



MOVEMENT OF THE EARTH

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INTRODUCTION



1 Many people have wondered what it would be like to visit space. Someday, this dream may come true for all of us. Until then, much can be learned about the objects that are seen in the sky.

2 A planet is a large, round-shaped object that orbits the sun in patterns. Earth is the planet which supports human, animal, and plant life. As Earth travels around the sun, the moon orbits Earth.

3 Earth is the third planet from the sun. There are two planets closer to the sun and other planets are farther away. Some people call Earth the “Goldilocks” planet because of its distance from the sun. It is not too hot or too cold but is just right to support life.

THE SUN

4 There are billions and billions of stars in the sky. The closest star to Earth is the sun, which is the daytime star. The sun is the largest and most important object in the Earth's solar system. The sun is so large that Earth could fit in it a million times!

5 The sun is really a big globe of hot gas. It is almost 10,000 degrees at the surface. To illustrate how hot that is, think of how warm it is in summer on Earth. Some parts of Earth never even reach 100 degrees.

6 Earth would be very different without the sun. There would be no life. Plants and animals, for example, need light and heat from the sun to live and grow.

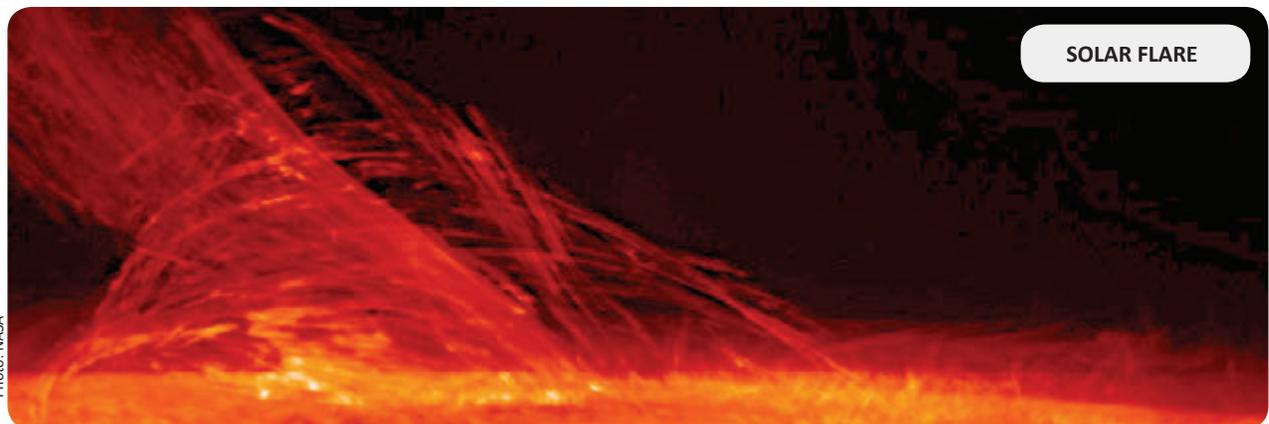
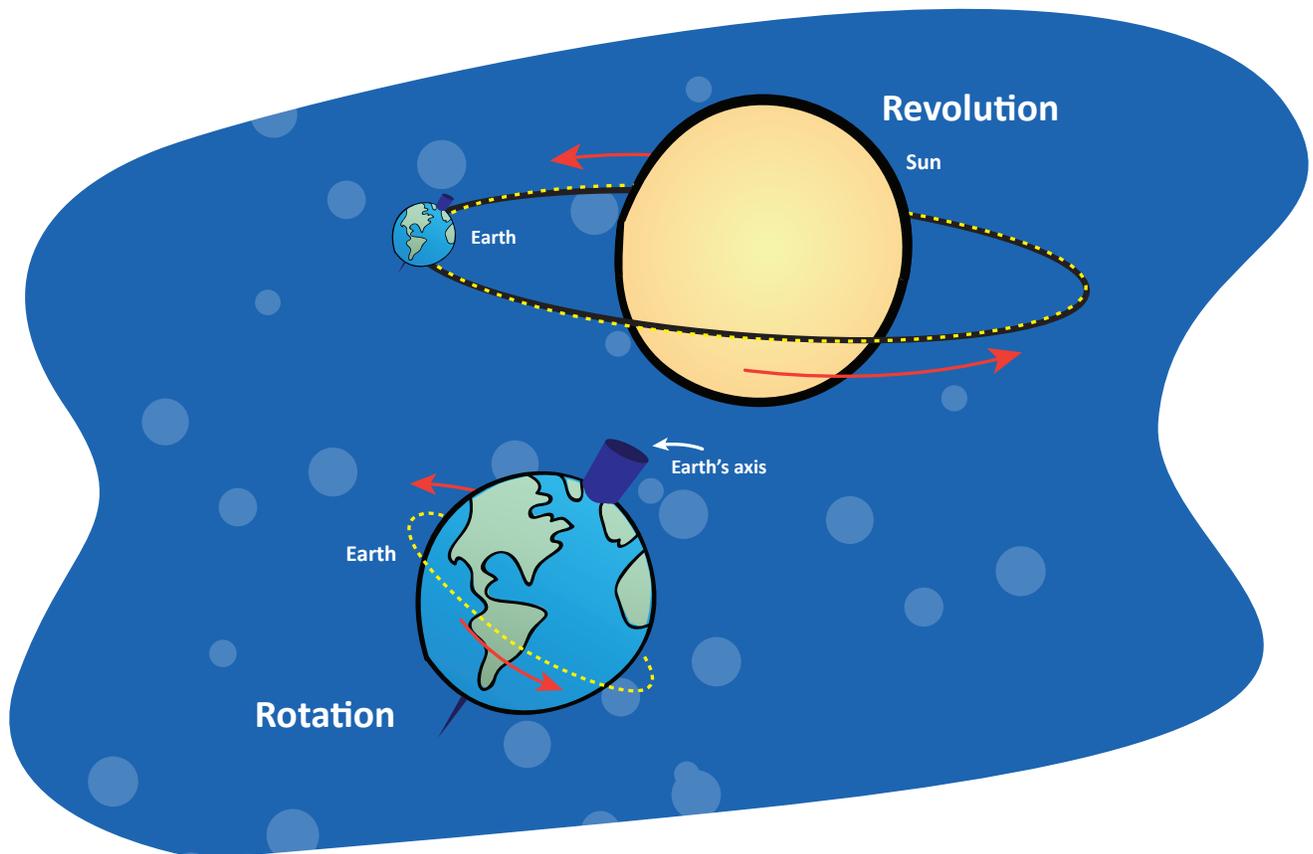


