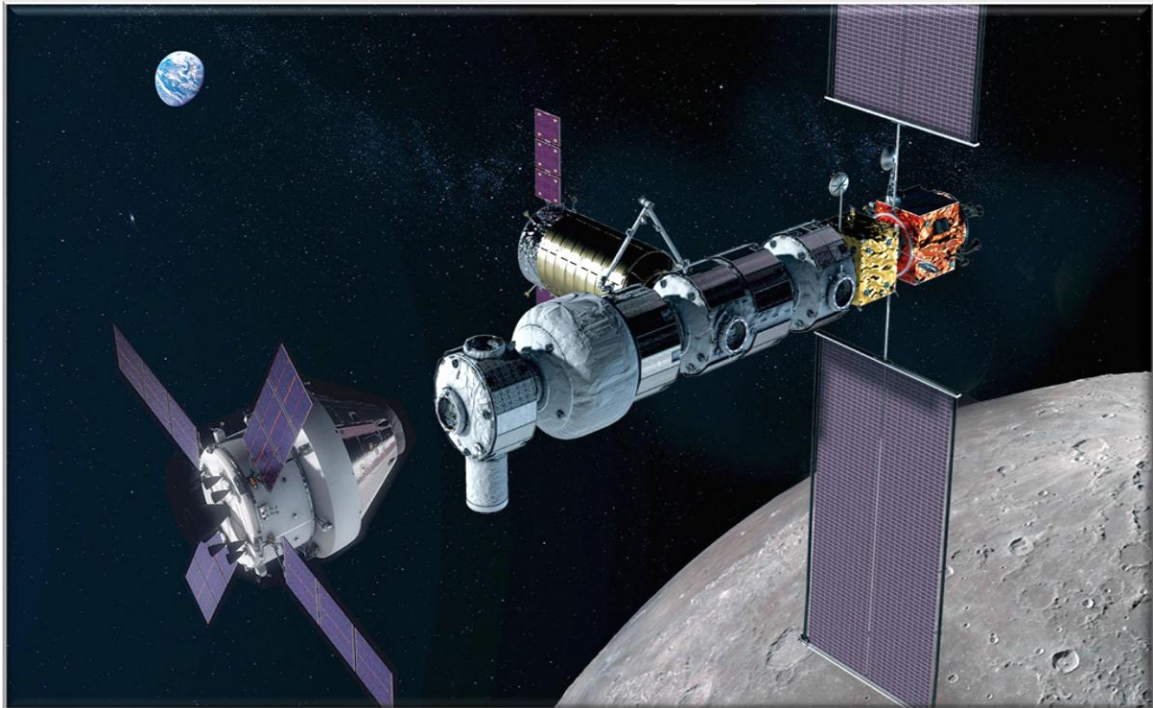


Spacegate Station Season 6

Episode 28



Hurricanes

Resource Content

- Guided Notes
- Higher Order Discussion Sheet
- Guided Notes Answer Key
- Curriculum Alignment Page

Season 6 Episode 2

Hurricanes Guided Notes

WORD BANK

atmosphere	eye	rotation
category	eyewall	Saffir–Simpson Scale
climate	flooding	satellites
convection	global patterns	storm surge
Coriolis effect	hurricane	tradition
Cyclonic	hurricanes	typhoon
Climate	jet stream	water cycle
cyclone	pressure	warm water
evacuation plans	prediction	weather
evaporation	rainbands	wind

SECTION 1 — Weather, Climate, and Meteorology

1. Meteorology is the scientific study of the _____ and how we forecast weather.
2. _____ provide a bird’s-eye view of Earth and help scientists track storms.
3. _____ describes what the atmosphere is doing right now.
4. _____ is the long-term pattern of weather over many decades.
5. Space-based data improves storm _____ and public safety.

SECTION 2 — Global Patterns and the Jet Stream

6. The _____ is a narrow band of strong winds high in the atmosphere that moves storms across continents.
7. It forms where warm air meets cold air, creating differences in temperature and _____.
8. These _____ influence local weather and help meteorologists track storm movement.

SECTION 3 — How Hurricanes Form

9. Hurricanes need _____ (at least 80°F / 27°C) to begin forming.
10. Heat from the Sun causes _____, turning ocean water into warm, moist air.
11. Rising warm air creates _____ currents that power the storm.
12. Earth's _____ causes the storm to spin, a process called the _____.
13. This entire process is connected to the _____.

SECTION 4 — Structure of a Hurricane

14. The center of the storm is called the _____, where winds are calm.
15. The _____ surrounds the eye and contains the strongest winds and heaviest rain.
16. Spiral _____ stretch outward and can cause flooding and tornadoes far from the center.
17. Hurricanes are _____ storms fueled by heat and moisture.

SECTION 5 — Hurricane Names Around the World

18. In the Americas, this type of storm is called a _____.
19. In Asia, it is known as a _____.
20. In the Indian Ocean and Australia, it is called a _____.
21. These names differ because of geography, language, and cultural _____.

SECTION 6 — Hurricane Classification

22. Hurricanes are ranked using the _____ Hurricane Wind Scale.
23. A _____ 1 storm has winds between 74–95 mph.
24. A Category 5 storm has winds over 157 mph and can cause catastrophic damage, including _____ and flooding.
25. The scale measures _____ speed, but hurricanes also cause damage through rain, tornadoes, and _____.

