

HERSCHEL AND THE STARS

Note: The transactional processes suggested in CISCE curriculum are highlighted in grey.

Learning Outcomes

- To observe how William's interest developed
- To trace the sequence of events that led to the discovery of Uranus
- To get familiar with the genre (non-fiction)

Pre-reading



This focusses on *assessment for learning*.

Initiate a discussion on stars and night-sky watching. Ask students whether they like watching the night sky or whether they have ever watched the night sky. Let students share what they see at night. (Stars; different

phases/ shapes of the moon; sometimes dark moving clouds; sometimes clear skies; a rare sighting would be meteor showers)

Lead students on to the pre-reading questions in the Reader. Let students answer the questions orally before writing in their books.

READING

Students read to comprehend, predict and analyse

Note: You can work on two types of questions to help students comprehend and scan for details and analyse.

1. 'Right-there' questions (Answers that are right there in the text)
2. 'Think and search' questions (Answers will not be direct, but they will have to think and search for the answers from anywhere in the text)

Read the text/Play the audio and pause at relevant points to explain the text and then check comprehension.

- *Astronomy is the study of stars, planets... make a bigger and more powerful telescope.*

Did you know? Today, ships use satellites to know where they are at sea. However, before satellites, sailors would use stars to help them understand what their position in the sea was.

Write the following questions on the board and brainstorm for the answers. (You may add more.)

Right-there questions: *What was William interested in? How did Isaac Herschel spend time with his children? What else besides music interested young William? What helped him become an astronomer?*

Think and search question: *How did William's love for music help him become interested in astronomy?*

- *He began ... interest in astronomy.*

Right-there questions: *What did William's brother and sister help him with? Why did William not have his food? Who proved that what William saw was a planet and not a comet? What was the newly discovered planet called?*

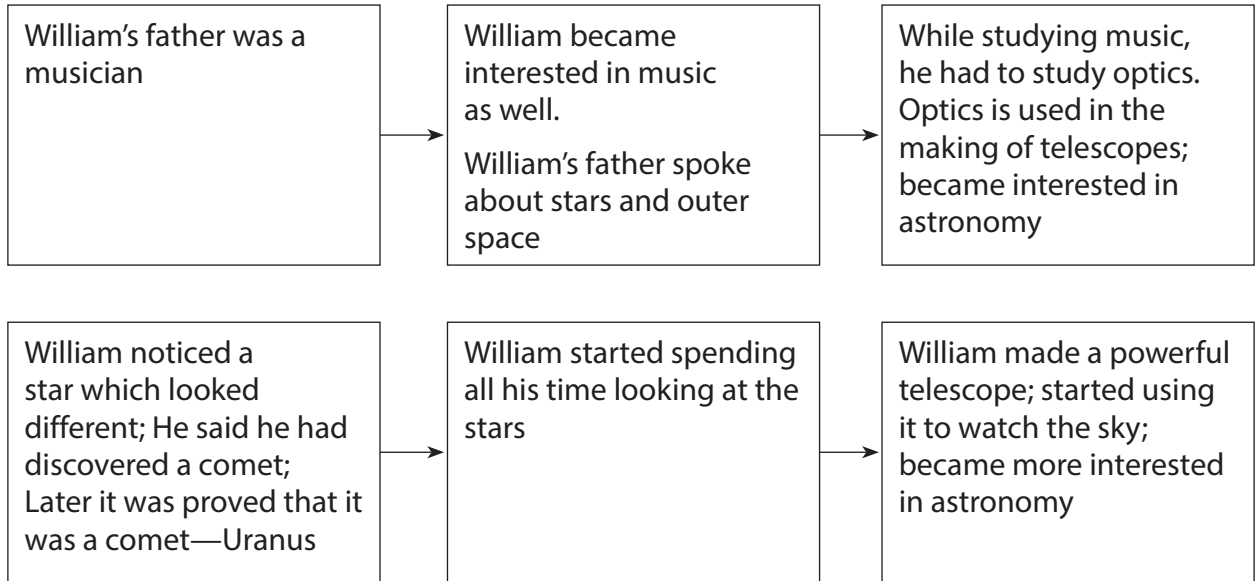
Think and search questions: *What was the clue that showed that what William saw was not a star? How did this lead to the discovery of Uranus?*



How do you think Herschel felt when Laplace proved he had discovered a planet? (Suggested answer, please accept any logical response. Herschel happy/overjoyed and proud when Laplace proved that Herschel had discovered a planet.)