Photo: NASA

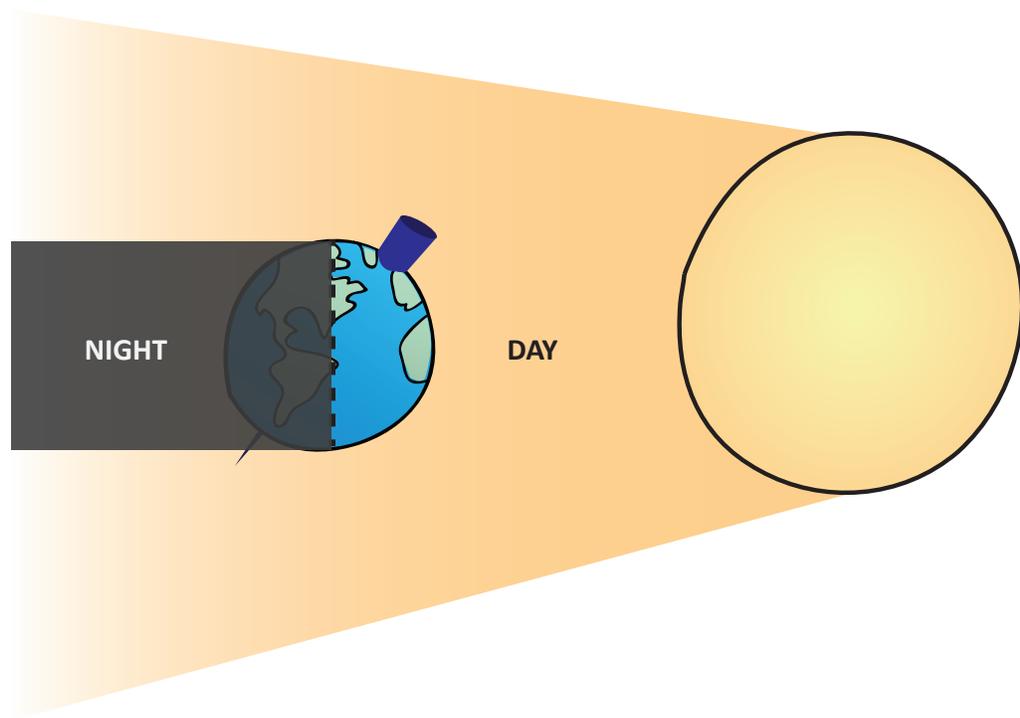
REVOLUTION AND ROTATION

7 Earth revolves around the sun. It makes one complete revolution each year. This movement is not detected but is seen in the change of seasons. Other objects in space, such as other planets, also revolve and rotate. Some move faster than Earth.

8 Earth rotates daily, but people probably never notice it. It spins completely around on an axis in 24 hours. This is one day. An axis is an imaginary line that runs through the center of Earth. A spinning top shows how the Earth's axis works. It slants to one side. Earth rotates this way also.

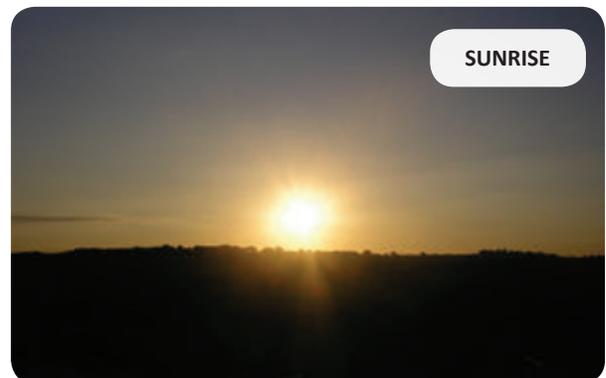


DAY AND NIGHT



9 The Earth and the Sun work together to create day and night. When part of Earth faces the Sun, it is daylight and the Earth is heated. The other side of Earth is colder and in the dark. As the Earth rotates, the part facing the sun turns away from it and it becomes night. It takes 24 hours for Earth to rotate once. Each day this pattern is repeated, moving from day to night and back to day.

10 The sun does not move. It seems to move across the sky starting in the east in the morning, moving toward the south at noon, and then toward the west as the day ends. It is the Earth turning that makes it seem as though the sun is moving.



SEASONS

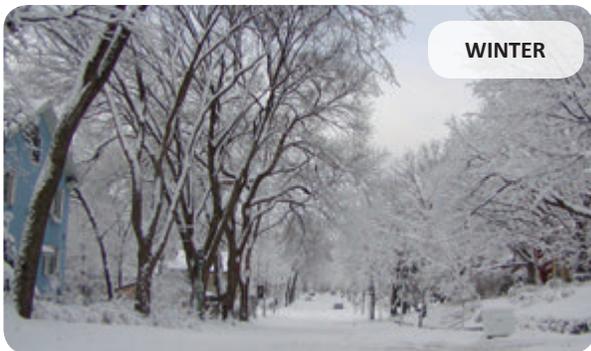
11 At different times of the year, the Earth's tilt and movement around the sun cause seasons. The seasons are fall, winter, spring, and summer. The seasons vary because of the closeness of the sun and Earth.

