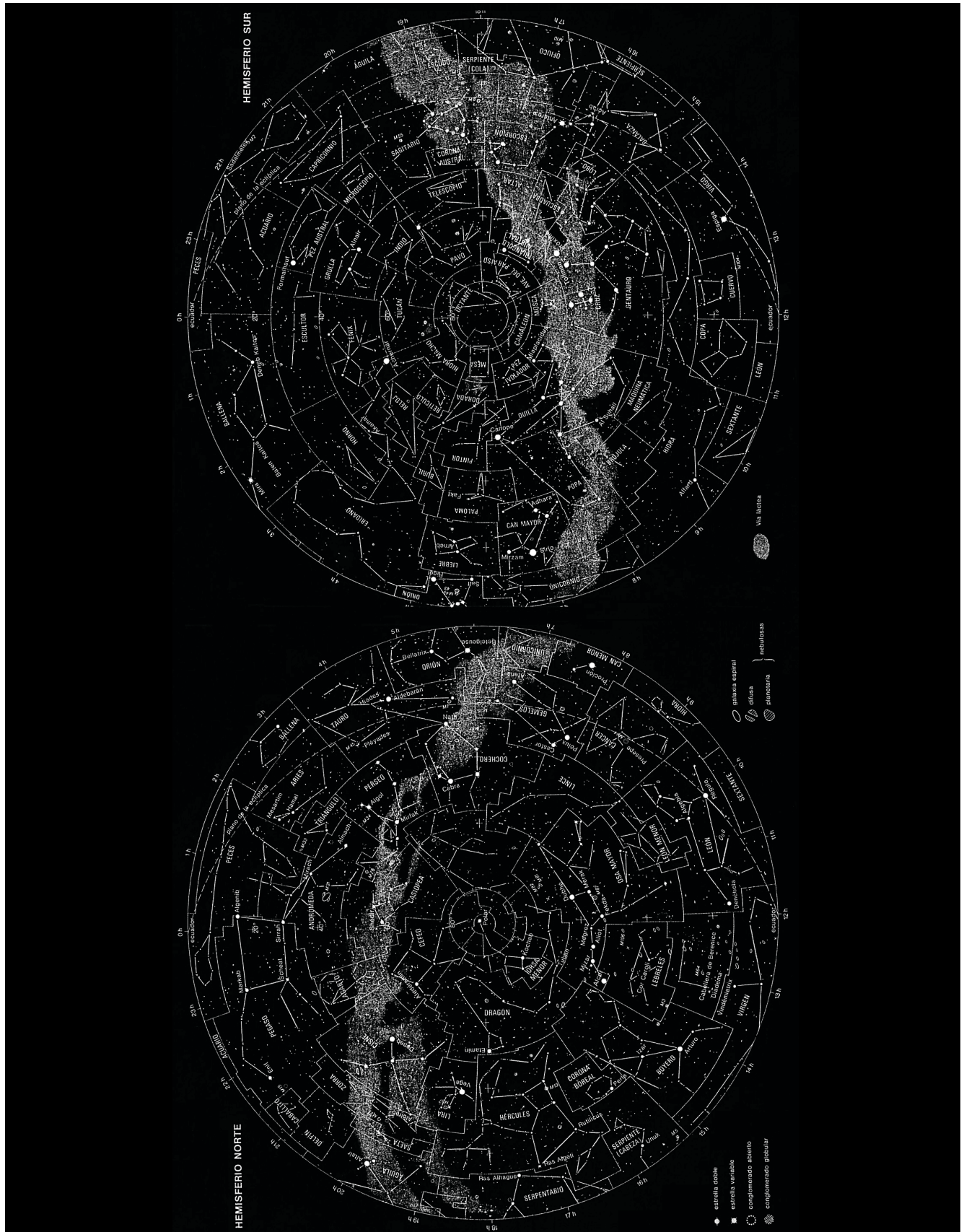
## ORION'S BELT



# RESOURCE 18

By Shadowxfox (Own work) [GFDL (<http://www.gnu.org/copyleft/fdl.html>) or CC BY-SA 4.0-3.0-2.5-2.0-1.0 (<http://creativecommons.org/licenses/by-sa/4.0-3.0-2.5-2.0-1.0>)], via Wikimedia Common

## CONSTELLATIONS



## RESOURCE 19

By maulleigh (Flickr) [CC BY-SA 2.0 (<http://creativecommons.org/licenses/by-sa/2.0>)], via Wikimedia Commons

## CELESTIAL MAP



## RESOURCE 20

<http://www.rmg.co.uk/discover/explore/south-african-star-myths>.

### STORIES ABOUT STARS

#### **Orion and Pleiades**

IsiLimela or the Pleiades were the 'digging stars', whose appearance in southern Africa warned of the coming need to begin hoeing the ground. All over Africa, these stars were used as a marker of the growing season. 'And we say isiLimelais renewed, and the year is renewed, and so we begin to dig'. (Callaway 1970). Xhosa men counted their years of manhood from the time in June when IsiLimela first became visible. According to the Namaquas, the Pleiades were the daughters of the sky god. When their husband (Aldebaran) shot his arrow (Orion's sword) at three zebras (Orion's belt), it fell short. He dared not return home because he had killed no game, and he dared not retrieve his arrow because of the fierce lion (Betelgeuse) which sat watching the zebras. There he sits still, shivering in the cold night and suffering thirst and hunger.

A girl child of the old people had magical powers so strong that when she looked at a group of fierce lions, they were immediately turned to stars. The largest are now in Orion's belt.

For the Tswana, the stars of Orion's sword were 'dintsa le Dikolobe', three dogs chasing the three pigs of Orion's belt. Warthogs have their litters while Orion is prominent in the sky – frequently litters of three.