Post-reading

Pair-work/Group-work: Make a flow chart listing all the things that helped in the discovery of Uranus.



GRAMMAR

Subject and predicate

Change the given sentences to a matching activity and write on the board. Ask students to match and make sentences.

1. Mohit / laughs.
2. He / reads a book.
3. She / has completed her homework in the afternoon.
4. My father / is an engineer.
5. These beautiful dolls / are mine.
6. My younger brother / is ten years old.

Write the sentences on the board.

Explain that:

Every complete sentence contains two parts: a **subject** and a **predicate**.

The subject is *the person, place, thing or an idea* that the sentence is about.

The predicate is the word or words that tell *what the subject of the sentence is or does*.

Now ask students to divide the sentences into subjects and predicates.

VOCABULARY

Phrasal verbs

Write these sentences on the board. Underline the phrasal verbs.

They always look down on him.

The planes always take off on time.

Explain to students that:

- the underlined words together form phrases.
- a phrase is made up of a main verb together with an adverb or a preposition, or both.

Explain:

- that the meaning of each word when taken in isolation would hold a different meaning from the phrase itself. For example, the phrasal verb *to look down on someone* doesn't mean that you are standing on an elevated ground and looking down at someone who is below you. It means that you think that the other person is not worthy enough to be considered your equal.
- that the verbs change tense accordingly. — *She blew out the candles after the lights came on. / She will blow out the candles soon.*

LISTENING

Post-listening

Tell students that they are going to listen to a conversation between Rhea and Shilpi.

Play the audio track and let students do the task after listening.

You may play the track one more time depending upon the capability of your class.

Review the answers.

WRITING

Imaginative paragraph

Help students set their objectives in writing (Why do I want to write this?). Guide them through every step. Share the sample writing and guidelines with them but encourage them to write their own composition

Why do I want to write this paragraph?

- To describe the person
- To help the reader see the person as I see her/him.
- To share my feelings about the person

How do I write a descriptive paragraph?

Begin the paragraph with the main sentence. The main sentence is known as *the topic sentence* and sums up the main idea of the paragraph. Write the topic sentence and some general information about whom you want to write and the way the person has influenced you.

The next step is to develop this idea. Write why you like the person. Keep your sentences short so that the meaning is clear. Provide interesting details that help the reader get to know the person you are talking about.

It is important to end the paragraph in the same way it was begun. The best and perhaps the most preferred way of doing it is to revisit the topic statement.

STUDENTS' BOOK ANSWER KEY

Herschel and the Stars

Pre-reading

- A. a. a planet b. the moon c. stars
- B. Both stars and planets can be seen in the night sky. Stars twinkle in the sky but planets don't.

Comprehension

- A.
1. William's father, Isaac Herschel, was a musician in the army band. Every day when he came home from work, he gathered his children around him and played music with them.
 2. To become a better musician, William began to study music.
 3. While studying music, he had to study a little bit of Maths and optics. Optics is used in the making of telescopes. William started using a simple telescope to look at the Sun and the Moon. He became more and more interested in astronomy.
 4. William started to spend all his time looking at the stars. Sometimes, he did not even have his food.
 5. The French astronomer Laplace, who proved that Herschel had really discovered a new planet, is mentioned in the text.
- B.
1. a. As William grew older, he became good at discussion and debate.
b. At a very early age, William became interested in music. When William was a teenager, he became a musician in the army band.
 2. a. Herschel thought that he had found a new comet.
b. The new object was a planet which was later named Uranus.
 3. a. William had made one of the greatest discoveries in science, and because of this, people began to show interest in astronomy.
b. William told everyone that he had found a new comet.
- C.
1. *Suggested answer (accept any logical answer):* Yes, this activity must have developed in William an early interest in stars. Later, when he started using telescopes to see stars, his early interest must have encouraged him.
 2. *Suggested answer (accept any logical answer):* William's father, Isaac Herschel, was a musician in the army band. He was a hard-working man who loved his family. He spent time with his children and taught them all that he knew. He played music, looked at stars, and had discussions and debates with them.