12 For example, when the northern part of Earth is tilted toward the sun, it is summer there. The southern part of the planet, tilted

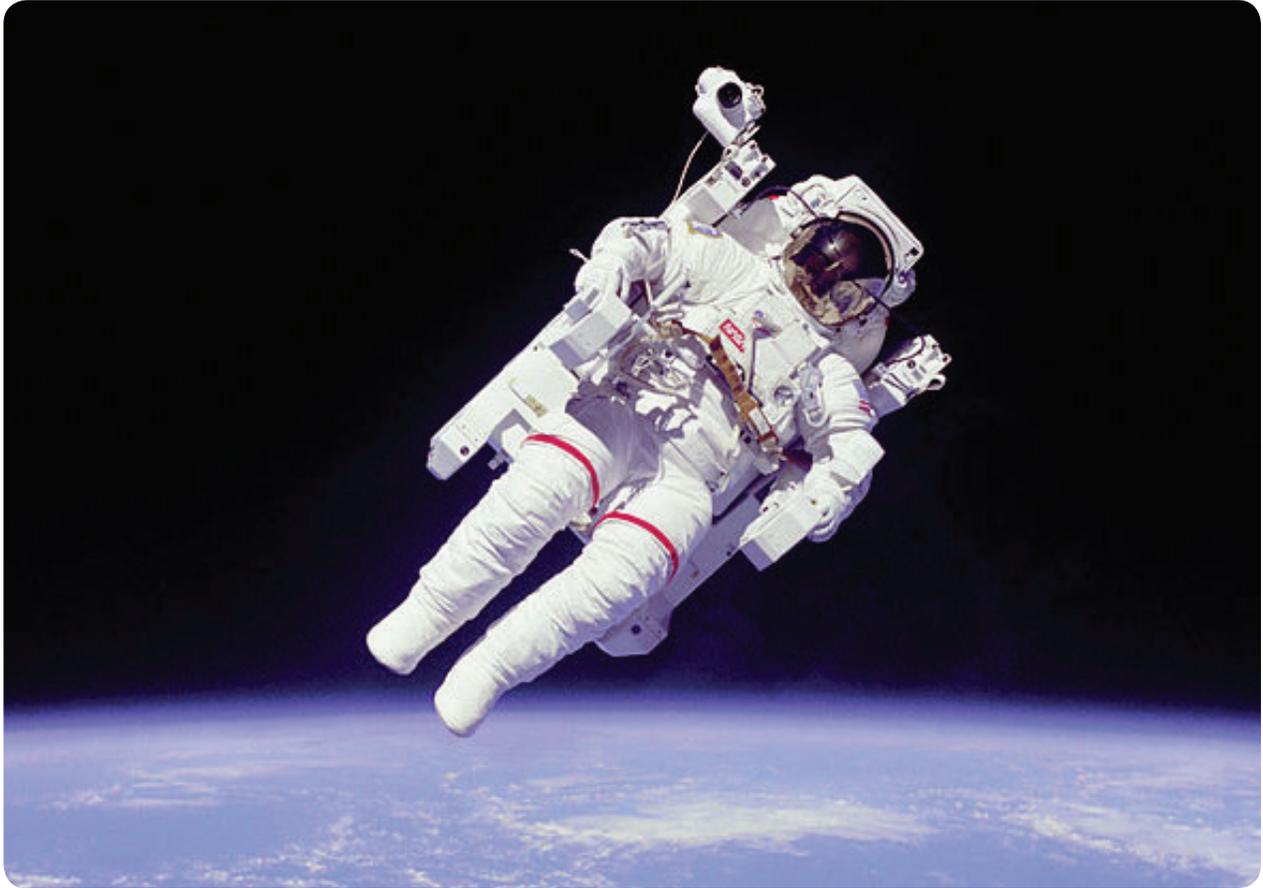
away from the sun, would be in winter. Summer and winter are opposite seasons. When it's winter in one-half of the world, it is summer in the other half.

The seasons affect many decisions, such as which clothes need to be worn or what activities can take place outside. Those decisions depend on Earth's movement.

13



THE POWER OF THE EARTH



Astronauts float in space because they are so far from the Earth's gravitational pull.

14 Earth has its own magnetic force that pulls everything toward the ground. This force is called gravity. People standing on the earth do not feel gravity. It keeps them from flying off into space.