#### **The Milky Way**

A strong-willed girl became so angry when her mother would not give her any of a delicious roasted root that she grabbed the roasting roots from the fire and threw the roots and ashes into the sky, where the red and white roots now glow as red and white stars, and the ashes are the Milky Way. Dornan, 1925 (The Bushmen)

To Xhosas, the Milky Way seemed like the raised bristles on the back of an angry dog. Sotho and Tswana saw it as Molalatladi, the place where lightning rests. It also kept the sky from collapsing, and showed the movement of time. Some said it turned the Sun to the east.

#### **The Stars**

A legend of the Karanga people held that the stars were the eyes of the dead, while many Tswana believed that they were the spirits of those unwilling to be born. Other Tswana believed that they were the souls of those so long dead that they were no longer ancestor spirits. The Venda pictured the stars as hanging from the solid dome of the sky by cords, while other groups believed the stars to be holes in the solid rock dome of the sky.

## RESOURCE 21

[https://commons.wikimedia.org/wiki/Stonehenge#/media/File:Stonehenge\\_from\\_north,\\_August\\_2010,\\_cropped.jpg](https://commons.wikimedia.org/wiki/Stonehenge#/media/File:Stonehenge_from_north,_August_2010,_cropped.jpg)

## STONEHENGE



## RESOURCE 22

By John Carmichael (Own work) [Public domain], via Wikimedia Commons

### SUNDIAL



## RESOURCE 23.1

Adapted from <https://en.wikipedia.org/wiki/>

### FAMOUS ASTRONOMERS

#### **Nicolaus Copernicus**

In 1543, Nicolaus Copernicus, a Polish mathematician and astronomer, published his book called *De revolutionibus orbium coelestium*, or in English, *On the Revolutions of the Celestial Spheres*. In it he correctly said that the Sun, rather than the Earth, was at the center of the Solar system. Before this everyone thought that the Earth was at the centre of the Solar System.

At this time only six planets were known and Copernicus correctly ordered all the planets known at the time in increasing distance from the Sun. In his model, all the orbits of the planets were circular not elliptical.

Here are some of his assumptions:

1. Celestial bodies (objects in the sky like planets) do not revolve around a single point.
2. The Earth is not at the center of the solar system.
3. All planets revolve around the Sun., which is at the center of the universe.
4. Stars do not move.



## RESOURCE 23.2

Adapted from <https://en.wikipedia.org/wiki/>

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Adapted from <https://en.wikipedia.org/wiki/>

### FAMOUS ASTRONOMERS

#### **Johannes Kepler**

Johannes Kepler was a German astronomer and mathematician. He spent ten years trying to explain the movement of Mars across the sky in detail. He could only get his model of the solar system to fit the observations of the planets' motions if he assumed that rather than moving in a circle around the Sun, the planets all orbited in ellipses (ovals). He discovered that the true shape of the planets' orbits is elliptical.

The Earth travels faster in its elliptical orbit when it is closer to the Sun than when it is farther away. This is because the gravitational force of attraction between the Earth and Sun is stronger when the Earth is closer to the Sun. This is true of the orbits of all planets around the Sun.

Here are some of his discoveries:

1. The orbit of every planet is an ellipse with the Sun at the focus.
2. The line joining a planet and the Sun sweeps out equal areas during equal intervals of time.

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Adapted from <https://en.wikipedia.org/wiki/>

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## RESOURCE 25.1

Adapted from <https://en.wikipedia.org/wiki/>

### FAMOUS ASTRONOMERS

#### **Galileo Galilei**

Galileo Galilei was an Italian physicist, mathematician and astronomer. He built his first telescope in 1609 and was the first astronomer to use a telescope. In 1610 he published a book called the Sidereal Messenger, listing the discoveries he had made using his telescope.

Here is a list of his discoveries:

1. Galileo discovered the four largest moons of Jupiter (which are now called the Galilean moons). Over several nights he watched them move and realized that they were actually orbiting around Jupiter.
2. He also found that Venus has phases just like the Moon (and just like all planets).
3. He discovered that the Moon has craters and that the Sun has dark spots which are called sunspots. This discovery got him into trouble with the Catholic Church because he was saying that God had made the Sun and Moon imperfect.
4. The Catholic Church allowed Galileo to conduct his research, as long as he did not tell anyone about his discoveries.
5. In 1632 Galileo angered the head of the Catholic Church (the Pope) when he published a book in which he stated that the Earth was moving around the Sun. He was put on trial and found guilty. He was first imprisoned and later placed under house arrest.

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Adapted from <https://en.wikipedia.org/wiki/>

### FAMOUS ASTRONOMERS

#### **Isaac Newton**

Isaac Newton was an English physicist and mathematician and is considered one of the greatest scientists of all time. He came up with mathematical laws to describe the motions of objects but his greatest discovery was that of the force of gravity.

In 1687 he published a book called *Philosophiae Naturalis Principia Mathematica*, or in English: *Mathematical Principles of Natural Philosophy*, in which he explained his ideas about the motions of objects and gravity.

There is a famous story which says that Newton was sitting under an apple tree when an apple fell on his head and he began to think about gravity and falling objects. The apple didn't really land on his head but he did watch an apple fall and began to wonder why apples always fall down.

Newton's discovery:

He suggested that it was the force of gravity that caused apples to fall.

He realized that it was the force of gravity that was holding the Moon in its orbit around the Earth. According to Newton, gravity is the reason that objects fall to the ground when dropped and why planets orbit the Sun and why moons orbit planets. Up until Newton no one had been able to explain what held the Moon and the planets up in their orbits.

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Adapted from <https://en.wikipedia.org/wiki/>

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