Grammar

- A.
1. I am going to London.
 2. Neha loves ice cream.

3. Students are going to school.
4. The station is far from my house.
5. The hills are cooler in summers.

- B.**
1. Rishabh goes for a walk every morning.
 2. Paul loves to read.
 3. Himanshi saw an elephant in front of her house.
 4. Summers are hot in Delhi.
 5. The snake was yellow and black in colour.

Vocabulary

1. They will take down the old building near our house.
2. Jenny stays near the airport. She loves to watch planes take off from the airport.
3. Aadil wants to take up photography as a hobby.
4. Joy took up the habit of waking up early to stay healthy.
5. Mayank is watching the peacock on that roof. He is waiting for it to take off.
6. Jiya took on Tabish in a game of badminton.

Listening

1. T
2. T
3. F
4. T
5. F

Writing

Free response

Punctuation

1. Ronnie had a lovely dream.
2. Amy and Rashmi are playing in the garden.
3. Are you going for a movie?
4. Oh, what a terrible mistake!
5. We won!
6. I am going outside to play with my friends.
7. Nimesh forgot his books at home.
8. Where is everyone going?

ANSWER KEY TO WORKSHEET 6

- A.**
1. The sun rises in the east.
 2. Tanima was wearing a blue dress.
 3. My mother goes to work every morning.
 4. The field was covered with grass.
 5. Sasha did not wait for Ruby.
 6. Ankur chased the monkey away.

- B.** 1. My brother wants a bicycle.
2. My uncle sings very well.
3. The bird flew over the beach.
4. Alia ate her lunch.
5. The banyan tree is very old.
6. Anoop built a sandcastle.
- C.** 1. take off 2. took down 3. take up 4. took off 5. take on
- D.** 1. a. delicate: weak
b. well-known: famous
c. mountaineer: a person who climbs mountains
2. a. When Junko was young, everyone called her a delicate and weak child.
b. At the age of 10, Junko went on a class trip to Mount Nasu.
c. Junko formed a mountain climbing club for women.
d. Junko became the first woman to reach the top of Mount Everest which is the highest mountain in the world.
e. Junko climbed many other mountains around the world.

QUESTION BANK

Herschel and the Stars

A. Answer in brief.

1. What is astronomy and what helped William Herschel to become a better astronomer?

Ans: Astronomy is the study of stars, planets, comets and the universe. William Herschel made a bigger and a more powerful telescope which helped him become a better astronomer.

2. Where was William Herschel born and what did his father do?

Ans: William was born in the city of Hanover in Germany. William's father Isaac Herschel was a musician in the army band.

3. What else did William Herschel learn about while studying music and what did this help him make?

Ans: While studying music, William studied a little bit of maths and optics. This knowledge helped him to make a telescope that was better than all the other telescopes at that time.

B. Answer in detail.

1. How do we know that Isaac Herschel loved to spend time with his children?

Ans: Every day after work, Isaac gathered his children around him and played music with them. Sometimes at night, they would all go out into the open fields and spend time studying the constellations in the sky. The children would listen carefully as their father talked about stars and outer space. Isaac also taught them subjects like art and science.

2. What did Herschel discover and what did it turn out to be?

Ans: When Herschel noticed a star that changed its place and shone steadily, he thought that he had found a new comet. After many months of studies, astronomers said that the new comet could be a planet. The French astronomer Laplace later proved that Herschel had really discovered a new planet and it was named Uranus.

C. Read the lines and answer the questions.

1. *He decided to make a bigger and more powerful telescope.*

- a. What does this tell us about William Herschel?
- b. Why did he need a bigger telescope?
- c. What did he think he discovered using this telescope?

Ans: a. This tells us that William was getting more and more interested in astronomy.

- b. He wanted to see the objects that were beyond the Sun and the Moon.
- c. He thought he had discovered a new comet.