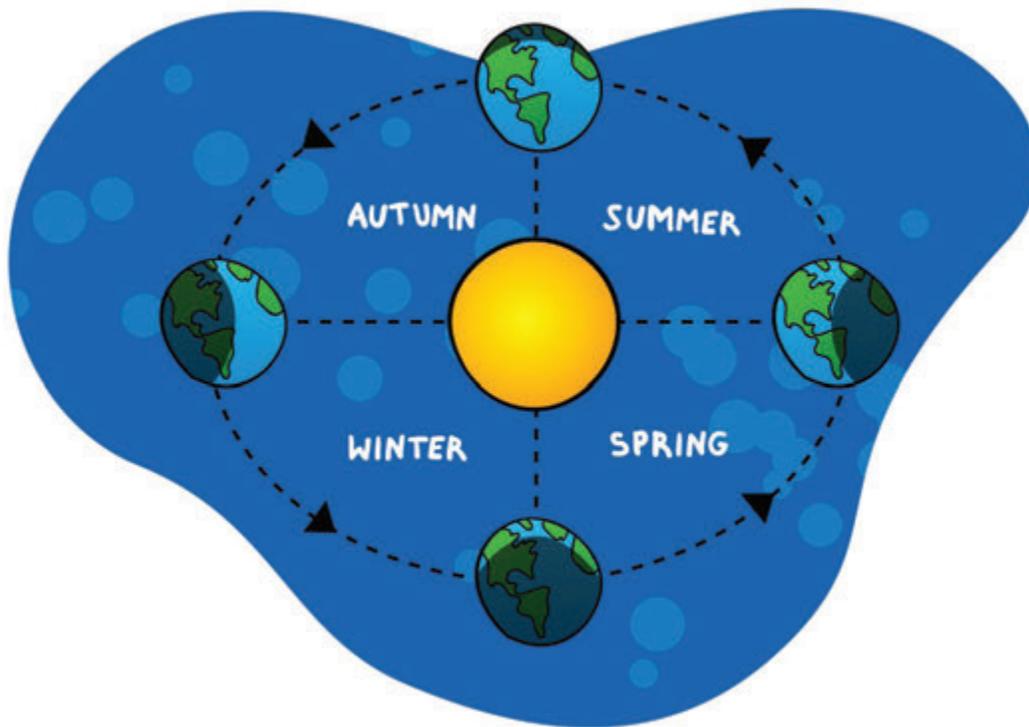
15 Gravity can be observed. A baseball is hit into the air. The baseball does

not keep going higher and higher. Soon, it starts to fall to the ground. An apple falls from a tree. The force of gravity pulls it to the ground.

The Earth's gravity also pulls objects in space towards it. The moon revolves around the Earth. Gravity keeps it in a fixed orbit.

16

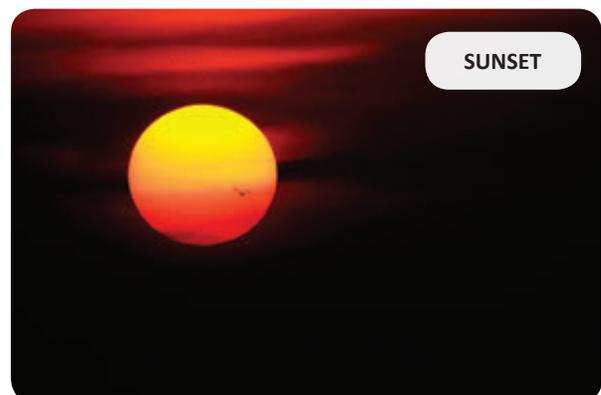
CONCLUSION



17 The sun is at the center of Earth's solar system and is the closest star to Earth. Its pull keeps the Earth in orbit around it. Earth is just the right distance from the sun to support life.

18 However, Earth does not just stay in one place. Earth rotates and revolves. This movement affects

many things. Even though Earth's movement is not felt, it causes day and night and spring, summer, fall, and winter. These are based on the movement of Earth.



(A fictional diary of a space station resident.)

VOICES

January 17, 2030

I live life in the vast blackness of space.