SECTION 7 — Human Impact and Safety

26. Meteorologists warn communities so people can prepare _____ and protect homes.
27. Understanding storms helps reduce the impact of natural disasters such as hurricanes, tornadoes, and _____.
28. Space-based meteorology supports transportation, agriculture, and _____ research.

Higher-Order Discussion Sheet

1. Systems Thinking — How Parts Interact

Hurricanes depend on warm water, rising air, Earth's rotation, and global wind patterns. Which of these factors do you think has the greatest influence on hurricane strength, and why?

2. Human Impact — Evaluating Preparedness

What do you think is the most important step people should take when preparing for a hurricane? What evidence supports your choice?

3. Cause and Effect — Climate Change Connection

How might warmer oceans change future hurricanes?

4. Cross-Cultural Understanding — Names and Geography

Why do you think it's important for scientists around the world to understand each other's terminology?

5. Data Interpretation — Satellite Imagery

What advantages do satellites provide that ground-based tools cannot?

6. Ethical Decision-Making — Evacuation Choices

What factors would you consider before recommending evacuation for a coastal city?

7. Engineering and Technology — Improving Forecasting

If you could design a new tool or technology to help meteorologists predict hurricanes more accurately, what would it be and how would it work?

8. Language and Science — Idioms in STEM

Why is it important for scientists and communicators to use clear language when explaining severe weather to the public?

9. Real-World Application — Community Safety

What local features might make hurricanes more or less dangerous where you live?

10. Reflection — Personal Responsibility

What is one thing YOU would do differently if a hurricane were approaching? Why?

Guided Notes Answer Key

SECTION 1

1. atmosphere
2. satellites
3. weather
4. climate
5. prediction

SECTION 2

6. jet stream
7. pressure
8. global patterns

SECTION 3

9. warm water
10. evaporation
11. convection
12. rotation
13. Coriolis effect
14. water cycle

SECTION 4

15. eye
16. eyewall
17. rainbands
18. cyclonic

SECTION 5

19. hurricane
20. typhoon
21. cyclone
22. tradition

SECTION 6

23. Saffir–Simpson Scale
24. Category
25. storm surge
26. wind
27. flooding

SECTION 7

28. evacuation plans
29. hurricanes
30. climate

Curriculum Alignment Page

Spacegate Station – Season 6, Episode 27:

Grade Band: Middle School (6–8)

Focus Areas: Weather, Climate, Global Patterns, Energy Transfer, Natural Hazards

Episode Length: 20 minutes

Instructional Purpose: Enrichment, remediation, and core science instruction

Learning Objectives

After viewing this episode, students will be able to:

- Explain the difference between **weather** and **climate**.
 - Describe how **global wind patterns**, including the **jet stream**, influence storm movement.
 - Identify the conditions required for **hurricane formation**.
 - Describe the **structure** of a hurricane (eye, eyewall, rainbands).
 - Explain how **energy from the Sun** drives convection and fuels severe weather.
 - Interpret satellite imagery and understand how meteorologists use **space-based data**.
 - Classify hurricanes using the **Saffir–Simpson Hurricane Wind Scale**.
 - Evaluate how natural disasters impact humans and how communities prepare for them.
-

NGSS Alignment (Middle School)

MS-ESS2-4-Develop a model to describe the cycling of water through Earth’s systems driven by energy from the Sun and gravity.

Episode Connection: Evaporation, rising humid air, convection, water cycle.

MS-ESS2-5 -Collect data to provide evidence for how air mass interactions result in weather conditions.

Episode Connection: Warm/cold air interactions, storm intensification, cloud formation.

MS-ESS2-6-Develop and use a model to describe how unequal heating and Earth’s rotation cause atmospheric and oceanic circulation patterns.

Episode Connection: Jet stream, Coriolis effect, global storm movement.

MS-ESS3-2 - Analyze and interpret data on natural hazards to forecast future events and inform technologies to mitigate their effects.

Episode Connection: Hurricane categories, storm surge, forecasting, evacuation planning.

Science & Engineering Practices (SEPs)

- Analyzing satellite data
- Using models (storm structure, convection)
- Constructing explanations
- Engaging in argument from evidence

Florida B.E.S.T. Science Standards Alignment

SC.6.E.7.3- Describe how global patterns such as the jet stream and ocean currents influence local weather.

Episode Connection: Jet stream explanation and storm steering.

SC.6.E.7.4- Differentiate between weather and climate.

Episode Connection: Aurora's explanation of weather vs. climate.

SC.6.E.7.5- Explain how energy from the Sun drives convection within the atmosphere and oceans.

Episode Connection: Warm water, evaporation, convection currents.

SC.6.E.7.6- Differentiate between radiation, conduction, and convection.

Episode Connection: Convection explicitly; radiation implied via solar heating.

SC.6.E.7.7 - Investigate how natural disasters impact humans and how humans prepare for and respond to these events.

Episode Connection: Hurricane impacts, storm surge, evacuation, meteorologist role.

SC.7.E.7.2 - Analyze the causes of weather patterns and climate, including the role of the Sun's energy, Earth's rotation, and the water cycle.

Episode Connection: Coriolis effect, Sun's energy, evaporation, convection.

SC.7.E.7.3- Relate the formation of severe weather events (hurricanes, tornadoes) to global weather patterns.

Episode Connection: Hurricane formation, global naming conventions, cyclonic activity.