Astronomy

Pre-reading activities: Comprehension strategy – Scanning

1. **Hunt the Text Challenge:** Locate the answers to the following clues as quickly as possible:
   - **(a)** Study of stars and planets: _____
   - **(b)** A passage grave in Co. Meath: _____
   - **(c)** The first person to say that the Earth revolves around the sun: _____
   - **(d)** The name of the instrument used to look at the stars: _____
   - **(e)** NASA stands for: _____

Think, Pair, Share: Comprehension strategy – Scanning

2 In pairs, scan the text to pick out five new interesting words.

During reading: Comprehension strategy: Self Questioning

3 Write three questions that you can ask your partner after reading the text.

The study of the stars, planets and space is called astronomy. A person who studies astronomy is called an astronomer. Humans have been studying the skies for thousands of years. Through the ages, people have built large structures (buildings) and monuments (built in memory of something or somebody) that would line up with the sun, moon or stars at certain times of the year. These structures became their calendars. They helped people to follow the movement of the moon and the stars.

FACT

Many scientists believe that the Ancient Egyptians studied the night sky, taking measurements from the stars to align their pyramids and sun temples with the earth's four cardinal points. The Great Pyramids of Giza provide a great example of this.

Newgrange Passage Grave

Newgrange passage grave

Newgrange is a passage grave in Co. Meath. It was built over 5000 years ago during the Stone Age. It is the best-known Irish example of how ancient people lined up structures with the sun.

On the winter solstice (21st December) each year, a narrow beam of sunlight shines through an opening or roof box just above the entrance to the passage. The passage leads to an inner chamber (room).

As the sun rises higher, the beam widens within the chamber so that the whole room becomes illuminated (lit up). This event lasts for about 17 minutes, beginning at around 9 in the morning. It is incredible how accurate the Newgrange chamber is at telling the time, considering that it was built 500 years before the Great Pyramid in Egypt and more than 1,000 years before Stonehenge was built in England.

The inner chamber of Newgrange

FACT

Stonehenge is located in Wiltshire, England. It is a ring of 83 standing stones built anywhere between 3,000 BC to 2,000 BC. Some archaeologists believe that Stonehenge may have been used as a calendar by ancient people.

Nicolaus Copernicus

Until around 1500, many people thought that the Earth lay inside a glass sphere (ball) and that the stars shone through holes in that ball. Others thought that the sun and the other planets revolved (went) around the Earth. In 1542, Nicolaus Copernicus from Poland wrote a book that stated the sun was at the centre of our solar system and that all the planets revolved around it.

The solar system

Galileo Galilei's homemade telescope

Galileo Galilei

In 1609, a scientist by the name of **Galileo Galilei** first peered (stared) at the stars through his small, homemade telescope. A telescope is an instrument made to make far away objects appear closer. The lenses (glasses) used in this telescope were not very powerful. The objects viewed were always a little blurry because the lenses bent the light. Galileo made many discoveries using his telescope including the four large moons around Jupiter.

Galileo discovered **sunspots** on the sun. These are dark, cooler areas on the sun. Galileo also learned that the moon is not smooth but is covered with large **craters** (holes). Galileo proved that Copernicus was right in saying that the Earth and the other planets revolved around the sun. What Galileo found out was brilliant, considering that his telescope was only about 3 metres long.

Johannes Hevelius

In 1647, **Johannes Hevelius** used a telescope that was 48 metres long. He and his wife made a catalogue (list) of more than 1,500 stars.

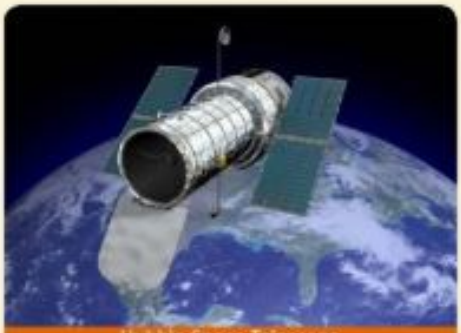
Johannes Hevelius

Isaac Newton

In 1668, **Isaac Newton** invented a new type of telescope. Until then, telescopes had used lenses. Newton replaced the lenses with a mirror. This mirror reflected the light. Newton found that, the more light the mirror reflected, the clearer everything in the sky appeared.

Since then, humans have continued to build bigger and better telescopes. The bigger a telescope is, the clearer far away objects appear.

Newton's telescope



Hubble Space Telescope

Hubble Space Telescope

In April 1990, NASA (National Aeronautics and Space Administration) in America launched the Hubble Space Telescope into space. It was launched by the space shuttle ***Discovery***. This has allowed astronauts get a much more detailed look at objects in space.

It is very heavy, weighing about 11,000 kg – that's about as heavy as one and half elephants! It is 570 km above the Earth and can circle our planet every 96 minutes. Astronomers have used Hubble to **observe** (look at) the most distant stars and planets in our solar system.

Post-reading activity: Comprehension strategy – Self Questioning

Ask your partners to answer the questions you have written.

ACTIVITIES

Astronomy

A A Little Light Thinking

1. What is a person who studies the stars, planets and space called?
2. Where in Ireland is the Newgrange passage grave?
3. How many years was Newgrange built before the Great Pyramids in Egypt?
4. Until 1500, what did people believe about the Earth and the sun?
5. Name the first astronomer to say that the sun is at the centre of our solar system.
6. For what is a telescope used?
7. What distance above the Earth is the Hubble Space Telescope?

B Deeper Thinking

1. Why do you think people have always been so interested in astronomy?
2. What is the meaning of the word *illuminated*?
3. Why do you think Galileo's discoveries were so important?
4. In what way is a larger telescope better than a smaller telescope?
5. What are the advantages of having the Hubble Telescope in space?

CHALLENGE

What is the winter solstice?
What happens on the winter solstice?

C Working with Words: True or False

Write in your copybook if the following statements are true or false.

1. The study of the stars, planets and space is called astrology.
2. Newgrange is a passage grave in Co. Meath.
3. The winter solstice occurs on the 21st of November.
4. Copernicus said that the sun is at the centre of our solar system.
5. In 1609, Galileo Galilei first peered at the stars through his small, homemade telescope.
6. A telescope makes faraway objects appear farther away.
7. Galileo discovered that the moon is smooth.
8. Isaac Newton invented a telescope with mirrors.
9. NASA stands for National Aeronautics and Satellite Administration.
10. Nicolaus Copernicus was from Italy.