I have been floating in the International Space Station for one year now. I have witnessed many of the magnificent forces that allow for life on earth.

The space station circles the Earth every 92 minutes. I see the burning ball of fire that gives earth light. The sun rises and sets here on the station about 15 times every 24 hours. Yet I never get tired of how beautiful the Earth is.

I see all the layers of the Earth's atmosphere light up and fade within seconds. I see the bright lights of Earth's cities at night. I see clouds casting shadows over the land and sea during the day.

And the moon! How incredible is its grace and grandeur: Always orbiting our planet.

From here, I appreciate the precision and harmony of the movements of the Earth. What amazing good fortune to be a part of the miracle of a solar system such as ours.



Photo: NASA

19

20

21

22

23

24

Additional Source

Directions: Carefully read the passage below.

The Earth and the Sun

by Marion Johns



If there was no sun, there would be no life on Earth. The energy from the sun heats up Earth. Earth's atmosphere traps this energy as heat. Therefore, the planet is kept at comfortable temperatures. Also, the **gravitational** force of the sun keeps Earth in orbit around the sun. But, what would happen if there was no sun? What would happen to life on Earth?

The entire planet would stay warm for a few million years. However, life on the surface would feel the cold almost immediately. In fact, within a week, the average surface temperature could fall to below 0° F. Then, in a year, it could drop to -100° F. The top layers of the oceans would freeze.

Some very small life forms living in the crust might survive. However, the process of photosynthesis would come to a halt. Without light, most plants would soon die. Therefore, most animal life would follow.

Close Reading Check

TC  12

Directions: Use the passage on the facing page to answer the questions below.

1. Find the word **gravitational** in paragraph 1. In the space provided, write your meaning of the word. Then, identify the strategy you used to determine the meaning. Finally, explain how this strategy was helpful to you.

WoPh
WM  3

2. Determine the main idea of each paragraph.

MI  3

P1

P2

P3

3. Summarize this passage in 25 words or less.

Sum  3

4. After reading paragraph 3, what inference can be made about animal life? Cite and quote evidence from the text to support your answer. Underline the evidence in the text.

DT  3

WRITING PROMPT

Your class finished a study of the solar system. As a final project, your teacher has asked you to write an informational paper about the link between the sun and the earth. Your paper will be read by your teacher.

Using more than one source, develop a main idea about the link between the sun and the earth. Choose the most important information from the sources to support your main idea. Then, write an informational paper several paragraphs long. Organize and support your main idea with details from the sources. Use your own words except when quoting directly from the sources. Cite the source title when using details from the sources.



R.A.F.T. Table

ROLE

AUDIENCE

FORMAT

TOPIC

I am _____ . I am writing _____ for
role *format*

_____ about _____ .
audience *topic*

MULTI-PARAGRAPH Graphic Organizer



INTRODUCTION (MAIN IDEA Sentence)

1st

SUPPORTING Detail

CITE SOURCE

Title

Page # _____

Paragraph # _____

2nd

SUPPORTING Detail

CITE SOURCE

Title

Page # _____

Paragraph # _____

3rd

SUPPORTING Detail

CITE SOURCE

Title

Page # _____

Paragraph # _____

CONCLUSION

INTRODUCTION



PLAN IT!

OPENING TYPES	SNAPPY! Opening Examples
SF STATEMENT / FACT	It was August 28, 1963 when Dr. Martin Luther King Jr. gave a powerful speech to nearly 250 thousand people in Washington, D.C.
? QUESTION	Is it fair that one group of people is treated fairly and another group of people is treated unfairly?
Q QUOTE	"I have a dream."
A ANECDOTE	It was a hot and humid day in late summer. I sat on the shoulders of my father looking out over a huge crowd of nearly 250 thousand people.



SNAPPY! Opening



LINKING Sentences



MAIN IDEA Sentence

BODY



PLAN IT!

1st

SUPPORTING Detail



ELABORATE



QUOTE or PARAPHRASE a detail from a source

CITE SOURCE

Title

Page # _____

Paragraph # _____

TRANSITIONS Table

1

In the first place
To begin with
First
For example
As an illustration

2

The author states
The text says
The author says
According to _____ *author* _____,

BODY



PLAN IT!

2nd SUPPORTING Detail



ELABORATE



QUOTE or PARAPHRASE a detail from a source

CITE SOURCE

<hr/> <hr/> <hr/>	Title <hr/> <hr/> Page # _____ Paragraph # _____
-------------------	---

TRANSITIONS Table

- | | | |
|---|--|--|
| 1 | Second
Another
Additionally
In addition | Further
Furthermore
Similarly
Later |
|---|--|--|

- | | |
|---|---|
| 2 | The author states
The text says
The author says
According to <i>author</i> , |
|---|---|

BODY



PLAN IT!

3rd

SUPPORTING Detail



ELABORATE



QUOTE or PARAPHRASE a detail from a source

CITE SOURCE

<hr/> <hr/> <hr/>	Title
	<hr/> <hr/>
	Page # _____ Paragraph # _____

TRANSITIONS Table

- | | |
|--|---|
| 1 Finally
Last
Third
A final example | In the same way
Along with
Of note
On the other hand |
|--|---|

- | |
|--|
| 2 The author states
The text says
The author says
According to <u>author</u> , |
|--|

CONCLUSION



PLAN IT!

CLOSING TYPES	SNAPPY Closing Examples
? WONDER / QUESTION	I wonder what Martin Luther King would think of America today?
M MESSAGE / MORAL	Peaceful protests can lead to change.
PS POWERFUL STATEMENT	He will long be remembered for his peaceful efforts to make change.
CC CLEVER CONNECTION	The dream lives on!



Restate the MAIN IDEA



SUMMARIZE the Supporting Details



SNAPPY! Closing

TRANSITIONS Table

1	In closing	In conclusion	2	As stated,	As discussed,
	To conclude	In brief		As noted,	In other words,
	In summary	To sum up		As shown above,	Therefore,
	To summarize				



READ IT!



CHECK IT!

CHECK GENRE

- INFORMATIONAL
- OPINION
- NARRATIVE

I

INTRODUCTION

B

BODY

C

CONCLUSION

RUBRIC

PURPOSE & ORGANIZATION	States a clear main idea, stays on topic	
	Is well-organized	
	Has an introduction and conclusion	
	Uses appropriate transitions	
SUBTOTAL		4
EVIDENCE & ELABORATION	Quotes or paraphrases from sources to support the main idea and supporting details	
	Elaborates the main idea and supporting details with examples, personal experiences, or details from the text	
	Develops ideas clearly using appropriate vocabulary (uses vocabulary from sources)	
	Style is appropriate for the format and audience (formal and academic)	
SUBTOTAL		4
CONVENTIONS	Uses proper spelling, punctuation, and capitalization	
	Uses correct grammar and sentence formation	
SUBTOTAL		2
TOTAL SCORE		10









5



6



7



8



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Winrich, R. *The sun*.

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Page 5

The Sun

<http://static.tumblr.com/2lapqsn/wVKmw0vjf/sun0419.png>

Sun Solar Flare, PD-USGOV-NASA.

http://commons.wikimedia.org/wiki/File:171879main_LimbFlareJan12_lg.jpg

Page 7

Sunset over Leek by Saperuad, PD

http://commons.wikimedia.org/wiki/File:Sunset_over_Leek.jpg

Page 8

Winter in St. Paul by William Wesen, Public Domain

http://commons.wikimedia.org/wiki/File:Winter_in_St._Paul.jpg

Autrans summer by Mfspecht, PD

http://commons.wikimedia.org/wiki/File:Autrans_summer.jpg

Nectarine Orchard by Liz West, CC BY 2.0

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Hapgood Pond by U.S. Department of Agriculture, CC BY 2.0

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Page 9

Views of the extravehicular activity during STS 41-B [photograph]. NASA

<http://commons.wikimedia.org/wiki/File:Astronaut-EVA.jpg>

Page 10

Flying Into the Sun by Vinoth Chandar

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